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

METHOXY PROPANOL (MP)

Version 2.1 Print Date 10.05.2023

Revision date / valid from 03.02.2023

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

1.1. Product identifier

Trade name	:	METHOXY PROPANOL (MP)
Substance name	:	2-methoxypropanol
Index-No.	:	603-064-00-3
CAS-No.	:	107-98-2
EC-No.	:	203-539-1
EU REACH-Reg. No.	:	01-2119457435-35-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

1.3. Details of the supplier of the safety data sheet

Company	:	BRENNTAG S.A. Avenue du Progrès 90 FR 69680 CHASSIEU
Telephone	:	+33(0)4.72.22.16.00
Telefax	:	+33(0)4.72.79.53.74
E-mail address	:	securite-produits@brenntag.fr
Responsible/issuing person	:	Direction HSE

1.4. Emergency telephone number

Emergency telephone number	:	Emergency phone number BRENNTAG SA Available 24h/7d 0800 07 42 28 from within France +33 800 07 42 28 international Poison Control Centers in France (Service ORFILA by the INRS) Available 24h/7d Information limited to intoxications 01 45 42 59 59 from within France +33 1 45 42 59 59 international

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 3	---	H226
Specific target organ toxicity - single exposure	Category 3	Central nervous system	H336

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 : Warning

Hazard statements :

H226	Flammable liquid and vapour.
H336	May cause drowsiness or dizziness.

Precautionary statements

Prevention :

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

Response :

P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel

			unwell.
		P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
Storage	:	P403 + P233	Store in a well-ventilated place. Keep container tightly closed.

Hazardous components which must be listed on the label:

- 1-methoxy-2-propanol

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.

If heated above flash point, the vapours may form an explosive mixture with air. Possible formation of peroxide.

SECTION 3: Composition/information on ingredients

3.1. Substances

Hazardous components	Amount [%]	Classification (REGULATION (EC) No 1272/2008)	
		Hazard class / Hazard category	Hazard statements
1-methoxy-2-propanol			
Index-No. : 603-064-00-3 CAS-No. : 107-98-2 EC-No. : 203-539-1 EU REACH-Reg. No. : 01-2119457435-35-xxxx	>= 99,5	Flam. Liq.3 STOT SE3	H226 H336
2-methoxypropanol			
Index-No. : 603-106-00-0 CAS-No. : 1589-47-5 EC-No. : 216-455-5	> 0,1 - < 0,3	Flam. Liq.3 Repr.1B STOT SE3 Skin Irrit.2 Eye Dam.1	H226 H360D H335 H315 H318

Remarks	:	2-methoxy propanol is considered as an impurity of 1-methoxy propanol and is therefore included in the same REACH registration dossier.

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	: Take off all contaminated clothing immediately.
If inhaled	: Remove to fresh air. If symptoms persist, call a physician.
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 thoroughly with plenty of water, also under the eyelids. If eye irritation persists, consult a specialist.
If swallowed	: Rinse mouth with water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. If a person vomits when lying on his back, place him in the recovery position. 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 may provoke the following symptoms: Central nervous system depression, Dizziness, Drowsiness, Headache, Nausea
Effects	: 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.

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.
Hazardous combustion products	:	Carbon monoxide, Carbon dioxide (CO2)

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.Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions	:	Keep away from heat and sources of ignition. Keep away unprotected persons. Use personal protective equipment. Ensure 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.

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).
Further information	:	Treat recovered material as described in the section "Disposal considerations".

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.
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 oxidizing agents. Do not store together with oxidizing and self-igniting products. Keep away from food, drink and animal feedingstuffs.
Suitable packaging materials	:	Stainless steel
Unsuitable packaging materials	:	, Aluminium, copper, Iron, natural rubber, Butyl rubber, Nitrile rubber.

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:	**1-methoxy-2-propanol**	**CAS-No. 107-98-2**

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

DNEL
Workers, Acute - local effects, Inhalation : 553,5 mg/m3

DNEL

Workers, Long-term - systemic effects, Skin contact	:	50,6 mg/kg bw/day
DNEL Workers, Long-term - systemic effects, Inhalation	:	369 mg/m3
DNEL Consumers, Long-term - systemic effects, Skin contact	:	18,1 mg/kg bw/day
DNEL Consumers, Long-term - systemic effects, Inhalation	:	43,9 mg/m3
DNEL Consumers, Long-term - systemic effects, Ingestion	:	3,3 mg/kg bw/day

Predicted No Effect Concentration (PNEC)

Fresh water	:	10 mg/l
Marine water	:	1 mg/l
Intermittent releases	:	100 mg/l
Sewage treatment plant (STP)	:	100 mg/l
Fresh water sediment	:	52,3 mg/kg d.w.
Marine sediment	:	5,2 mg/kg d.w.
Soil	:	4,59 mg/kg 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, Short Term Exposure Limit (STEL):
150 ppm, 568 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, Time Weighted Average (TWA):
100 ppm, 375 mg/m3
Indicative

France. Threshold Limit Values (VLEP) for Occupational Exposure to Chemicals in France, INRS ED 984, as amended, French Time Weighted Average (VME):
50 ppm, 188 mg/m3
Regulatory binding (VRC)

France. Threshold Limit Values (VLEP) for Occupational Exposure to Chemicals in France, INRS ED 984, as amended, Skin designation:
Can be absorbed through the skin.

France. Threshold Limit Values (VLEP) for Occupational Exposure to Chemicals in France, INRS ED 984, as amended, French Short Term Limit (VLE):
100 ppm, 375 mg/m3, (15 minutes)
Regulatory binding (VRC)

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 insufficient ventilation, wear suitable respiratory equipment. Respiratory protection complying with EN 141. Recommended Filter type:A In case of dust or aerosol formation: use respiratory protection with approved filter (P2)

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	:	butyl-rubber
Break through time	:	8 h
Glove thickness	:	0,5 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.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Form	:	liquid
Physical state	:	liquid
Colour	:	colourless
Odour	:	mild, alcohol-like
Odour Threshold	:	No data available
Melting point/range	:	-95 °C
Boiling point/boiling range	:	119 - 122 °C
Flammability (solid, gas)	:	Product is a liquid, see section 9.2.
Upper explosion limit / Upper flammability limit	:	13,7 %(V)
Lower explosion limit / Lower flammability limit	:	1,5 %(V)
Flash point	:	30 °C Method: DIN 51755
Auto-ignition temperature	:	270 °C Method: DIN 51794
Decomposition temperature	:	No data available
Self-Accelerating decomposition temperature (SADT)	:	No data available
pH	:	Not applicable
Viscosity		
Viscosity, dynamic	:	1,91 mPa.s (20 °C)
Viscosity, kinematic	:	1,86 mm2/s (25 °C)
Flow time	:	No data available
Solubility(ies)		
Water solubility	:	(20 °C) completely miscible
Solubility in other solvents	:	No data available
Dissolution Rate	:	No data available
Partition coefficient: n-octanol/water	:	log Pow: -0,437
Dispersion Stability	:	No data available

Vapour pressure	:	13,3 hPa (20 °C)
Relative density	:	No data available
Density	:	0,92 g/cm3 (20 °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.
Flammability (liquids)	:	Flammable liquid and vapour.
Evaporation rate	:	0,75

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 : Reacts with air to form peroxides. Formation of explosive air/vapour mixtures is possible.

10.4. Conditions to avoid

Conditions to avoid : Heat, flames and sparks.

10.5. Incompatible materials

Materials to avoid : Strong oxidizing agents, Acid anhydrides, Air, Oxygen, Avoid moisture. Strong acids and strong bases

10.6. Hazardous decomposition products

Hazardous decomposition products : Under fire conditions: Carbon oxides

SECTION 11: Toxicological information

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

Data for the product

Further information

Other relevant toxicity information	:	Handle in accordance with good industrial hygiene and safety practice.
Experience with human exposure	:	Health injuries are not known or expected under normal use.,

Component:	**1-methoxy-2-propanol**	**CAS-No. 107-98-2**

Acute toxicity

Oral

LD50	:	4016 mg/kg (Rat, male and female) (Directive 67/548/EEC, Annex V, B.1.)Ingestion may cause central nervous system depression.

Inhalation

LC50	:	> 25,8 mg/l (Rat; 6 h; vapour)

Dermal

LD50	:	> 2000 mg/kg (Rabbit)

Irritation

Skin

Result	:	No skin irritation (Rabbit; 4 h) (Directive 67/548/EEC, Annex V, B.4.)

Eyes

Result	:	No eye irritation (Rabbit) (Directive 67/548/EEC, Annex V, B.5.)

Sensitisation

Result	:	not sensitizing (Guinea pig) (Directive 67/548/EEC, Annex V, B.6.)

CMR effects

CMR Properties

Carcinogenicity	:	Did not show carcinogenic effects in animal experiments.
Mutagenicity	:	In vitro tests did not show mutagenic effects Did not show mutagenic effects in animal experiments.
Teratogenicity	:	Did not show teratogenic effects in animal experiments. Causes developmental effects in animals at high, maternally toxic doses.

Reproductive toxicity	:	In animal testing, risk of impaired fertility was shown only after administration of very high doses of this substance.

Specific Target Organ Toxicity		
Single exposure		
Inhalation	:	Target Organs: Central nervous systemMay cause drowsiness or dizziness.
Repeated exposure		
Remarks	:	The substance or mixture is not classified as specific target organ toxicant, repeated exposure.
Other toxic properties		
Aspiration hazard		
		No aspiration toxicity classification,

11.2. Information on other hazards

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

Component:	1-methoxy-2-propanol	CAS-No. 107-98-2
Endocrine disrupting properties		
Assessment	:	No information available about endocrine disruption properties for human health.

SECTION 12: Ecological information

12.1. Toxicity

Component:	1-methoxy-2-propanol	CAS-No. 107-98-2
Acute toxicity		
Fish		
LC50	:	6.812 mg/l (Leuciscus idus (Golden orfe); 96 h) (static test; DIN 38412)
LC50		20.800 mg/l (Pimephales promelas (fathead minnow); 96 h) (static test; ASTM)

LC50		>= 1.000 mg/l (Oncorhynchus mykiss (rainbow trout); 96 h) (semi-static test; OECD Test Guideline 203)

Toxicity to daphnia and other aquatic invertebrates		
LC50	:	21.100 - 25.900 mg/l (Daphnia magna (Water flea); 48 h) (static test)

algae		
ErC50	:	> 1000 mg/l (Pseudokirchneriella subcapitata (microalgae); 7 d) (static test; End point: Growth rate)

Bacteria		
IC50	:	1000 mg/l (activated sludge; 3 h) (static test; OECD Test Guideline 209)

12.2. Persistence and degradability

Component:	**1-methoxy-2-propanol**	**CAS-No. 107-98-2**
Persistence and degradability		
Persistence		
Result	:	No data available
Biodegradability		
Result	:	96 % (Related to: Dissolved organic carbon (DOC); Exposure Time: 28 d)(OECD Test Guideline 301E)Readily biodegradable.The 10 day time window criterion is fulfilled.

12.3. Bioaccumulative potential

Component:	**1-methoxy-2-propanol**	**CAS-No. 107-98-2**
Bioaccumulation		
Result	:	log Kow 0,37
	:	BCF: < 100; The product has low potential bioaccumulation.

12.4. Mobility in soil

Component:	1-methoxy-2-propanol	CAS-No. 107-98-2

Mobility

Soil	:	Highly mobile in soils
Water	:	The product is insoluble in water.

Distribution among environmental compartments

Adsorption/Soil,	:	Koc: 0,2 - 1,0, (estimated)

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.

Component:	1-methoxy-2-propanol	CAS-No. 107-98-2

Results of PBT and vPvB assessment

Result	:	This substance is not considered to be persistent, bioaccumulating nor toxic (PBT)., This substance is not considered to be very persistent and very bioaccumulating (vPvB).

12.6. Endocrine disrupting properties

Data for the product

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

Component:	1-methoxy-2-propanol	CAS-No. 107-98-2

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

12.7. Other adverse effects

Component:	1-methoxy-2-propanol	CAS-No. 107-98-2

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 according to the European Waste Catalogue can be assigned for this product, as the intended use dictates the assignment. The waste code is established in consultation with the regional waste disposer.

SECTION 14: Transport information

14.1. UN number or ID number

3092

14.2. UN proper shipping name

ADR : 1-METHOXY-2-PROPANOL
RID : 1-METHOXY-2-PROPANOL
IMDG : 1-METHOXY-2-PROPANOL

14.3. Transport hazard class(es)

ADR-Class	: 3
(Labels; Classification Code; Hazard Identification Number; Tunnel restriction code)	3; F1; 30; (D/E)
RID-Class	: 3
(Labels; Classification Code; Hazard Identification Number)	3; F1; 30
IMDG-Class	: 3
(Labels; EmS)	3; F-E, S-D

14.4. Packaging group

ADR : III
RID : III
IMDG : III

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

EU. REACH, Annex XVII, Marketing and Use Restrictions (Regulation 1907/2006/EC)	:	, 3; Listed
Nomenclature of classified installations (ICPE) - Directive Seveso III	:	4331 Flammable liquid, Hazard category 2 or 3

Component: 1-methoxy-2-propanol CAS-No. 107-98-2

EU. Chemicals Subject to PIC Procedure: Regulation 649/2012/EU on export and import of dangerous chemicals, as amended	:	; Not listed
EU. REACH, Annex XVII, Marketing and Use Restrictions (Regulation 1907/2006/EC)	:	, 3; 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.

France. INRS, Maladies Professionelles, Table of Work-Related Illnesses	:	Table: 84; Listed

Notification status
1-methoxy-2-propanol:

Regulatory List	Notification	Notification number
AICS	YES	
DSL	YES	
EINECS	YES	203-539-1
ENCS (JP)	YES	(2)-404
ENCS (JP)	YES	(7)-97
IECSC	YES	
INSQ	YES	
ISHL (JP)	YES	(2)-404
ISHL (JP)	YES	(7)-97
JEX (JP)	YES	(2)-404
KECI (KR)	YES	KE-23379
NZIOC	YES	HSR001187
ONT INV	YES	
PICCS (PH)	YES	
TCSI	YES	
TH INV	YES	55-1-00486
TH INV	YES	2909.49
TSCA	YES	
VN INVL	YES	

Component:	**2-methoxypropanol**	**CAS-No. 1589-47-5**

EU. REACH, Annex XVII, Appendix 6, Entry 30 - Toxic to reproduction: Category 1B (Table 3). (Regulation 1907/2006/EC)	:	, 216-455-5; Reproductive toxicity; Category 1B
EU. REACH, Annex XVII, Marketing and Use Restrictions (Regulation 1907/2006/EC)		Point Nos.: , 30; Listed
EU. Cosmetics Directive 76/768/EEC - Annex II	:	Reference number: 668; 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.
France. INRS, Maladies Professionelles, Table of Work-Related Illnesses	:	Table: 84; Listed

Notification status
2-methoxypropanol:

Regulatory List	Notification	Notification number
AICS	YES	
DSL	YES	
EINECS	YES	216-455-5
ENCS (JP)	YES	(7)-97
IECSC	YES	
ISHL (JP)	YES	(7)-97
KECI (KR)	YES	KE-23378
NZIOC	YES	
PICCS (PH)	YES	
TCSI	YES	
TH INV	YES	55-1-02108
TH INV	YES	2909.49
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.

H226	Flammable liquid and vapour.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.

H360D	May damage the unborn child.

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
STOT	specific target organ toxicity
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
vPvB	very persistent and very bioaccumulative

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 AuthApC. 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	ES540
2	Use as an intermediate	NA	3	NA	NA	1, 2, 3, 4, 8a, 8b, 15	6a	NA	ES554
3	Formulation & (re)packing of substances and mixtures	NA	3	10	NA	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15	2	NA	ES582
4	Use in coatings, solvent based process	NA	3	NA	NA	1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 14, 15	4	NA	ES608
5	Use in coatings, solvent based process	NA	21	NA	9a	NA	8a, 8d	NA	ES620
6	Use in coatings, solvent based process	NA	22	NA	NA	1, 2, 3, 4, 5, 8a, 8b, 10, 11, 13, 15, 19	8a, 8d	NA	ES623
7	Use in coatings, water based process	NA	3	NA	NA	1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 14, 15	4	NA	ES621
8	Use in coatings, water based process	NA	21	NA	9a	NA	8a, 8d	NA	ES654
9	Use in coatings, water based process	NA	22	NA	NA	1, 2, 3, 4, 5, 8a, 8b, 10, 11, 13, 15, 19	8a, 8d	NA	ES625
10	Use in cleaning agents	NA	3	NA	NA	1, 2, 3, 4, 7, 8a, 8b, 10, 13	4	NA	ES639
11	Use in cleaning agents	NA	21	NA	35	NA	8a, 8d	NA	ES651
12	Use in cleaning agents	NA	22	NA	NA	1, 2, 3, 4, 8a, 8b, 10, 11, 13	8a, 8d	NA	ES644
13	Use in agrochemicals	NA	22	NA	NA	1, 2, 4, 8a, 8b, 11, 13	8d	NA	ES539
14	Use in de-icing and anti-icing applications	NA	21	NA	4	NA	8d	NA	ES661
15	Use in cosmetics	NA	21	NA	39	NA	8a	NA	ES4083

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 the substance or use as a process chemical or extraction agent. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities.

2.1 Contributing scenario controlling environmental exposure for: ERC1		
Substance is a unique structure, Readily biodegradable.		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
Amount used	Amounts used in the EU (tonnes/year)	200000 tonnes
	Fraction of EU tonnage used in region:	1
	Fraction of regional tonnage used locally:	0,6
	Annual site tonnage	120000 tonnes
	Maximum daily site tonnage (kg/day):	400000 kg
Frequency and duration of use	Continuous exposure	300 days/year, Continuous release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor10
	Other data. Other information	Local marine water dilution factor100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	0,1 %
	initial release prior to RMM, .	
	Emission or Release Factor: Water	0,3 %
	initial release prior to RMM, .	

	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	No air emission controls required; required removal efficiency is 0%.
	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement). (Degradation effectiveness: 87,3 %)
	Water	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal., Prevent discharge of undissolved substance to or recover from onsite wastewater., If discharging to domestic sewage treatment plant, no secondary wastewater treatment required., Risk from environmental exposure is driven by freshwater., Risk from environmental exposure is driven by marine water. (Degradation effectiveness: 0 %)
	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases. A leak prevention plan is needed to prevent low level continual releases. Bund storage facilities to prevent soil and water pollution in the event of spillage. Common practices vary across sites thus conservative process release estimates used.	
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
	Degradation efficiency	87,3 %
	Percentage removed from waste water	87,3 %
	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	During manufacturing no waste of the substance is generated.
	Disposal methods	Waste product and empty containers should be disposed of as hazardous waste in accordance with all local and national regulations.
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
Amount used	Not applicable	
Frequency and duration of use	Frequency of use	5 days/week
	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
Technical conditions and measures to control dispersion	Bulk transfers Dedicated facility	Clear transfer lines prior to de-coupling.(PROC8b)

from source towards the worker		
Organisational measures to prevent /limit releases, dispersion and exposure	Process sampling Closed systems	Avoid carrying out operation for more than 15 minutes.(PROC2)

3. Exposure estimation and reference to its source

Environment

ERC1: EUSES

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC1	---	Fresh water	---	---	0,757
ERC1	---	Marine water	---	---	0,757

A&B-tables taken from TGD 2003. Measured exposure data.

Workers

PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15: ESIG GES worker tool

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - systemic	0,04mg/m³	0,0001
PROC1	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC2	General exposures, Continuous process, Closed systems, With sample collection	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC2	General exposures, Continuous process, Closed systems, With sample collection	Worker - dermal, long-term - systemic	1,37mg/kg bw/day	0,03
PROC3	---	Worker - inhalative, long-term - systemic	93,85mg/m³	0,25
PROC3	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC4	---	Worker - inhalative, long-term - systemic	75,08mg/m³	0,2
PROC4	---	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,14
PROC8a	---	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC8a	---	Worker - dermal, long-term - systemic	13,71mg/kg bw/day	0,27
PROC8b	---	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC8b	---	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,14
PROC15	---	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC15	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC2	Process sampling, Closed systems	Worker - inhalative, long-term - systemic	3,75mg/m³	0,01

PROC2	Process sampling, Closed systems	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC2	Bulk product storage, Closed systems	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC2	Bulk product storage, Closed systems	Worker - dermal, long-term - systemic	1,37mg/kg bw/day	0,03

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.
For scaling see: http://www.esig.org/en/regulatory-information/reach/ges-library/ges-library-3

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 2: Use as an intermediate	
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	PROC1: 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.

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
Amount used	Amounts used in the EU (tonnes/year)	57000 tonnes
	Fraction of EU tonnage used in region:	1
	Fraction of regional tonnage used locally:	0,2
	Annual site tonnage	11400 tonnes
	Maximum daily site tonnage (kg/day):	38000 kg
Frequency and duration of use	Continuous exposure	300 days/year, Continuous release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor10
	Other data. Other information	Local marine water dilution factor100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	0,01 %
	initial release prior to RMM, .	
	Emission or Release Factor: Water	0,05 %
	initial release prior to RMM, .	
	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)., If discharging to domestic sewage treatment plant, no secondary wastewater treatment required., Prevent discharge of undissolved substance to or recover from onsite wastewater., Risk from environmental exposure is driven by freshwater., Risk from environmental exposure is driven by marine water. (Degradation effectiveness: 87,3 %)
	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases. A leak prevention plan is needed to prevent low level continual releases. Bund storage facilities to prevent soil and water pollution in the event of spillage. Common practices vary across sites thus conservative process release estimates used.	
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
	Degradation efficiency	87,3 %
	Percentage removed from waste water	87,3 %
	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	Disposal methods	Dispose of waste product or used containers according to local regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
	Physical Form (at time of use)	Medium volatile liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Amount used	Not applicable	
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 Dedicated facility	Clear transfer lines prior to de-coupling.(PROC8b)
Organisational measures to prevent /limit releases, dispersion and exposure	Process sampling Closed systems	Avoid carrying out operation for more than 15 minutes.(PROC2)

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	Marine water	---	---	0,0129

A&B-tables taken from TGD 2003. Measured exposure data.

Workers

PROC1: ESIG GES worker tool

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - systemic	0,04mg/m³	0,0001
PROC1	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC2	---	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC2	---	Worker - dermal, long-term - systemic	1,37mg/kg bw/day	0,03
PROC3	---	Worker - inhalative, long-term - systemic	93,85mg/m³	0,25
PROC3	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC4	---	Worker - inhalative, long-term - systemic	75,08mg/m³	0,2
PROC4	---	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,14
PROC8a	---	Worker - inhalative, long-term - systemic	187,81mg/m³	0,51
PROC8a	---	Worker - dermal, long-term - systemic	13,71mg/kg bw/day	0,27
PROC8b	---	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC8b	---	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,14
PROC15	---	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC15	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01

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.
Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.esig.org/en/regulatory-information/reach/ges-library/ges-library-3

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 3: 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.		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
Amount used	Amounts used in the EU (tonnes/year)	63000 tonnes
	Fraction of EU tonnage used in region:	1
	Fraction of regional tonnage used locally:	0,4
	Annual site tonnage	25200 tonnes
	Maximum daily site tonnage (kg/day):	84000 kg
Frequency and duration of use	Continuous exposure	300 days/year, Continuous release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor10
	Other data. Other information	Local marine water dilution factor100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	0,5 %

	initial release prior to RMM, .	
	Emission or Release Factor: Water	0,3 %
	initial release prior to RMM, .	
	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	No air emission controls required; required removal efficiency is 0%.
	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement)., Prevent discharge of undissolved substance to or recover from onsite wastewater., If discharging to domestic sewage treatment plant, no secondary wastewater treatment required., Risk from environmental exposure is driven by freshwater., Risk from environmental exposure is driven by marine water. (Degradation effectiveness: 87,3 %)
	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases. A leak prevention plan is needed to prevent low level continual releases. Bund storage facilities to prevent soil and water pollution in the event of spillage. Common practices vary across sites thus conservative process release estimates used.	
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
	Degradation efficiency	87,3 %
	Percentage removed from waste water	87,3 %
	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	Disposal methods	Dispose of waste product or used containers according to local 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
Amount used	Not applicable	
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	Batch processes at elevated temperatures	Provide extract ventilation to points where emissions occur. (Efficiency: 90 %)(PROC3)

from source towards the worker	Closed systems	
	Bulk transfers Dedicated facility	Clear lines prior to de-coupling.(PROC8b)

3. Exposure estimation and reference to its source

Environment

ERC2: EUSES

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC2	---	Marine water	---	---	0,1603

Workers

PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: ESIG GES worker tool

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - systemic	0,04mg/m³	0,0001
PROC1	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC2	General exposures, Continuous process, Closed systems, With sample collection	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC2	General exposures, Continuous process, Closed systems, With sample collection	Worker - dermal, long-term - systemic	1,37mg/kg bw/day	0,03
PROC3	General exposures, Use in contained batch processes, Process sampling	Worker - inhalative, long-term - systemic	93,85mg/m³	0,25
PROC3	General exposures, Use in contained batch processes, Process sampling	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC3	Use in closed batch process (synthesis or formulation), Process sampling, Closed systems	Worker - inhalative, long-term - systemic	3,75mg/m³	0,01
PROC3	Use in closed batch process (synthesis or formulation), Process sampling, Closed systems	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC3	Batch process, Elevated temperature, Closed systems	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC3	Batch process, Elevated temperature, Closed systems	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC4	---	Worker - inhalative, long-	75,08mg/m³	0,2

		term - systemic		
PROC4	---	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,14
PROC5	---	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC5	---	Worker - dermal, long-term - systemic	13,71mg/kg bw/day	0,27
PROC8a	Equipment maintenance, Cleaning	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC8a	Equipment maintenance, Cleaning	Worker - dermal, long-term - systemic	13,71mg/kg bw/day	0,27
PROC8b	Bulk transfers, Dedicated facility	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC8b	Bulk transfers, Dedicated facility	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,14
PROC9	---	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC9	---	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,14
PROC14	---	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC14	---	Worker - dermal, long-term - systemic	3,43mg/kg bw/day	0,07
PROC15	---	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC15	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC2	Bulk product storage, Closed systems	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC2	Bulk product storage, Closed systems	Worker - dermal, long-term - systemic	1,37mg/kg bw/day	0,03
PROC3	General exposures, Use in contained batch processes, Process sampling	Worker - inhalative, long-term - systemic	93,85mg/m³	0,25
PROC3	General exposures, Use in contained batch processes, Process sampling	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC3	Process sampling, Closed systems	Worker - inhalative, long-term - systemic	3,75mg/m³	0,01
PROC3	Process sampling, Closed systems	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC8a	Transfer from/pouring from containers, Manual	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC8a	Transfer from/pouring from containers, Manual	Worker - dermal, long-term - systemic	13,71mg/kg bw/day	0,27
PROC8b	Drum/batch transfers, Dedicated facility	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC8b	Drum/batch transfers, Dedicated facility	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,14

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.
Relevant for section 2.1:
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.
For scaling see: http://www.esig.org/en/regulatory-information/reach/ges-library/ges-library-3

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 4: Use in coatings, solvent based process	
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.

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
Amount used	Amounts used in the EU (tonnes/year)	63000 tonnes
	Fraction of EU tonnage used in region:	1
	Fraction of regional tonnage used locally:	0,05
	Annual site tonnage	3200 tonnes
	Maximum daily site tonnage (kg/day):	10500 kg
Frequency and duration of use	Continuous exposure	300 days/year, Continuous release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor10
	Other data. Other information	Local marine water dilution factor100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300

	Emission or Release Factor: Air	90 %
	initial release prior to RMM, .	
	Emission or Release Factor: Water	2 %
	initial release prior to RMM, .	
	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 discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 70 %)
	Water	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., Prevent discharge of undissolved substance to or recover from onsite wastewater., Risk from environmental exposure is driven by freshwater., Risk from environmental exposure is driven by marine water. (Degradation effectiveness: 87,3 %)
	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases. A leak prevention plan is needed to prevent low level continual releases. Common practices vary across sites thus conservative process release estimates used.	
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
	Degradation efficiency	87,3 %
	Percentage removed from waste water	87,3 %
	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	Disposal methods	Waste product and empty containers should be disposed of as hazardous waste in accordance with all local and 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)	Medium volatile liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Amount used	Not applicable	
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	Spraying Manual	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) (Efficiency: 70 %)(PROC7)
	Spraying (automatic/robotic)	Carry out in a vented booth or extracted enclosure. (Efficiency: 95 %)(PROC7)
Conditions and measures related to personal protection, hygiene and health evaluation	Spraying Manual	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC7)
	Roller, spreader, flow application	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC10)

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	Fresh water	---	---	0,1338
---	---	Marine water	---	---	0,1338

A&B-tables taken from TGD 2003. Measured exposure data.

Workers

PROC1: ESIG GES worker tool

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - systemic	0,04mg/m³	0,0001
PROC1	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC2	---	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC2	---	Worker - dermal, long-term - systemic	1,37mg/kg bw/day	0,03
PROC2	Elevated temperature	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC2	Elevated temperature	Worker - dermal, long-term - systemic	1,37mg/kg bw/day	0,03
PROC3	---	Worker - inhalative, long-term - systemic	93,85mg/m³	0,25
PROC3	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC4	---	Worker - inhalative, long-term - systemic	75,08mg/m³	0,2
PROC4	---	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,14
PROC5	---	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC5	---	Worker - dermal, long-term - systemic	13,71mg/kg bw/day	0,27
PROC7	Spraying, Automatic/robotic	Worker - inhalative, long-term - systemic	46,93mg/m³	0,13
PROC7	Spraying,	Worker - dermal, long-	2,14mg/kg bw/day	0,04

	Automatic/robotic	term - systemic		
PROC7	Spraying, Manual	Worker - inhalative, long-term - systemic	281,56mg/m³	0,76
PROC7	Spraying, Manual	Worker - dermal, long-term - systemic	8,57mg/kg bw/day	0,17
PROC8a	---	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC8a	---	Worker - dermal, long-term - systemic	13,71mg/kg bw/day	0,27
PROC8b	---	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC8b	---	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,14
PROC9	---	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC9	---	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,14
PROC10	---	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC10	---	Worker - dermal, long-term - systemic	5,49mg/kg bw/day	0,11
PROC13	---	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC13	---	Worker - dermal, long-term - systemic	13,71mg/kg bw/day	0,27
PROC14	---	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC14	---	Worker - dermal, long-term - systemic	3,43mg/kg bw/day	0,07
PROC15	---	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC15	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01

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.
Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.esig.org/en/regulatory-information/reach/ges-library/ges-library-3

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 5: Use in coatings, solvent based process	
Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical product category	PC9a: Coatings and paints, thinners, paint removers
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.		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 10%
Amount used	Amounts used in the EU (tonnes/year)	63000 tonnes
	Fraction of EU tonnage used in region:	1
	Fraction of regional tonnage used locally:	0,0001
	Annual site tonnage	6,3 tonnes
	Maximum daily site tonnage (kg/day):	3200 kg
Frequency and duration of use	Continuous exposure	2 days/year, Continuous release
Environment factors not influenced by risk management	Other data.Other information	Local freshwater dilution factor: 10
	Other data.Other information	Local marine water dilution factor: 100
Other given operational conditions affecting environmental exposure	Number of emission days per year	2
	Emission or Release Factor: Air	80 %
	initial release prior to RMM, .	
	Emission or Release Factor: Water	15 %
	initial release prior to RMM, .	
	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	Water	Do not empty into drains., Prevent discharge of undissolved substance to or recover from onsite wastewater.
	Soil	Prevent exposure of soil using protective covers
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

	Degradation efficiency	87,3 %
	Percentage removed from waste water	87,3 %
Conditions and measures related to external treatment of waste for disposal	Disposal methods	Waste product and empty containers should be disposed of as hazardous waste in accordance with all local and 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: PC9a

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 10%
	Physical Form (at time of use)	High volatile liquid
	Vapour pressure	> 10 Pa
	standard temperature and pressure	
Amount used	Amount used per event	500 g
Frequency and duration of use	Application duration	1,1 h
	Frequency of use	1 Times per day
Other given operational conditions affecting consumers exposure	Indoor or outdoor use	
	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)	Consumer Measures	Avoid using in room with closed doors. Avoid using when windows closed.

3. Exposure estimation and reference to its source

Environment

ERC8a, ERC8d: EUSES

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a, ERC8d	---	Marine water	---	---	0,001433
A&B-tables taken from TGD 2003. Measured exposure data.					

Consumers

PC9a: ConsExpo 4.1

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PC9a	---	Consumer - inhalative, long-term - systemic	7,46mg/m³	0,51
PC9a	---	Consumer - dermal, long-term - systemic	3,3mg/kg bw/day	0,18
ECETOC TRA consumer v3.				

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.
For further information on the assessment method, see:
http://www.rivm.nl/en/healthanddisease/productsafety/ConsExpo.jsp

1. Short title of Exposure Scenario 6: Use in coatings, solvent based process	
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.		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
Amount used	Amounts used in the EU (tonnes/year)	63000 tonnes
	Fraction of EU tonnage used in region:	1
	Fraction of regional tonnage used locally:	0,05
	Annual site tonnage	3150 tonnes
	Maximum daily site tonnage (kg/day):	10508 kg
Frequency and duration of use	Continuous exposure	300 days/year, Continuous release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor10
	Other data. Other information	Local marine water dilution factor100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	90 %
	initial release prior to RMM, .	

	Emission or Release Factor: Water	2 %
	initial release prior to RMM, .	
	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 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)., If discharging to domestic sewage treatment plant, no secondary wastewater treatment required., Prevent discharge of undissolved substance to or recover from onsite wastewater., Risk from environmental exposure is driven by freshwater., Risk from environmental exposure is driven by marine water. (Degradation effectiveness: 87,3 %)
	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases. A leak prevention plan is needed to prevent low level continual releases. Common practices vary across sites thus conservative process release estimates used.	
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
	Degradation efficiency	87,3 %
	Percentage removed from waste water	87,3 %
	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	Disposal methods	Waste product and empty containers should be disposed of as hazardous waste in accordance with all local and 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)	Medium volatile liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Amount used	Not applicable	
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	Preparation of material for application	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency:

from source towards the worker	Indoor	30 %)(PROC5)
	Preparation of material for application Outdoor	Ensure operation is undertaken outdoors.(PROC5)
	Material transfers Drum/batch transfers Non-dedicated facility	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency: 30 %)(PROC8a)
	Roller, spreader, flow application Indoor	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency: 30 %)(PROC10)
	Roller, spreader, flow application Outdoor	Ensure operation is undertaken outdoors.(PROC10)
	Spraying Manual Indoor	Carry out in a vented booth or extracted enclosure. (Efficiency: 80 %)(PROC11)
	Spraying Manual Outdoor	Ensure operation is undertaken outdoors. (Efficiency: 30 %)(PROC11)
	Dipping, immersion and pouring Indoor	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency: 30 %)(PROC13)
	Dipping, immersion and pouring Outdoor	Ensure operation is undertaken outdoors.(PROC13)
	Hand application - fingerpaints, pastels, adhesives Indoor	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency: 30 %)(PROC19)
	Hand application - fingerpaints, pastels, adhesives Outdoor	Ensure operation is undertaken outdoors.(PROC19)
Conditions and measures related to personal protection, hygiene and health evaluation	Roller, spreader, flow application Indoor	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC10)
	Roller, spreader, flow application Outdoor	Wear suitable gloves tested to EN374.(PROC10)
	Spraying Manual Indoor	Wear a respirator conforming to EN140 with Type A filter or better. (Efficiency: 90 %)(PROC11)
	Spraying Manual Outdoor	Wear a respirator conforming to EN140 with Type A filter or better. (Efficiency: 90 %)(PROC11)
	Hand application - fingerpaints, pastels, adhesives Indoor	Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. (Efficiency: 90 %)(PROC19)
	Hand application - fingerpaints, pastels, adhesives Outdoor	Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.(PROC19)
	Spraying Manual Outdoor	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC11)

3. Exposure estimation and reference to its source

Environment

ERC8a: EUSES

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a	---	Fresh water	---	---	0,029
ERC8a	---	Marine water	---	---	0,029
A&B-tables taken from TGD 2003. Measured exposure data.					

Workers

PROC1: ESIG GES worker tool

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - systemic	0,04mg/m³	0,0001
PROC1	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC2	---	Worker - inhalative, long-term - systemic	75,08mg/m³	0,20
PROC2	---	Worker - dermal, long-term - systemic	1,37mg/kg bw/day	0,03
PROC3	---	Worker - inhalative, long-term - systemic	93,85mg/m³	0,24
PROC3	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC4	---	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC4	---	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,14
PROC5	---	Worker - inhalative, long-term - systemic	262,79mg/m³	0,71
PROC5	---	Worker - dermal, long-term - systemic	13,71mg/kg bw/day	0,27
PROC8a	---	Worker - inhalative, long-term - systemic	262,79mg/m³	0,71
PROC8a	---	Worker - dermal, long-term - systemic	13,71mg/kg bw/day	0,27
PROC8b	---	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC8b	---	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,14
PROC10	Indoor use	Worker - inhalative, long-term - systemic	262,79mg/m³	0,71
PROC10	Indoor use	Worker - dermal, long-term - systemic	5,49mg/kg bw/day	0,11
PROC10	Outdoor use	Worker - inhalative, long-term - systemic	262,79mg/m³	0,71
PROC10	Outdoor use	Worker - dermal, long-term - systemic	5,49mg/kg bw/day	0,11
PROC11	Indoor use	Worker - inhalative, long-	37,54mg/m³	0,1

		term - systemic		
PROC11	Indoor use	Worker - dermal, long-term - systemic	2,14mg/kg bw/day	0,04
PROC11	Outdoor use	Worker - inhalative, long-term - systemic	131,4mg/m³	0,36
PROC11	Outdoor use	Worker - dermal, long-term - systemic	21,43mg/kg bw/day	0,42
PROC13	---	Worker - inhalative, long-term - systemic	262,79mg/m³	0,71
PROC13	---	Worker - dermal, long-term - systemic	13,71mg/kg bw/day	0,27
PROC15	---	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC15	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC19	Indoor use	Worker - inhalative, long-term - systemic	262,79mg/m³	0,71
PROC19	Indoor use	Worker - dermal, long-term - systemic	14,14mg/kg bw/day	0,28
PROC19	Outdoor use	Worker - inhalative, long-term - systemic	262,79mg/m³	0,71
PROC19	Outdoor use	Worker - dermal, long-term - systemic	14,14mg/kg bw/day	0,28

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.
Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.esig.org/en/regulatory-information/reach/ges-library/ges-library-3

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 7: Use in coatings, water based process	
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.

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 5%.
Amount used	Amounts used in the EU (tonnes/year)	2600 tonnes
	Fraction of EU tonnage used in region:	1
	Fraction of regional tonnage used locally:	0,05
	Annual site tonnage	130 tonnes
	Maximum daily site tonnage (kg/day):	430 kg
Frequency and duration of use	Continuous exposure	300 days/year, Continuous release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor10
	Other data. Other information	Local marine water dilution factor100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300

	Emission or Release Factor: Air	80 %
	initial release prior to RMM, .	
	Emission or Release Factor: Water	10 %
	initial release prior to RMM, .	
	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 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)., If discharging to domestic sewage treatment plant, no secondary wastewater treatment required., Prevent discharge of undissolved substance to or recover from onsite wastewater., Risk from environmental exposure is driven by freshwater., Risk from environmental exposure is driven by marine water. (Degradation effectiveness: 87,3 %)
	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases. A leak prevention plan is needed to prevent low level continual releases. Bund storage facilities to prevent soil and water pollution in the event of spillage. Common practices vary across sites thus conservative process release estimates used.	
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
	Degradation efficiency	87,3 %
	Percentage removed from waste water	87,3 %
	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	Disposal methods	Waste product and empty containers should be disposed of as hazardous waste in accordance with all local and 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 5%.
	Physical Form (at time of use)	Medium volatile liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Amount used	Not applicable	

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.	
Conditions and measures related to personal protection, hygiene and health evaluation	Spraying (automatic/robotic)	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC7)
	Spraying Manual	Wear suitable gloves tested to EN374.(PROC7)
	Roller, spreader, flow application	Wear suitable gloves tested to EN374.(PROC10)

3. Exposure estimation and reference to its source

Environment

ERC4: EUSES

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4	---	Fresh water	---	---	0,029
ERC4	---	Marine water	---	---	0,029

A&B-tables taken from TGD 2003. Measured exposure data.

Workers

PROC1: ESIG GES worker tool

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - systemic	---	< 1
PROC1	---	Worker - dermal, long-term - systemic	---	< 1
PROC2	---	Worker - inhalative, long-term - systemic	7,51mg/m³	0,03
PROC2	---	Worker - dermal, long-term - systemic	1,37mg/kg bw/day	0,03
PROC2	Elevated temperature	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC2	Elevated temperature	Worker - dermal, long-term - systemic	1,37mg/kg bw/day	0,03
PROC3	---	Worker - inhalative, long-term - systemic	18,77mg/m³	0,05
PROC3	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC4	---	Worker - inhalative, long-term - systemic	15,02mg/m³	0,04
PROC4	---	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,014
PROC5	---	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC5	---	Worker - dermal, long-term - systemic	13,71mg/kg bw/day	0,27
PROC7	Spraying, Automatic/robotic	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC7	Spraying, Automatic/robotic	Worker - dermal, long-term - systemic	8,57mg/kg bw/day	0,17

PROC7	Spraying, Manual	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC7	Spraying, Manual	Worker - dermal, long-term - systemic	8,57mg/kg bw/day	0,17
PROC8a	---	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC8a	---	Worker - dermal, long-term - systemic	13,71mg/kg bw/day	0,27
PROC8b	---	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC8b	---	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,14
PROC9	---	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC9	---	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,14
PROC10	---	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC10	---	Worker - dermal, long-term - systemic	27,43mg/kg bw/day	0,54
PROC13	---	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC13	---	Worker - dermal, long-term - systemic	13,71mg/kg bw/day	0,27
PROC14	---	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC14	---	Worker - dermal, long-term - systemic	3,43mg/kg bw/day	0,07
PROC15	---	Worker - inhalative, long-term - systemic	7,51mg/m³	0,02
PROC15	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01

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.
Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.esig.org/en/regulatory-information/reach/ges-library/ges-library-3

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 8: Use in coatings, water based process	
Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical product category	PC9a: Coatings and paints, thinners, paint removers
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.

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
Amount used	Amounts used in the EU (tonnes/year)	2600 tonnes
	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	260 tonnes
	Fraction of regional tonnage used locally:	0,0001
	Annual site tonnage	0,026 tonnes
	Maximum daily site tonnage (kg/day):	0,087 kg
Frequency and duration of use	Continuous exposure	300 days/year, Continuous release
Environment factors not influenced by risk management	Other data.Other information	Local freshwater dilution factor: 10
	Other data.Other information	Local marine water dilution factor: 100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	80 %
	initial release prior to RMM, .	
	Emission or Release Factor: Water	15 %
	initial release prior to RMM, .	
	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	Water	Do not empty into drains., Risk from environmental exposure is driven by marine water.
	Soil	Prevent exposure of soil using protective covers

prevent/limit release from the site		
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
	Degradation efficiency	87,3 %
	Percentage removed from waste water	87,3 %
Conditions and measures related to external treatment of waste for disposal	Disposal methods	Waste product and empty containers should be disposed of as hazardous waste in accordance with all local and 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: PC9a: Waterborne latex wall paint

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 5%.
	Physical Form (at time of use)	High volatile liquid
	Vapour pressure	> 10 Pa
	standard temperature and pressure	
Amount used	Amount used per event	1880 g
Frequency and duration of use	Application duration	3 h
	Frequency of use	1 Times per day
Other given operational conditions affecting consumers exposure	Indoor or outdoor use	
	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)	Consumer Measures	Avoid using in room with closed doors. Avoid using when windows closed.

3. Exposure estimation and reference to its source

Environment

ERC8a, ERC8d: EUSES

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a, ERC8d	---	Marine water	---	---	0,00139

A&B-tables taken from TGD 2003. Measured exposure data.

Consumers

PC9a: ConsExpo 4.1

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PC9a	---	Consumer - inhalative, long-term - systemic	5,73mg/m³	0,39
PC9a	---	Consumer - dermal, long-term - systemic	4,5mg/kg bw/day	0,25

ECETOC TRA consumer v3.

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.
For further information on the assessment method, see:
http://www.rivm.nl/en/healthanddisease/productsafety/ConsExpo.jsp

1. Short title of Exposure Scenario 9: Use in coatings, water based process	
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.		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 5%.
Amount used	Amounts used in the EU (tonnes/year)	2600 tonnes
	Fraction of EU tonnage used in region:	1
	Fraction of regional tonnage used locally:	0,05
	Annual site tonnage	130 tonnes
	Maximum daily site tonnage (kg/day):	433 kg
Frequency and duration of use	Continuous exposure	300 days/year, Continuous release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor10
	Other data. Other information	Local marine water dilution factor100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	80 %
	initial release prior to RMM, .	

	Emission or Release Factor: Water	10 %
	initial release prior to RMM, .	
	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 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)., If discharging to domestic sewage treatment plant, no secondary wastewater treatment required., Prevent discharge of undissolved substance to or recover from onsite wastewater., Risk from environmental exposure is driven by freshwater., Risk from environmental exposure is driven by marine water. (Degradation effectiveness: 87,3 %)
	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases. A leak prevention plan is needed to prevent low level continual releases. Bund storage facilities to prevent soil and water pollution in the event of spillage. Common practices vary across sites thus conservative process release estimates used.	
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
	Degradation efficiency	87,3 %
	Percentage removed from waste water	87,3 %
	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	Disposal methods	Waste product and empty containers should be disposed of as hazardous waste in accordance with all local and 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 5%.
	Physical Form (at time of use)	Medium volatile liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Amount used	Not applicable	
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	Spraying	Provide a good standard of general ventilation (not

measures to control dispersion from source towards the worker	Manual Indoor	less than 3 to 5 air changes per hour). (Efficiency: 30 %)(PROC11)
	Spraying Manual Outdoor	Ensure operation is undertaken outdoors. (Efficiency: 30 %)(PROC11)
Conditions and measures related to personal protection, hygiene and health evaluation	Roller, spreader, flow application	Wear suitable gloves tested to EN374.(PROC10)
	Spraying Manual Indoor	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency: 90 %)(PROC11)
	Spraying Manual Outdoor	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency: 90 %)(PROC11)
	Hand application - fingerpaints, pastels, adhesives	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC19)

3. Exposure estimation and reference to its source

Environment

ERC8a, ERC8d: EUSES

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a, ERC8d	---	Fresh water	---	---	0,029
ERC8a, ERC8d	---	Marine water	---	---	0,029
A&B-tables taken from TGD 2003. Measured exposure data.					

Workers

PROC1: ESIG GES worker tool

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - systemic	0,04mg/m³	0,0001
PROC1	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC2	---	Worker - inhalative, long-term - systemic	75,08mg/m³	0,20
PROC2	---	Worker - dermal, long-term - systemic	1,37mg/kg bw/day	0,03
PROC3	---	Worker - inhalative, long-term - systemic	18,77mg/m³	0,05
PROC3	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC4	---	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC4	---	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,14
PROC5	---	Worker - inhalative, long-term - systemic	75,08mg/m³	0,2
PROC5	---	Worker - dermal, long-term - systemic	13,71mg/kg bw/day	0,27
PROC8a	---	Worker - inhalative, long-	75,08mg/m³	0,2

		term - systemic		
PROC8a	---	Worker - dermal, long-term - systemic	13,71mg/kg bw/day	0,27
PROC8b	---	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC8b	---	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,14
PROC10	Indoor use	Worker - inhalative, long-term - systemic	75,08mg/m³	0,2
PROC10	Indoor use	Worker - dermal, long-term - systemic	27,43mg/kg bw/day	0,54
PROC10	Outdoor use	Worker - inhalative, long-term	75,08mg/m³	0,2
PROC10	Outdoor use	Worker - dermal, long-term - systemic	27,43mg/kg bw/day	0,54
PROC11	Indoor use	Worker - inhalative, long-term - systemic	262,79mg/m³	0,71
PROC11	Indoor use	Worker - dermal, long-term - systemic	10,71mg/kg bw/day	0,21
PROC11	Outdoor use	Worker - inhalative, long-term	262,79mg/m³	0,71
PROC11	Outdoor use	Worker - dermal, long-term - systemic	10,71mg/kg bw/day	0,21
PROC13	---	Worker - inhalative, long-term - systemic	75,08mg/m³	0,2
PROC13	---	Worker - dermal, long-term - systemic	13,71mg/kg bw/day	0,27
PROC15	---	Worker - inhalative, long-term - systemic	7,51mg/m³	0,02
PROC15	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC19	Indoor use	Worker - inhalative, long-term - systemic	75,08mg/m³	0,2
PROC19	Indoor use	Worker - dermal, long-term - systemic	28,29mg/kg bw/day	0,56
PROC19	Outdoor use	Worker - inhalative, long-term - systemic	75,08mg/m³	0,2
PROC19	Outdoor use	Worker - dermal, long-term - systemic	28,29mg/kg bw/day	0,56

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.
Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.esig.org/en/regulatory-information/reach/ges-library/ges-library-3

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 10: Use in cleaning agents	
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	PROC1: 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 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.		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
Amount used	Amounts used in the EU (tonnes/year)	5200 tonnes
	Fraction of EU tonnage used in region:	1
	Fraction of regional tonnage used locally:	0,0192
	Annual site tonnage	99,84 tonnes
	Maximum daily site tonnage (kg/day):	5000 kg
Frequency and duration of use	Continuous exposure	20 days/year, Continuous release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor10
	Other data. Other information	Local marine water dilution factor100
Other given operational conditions affecting environmental exposure	Number of emission days per year	20
	Emission or Release Factor: Air	30 %
	Emission or Release Factor: Water	0,01 %
	Emission or Release Factor: Soil	0 %
Technical conditions and	Air	Treat air emissions to provide a typical removal (or

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		abatement) (Efficiency: 0 %)
	Water	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., Prevent discharge of undissolved substance to or recover from onsite wastewater., Risk from environmental exposure is driven by marine water. (Degradation effectiveness: 87,3 %)
	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases. Common practices vary across sites thus conservative process release estimates used.	
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
	Degradation efficiency	87,3 %
	Percentage removed from waste water	87,3 %
	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	Disposal methods	Waste product and empty containers should be disposed of as hazardous waste in accordance with all local and 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 the percentage of the substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	Medium volatile liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).(PROC4)	
Technical conditions and measures to control dispersion from source towards the worker	Storage	Store substance within a closed system.(PROC1)
	Use in contained batch processes Treatment by heating	Provide extract ventilation to points where emissions occur. (Efficiency: 90 %)(PROC4)
	Cleaning with high pressure washers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) (Efficiency: 70 %)(PROC7)
Conditions and measures related to personal protection, hygiene and health evaluation	Cleaning with high pressure washers	Limit the substance content in the product to 25 %. or

		Avoid carrying out operation for more than 4 hours.(PROC7)
	Cleaning no spraying Manual	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC10)
	Cleaning with low-pressure washers	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC10)

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	Marine water	---	---	0,0017

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

Workers

PROC1: ESIG GES worker tool

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - systemic	---	< 1
PROC1	---	Worker - dermal, long-term - systemic	---	< 1
PROC2	---	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC2	---	Worker - dermal, long-term - systemic	1,37mg/kg bw/day	0,01
PROC3	---	Worker - inhalative, long-term - systemic	93,85mg/m³	0,25
PROC3	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC4	Elevated temperature	Worker - inhalative, long-term - systemic	37,54mg/m³	0,1
PROC4	Elevated temperature	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,14
PROC7	---	Worker - inhalative, long-term - systemic	168,94mg/m³	0,46
PROC7	---	Worker - dermal, long-term - systemic	8,57mg/kg bw/day	0,17
PROC8a	---	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC8a	---	Worker - dermal, long-term - systemic	13,71mg/kg bw/day	0,27
PROC8b	---	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC8b	---	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,14
PROC10	---	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC10	---	Worker - dermal, long-term - systemic	5,49mg/kg bw/day	0,11

PROC13	---	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC13	---	Worker - dermal, long-term - systemic	13,71mg/kg bw/day	0,27

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.
For scaling see: http://www.esig.org/en/regulatory-information/reach/ges-library/ges-library-3

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 11: Use in cleaning agents		
Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)	
Chemical product category	PC35: Washing and cleaning products	
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems	
Activity	Covers general exposures to consumers arising from the use of household products sold as washing and cleaning products, aerosols, coatings, de-icers, lubricants and air care products.	
2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d		
Substance is a unique structure, Readily biodegradable.		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 10%
Amount used	Amounts used in the EU (tonnes/year)	260 tonnes
	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	26 tonnes
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage	0,01 tonnes
	Maximum daily site tonnage (kg/day):	0,03 kg
Frequency and duration of use	Continuous exposure	365 days/year, Continuous release
Environment factors not influenced by risk management	Other data.Other information	Local freshwater dilution factor: 10
	Other data.Other information	Local marine water dilution factor: 100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	95 %
	initial release prior to RMM, .	
	Emission or Release Factor: Water	2,5 %
	initial release prior to RMM, .	
	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	Risk from environmental exposure is driven by marine water.
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
	Degradation efficiency	87,3 %
	Percentage removed from waste water	87,3 %
Conditions and measures related to external treatment of waste for disposal	Disposal methods	Waste product and empty containers should be disposed of as hazardous waste in accordance with all local and 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: PC35: Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 10%
	Physical Form (at time of use)	High volatile liquid
	Vapour pressure	> 10 Pa
	standard temperature and pressure	
Amount used	Amount used per event	16 g
Frequency and duration of use	Application duration	60 min
	Frequency of use	1 Times per day
	Frequency of use	365 days/year
Other given operational conditions affecting consumers exposure	Indoor or outdoor use	
	Room size	15 m3
	Covers use under typical household ventilation., Covers use at ambient temperatures.	

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	---	---	---	0,00138

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

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.
For further information on the assessment method, see:
http://www.rivm.nl/en/healthanddisease/productsafety/ConsExpo.jsp

1. Short title of Exposure Scenario 12: Use in cleaning agents	
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	PROC1: 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.

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
Amount used	Amounts used in the EU (tonnes/year)	5200 tonnes
	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	520 tonnes
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage	0,26 tonnes
	Maximum daily site tonnage (kg/day):	0,712 kg
Frequency and duration of use	Continuous exposure	365 days/year, Continuous release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor10
	Other data. Other information	Local marine water dilution factor100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	2 %
	initial release prior to RMM, .	
	Emission or Release Factor: Water	0,0001 %

	initial release prior to RMM, .	
	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 emissions to provide a typical removal (or abatement) (Efficiency: 70 %)
	Water	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., Prevent discharge of undissolved substance to or recover from onsite wastewater., Risk from environmental exposure is driven by marine water. (Degradation effectiveness: 87,3 %)
	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases. Common practices vary across sites thus conservative process release estimates used.	
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
	Degradation efficiency	87,3 %
	Percentage removed from waste water	87,3 %
	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	Disposal methods	Waste product and empty containers should be disposed of as hazardous waste in accordance with all local and 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 the percentage of the substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	Medium volatile liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	Storage	Store substance within a closed system.(PROC1)
	Filling/ preparation of equipment from drums or containers. Non-dedicated facility Outdoor	Ensure operation is undertaken outdoors. (Efficiency: 30 %)(PROC8a)

	Cleaning Surfaces Manual Dipping, immersion and pouring	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) (Efficiency: 70 %)(PROC13)
	Cleaning with low-pressure washers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) (Efficiency: 70 %)(PROC10)
	Cleaning Surfaces Manual Spraying	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) (Efficiency: 30 %)(PROC10)
	Cleaning with high pressure washers Indoor	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) (Efficiency: 70 %)(PROC11)
	Cleaning with high pressure washers Outdoor	Ensure operation is undertaken outdoors. (Efficiency: 30 %)(PROC11)
	Ad hoc manual application via trigger sprays, dipping, etc. Rolling, Brushing	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) (Efficiency: 80 %)(PROC10)
Conditions and measures related to personal protection, hygiene and health evaluation	Filling/ preparation of equipment from drums or containers. Non-dedicated facility Outdoor	Avoid carrying out operation for more than 4 hours.(PROC8a)
	Cleaning Surfaces Manual Spraying	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC10)
	Cleaning with high pressure washers Indoor	Limit the substance content in the product to 5 %.(PROC11)
	Cleaning with high pressure washers Indoor	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC11)
	Cleaning with high pressure washers Outdoor	Limit the substance content in the product to 5 %.(PROC11)
	Cleaning with high pressure washers Outdoor	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency: 90 %)(PROC11)
	Ad hoc manual application via trigger sprays, dipping, etc. Rolling, Brushing	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC10)

3. Exposure estimation and reference to its source

Environment

ERC8a, ERC8d: EUSES

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a, ERC8d	---	Marine water	---	---	0,00138

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

Workers

PROC1: ESIG GES worker tool

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - systemic	---	< 1
PROC1	---	Worker - dermal, long-term - systemic	---	< 1
PROC2	---	Worker - inhalative, long-term - systemic	75,08mg/m³	0,2
PROC2	---	Worker - dermal, long-term - systemic	1,37mg/kg bw/day	0,03
PROC3	---	Worker - inhalative, long-term - systemic	93,85mg/m³	0,25
PROC3	---	Worker - dermal, long-term - systemic	0,34mg/kg bw/day	0,01
PROC4	---	Worker - inhalative, long-term - systemic	187,87mg/m³	0,51
PROC4	---	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,04
PROC8a	---	Worker - inhalative, long-term - systemic	157,68mg/m³	0,43
PROC8a	---	Worker - dermal, long-term - systemic	13,71mg/kg bw/day	0,27
PROC8b	---	Worker - inhalative, long-term - systemic	187,71mg/m³	0,51
PROC8b	---	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,14
PROC10	low-pressure washers	Worker - inhalative, long-term - systemic	112,63mg/m³	0,31
PROC10	low-pressure washers	Worker - dermal, long-term - systemic	27,43mg/kg bw/day	0,54
PROC10	Manual, Spraying	Worker - inhalative, long-term - systemic	262,79mg/m³	0,71
PROC10	Manual, Spraying	Worker - dermal, long-term - systemic	5,49mg/kg bw/day	0,11
PROC10	Ad hoc manual application via trigger sprays, dipping, etc., Rolling, Brushing	Worker - inhalative, long-term - systemic	75,08mg/m³	0,2
PROC10	Ad hoc manual application via trigger sprays, dipping, etc., Rolling, Brushing	Worker - dermal, long-term - systemic	27,43mg/kg bw/day	0,54
PROC11	Indoor use	Worker - inhalative, long-term - systemic	112,63mg/m³	0,31
PROC11	Indoor use	Worker - dermal, long-term - systemic	21,43mg/kg bw/day	0,42
PROC11	Outdoor use	Worker - inhalative, long-term - systemic	262,79mg/m³	0,71
PROC11	Outdoor use	Worker - dermal, long-	10,71mg/kg bw/day	0,21

		term - systemic		
PROC13	---	Worker - inhalative, long-term - systemic	112,63mg/m³	0,31
PROC13	---	Worker - dermal, long-term - systemic	13,71mg/kg bw/day	0,27

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.
For scaling see: http://www.esig.org/en/regulatory-information/reach/ges-library/ges-library-3

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 13: Use in agrochemicals	
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 PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring
Environmental Release Categories	ERC8d: Wide dispersive outdoor use of processing aids in open systems
Activity	Use as an agrochemical excipient for application by manual or machine spraying, smokes and fogging; including equipment clean-downs and disposal.

2.1 Contributing scenario controlling environmental exposure for: ERC8d		
Substance is a unique structure, Readily biodegradable.		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
Amount used	Amounts used in the EU (tonnes/year)	650 tonnes
	Fraction of EU tonnage used in region:	1
	Regional use tonnage (tons/year):	650 tonnes
	Fraction of regional tonnage used locally:	0,001
	Annual site tonnage	0,65 tonnes
	Maximum daily site tonnage (kg/day):	325 kg
Frequency and duration of use	Continuous exposure	2 days/year, Intermittent release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor: 10
	Other data. Other information	Local marine water dilution factor: 100
Other given operational conditions affecting environmental exposure	Number of emission days per year	2
	Emission or Release Factor: Air	5 %
	initial release prior to RMM, .	
	Emission or Release Factor: Water	10 %
	initial release prior to RMM, .	
	Emission or Release Factor: Soil	80 %
	initial release prior to RMM, .	
Technical conditions and	Air	Treat air emissions to provide a typical removal (or

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		abatement) (Efficiency: 0 %)
	Water	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., Prevent discharge of undissolved substance to or recover from onsite wastewater., Risk from environmental exposure is driven by marine water. (Degradation effectiveness: 87,3 %)
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	87,3 %
	Percentage removed from waste water	87,3 %
	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	Disposal methods	Waste product and empty containers should be disposed of as hazardous waste in accordance with all local and national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC11, PROC13		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
	Physical Form (at time of use)	Medium volatile liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Amount used	Not applicable	
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	Spraying/ fogging by machine application	Carry out in a vented booth or extracted enclosure. (Efficiency: 80 %)(PROC11)
Conditions and measures related to personal protection, hygiene and health evaluation	Spraying/ fogging by manual application Outdoor	Wear a respirator conforming to EN140 with Type A filter or better. (Efficiency: 90 %)(PROC11)
	Spraying/ fogging by manual application Outdoor	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC11)
3. Exposure estimation and reference to its source		
Environment		

ERC8d: EUSES

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8d	---	Marine water	---	---	0,0176

A&B-tables taken from TGD 2003. Measured exposure data.

Workers

PROC1: ESIG GES worker tool

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	Outdoor use	Worker - inhalative, long-term - systemic	---	< 1
PROC1	Outdoor use	Worker - dermal, long-term - systemic	---	< 1
PROC2	Outdoor use	Worker - inhalative, long-term - systemic	45,05mg/m³	0,12
PROC2	Outdoor use	Worker - dermal, long-term - systemic	1,37mg/kg bw/day	0,03
PROC4	Outdoor use	Worker - inhalative, long-term - systemic	112,63mg/m³	0,31
PROC4	Outdoor use	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,14
PROC8a	---	Worker - inhalative, long-term - systemic	225,25mg/m³	0,61
PROC8a	---	Worker - dermal, long-term - systemic	13,71mg/kg bw/day	0,27
PROC8b	---	Worker - inhalative, long-term - systemic	112,63mg/m³	0,31
PROC8b	---	Worker - dermal, long-term - systemic	6,86mg/kg bw/day	0,14
PROC11	Outdoor use	Worker - inhalative, long-term - systemic	112,63mg/m³	0,31
PROC11	Outdoor use	Worker - dermal, long-term - systemic	21,43mg/kg bw/day	0,42
PROC11	Indoor use	Worker - inhalative, long-term - systemic	225,25mg/m³	0,61
PROC11	Indoor use	Worker - dermal, long-term - systemic	2,14mg/kg bw/day	0,04
PROC13	---	Worker - inhalative, long-term - systemic	225,25mg/m³	0,61
PROC13	---	Worker - dermal, long-term - systemic	13,71mg/kg bw/day	0,27

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.

Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.esig.org/en/regulatory-information/reach/ges-library/ges-library-3

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 14: Use in de-icing and anti-icing applications		
Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)	
Chemical product category	PC4: Anti-Freeze and de-icing products	
Environmental Release Categories	ERC8d: Wide dispersive outdoor use of processing aids in open systems	
Activity	De-icing of vehicles and similar equipment by spraying	
2.1 Contributing scenario controlling environmental exposure for: ERC8d		
Substance is a unique structure, Readily biodegradable.		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 30%
	Physical Form (at time of use)	liquid
Amount used	Fraction of EU tonnage used in region:	0,1
	Amounts used in the EU (tonnes/year)	260 tonnes
	Fraction of regional tonnage used locally:	0,002
	Annual site tonnage	0,52 tonnes
	Maximum daily site tonnage (kg/day):	26 kg
Frequency and duration of use	Continuous exposure	2 days/year, Continuous release
Environment factors not influenced by risk management	Other data.Other information	Local freshwater dilution factor: 10
	Other data.Other information	Local marine water dilution factor: 100
Other given operational conditions affecting environmental exposure	Number of emission days per year	2
	Emission or Release Factor: Air	90 %
	initial release prior to RMM, .	
	Emission or Release Factor: Water	5 %
	initial release prior to RMM, .	
	Emission or Release Factor: Soil	5 %
	initial release prior to RMM, .	
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
	Degradation efficiency	87,3 %
	Percentage removed from waste water	87,3 %
Conditions and measures related to external treatment of waste for disposal	Disposal methods	Waste product and empty containers should be disposed of as hazardous waste in accordance with all local and 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 consumer exposure for: PC4

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 30%
	Physical Form (at time of use)	High volatile liquid
	Vapour pressure	> 10 Pa
	standard temperature and pressure	
Amount used	Amount used per event	500 g
Frequency and duration of use	Application duration	0,5 h
	Frequency of use	1 Times per day
Other given operational conditions affecting consumers exposure	Covers outdoor use.	

3. Exposure estimation and reference to its source

Environment

EUSES.

Consumers

ConsExpo 4.1

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
---	---	Consumer - inhalative, long-term - systemic	5,2mg/m³	0,36
---	---	Consumer - dermal, long-term - systemic	0,9mg/kg bw/day	0,05
---	---	consumer oral, long term - systemic	0,1mg/kg bw/day	0,03

ECETOC TRA consumer v3.

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.
For further information on the assessment method, see:
http://www.rivm.nl/en/healthanddisease/productsafety/ConsExpo.jsp

1. Short title of Exposure Scenario 15: Use in cosmetics		
Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)	
Chemical product category	PC39: Cosmetics, personal care products	
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems	
Activity	Consumer uses e.g. as a carrier in cosmetics/personal care products, perfumes and fragrances. Note: For cosmetic and personal care products, risk assessment only required for the environment under REACH as human health is covered by alternative legislation, This use is exempted from registration according to Art.2 (5)(6) of the REACH regulation (EC) No 1907/2006. Therefore, the conditions and measures described in this Exposure Scenario are only intended for a technical function of the substance	
2.1 Contributing scenario controlling environmental exposure for: ERC8a		
Product characteristics	Concentration of the Substance in Mixture/Article	Not applicable.
Amount used	Amounts used in the EU (tonnes/year)	2600 tonnes
	Fraction of EU tonnage used in region:	0,1
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage	13 kg/year
	Maximum daily site tonnage (kg/day):	0,04 kg
Frequency and duration of use	Continuous exposure	365 days/year, Continuous release
Environment factors not influenced by risk management	Other data.Other information	Local freshwater dilution factor: 10
	Other data.Other information	Local marine water dilution factor: 100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	95 %
	Emission or Release Factor: Water	2,5 %
	Emission or Release Factor: Soil	2,5 %
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	Risk from environmental exposure is driven by marine water.
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
	Degradation efficiency	87,3 %
	Percentage removed from waste water	87,3 %

2.2 Contributing scenario controlling consumer exposure for: PC39

Consumer exposure for PC39 (cosmetic products) is regulated by the Cosmetic Directive 76/768/EEC and therefore out of scope for this section.

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a	---	Marine water	---	---	0,00138

ESVOC spERC 8.16.v1 has been used to evaluate the exposure for the environment.

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

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

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