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

ETHANOL BLUE DENATURED

Version 1.0 Print Date 26.03.2026

Revision date / valid from 13.02.2023

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

1.1. Product identifier

Trade name	:	ETHANOL BLUE DENATURED
REACH Status	:	Each component of the product is either registered or exempted from registration obligations according to REACH Regulation (EC) No 1907/2006
UFI	:	XME0-013Y-T00S-95XQ
UFI code notified in	:	Belgium, Germany, Denmark, Estonia, Spain, Croatia, Ireland, Iceland, Lithuania, Luxembourg, Latvia, Malta, Netherlands, Norway, Portugal, Sweden

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

Use of the Substance/Mixture	:	Industrial application
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 N.V. Nijverheidslaan 38 BE 8540 Deerlijk
Telephone	:	+32 (0)56 77 6944
Telefax	:	+32 (0)56 77 5711
E-mail address	:	info@brenntag.be
Responsible/issuing person	:	Master Data Administration
Company	:	Brenntag Nederland B.V. Donker Duyvisweg 44 NL 3316 BM Dordrecht
Telephone	:	+31 (0)78 65 44 944
Telefax	:	+31 (0)78 65 44 919
E-mail address	:	info@brenntag.nl
Responsible/issuing person	:	Master Data Administration

1.4. Emergency telephone number

Emergency telephone number	:	Belgium: Antipoison Center - Brussels TEL: +32(0)70 245 245 Netherland: National Poisoning Information Center - Bilthoven TEL: +31(0) 88 755 8000 (Only for the purpose of informing

medical personnel in cases of acute intoxications)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

REGULATION (EC) No 1272/2008			
Hazard class	**Hazard category**	**Target Organs**	**Hazard statements**
Flammable liquids	Category 2	---	H225
Eye irritation	Category 2	---	H319

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

Most important adverse effects

Human Health	:	See section 11 for toxicological information.
Physical and chemical hazards	:	See section 9/10 for physicochemical information.
Potential environmental effects	:	See section 12 for environmental information.

2.2. Label elements

Labelling according to Regulation (EC) No 1272/2008

Hazard symbols :

Signal word	:	Danger	
Hazard statements	:	H225	Highly flammable liquid and vapour.
		H319	Causes serious eye irritation.
Precautionary statements			
Prevention	:	P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
		P233	Keep container tightly closed.
		P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response	:	P337 + P313	If eye irritation persists: Get medical advice/ attention.

Storage	:	P403 + P235	Store in a well-ventilated place. Keep cool.
Disposal	:	P501	Dispose of contents/ container in accordance with the local/regional/international regulations.

Hazardous components which must be listed on the label:

- ethanol

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: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Hazardous components	Amount [%]	Classification (REGULATION (EC) No 1272/2008)	
		Hazard class / Hazard category	Hazard statements
ethanol			
Index-No. : 603-002-00-5 CAS-No. : 64-17-5 EC-No. : 200-578-6 EU REACH-Reg. No. : 01-2119457610-43-xxxx	>= 90 - <= 100	Flam. Liq.2 Eye Irrit.2 specific concentration limit Eye Irrit. 2; H319 >= 50 %	H225 H319
propan-2-ol			
Index-No. : 603-117-00-0 CAS-No. : 67-63-0 EC-No. : 200-661-7 EU REACH-Reg. No. : 01-2119457558-25-xxxx	>= 1 - <= 1,5	Flam. Liq.2 Eye Irrit.2 STOT SE3	H225 H319 H336
butanone			
Index-No. : 606-002-00-3 CAS-No. : 78-93-3 EC-No. : 201-159-0	>= 1 - <= 1,5	Flam. Liq.2 Eye Irrit.2 STOT SE3	H225 H319 H336

EU REACH-Reg. No.	: 01-2119457290-43-xxxx	EUH066

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

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice	: Remove from exposure, lie down. Take off all contaminated clothing immediately.
If inhaled	: Remove to fresh air. If breathing is irregular or stopped, administer artificial respiration. If unconscious place in recovery position. Consult a physician after significant exposure.
In case of skin contact	: Wash off immediately with soap and plenty of water. If skin irritation persists, call a physician.
In case of eye contact	: Rinse immediately with plenty of water, also under the eyelids, for at least 5 minutes. Consult an eye specialist immediately. Go to an ophthalmic hospital if possible.
If swallowed	: Clean mouth with water and drink afterwards plenty of 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.

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

Symptoms	: Inhalation of high vapour concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting. See Section 11 for more detailed information on health effects and symptoms.
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.For specialist advice physicians should contact the Poisons Information Service.

SECTION 5: Firefighting measures

5.1. Extinguishing media

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

5.2. Special hazards arising from the substance or mixture

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

5.3. Advice for firefighters

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

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

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

6.2. Environmental precautions

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

6.3. Methods and materials for containment and cleaning up

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

6.4. Reference to other sections

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

SECTION 7: Handling and storage

7.1. Precautions for safe handling

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

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers	:	Store in original container. Keep in an area equipped with solvent resistant flooring.
Advice on protection against fire and explosion	:	Keep away from sources of ignition - No smoking. The vapour may be invisible, heavier than air and spread along ground. Vapours may form explosive mixtures with air. Take measures to prevent the build up of electrostatic charge. Use only in an area containing explosion proof equipment.
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.

7.3. Specific end use(s)

Specific use(s)	:	No information available.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Component:	**ethanol**	**CAS-No. 64-17-5**
Derived No Effect Level (DNEL)/Derived Minimal Effect Level (DMEL)		

DNEL
Workers, Long-term - systemic effects, Inhalation : 950 mg/m3

DNEL
Workers, Acute - local effects, Inhalation : 1900 mg/m3

DNEL
Workers, Long-term - systemic effects, Skin contact : 343 mg/kg bw/day

DNEL

Consumers, Long-term - systemic effects, Inhalation	:	114 mg/m3
DNEL Consumers, Acute - local effects, Inhalation	:	950 mg/m3
DNEL Consumers, Long-term - systemic effects, Skin contact	:	206 mg/kg bw/day
DNEL Consumers, Long-term - systemic effects, Ingestion	:	87 mg/kg bw/day

Predicted No Effect Concentration (PNEC)

Fresh water	:	0,96 mg/l
Marine water	:	0,79 mg/l
Intermittent releases	:	2,75 mg/l
Sewage treatment plant (STP)	:	580 mg/l
Fresh water sediment	:	3,6 mg/kg d.w.
Marine sediment	:	2,9 mg/kg d.w.
Soil	:	0,63 mg/kg d.w.
Secondary poisoning	:	380 mg/kg food

Other Occupational Exposure Limit Values

Belgium. OELs. Exposure Limit Values to Chemical Substances at Work, Code of Well-being at work, Book VI, Title 1, as amended, Time Weighted Average (TWA):
1.000 ppm, 1.907 mg/m3

Netherlands. OELs (binding), as amended, Skin designation:
Can be absorbed through the skin.

Netherlands. OELs (binding), as amended, Short Term Exposure Limit (STEL):
1.900 mg/m3, (15 minutes)
Section B: List of Carcinogens

Netherlands. OELs (binding), as amended, Time Weighted Average (TWA):
260 mg/m3
Section B: List of Carcinogens

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. When aerosol or mist is formed use suitable respiratory protection. Respiratory protection complying with EN 141. Combination filter: A-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	:	> 480 min
Glove thickness	:	0,7 mm

Eye protection

Advice	:	Safety goggles

Skin and body protection

Advice	:	Solvent resistant protective clothing

Environmental exposure controls

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

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Form	:	liquid
Physical state	:	liquid
Colour	:	blue
Odour	:	characteristic
Odour Threshold	:	No data available
Melting point/freezing point	:	-114 °C Ethanol
Boiling point/boiling range	:	78 °C Ethanol
Flammability	:	No data available

Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Flash point	:	12 °C Ethanol
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Self-Accelerating decomposition temperature (SADT)	:	No data available
pH	:	5,3 (20 °C) Concentration: 100 g/l Ethanol
Viscosity		
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	No data available
Flow time	:	No data available
Solubility(ies)		
Water solubility	:	soluble
Solubility in other solvents	:	No data available
Dissolution Rate	:	No data available
Partition coefficient: n-octanol/water	:	log Pow: -0,35 Ethanol
Dispersion Stability	:	No data available
Vapour pressure	:	No data available
Relative density	:	No data available
Density	:	0,806 - 0,850 g/cm3 (20 °C)
Bulk density	:	No data available
Relative vapour density	:	No data available

Particle characteristics
No data available

9.2 Other information

No data available

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 the following substances: Strong oxidizing agents
Strong acids

10.4. Conditions to avoid

Conditions to avoid : Heat, flames and sparks.

10.5. Incompatible materials

Materials to avoid : Strong oxidizing agents, Strong acids

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	
Acute toxicity	
Oral	
Based on available data, the classification criteria are not met.	
Inhalation	
Based on available data, the classification criteria are not met.	
Dermal	
Based on available data, the classification criteria are not met.	
Irritation	
Skin	
Result	: Based on available data, the classification criteria are not met.
Eyes	

Result	:	Causes serious eye irritation.

Sensitisation

Result	:	Based on available data, the classification criteria are not met.

CMR effects

CMR Properties

Carcinogenicity	:	Based on available data, the classification criteria are not met.
Mutagenicity	:	Based on available data, the classification criteria are not met.
Reproductive toxicity	:	Based on available data, the classification criteria are not met.

Specific Target Organ Toxicity

Single exposure

Remarks	:	Based on available data, the classification criteria are not met.

Repeated exposure

Remarks	:	Based on available data, the classification criteria are not met.

Other toxic properties

Repeated dose toxicity

No data available

Aspiration hazard

No data available

Component:	**ethanol**	**CAS-No. 64-17-5**

Acute toxicity

Oral

LD50	:	10470 mg/kg (Rat, male and female) (OECD Test Guideline 401)

Inhalation

LC50	:	51 mg/l (Rat; 4 h; vapour) (OECD Test Guideline 403)

Dermal

LD50	:	> 2000 mg/kg (Rabbit) (OECD Test Guideline 402)

Irritation

Skin

Result	:	No skin irritation (Rabbit) (OECD Test Guideline 404)

Eyes

Result	:	Causes serious eye irritation. (Rabbit) (OECD Test Guideline 405)

Sensitisation

Result	:	not sensitizing (Guinea pig) (Maximisation Test) not sensitizing (Mouse) (OECD Test Guideline 429) not sensitizing (Inhalation; Rat)

CMR effects

Carcinogenicity

NOAEL	:	> 4.000 mg/kg bw/day (Mouse, female)(Target Organs: Liver)(Oral; 105 weeks; Frequency of treatment: 5 days/week)
NOAEL	:	> 4.250 mg/kg bw/day (Mouse, male)(Target Organs: Liver)(Oral; 105 weeks; Frequency of treatment: 5 days/week)(OPPTS 870.4200)
NOAEL	:	> 3.000 mg/kg bw/day (Rat)(OECD Test Guideline 451)

CMR Properties

Carcinogenicity	:	Animal testing did not show any carcinogenic effects.
Mutagenicity	:	In vitro tests did not show mutagenic effects In vivo tests did not show mutagenic effects
Teratogenicity	:	It is not considered teratogenic.
Reproductive toxicity	:	It is not considered toxic for reproduction.

Genotoxicity in vitro

Result	:	negative (Ames test; Salmonella typhimurium) (OECD Test Guideline 471) negative (Mouse Lymphoma Cells) (OECD Test Guideline 476) Positive as well as negative results were obtained. (Bacterial Reverse Mutation Test; Escherichia coli) (No guideline followed)

Genotoxicity in vivo

Result	:	Positive as well as negative results were obtained. (Dominant lethal assay; Mouse, male) (Oral; 5 days) (OECD Test Guideline 478)

negative (Chromosome aberration test in vivo; Hamster, male and female) (Oral;) (OECD Test Guideline 475)
negative (In vivo micronucleus test; Mouse) (OECD Test Guideline 475)

Teratogenicity

LOAEL Develop.	:	8.200 mg/kg bw/day (Rat, Sprague-Dawley)(6 Weeks)(No guideline followed)Reduced skeletal ossification.
NOAEL Develop.	:	5.200 mg/kg bw/day (Rat, Sprague-Dawley)(6 Weeks)(No guideline followed)
NOAEL Maternal	:	>= 20.000 ppm
NOAEL Teratog.	:	16.000 ppm (Rat, Sprague-Dawley)(Inhalation; 10,000, 16,000, 20,000 ppm; 7 hours/day)(OECD Test Guideline 414)Reduced maternal food consumption

Reproductive toxicity

NOAEL Parent	:	21,5 mg/kg bw/day (Mouse, male and female)(OECD Test Guideline 416)No negative effects.
NOAEL F1	:	13,8 mg/kg bw/day (Mouse, male and female)(OECD Test Guideline 416)Reduction in sperm motility.

Specific Target Organ Toxicity

Single exposure

Remarks	:	The substance or mixture is not classified as specific target organ toxicant, single exposure.

Repeated exposure

Remarks	:	The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Other toxic properties

Repeated dose toxicity

NOAEL	:	1730 mg/kg bw/day

		(Rat, female)(Oral; 90-day) (OECD Test Guideline 408), Target Organs: Liver
NOAEL	:	> 20 mg/l
		(Rat, male)(Inhalation; 21 days) (OECD Test Guideline 403)

Aspiration hazard

No aspiration toxicity classification,

Further information

Other relevant toxicity information	:	Exposure to ethanol vapors may result in irritation of the eyes and nose, drowsiness and headache. Other symptoms may include stupor, nausea, mental excitement or depression, vomiting, flushing and coma. It can cause irritation of the respiratory tract, intra ocular tension, ataxia, sleepiness, narcosis, impaired perception and incoordination. It can also cause lowered inhibitions, dizziness, shallow respiration, unconsciousness and death. Chronic symptoms of ingestion and/or vapor exposure may include weight loss, cirrhosis of the liver, gastroenteritis, anorexia, diarrhea, polyneuritis with pain, motor and sensory loss in the extremities, optic atrophy and loss or impairment of other abilities, excitement, acute and chronic gastritis, malabsorption syndrome, acute and chronic pancreatitis, anemia due to acute or chronic blood myopathy, alcoholic cardiomyopathy, lactic acidosis, hypomagnesemia, hypouricemia, hyperlipidemia, pulmonary aspiration and respiratory infections. Chronic exposure may also result in serious neurological and mental disorders (e.g. brain damage, memory loss, sleep disturbances, and psychoses). Other symptoms include mucous membrane irritation, central nervous system depression, giddiness, jaundice, pain in upper abdomen on the right side and staggering gait. It may cause liver, kidney and heart damage. The pupils are sometimes widely dilated and unreactive to light. The liquid can defat the skin, producing a dermatitis characterized by drying and fissuring. It rarely causes temporary blindness. Ingestion of this compound can enhance the effects of coumarin, anticoagulants, antihistamines, hypnotics, sedatives, tranquilizers, insulin, monoamine oxidase inhibitors, and antidepressants. Can cause reproductive and teratogenic effects
Experience with human exposure	:	Repeated and prolonged exposure to solvents may cause brain and nervous system damage.,

Component:	**propan-2-ol**	**CAS-No. 67-63-0**

Acute toxicity

Oral

LD50	:	5840 mg/kg (Rat) (OECD Test Guideline 401)

Inhalation

LC50	:	> 25 mg/l (Rat; 6 h; vapour) (OECD Test Guideline 403)

Dermal

LD50	:	13900 mg/kg (Rabbit) (OECD Test Guideline 402)

Irritation

Skin

Result	:	No skin irritation (OECD Test Guideline 404)Degreases the skin which may cause dry and rough. Prolonged or repeated skin contact may result in dermatitis.

Eyes

Result	:	Eye irritation (OECD Test Guideline 405)Splashes in eyes may cause strong pain. Vapour acts irritant.

Sensitisation

Result	:	not sensitizing (Buehler Test; Dermal; Guinea pig) (OECD Test Guideline 406)

CMR effects

Carcinogenicity

NOEL	:	5.000 ppm (negative, Mouse, male and female)(Inhalation; 0, 500, 2500, 5000 ppm; 78 weeks; Frequency of treatment: 5 days/week)(OECD Test Guideline 451)

CMR Properties

Carcinogenicity	:	Based on available data, the classification criteria are not met.
Mutagenicity	:	In vitro tests did not show mutagenic effects In vivo tests did not show mutagenic effects
Teratogenicity	:	No effects on or via lactation
Reproductive toxicity	:	Based on available data, the classification criteria are not met.

Genotoxicity in vitro

Result	:	negative (Bacterial Reverse Mutation Test; Salmonella typhimurium; with and without metabolic activation) (OECD Test Guideline 471) negative (In vitro gene mutation study in mammalian cells; CHO (Chinese Hamster Ovary) cells; with and without metabolic activation) (OECD Test Guideline 476)

Genotoxicity in vivo

Result	:	negative (In vivo micronucleus test; Mouse, male and female) (intraperitoneal;) (OECD Test Guideline 474)

Teratogenicity

NOAEL Maternal	:	400 mg/kg bw/day
NOAEL Develop.	:	400 mg/kg bw/day (Rat, Sprague-Dawley)(Oral)(OECD Test Guideline 414)No adverse effects

Reproductive toxicity

NOAEL Parent	:	853 mg/kg bw/day (One-Generation Reproduction Toxicity Study; Rat, wistar, male and female)(Oral)(OECD Test Guideline 415)No negative effects.
NOAEL Parent	:	500 mg/kg bw/day (Two-generation reproductive toxicity; Rat, Sprague-Dawley, male and female)(Oral)(OECD Test Guideline 416)No negative effects.

Specific Target Organ Toxicity

Single exposure

Inhalation	:	Target Organs: Central nervous systemMay cause drowsiness or dizziness.

Repeated exposure

Remarks	:	Oral and inhalation repeated exposure studies demonstrated target organ effects in male rats (kidney) and male and female mice (thyroid) by mechanisms of action that are not relevant to humans

Other toxic properties

Aspiration hazard

Aspiration hazard if swallowed - can enter lungs and cause damage.

Aspiration may cause pulmonary oedema and pneumonitis.
Based on available data, the classification criteria are not met.,

Component:		butanone	CAS-No. 78-93-3
Acute toxicity			
Oral			
LD50	:	> 2193 mg/kg (Rat) (OECD Test Guideline 423)	
Inhalation			
LC50	:	34 mg/l (Rat; 4 h)	
Dermal			
LD50	:	> 5000 mg/kg (Rabbit) (OECD Test Guideline 402)	
Irritation			
Skin			
Result	:	No skin irritation (Rabbit; 4 h) (OECD Test Guideline 404)Repeated exposure may cause skin dryness or cracking.	
Eyes			
Result	:	Eye irritation (Rabbit) (OECD Test Guideline 405)	
Sensitisation			
Result	:	not sensitizing (Buehler Test; Dermal; Guinea pig) (OECD Test Guideline 406)	
CMR effects			
CMR Properties			
Carcinogenicity	:	Not expected to be carcinogenic.	
Mutagenicity	:	In vitro tests did not show mutagenic effects In vivo tests did not show mutagenic effects	
Teratogenicity	:	Animal testing did not show any effects on foetal development.	
Reproductive toxicity	:	Not expected to impair fertility. Read-across (Analogy)	
Genotoxicity in vitro			
Result	:	negative (rat hepatocytes) (OECD Test Guideline 473)	

negative (Mouse Lymphoma Cells) (OECD Test Guideline 476)
negative (Salmonella typhimurium) (OECD Test Guideline 471)

Genotoxicity in vivo

Result	:	negative (Mouse, male and female) (OECD Test Guideline 474)

Teratogenicity

NOAEC Develop.	:	1.002 ppm (Rat)(18 d; 7 hours/day)(OECD Test Guideline 414)Based on available data, the classification criteria are not met.
LOAEC Develop.	:	3.000 ppm (Rat)(18 d; 7 hours/day)(OECD Test Guideline 414)Body weight loss

Specific Target Organ Toxicity

Single exposure

Remarks	:	Target Organs: Central nervous systemMay cause drowsiness or dizziness.

Repeated exposure

Remarks	:	No known significant effects or critical hazards.

Other toxic properties

Repeated dose toxicity

NOAEC	:	5041 ppm (Rat, male and female)(Inhalation; vapour; 4 month; 6 hours/day) (OECD Test Guideline 413); No adverse effect has been observed with repeated intake in toxicity tests.

Aspiration hazard

No aspiration toxicity classification,

Further information

Experience with human exposure	:	Inhalation of high vapour concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting. Chronic exposure may cause dermatitis.,

11.2. Information on other hazards

Data for the product		
Endocrine disrupting properties		
Assessment	:	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Component:	**propan-2-ol**	**CAS-No. 67-63-0**
Endocrine disrupting properties		
Assessment	:	No information available about endocrine disruption properties for human health.

Component:	**butanone**	**CAS-No. 78-93-3**
Endocrine disrupting properties		
Assessment	:	No information available about endocrine disruption properties for human health.

SECTION 12: Ecological information

12.1. Toxicity

Data for the product		
Acute toxicity		
Short-term (acute) aquatic hazard		
Result	:	Based on available data, the classification criteria are not met.
Chronic toxicity		
Long-term (chronic) aquatic hazard		
Result	:	Based on available data, the classification criteria are not met.

Component:	**ethanol**	**CAS-No. 64-17-5**
Acute toxicity		
Fish		
LC50	:	15.300 mg/l (Pimephales promelas (fathead minnow); 96 h) (flow-through test; US-EPA)
LC50		11.200 mg/l (Salmo gairdneri; 24 h) (flow-through test; US-EPA)
LC50		13.000 mg/l (Oncorhynchus mykiss; 96 h) (OECD Test Guideline

203)

Toxicity to daphnia and other aquatic invertebrates		
EC50	:	858 mg/l (Artemia salina; 24 h) (OECD Test Guideline 202)Marine water
EC50		12.340 mg/l (Daphnia magna (Water flea); 48 h) (ASTM E 729-80)Fresh water
LC50		5.012 mg/l (Ceriodaphnia dubia (water flea); 48 h) (static test; ASTM E 729-80)Fresh water

algae		
EC50	:	275 mg/l (Chlorella vulgaris (Fresh water algae); 72 h) (static test; End point: Growth rate; OECD Test Guideline 201)Fresh water
EC10		11,5 mg/l (Chlorella vulgaris (Fresh water algae); 72 h) (static test; OECD Test Guideline 201)

Bacteria		
EC50	:	5800 mg/l (Paramaecium caudatum; 4 h) (static test; No guideline followed)

Chronic toxicity

Fish

NOEC	:	245 mg/l (30 d) (QSAR)

Aquatic invertebrates

NOEC		9,6 mg/l (Ceriodaphnia dubia (water flea); 10 d) (semi-static test; End point: Reproduction; No guideline followed)
NOEC		79 mg/l (Palaemonetes pugio; 12 d) (static test)

Component:	propan-2-ol	CAS-No. 67-63-0

Acute toxicity

Fish

LC50	:	9.640 mg/l (Pimephales promelas, mortality; 96 h) (flow-through test; OECD Test Guideline 203)

Toxicity to daphnia and other aquatic invertebrates		
LC50	:	9.714 mg/l (Daphnia magna, mortality; 24 h) (static test; OECD Test Guideline 202)

algae		
EC50	:	> 100 mg/l (Scenedesmus subspicatus; 72 h)
LOEC		1000 mg/l (algae; 8 d)

Bacteria		
EC50	:	> 100 mg/l (Bacteria) no harming action

Component:	butanone	CAS-No. 78-93-3

Acute toxicity		

Fish		
LC50	:	2.993 mg/l (Pimephales promelas; 96 h) (static test; OECD Test Guideline 203)

Toxicity to daphnia and other aquatic invertebrates		
EC50	:	308 mg/l (Daphnia magna; 48 h) (static test; OECD Test Guideline 202)

algae		
EC50	:	1972 mg/l (Pseudokirchneriella subcapitata (green algae); 72 h) (static test; End point: Growth rate; OECD Test Guideline 201)

Bacteria		
EC0	:	1150 mg/l (Pseudomonas putida; 16 h) (static test; DIN 38412)

12.2. Persistence and degradability

Data for the product
Persistence and degradability
Persistence

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

Component:	**ethanol**	**CAS-No. 64-17-5**
Persistence and degradability		
Persistence		
Result	:	(Related to: Water) non-significant hydrolysis
Biodegradability		
Result	:	97 % (aerobic; activated sludge; Related to: CO2 formation (% of the theoretical value).; Exposure Time: 28 d)(OECD Test Guideline 301B)Readily biodegradable.

Component:	**propan-2-ol**	**CAS-No. 67-63-0**
Persistence and degradability		
Persistence		
Result	:	Transformation due to hydrolysis not expected to be significant. Transformation due to photolysis not expected to be significant.
Biodegradability		
Result	:	53 % (aerobic; domestic sewage; Related to: O2 consumption; Exposure Time: 5 d)(Directive 67/548/EEC, Annex V, C.5)Readily biodegradable.

Component:	**butanone**	**CAS-No. 78-93-3**
Persistence and degradability		
Persistence		
Result	:	Transformation due to hydrolysis not expected to be significant. Transformation due to photolysis not expected to be significant.
Biodegradability		
Result	:	98 % (Exposure Time: 28 d)(OECD Test Guideline 301D)Readily biodegradable.

12.3. Bioaccumulative potential

Component:	**ethanol**	**CAS-No. 64-17-5**
Bioaccumulation		
Result	:	log Kow -0,35 (24 °C; pH 7,4) (OECD Test Guideline 107)
	:	BCF: 0,66; Does not bioaccumulate.

Component:	propan-2-ol	CAS-No. 67-63-0
Bioaccumulation		

Result : log Kow 0,05 (25 °C)
: Bioaccumulation is not expected.

Component:	butanone	CAS-No. 78-93-3
Bioaccumulation		

Result : log Kow 0,3 (40 °C)
: Does not bioaccumulate.

12.4. Mobility in soil

Component:	ethanol	CAS-No. 64-17-5
Mobility		

Water : The product is water soluble.
Air : The product evaporates readily.
Soil : Not expected to adsorb on soil.

Component:	propan-2-ol	CAS-No. 67-63-0
Mobility		

Water : The product is water soluble.
Soil : Mobile in soils

Component:	butanone	CAS-No. 78-93-3
Mobility		

Water : Expected to remain in water or migrate through soil., The product is partly soluble in water.

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:	ethanol	CAS-No. 64-17-5
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).

Component:	**propan-2-ol**	**CAS-No. 67-63-0**
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).

Component:	**butanone**	**CAS-No. 78-93-3**
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	:	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Component:	**propan-2-ol**	**CAS-No. 67-63-0**
Endocrine disrupting potential	:	No information available about endocrine disruption properties for environment.

Component:	**butanone**	**CAS-No. 78-93-3**
Endocrine disrupting potential	:	No information available about endocrine disruption properties for environment.

12.7. Other adverse effects

Data for the product		
Additional ecological information		
Result	:	Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration.

Component:	**ethanol**	**CAS-No. 64-17-5**
Biochemical Oxygen Demand (BOD)		
Result	:	100 mg/g

Chemical Oxygen Demand (COD)		
Result	:	1900 mg/g

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

Component:	propan-2-ol	CAS-No. 67-63-0

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

Component:	butanone	CAS-No. 78-93-3

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

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product	:	Disposal together with normal waste is not allowed. Special disposal required according to local regulations. Do not let product enter drains. Contact waste disposal services. This product shall be disposed of or recovered in compliance with Directive 2008/98/EC on waste as lastly amended.
Contaminated packaging	:	Empty contaminated packagings thoroughly. They can be recycled after thorough and proper cleaning. If recycling is not practicable, dispose of in compliance with local regulations. Do not burn, or use a cutting torch on, the empty drum. Risk of explosion.
European Waste Catalogue Number	:	No waste code 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

1170

14.2. UN proper shipping name

ADR : ETHANOL SOLUTION
RID : ETHANOL SOLUTION
IMDG : ETHANOL SOLUTION

14.3. Transport hazard class(es)

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

14.4. Packaging group

ADR	:	II
RID	:	II
IMDG	:	II

14.5. Environmental hazards

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

14.6. Special precautions for user

Not applicable.

14.7 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.

SECTION 15: Regulatory information

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

Data for the product

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.

Component:	ethanol	CAS-No. 64-17-5

EU. Chemicals Subject to PIC Procedure: Regulation 649/2012/EU on export and import of dangerous chemicals, as amended	:	; The substance/mixture does not fall under this legislation.
EU. REACH, Annex XVII, Marketing and Use Restrictions (Regulation 1907/2006/EC)	:	Point Nos.: , 3; Listed Point Nos.: , 40; Listed
EU. Regulation No 1451/2007 [Biocides], Annex I, OJ (L 325)	:	EC Number: , 200-578-6; 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.
Netherlands. Substances toxic to reproduction, as amended	:	Hazard Designation: ; May cause harm to breastfed babies.
Netherlands. Carcinogenic substances and processes, as amended	:	Hazard Designation: ; Carcinogenic

Netherlands. Substances toxic to reproduction, as amended	:	Hazard Designation: 1A; May cause harm to the unborn child.
Netherlands. Substances toxic to reproduction, as amended	:	Hazard Designation: 1A; May impair fertility.

Component:	**propan-2-ol**	**CAS-No. 67-63-0**

EU. Chemicals Subject to PIC Procedure: Regulation 649/2012/EU on export and import of dangerous chemicals, as amended	:	; The substance/mixture does not fall under this legislation.
EU. REACH, Annex XVII, Marketing and Use Restrictions (Regulation 1907/2006/EC)	:	Point Nos.: , 3; Listed Point Nos.: , 40; Listed
EU. Regulation No 1451/2007 [Biocides], Annex I, OJ (L 325)	:	EC Number: , 200-661-7; 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.

Component:	**butanone**	**CAS-No. 78-93-3**

EU. Regulation EC No. 689/2008	:	; The substance/mixture does not fall under this legislation.

EU. Regulation 273/2004, Drug Precursors, Category 3	:	Scheduled substance Combined Nomenclature (CN) code: , 2914 12 00; Combined Nomenclature designation
EU. REACH, Annex XVII, Marketing and Use Restrictions (Regulation 1907/2006/EC)	:	Point Nos.: , 3; Listed Point Nos.: , 40; Listed Point Nos.: , 75; 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: 50 tonnes; Part 1: Categories of dangerous substances; P5b:Flammable liquids Category 2 or 3 where particular processing conditions, such as high pressure or high temperature, may create major-accident hazards;, 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: 200 tonnes; Part 1: Categories of dangerous substances; P5b:Flammable liquids Category 2 or 3 where particular processing conditions, such as high pressure or high temperature, may create major-accident hazards;, The information given is valid if the product is stored below the boiling point and at a pressure of 1013 hPa.

15.2. Chemical safety assessment

No data available

SECTION 16: Other information

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

H225	Highly flammable liquid and vapour.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.

Full text of the Notes referred to under section 3.

Abbreviations and Acronyms

AU AIICL	Australia. Industrial Chemicals Act (AIIC) List
BCF	bioconcentration factor
BOD	biochemical oxygen demand

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

SVHC	substance of very high concern
TCSI	Taiwan. Existing Chemicals Inventory
TH INV	Thailand. Existing Chemicals Inventory from FDA

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	Main User Group (SU)	Sector of Use (SU)	Product Category (PC)	Process Category (PROC)	Environmental Release Category (ERC)	Article Category (AC)	Specified
1	Manufacture of substance	3	8, 9	NA	1, 2, 3, 4, 8a, 8b	1, 4, 6a	NA	ES3100
2	Use as an intermediate	3	NA	NA	1, 2, 3, 4, 8a, 8b	1, 4, 6a	NA	ES3589
3	Distribution of substance	3	8, 9	NA	8a, 8b, 9	2	NA	ES3108
4	Formulation & (re)packing of substances and mixtures	3	10	NA	3, 5, 8a, 8b, 9, 14	2	NA	ES3124
5	Use in non-spraying formulations	3	NA	NA	10, 13	4	NA	ES3135
6	Use in spraying formulations	3	NA	NA	7	4	NA	ES3138
7	Use in non-spraying formulations	22	NA	NA	10, 13, 14, 19	8a, 8d	NA	ES3140
8	Use in spraying formulations	22	NA	NA	11	8a, 8d	NA	ES3143
9	Uses in coatings	21	NA	9a	NA	8a, 8d	NA	ES3158
10	Use in Cleaning Agents	21	NA	35	NA	8a, 8d	NA	ES3162
11	Use as a fuel	21	NA	13	NA	8a, 8d	NA	ES3147
12	Use as Functional Fluids	3	NA	NA	20	7	NA	ES3171
13	Use as Functional Fluids	22	NA	NA	20	9a, 9b	NA	ES3174
14	Use in heat transfer and hydraulic fluids	21	NA	16, 17	NA	9a, 9b	NA	ES3156
15	Use in laboratories	3	NA	NA	15	2, 4	NA	ES3165
16	Use in laboratories	22	NA	NA	15	8a	NA	ES3168
17	Use in de-icing and anti-icing applications	21	NA	4	NA	8d	NA	ES3160
18	Use as a process chemical	3	8, 9	NA	1, 2, 3, 4, 8a, 8b	1, 4, 6a	NA	ES3605
19	Consumer use	21	NA	1, 3, 8, 12, 14, 15, 18, 23, 24, 27, 28, 30, 31, 34, 39	NA	8a, 8d	NA	ES3151

1. Short title of Exposure Scenario 1: Manufacture of substance		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals	
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	
Environmental Release Categories	ERC1: Manufacture of substances ERC4: Industrial use of processing aids in processes and products, not becoming part of articles ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)	
2.1 Contributing scenario controlling environmental exposure for: ERC1, ERC4, ERC6a		
Readily biodegradable., Does not bioaccumulate., Fully soluble in water		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Amount used	annually at point source	400000 tonnes
	Annually total	4,6 Million tonnes/year
	Fraction used at the main local source.	0,086
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	226 kg/day
	Emission or Release Factor: Water	11,3 kg/day
	Indoor/Outdoor use. Ambient temperature Ambient pressure.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and	Air	Apply technical measures aiming at reducing releases to air., Containment by preference or catalytic or thermal gas oxidation., Use appropriate emission abatement equipment from LEV systems if required by local legislation. (Efficiency: > 70 %)

releases to soil Organizational measures to prevent/limit release from the site	Water	Apply technical measures aiming at reducing and cleaning of wastewater., Do not release wastewater directly into environment., Wastewater release into municipal STP., Do not discharge into sewers or drains. (Degradation effectiveness: > 87 %)
	Keep container tightly closed. Store in a bounded area. Bioaccumulation is not expected.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	90 %
	Sludge Treatment	Disposal or recovery
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, Hazardous waste incineration., Dispose for use in recycled fuels.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	5,73 kPa
Frequency and duration of use	Exposure duration per day	> 4 h
	Frequency of use	> 4 days/week
	Frequency of use	240 days/year
Human factors not influenced by risk management	Exposed skin areas	Two hands face side only. 480 cm² (PROC1, PROC2, PROC3, PROC4)
	Exposed skin areas	Two hands 960 cm² (PROC8a, PROC8b)
Other operational conditions affecting workers exposure	Outdoor use.	
Technical conditions and measures to control dispersion from source towards the worker	Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation. Provide extraction ventilation at points where emissions occur. (Efficiency: 95 %)	
Conditions and measures related to personal protection, hygiene and health evaluation	If splashes are likely to occur: Use suitable eye protection.	
	Wear suitable gloves tested to EN374.	
3. Exposure estimation and reference to its source		

Environment

EUSES.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
Relevant for all ERCs	---	Sewage treatment plant (STP)	PEC	5,65mg/L	---
Relevant for all ERCs	---	Soil	PEC	0,0012mg/kg	---
Relevant for all ERCs	---	Fresh water	PEC	0,264.10-4 mg/L	---
Relevant for all ERCs	---	Marine water	PEC	0,0224.10-4 mg/L	---

Workers

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC8a	---	Inhalation worker exposure	96,04mg/m3	---
PROC8a	---	Dermal worker exposure	13,71mg/kg bw/day	---

Given exposure estimates are based on the PROC with the highest exposure levels in this scenario

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.
If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

The measures reported in this section have not been taken into account in the exposure estimates related to the exposure above.
Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the ES when possible.

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 2: Use as an intermediate		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	
Environmental Release Categories	ERC1: Manufacture of substances ERC4: Industrial use of processing aids in processes and products, not becoming part of articles ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)	
2.1 Contributing scenario controlling environmental exposure for: ERC1, ERC4, ERC6a		
Readily biodegradable., Does not bioaccumulate., Fully soluble in water		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Amount used	annually at point source	400000 tonnes
	Annually total	4,6 Million tonnes/year
	Fraction used at the main local source.	0,086
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	226 kg/day
	Emission or Release Factor: Water	11,3 kg/day
	Indoor/Outdoor use. Ambient temperature Ambient pressure.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to	Air	Apply technical measures aiming at reducing releases to air., Containment by preference or catalytic or thermal gas oxidation., Use appropriate emission abatement equipment from LEV systems if required by local legislation. (Efficiency: > 70 %)
	Water	Apply technical measures aiming at reducing and cleaning of wastewater., Do not release wastewater directly into environment., Wastewater release into

prevent/limit release from the site		municipal STP., Do not discharge into sewers or drains. (Degradation effectiveness: > 87 %)
	Keep container tightly closed. Store in a bounded area. Bioaccumulation is not expected.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	90 %
	Sludge Treatment	Disposal or recovery
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, Hazardous waste incineration., Dispose for use in recycled fuels.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	5,73 kPa
Frequency and duration of use	Exposure duration per day	> 4 h
	Frequency of use	> 4 days/week
	Frequency of use	240 days/year
Human factors not influenced by risk management	Exposed skin areas	Two hands face side only. 480 cm² (PROC1, PROC2, PROC3, PROC4)
	Exposed skin areas	Two hands 960 cm² (PROC8a, PROC8b)
Other operational conditions affecting workers exposure	Outdoor use.	
Technical conditions and measures to control dispersion from source towards the worker	Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation. Provide extraction ventilation at points where emissions occur. (Efficiency: 95 %)	
Conditions and measures related to personal protection, hygiene and health evaluation	If splashes are likely to occur: Use suitable eye protection.	
	Wear suitable gloves tested to EN374.	
3. Exposure estimation and reference to its source		
Environment		

EUSES.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
Relevant for all ERCs	---	Sewage treatment plant (STP)	PEC	5,65mg/L	---
Relevant for all ERCs	---	Soil	PEC	0,0012mg/kg	---
Relevant for all ERCs	---	Fresh water	PEC	0,264.10-4 mg/L	---
Relevant for all ERCs	---	Marine water	PEC	0,0224.10-4 mg/L	---

Workers

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC8a	---	Inhalation worker exposure	96,04mg/m3	---
PROC8a	---	Dermal worker exposure	13,71mg/kg bw/day	---

Given exposure estimates are based on the PROC with the highest exposure levels in this scenario

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.
If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

The measures reported in this section have not been taken into account in the exposure estimates related to the exposure above.
Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the ES when possible.

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 3: Distribution of substance		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals	
Process categories	PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	
Environmental Release Categories	ERC2: Formulation of preparations	
2.1 Contributing scenario controlling environmental exposure for: ERC2		
Readily biodegradable., Does not bioaccumulate., Fully soluble in water		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Amount used	annually at point source	75000 ton(s)/year
	Annually total	3,8 Million tonnes/year
	Fraction used at the main local source.	0,1
	Amount used locally	5000 kg/day
Frequency and duration of use	Continuous exposure	300 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	50 kg/day
	Emission or Release Factor: Water	15 kg/day
	Emission or Release Factor: Soil	1 kg/day
	Outdoor use. Ambient temperature Ambient pressure.	
Technical conditions and measures at process level (source) to prevent release	Water	Do not release wastewater directly into environment., Wastewater release into municipal STP.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Keep container tightly closed. Store in a bounded area.	
Organizational measures to		

prevent/limit release from the site		
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	90 %
	Sludge Treatment	Disposal or recovery
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, Hazardous waste incineration., Dispose for use in recycled fuels.
2.2 Contributing scenario controlling worker exposure for: PROC8a, PROC8b, PROC9		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	5,73 kPa
Frequency and duration of use	Exposure duration per day	> 4 h
	Frequency of use	> 4 days/week
	Frequency of use	240 days/year
Human factors not influenced by risk management	Exposed skin areas	Two hands 960 cm²
Other operational conditions affecting workers exposure	Outdoor or in highly ventilated (open) spaces	
Technical conditions and measures to control dispersion from source towards the worker	When indoor: Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur.	
Conditions and measures related to personal protection, hygiene and health evaluation	If splashes are likely to occur: Use suitable eye protection.	
	Wear suitable gloves tested to EN374.	

3. Exposure estimation and reference to its source

Environment

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC2	---	Sewage treatment plant (STP)	PEC	4,66mg/L	---

ERC2	---	Fresh water	PEC	0,52mg/L	---
ERC2	---	Soil	PEC	0,007mg/kg	---
ERC2	---	Marine water	PEC	0,0515mg/L	---

Workers

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC8a	---	Inhalation worker exposure	96,04mg/m3	---
PROC8a	---	Dermal worker exposure	13,71mg/kg bw/day	---

Given exposure estimates are based on the PROC with the highest exposure levels in this scenario

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.
If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

The measures reported in this section have not been taken into account in the exposure estimates related to the exposure above.
Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the ES when possible.

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 4: Formulation & (re)packing of substances and mixtures	
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Process categories	PROC3: Use in closed batch process (synthesis or formulation) PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelettisation
Environmental Release Categories	ERC2: Formulation of preparations

2.1 Contributing scenario controlling environmental exposure for: ERC2		
Readily biodegradable., Does not bioaccumulate., Fully soluble in water		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Amount used	annually at point source	280000 ton(s)/year
	Annually total	3,8 Million tonnes/year
	Fraction used at the main local source.	0,1
	Amount used locally	93333 kg/day
Frequency and duration of use	Continuous exposure	300 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	469 kg/day
	Emission or Release Factor: Water	28 kg/day
	Emission or Release Factor: Soil	9 kg/day
	Formulation activity is assumed to be a predominantly enclosed process. Indoor use. Ambient temperature Ambient pressure.	
Technical conditions and measures at process level	Water	Apply technical measures aiming at reducing and cleaning of wastewater., Do not release wastewater

(source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site		directly into environment., Wastewater release into municipal STP., Do not discharge into sewers or drains. (Degradation effectiveness: > 90 %)
	Keep container tightly closed. Store in a bounded area.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	90 %
	Sludge Treatment	Disposal or recovery
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, Hazardous waste incineration., Dispose for use in recycled fuels.
2.2 Contributing scenario controlling worker exposure for: PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC14		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	5,73 kPa
Frequency and duration of use	Exposure duration per day	> 4 h
	Frequency of use	> 4 days/week
	Frequency of use	240 days/year
Human factors not influenced by risk management	Exposed skin areas	Two hands face side only. 480 cm² (PROC3)
	Exposed skin areas	Two hands 960 cm² (PROC8a, PROC8b)
Other operational conditions affecting workers exposure	Indoor use.	
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur.	
Conditions and measures related to personal protection, hygiene and health evaluation	If splashes are likely to occur: Use suitable eye protection.	
	Wear suitable gloves tested to EN374.	
3. Exposure estimation and reference to its source		
Environment		

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC2	---	Sewage treatment plant (STP)	PEC	1,73mg/L	---
ERC2	---	Fresh water	PEC	0,185mg/L	---
ERC2	---	Soil	PEC	0,0117mg/kg	---
ERC2	---	Marine water	PEC	0,0186mg/L	---

Workers

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC8a	---	Inhalation worker exposure	96,04mg/m3	---
PROC8a	---	Dermal worker exposure	13,71mg/kg bw/day	---

Given exposure estimates are based on the PROC with the highest exposure levels in this scenario

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.
If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

The measures reported in this section have not been taken into account in the exposure estimates related to the exposure above.
Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the ES when possible.

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 5: Use in non-spraying formulations		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Process categories	PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring	
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles	
2.1 Contributing scenario controlling environmental exposure for: ERC4		
Readily biodegradable., Does not bioaccumulate., Fully soluble in water		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Amount used	annually at point source	2750 ton(s)/year
	Annually total	27500 ton(s)/year
	Fraction used at the main local source.	0,1
	Amount used locally	458 kg/day
Frequency and duration of use	Continuous exposure	300 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	367 kg/day
	Emission or Release Factor: Water	5 kg/day
	Emission or Release Factor: Soil	1 kg/day
	Indoor/Outdoor use. Ambient temperature Ambient pressure.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Apply technical measures aiming at reducing and cleaning of wastewater., Do not release wastewater directly into environment., Wastewater release into municipal STP., Do not discharge into sewers or drains. (Degradation effectiveness: > 70 %)
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	90 %

	Sludge Treatment	Disposal or recovery
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, Hazardous waste incineration., Dispose for use in recycled fuels.
2.2 Contributing scenario controlling worker exposure for: PROC10, PROC13		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	5,73 kPa
Frequency and duration of use	Exposure duration per day	> 4 h
	Frequency of use	> 4 days/week
	Frequency of use	240 days/year
Human factors not influenced by risk management	Exposed skin areas	Two hands face side only. 480 cm² (PROC13)
	Exposed skin areas	Two hands 960 cm² (PROC10)
Other operational conditions affecting workers exposure	Indoor and outdoor use.	
Technical conditions and measures to control dispersion from source towards the worker	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur.	
	When indoor: Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN374 during the activities where the skin contact is possible.	
	If splashes are likely to occur: Use suitable eye protection.	

3. Exposure estimation and reference to its source

Environment

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4	---	Sewage treatment plant (STP)	PEC	0,285mg/L	---
ERC4	---	Fresh water	PEC	0,039mg/L	---
ERC4	---	Soil	PEC	0,0091mg/kg	---
ERC4	---	Marine water	PEC	0,0039mg/L	---

Workers

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC10	---	Inhalation worker exposure	96,04mg/m3	---
PROC10	---	Dermal worker exposure	27,43mg/kg bw/day	---

Given exposure estimates are based on the PROC with the highest exposure levels in this scenario

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.
If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

The measures reported in this section have not been taken into account in the exposure estimates related to the exposure above.
Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the ES when possible.

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 6: Use in spraying formulations		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Process categories	PROC7: Industrial spraying	
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles	
2.1 Contributing scenario controlling environmental exposure for: ERC4		
Readily biodegradable., Does not bioaccumulate., Fully soluble in water		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
Amount used	annually at point source	2750 ton(s)/year
	Annually total	27500 ton(s)/year
	Fraction used at the main local source.	0,1
	Amount used locally	458 kg/day
Frequency and duration of use	Continuous exposure	300 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	367 kg/day
	Emission or Release Factor: Water	5 kg/day
	Emission or Release Factor: Soil	1 kg/day
	Indoor/Outdoor use. Ambient temperature Ambient pressure.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Apply technical measures aiming at reducing and cleaning of wastewater., Do not release wastewater directly into environment., Wastewater release into municipal STP., Do not discharge into sewers or drains. (Degradation effectiveness: > 70 %)
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	90 %

	Sludge Treatment	Disposal or recovery
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, Hazardous waste incineration., Dispose for use in recycled fuels.
2.2 Contributing scenario controlling worker exposure for: PROC7		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	5,73 kPa
Frequency and duration of use	Exposure duration per day	> 4 h
	Frequency of use	> 4 days/week
	Frequency of use	240 days/year
Human factors not influenced by risk management	Exposed skin areas	Hands and forearms. 1500 cm² (PROC13)
Other operational conditions affecting workers exposure	Indoor use.	
Technical conditions and measures to control dispersion from source towards the worker	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	Avoid frequent and direct contact with substance Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. If no vented laminar spray booth available: Wear a respirator conforming to EN140 with Type A filter or better.	

3. Exposure estimation and reference to its source

Environment

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4	---	Sewage treatment plant (STP)	PEC	0,285mg/L	---
ERC4	---	Fresh water	PEC	0,039mg/L	---
ERC4	---	Soil	PEC	0,0091mg/kg	---
ERC4	---	Marine water	PEC	0,0039mg/L	---

Workers

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC7	---	Inhalation worker exposure	480,21mg/m3	---
PROC7	---	Dermal worker exposure	42,86mg/kg bw/day	---

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.
If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

The measures reported in this section have not been taken into account in the exposure estimates related to the exposure above.
Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the ES when possible.

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 7: Use in non-spraying formulations		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Process categories	PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelettisation 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	
2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d		
Readily biodegradable., Does not bioaccumulate., Fully soluble in water		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Amount used	Annually total	10000 ton(s)/year
	Fraction used at the main local source.	0,1
	Amount used locally	5,5 kg/day
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	5 kg/day
	Emission or Release Factor: Water	5 kg/day
	Emission or Release Factor: Soil	1 kg/day
	Indoor/Outdoor use. Ambient temperature Ambient pressure.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Do not release wastewater directly into environment., Wastewater release into municipal STP.
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage	2.000 m3/d

	treatment plant effluent	
	Degradation efficiency	90 %
	Sludge Treatment	Disposal or recovery
Conditions and measures related to external treatment of waste for disposal	Disposal methods	Contain and dispose of waste according to local regulations.
2.2 Contributing scenario controlling worker exposure for: PROC10, PROC13, PROC14, PROC19		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	5,73 kPa
Frequency and duration of use	Exposure duration per day	> 4 h(except PROC19)
	Exposure duration per day	< 4 h(PROC19)
	Frequency of use	240 days/year
	Frequency of use	> 4 days/week
Human factors not influenced by risk management	Exposed skin areas	Two hands face side only. 480 cm² (PROC13, PROC14)
	Exposed skin areas	Two hands 960 cm² (PROC10)
	Exposed skin areas	Hands and forearms. 1980 cm² (PROC19)
Other operational conditions affecting workers exposure	Indoor and outdoor use.	
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.	
Conditions and measures related to personal protection, hygiene and health evaluation	If splashes are likely to occur: Use suitable eye protection. Wear suitable gloves tested to EN374. Avoid direct skin contact with product.(only PROC19)	
2.3 Contributing scenario controlling worker exposure for: PROC19		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	5,73 kPa
Frequency and duration of use	Exposure duration per day	> 4 h
	Frequency of use	240 days/year

	Frequency of use	> 4 days/week
Human factors not influenced by risk management	Exposed skin areas	Hands and forearms. 1980 cm² (PROC19)
Other operational conditions affecting workers exposure	Indoor and outdoor use.	
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.	

3. Exposure estimation and reference to its source

Environment

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a	---	Sewage treatment plant (STP)	PEC	0,34mg/L	---
ERC8a	---	Fresh water	PEC	0,045mg/L	---
ERC8a	---	Soil	PEC	0,0003mg/kg	---
ERC8a	---	Marine water	PEC	0,0044mg/L	---

Workers

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC19	---	Inhalation worker exposure	115,25mg/m3	---
PROC19	---	Dermal worker exposure	84,86mg/kg bw/day	---

Given exposure estimates are based on the PROC with the highest exposure levels in this scenario

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.
If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that

risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

The measures reported in this section have not been taken into account in the exposure estimates related to the exposure above.
Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the ES when possible.

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 8: Use in spraying formulations		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Process categories	PROC11: Non industrial spraying	
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems	
2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d		
Readily biodegradable., Does not bioaccumulate., Fully soluble in water		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 5% - 25%
Amount used	Annually total	10000 ton(s)/year
	Fraction used at the main local source.	0,1
	Amount used locally	5,5 kg/day
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Indoor/Outdoor use. Ambient temperature Ambient pressure.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Do not release wastewater directly into environment., Wastewater release into municipal STP.
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	90 %
	Sludge Treatment	Disposal or recovery
Conditions and measures related to external treatment of waste for disposal	Disposal methods	Contain and dispose of waste according to local regulations.
2.2 Contributing scenario controlling worker exposure for: PROC11		
Product characteristics	Concentration of the	Covers percentage substance in the product up to 5

	Substance in Mixture/Article	%.
	Physical Form (at time of use)	liquid
	Vapour pressure	5,73 kPa
Frequency and duration of use	Exposure duration per day	> 4 h
	Frequency of use	300 days/year
	Frequency of use	> 4 days/week
Human factors not influenced by risk management	Exposed skin areas	Hands and forearms. 1500 cm²
Other operational conditions affecting workers exposure	Indoor and outdoor use.	
2.3 Contributing scenario controlling worker exposure for: PROC11		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	5,73 kPa
Frequency and duration of use	Exposure duration per day	1 - 4 h
	Frequency of use	300 days/year
	Frequency of use	> 4 days/week
Human factors not influenced by risk management	Exposed skin areas	Hands and forearms. 1500 cm²
Other operational conditions affecting workers exposure	Indoor and outdoor use.	
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN374 during the activities where the skin contact is possible.	
2.4 Contributing scenario controlling worker exposure for: PROC11		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	5,73 kPa
Frequency and duration of use	Exposure duration per day	< 1 h

	Frequency of use	300 days/year
	Frequency of use	> 4 days/week
Human factors not influenced by risk management	Exposed skin areas	Hands and forearms. 1500 cm²
Other operational conditions affecting workers exposure	Indoor and outdoor use.	
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). Provide enhanced general ventilation by mechanical means. (Efficiency: 70 %)	
Conditions and measures related to personal protection, hygiene and health evaluation	If no adequate ventilation is available: Wear respiratory protection. (Efficiency: 90 %)	

3. Exposure estimation and reference to its source

Environment

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a	---	Sewage treatment plant (STP)	PEC	0,34mg/L	---
ERC8a	---	Fresh water	PEC	0,045mg/L	---
ERC8a	---	Soil	PEC	0,0003mg/kg	---
ERC8a	---	Marine water	PEC	0,0044mg/L	---

Workers

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC11	---	Inhalation worker exposure	672,29mg/m3	---
PROC11	---	Dermal worker exposure	21,43mg/kg bw/day	---

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.
If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)

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

Additional good practice advice beyond the REACH Chemical Safety Assessment

The measures reported in this section have not been taken into account in the exposure estimates related to the exposure above.
Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the ES when possible.

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 9: Uses in coatings		
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	
2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d		
Readily biodegradable., Does not bioaccumulate., Fully soluble in water		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 1% - 15%
Amount used	Annually total	10000 ton(s)/year
	Fraction used at the main local source.	0,002
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Indoor/Outdoor use. Ambient temperature Ambient pressure.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	90 %
	Sludge Treatment	Disposal or recovery
2.2 Contributing scenario controlling consumer exposure for: PC9a		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 1% - 15%
Amount used	Amount used per event	250 g
Frequency and duration of use	Exposure duration	20 - 60 min
	Frequency of use	5 Times per year:
Human factors not influenced by risk management	Exposed skin areas	Palms of both hands 428 cm²
Other given operational conditions affecting consumers exposure	Indoor/Outdoor use.	
	Room size	20 m3
Conditions and measures related to protection of consumer (e.g.	Consumer Measures	Avoid using in room with closed doors.

behavioural advice, personal protection and hygiene)	

3. Exposure estimation and reference to its source

Environment

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a, ERC8d	---	Sewage treatment plant (STP)	PEC	0,34mg/L	---
ERC8a, ERC8d	---	Fresh water	PEC	0,0447mg/L	---
ERC8a, ERC8d	---	Soil	PEC	0,0003mg/kg	---
ERC8a, ERC8d	---	Marine water	PEC	0,0044mg/L	---

Consumers

ConsExpo 4.1

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PC9a	---	Inhalation	0,3mg/m³/day	---
PC9a	---	Dermal	0,5mg/kg bw/day	---

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.
Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

The measures reported in this section have not been taken into account in the exposure estimates related to the exposure above.
Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the ES when possible.

1. Short title of Exposure Scenario 10: Use in Cleaning Agents		
Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)	
Chemical product category	PC35: Washing and cleaning products (including solvent based products)	
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems	
2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d		
Readily biodegradable., Does not bioaccumulate., Fully soluble in water		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
Amount used	Annually total	40000 ton(s)/year
	Fraction used at the main local source.	0,002
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Indoor/Outdoor use. Ambient temperature Ambient pressure.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	90 %
	Sludge Treatment	Disposal or recovery
2.2 Contributing scenario controlling consumer exposure for: PC35: Laundry regular, PC35: Cleaners, liquids, PC35: Floor cleaning (liquids), PC35: Carpet cleaning (liquids)		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 5 %.
Amount used	Amount used per event	250 g
Frequency and duration of use	Exposure duration	15 - 60 min
	Frequency of use	1 Times per day
Other given operational conditions affecting consumers exposure	Indoor/Outdoor use.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal	Consumer Measures	Spray can products:

protection and hygiene)		

2.3 Contributing scenario controlling consumer exposure for: PC35: Toilet cleaners (bleach/acid), PC35: Bathroom Cleaners (spray), PC35: Bathroom Cleaners (liquid), PC35: Glass cleaner, PC35: Hand dishwashing liquids

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 5 %., Concentration of substance in product: 5% - 25%
Amount used	Amount used per event	250 g
Frequency and duration of use	Exposure duration	15 - 60 min
	Frequency of use	1 Times per day
Other given operational conditions affecting consumers exposure	Indoor/Outdoor use.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	Spray can products:

3. Exposure estimation and reference to its source

Environment

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a	---	Sewage treatment plant (STP)	PEC	0,681mg/L	---
ERC8a	---	Fresh water	PEC	0,0818mg/L	---
ERC8a	---	Soil	PEC	0,0005mg/kg	---
ERC8a	---	Marine water	PEC	0,0081mg/L	---

Consumers

ConsExpo 4.1

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PC35	---	Inhalation	1,73mg/m³/day	---
PC35	---	Dermal	10,7mg/kg bw/day	---

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.
Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

The measures reported in this section have not been taken into account in the exposure estimates related to the exposure above.
Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the ES when possible.

1. Short title of Exposure Scenario 11: Use as a fuel		
Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)	
Chemical product category	PC13: Fuels	
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems	
2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d		
Readily biodegradable., Does not bioaccumulate., Fully soluble in water		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Amount used	Annually total	10000 ton(s)/year
	Fraction used at the main local source.	0,002
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Only environmental release from the consumer use of substance as domestic fuel is evaporation during filling of the burner device	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	No release to water or STP
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Normally no generation of waste.
2.2 Contributing scenario controlling consumer exposure for: PC13		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 25% - 100%
Amount used	Amount used per event	1 l
Frequency and duration of use	Exposure duration	5 min
	Frequency of use	1 Times per week
Human factors not influenced by risk management	Exposed skin areas	Palm of one Hand 210 cm²

Other given operational conditions affecting consumers exposure	Indoor/Outdoor use.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	Wear protective eye glasses for protection against liquid splashes.

3. Exposure estimation and reference to its source

Environment

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a	---	Sewage treatment plant (STP)	PEC	0,34mg/L	---
ERC8a	---	Fresh water	PEC	0,0447mg/L	---
ERC8a	---	Soil	PEC	0,0003mg/kg	---
ERC8a	---	Marine water	PEC	0,0044mg/L	---

Consumers

ConsExpo 4.1

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PC13	---	Inhalation	0,81mg/m3	---
PC13	---	Dermal	70mg/kg bw/day	---

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.
Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

The measures reported in this section have not been taken into account in the exposure estimates related to the exposure above.
Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the ES when possible.

1. Short title of Exposure Scenario 12: Use as Functional Fluids		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Process categories	PROC20: Heat and pressure transfer fluids in dispersive, professional use but closed systems	
Environmental Release Categories	ERC7: Industrial use of substances in closed systems	
2.1 Contributing scenario controlling environmental exposure for: ERC7		
Readily biodegradable., Does not bioaccumulate., Fully soluble in water		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Amount used	annually at point source	1000 ton(s)/year
	Annually total	10000 ton(s)/year
	Fraction used at the main local source.	0,1
	Amount used locally	5,5 kg/day
Frequency and duration of use	Continuous exposure	365 days/year
Other given operational conditions affecting environmental exposure	Indoor/Outdoor use. Ambient temperature Ambient pressure.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Keep container tightly closed. Should not be released into the environment.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	90 %
	Sludge Treatment	Disposal or recovery
Conditions and measures related to external treatment of waste for disposal	Disposal methods	Contain and dispose of waste according to local regulations.
	All waste products are assumed to be collected and returned for re-processing or re-use	
2.2 Contributing scenario controlling worker exposure for: PROC20		

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	5,73 kPa
Human factors not influenced by risk management	Exposed skin areas	Two hands face side only. 480 cm²
Other operational conditions affecting workers exposure	Indoor and outdoor use.	
Technical conditions and measures to control dispersion from source towards the worker	Handle substance within a closed system. Store substance within a closed system.	
Conditions and measures related to personal protection, hygiene and health evaluation	If splashes are likely to occur: Use suitable eye protection.	

3. Exposure estimation and reference to its source

Environment

Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

Workers

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC20	---	Inhalation worker exposure	38,42mg/m3	---
PROC20	---	Dermal worker exposure	1,71mg/kg bw/day	---

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.
If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that

risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

The measures reported in this section have not been taken into account in the exposure estimates related to the exposure above.
Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the ES when possible.

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 13: Use as Functional Fluids		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Process categories	PROC20: Heat and pressure transfer fluids in dispersive, professional use but closed systems	
Environmental Release Categories	ERC9a: Wide dispersive indoor use of substances in closed systems ERC9b: Wide dispersive outdoor use of substances in closed systems	
2.1 Contributing scenario controlling environmental exposure for: ERC9a, ERC9b		
Readily biodegradable., Does not bioaccumulate., Fully soluble in water		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Amount used	annually at point source	1000 ton(s)/year
	Annually total	10000 ton(s)/year
	Fraction used at the main local source.	0,1
	Amount used locally	5,5 kg/day
Frequency and duration of use	Continuous exposure	365 days/year
Other given operational conditions affecting environmental exposure	Indoor/Outdoor use. Ambient temperature Ambient pressure.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Keep container tightly closed. Should not be released into the environment.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	90 %
	Sludge Treatment	Disposal or recovery
Conditions and measures related to external treatment of waste for disposal	Disposal methods	Contain and dispose of waste according to local regulations.
	All waste products are assumed to be collected and returned for re-processing or re-use	
2.2 Contributing scenario controlling worker exposure for: PROC20		

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	5,73 kPa
Human factors not influenced by risk management	Exposed skin areas	Two hands face side only. 480 cm²
Other operational conditions affecting workers exposure	Indoor and outdoor use.	
Technical conditions and measures to control dispersion from source towards the worker	Handle substance within a closed system. Store substance within a closed system.	
Conditions and measures related to personal protection, hygiene and health evaluation	If splashes are likely to occur: Use suitable eye protection.	

3. Exposure estimation and reference to its source

Environment

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a	---	Fresh water	PEC	0,0107mg/L	---
ERC8a	---	Soil	PEC	0,0002mg/kg	---
ERC8a	---	Marine water	PEC	0,001mg/L	---

Workers

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC20	---	Inhalation worker exposure	38,42mg/m3	---
PROC20	---	Dermal worker exposure	1,71mg/kg bw/day	---

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.
If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:

PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

The measures reported in this section have not been taken into account in the exposure estimates related to the exposure above.
Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the ES when possible.

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 14: Use in heat transfer and hydraulic fluids		
Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)	
Chemical product category	PC16: Heat transfer fluids PC17: Hydraulic fluids	
Environmental Release Categories	ERC9a: Wide dispersive indoor use of substances in closed systems ERC9b: Wide dispersive outdoor use of substances in closed systems	
2.1 Contributing scenario controlling environmental exposure for: ERC9a, ERC9b		
Readily biodegradable., Does not bioaccumulate., Fully soluble in water		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Amount used	Annually total	10000 ton(s)/year
	Fraction used at the main local source.	0,002
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Closed system Ambient temperature Ambient pressure. Indoor use.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	No release to water or STP
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Normally no generation of waste.
2.2 Contributing scenario controlling consumer exposure for: PC16, PC17		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 25% - 100%
Frequency and duration of use	Frequency of use	5 Times per year:
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	If splashes are likely to occur:

3. Exposure estimation and reference to its source

Environment

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC9a, ERC9b	---	Sewage treatment plant (STP)	PEC	0,017mg/L	---
ERC9a, ERC9b	---	Fresh water	PEC	0,0155mg/L	---
ERC9a, ERC9b	---	Soil	PEC	0,0001mg/kg	---
ERC9a, ERC9b	---	Marine water	PEC	0,0015mg/L	---

Consumers

ConsExpo 4.1

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PC16	---	Inhalation	0,04mg/m3	---
PC16	---	Dermal	0,85mg/kg bw/day	---

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.
Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

The measures reported in this section have not been taken into account in the exposure estimates related to the exposure above.
Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the ES when possible.

1. Short title of Exposure Scenario 15: Use in laboratories		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Process categories	PROC15: Use as laboratory reagent	
Environmental Release Categories	ERC2: Formulation of preparations ERC4: Industrial use of processing aids in processes and products, not becoming part of articles	
2.1 Contributing scenario controlling environmental exposure for: ERC2, ERC4		
Readily biodegradable., Does not bioaccumulate., Fully soluble in water		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Amount used	annually at point source	500 ton(s)/year
	Annually total	5000 ton(s)/year
	Fraction used at the main local source.	0,1
	Amount used locally	2,47 kg/day
Frequency and duration of use	Continuous exposure	300 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	3 kg/day
	Emission or Release Factor: Water	3 kg/day
	Emission or Release Factor: Soil	1 kg/day
	Indoor use. Ambient temperature Ambient pressure.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Do not release wastewater directly into environment., Wastewater release into municipal STP.
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	90 %

	Sludge Treatment	Disposal or recovery
Conditions and measures related to external treatment of waste for disposal	Disposal methods	Contain and dispose of waste according to local regulations.
2.2 Contributing scenario controlling worker exposure for: PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	5,73 kPa
Frequency and duration of use	Exposure duration per day	1 - 4 h
	Frequency of use	240 days/year
	Frequency of use	> 4 days/week
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm²
Other operational conditions affecting workers exposure	Indoor	
Conditions and measures related to personal protection, hygiene and health evaluation	If splashes are likely to occur: Use suitable eye protection.	

3. Exposure estimation and reference to its source

Environment

Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

Workers

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC15	---	Inhalation worker exposure	19,21mg/m3	---
PROC15	---	Dermal worker exposure	0,34mg/kg bw/day	---

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.

If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

The measures reported in this section have not been taken into account in the exposure estimates related to the exposure above.
Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the ES when possible.

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 16: Use in laboratories		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Process categories	PROC15: Use as laboratory reagent	
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems	
2.1 Contributing scenario controlling environmental exposure for: ERC8a		
Readily biodegradable., Does not bioaccumulate., Fully soluble in water		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Amount used	annually at point source	500 ton(s)/year
	Annually total	5000 ton(s)/year
	Fraction used at the main local source.	0,1
	Amount used locally	2,47 kg/day
Frequency and duration of use	Continuous exposure	300 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	3 kg/day
	Emission or Release Factor: Water	3 kg/day
	Emission or Release Factor: Soil	1 kg/day
	Indoor use. Ambient temperature Ambient pressure.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Do not release wastewater directly into environment., Wastewater release into municipal STP.
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	90 %

	Sludge Treatment	Disposal or recovery
Conditions and measures related to external treatment of waste for disposal	Disposal methods	Contain and dispose of waste according to local regulations.

2.2 Contributing scenario controlling worker exposure for: PROC15

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	5,73 kPa
Frequency and duration of use	Exposure duration per day	1 - 4 h
	Frequency of use	240 days/year
	Frequency of use	> 4 days/week
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm²
Other operational conditions affecting workers exposure	Indoor	
Conditions and measures related to personal protection, hygiene and health evaluation	If splashes are likely to occur: Use suitable eye protection.	

3. Exposure estimation and reference to its source

Environment

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a	---	Sewage treatment plant (STP)	PEC	0,17mg/L	---
ERC8a	---	Fresh water	PEC	0,027mg/L	---
ERC8a	---	Soil	PEC	0,0002mg/kg	---
ERC8a	---	Marine water	PEC	0,0027mg/L	---

Workers

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC15	---	Inhalation worker exposure	19,21mg/m3	---
PROC15	---	Dermal worker exposure	0,34mg/kg bw/day	---

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.
If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

The measures reported in this section have not been taken into account in the exposure estimates related to the exposure above.
Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the ES when possible.

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 17: 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	
2.1 Contributing scenario controlling environmental exposure for: ERC8d		
Readily biodegradable., Does not bioaccumulate., Fully soluble in water		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Amount used	Annually total	125000 ton(s)/year
	Fraction used at the main local source.	0,002
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Indoor use. Ambient temperature Ambient pressure.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	90 %
	Sludge Treatment	Disposal or recovery
2.2 Contributing scenario controlling consumer exposure for: PC4		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 25% - 100%
Amount used	Amount used per event	50 g
Frequency and duration of use	Exposure duration	< 5 min
	Frequency of use	1 Times per week
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 214 cm²
Other given operational conditions affecting consumers exposure	Indoor/Outdoor use.	
Conditions and measures related to protection of consumer (e.g.	Consumer Measures	Controlled spray or release device

behavioural advice, personal protection and hygiene)	

3. Exposure estimation and reference to its source

Environment

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8d	---	Sewage treatment plant (STP)	PEC	0,0011mg/L	---
ERC8d	---	Fresh water	PEC	0,014mg/L	---
ERC8d	---	Soil	PEC	0,0001mg/kg	---
ERC8d	---	Marine water	PEC	0,0013mg/L	---

Consumers

ConsExpo 4.1

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PC4	---	Inhalation	0,51mg/m³/day	---
PC4	---	Dermal	17,87mg/kg bw/day	---

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.
Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

The measures reported in this section have not been taken into account in the exposure estimates related to the exposure above.
Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the ES when possible.

1. Short title of Exposure Scenario 18: Use as a process chemical		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals	
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	
Environmental Release Categories	ERC1: Manufacture of substances ERC4: Industrial use of processing aids in processes and products, not becoming part of articles ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)	
2.1 Contributing scenario controlling environmental exposure for: ERC1, ERC4, ERC6a		
Readily biodegradable., Does not bioaccumulate., Fully soluble in water		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Amount used	annually at point source	400000 tonnes
	Annually total	4,6 Million tonnes/year
	Fraction used at the main local source.	0,086
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	226 kg/day
	Emission or Release Factor: Water	11,3 kg/day
	Indoor/Outdoor use. Ambient temperature Ambient pressure.	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and	Air	Apply technical measures aiming at reducing releases to air., Containment by preference or catalytic or thermal gas oxidation., Use appropriate emission abatement equipment from LEV systems if required by local legislation. (Efficiency: > 70 %)

releases to soil Organizational measures to prevent/limit release from the site	Water	Apply technical measures aiming at reducing and cleaning of wastewater., Do not release wastewater directly into environment., Wastewater release into municipal STP., Do not discharge into sewers or drains. (Degradation effectiveness: > 87 %)
	Keep container tightly closed. Store in a bounded area. Bioaccumulation is not expected.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	90 %
	Sludge Treatment	Disposal or recovery
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, Hazardous waste incineration., Dispose for use in recycled fuels.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	5,73 kPa
Frequency and duration of use	Exposure duration per day	> 4 h
	Frequency of use	> 4 days/week
	Frequency of use	240 days/year
Human factors not influenced by risk management	Exposed skin areas	Two hands face side only. 480 cm² (PROC1, PROC2, PROC3, PROC4)
	Exposed skin areas	Two hands 960 cm² (PROC8a, PROC8b)
Other operational conditions affecting workers exposure	Outdoor use.	
Technical conditions and measures to control dispersion from source towards the worker	Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation. Provide extraction ventilation at points where emissions occur. (Efficiency: 95 %)	
Conditions and measures related to personal protection, hygiene and health evaluation	If splashes are likely to occur: Use suitable eye protection.	
	Wear suitable gloves tested to EN374.	
3. Exposure estimation and reference to its source		

Environment

EUSES.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
Relevant for all ERCs	---	Sewage treatment plant (STP)	PEC	5,65mg/L	---
Relevant for all ERCs	---	Soil	PEC	0,0012mg/kg	---
Relevant for all ERCs	---	Fresh water	PEC	0,264.10-4 mg/L	---
Relevant for all ERCs	---	Marine water	PEC	0,0224.10-4 mg/L	---

Workers

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC8a	---	Inhalation worker exposure	96,04mg/m3	---
PROC8a	---	Dermal worker exposure	13,71mg/kg bw/day	---

Given exposure estimates are based on the PROC with the highest exposure levels in this scenario

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.
If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

The measures reported in this section have not been taken into account in the exposure estimates related to the exposure above.
Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the ES when possible.

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 19: Consumer use	
Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical product category	PC1: Adhesives, sealants PC3: Air care products PC8: Biocidal products PC12: Lawn and garden preparations, including fertilizers (- Fertilizers) PC14: Metal surface treatment products, including galvanic and electroplating products PC15: Non-metal-surface treatment products PC18: Ink and toners PC23: Leather tanning, dye, finishing, impregnation and care products PC24: Lubricants, greases, release products PC27: Plant protection products PC28: Perfumes, fragrances PC30: Photo-chemicals PC31: Polishes and wax blends PC34: Textile dyes, finishing and impregnating products; including bleaches and other processing aids PC39: Cosmetics, personal care products
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d		
Readily biodegradable., Does not bioaccumulate., Fully soluble in water		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Amount used	Annually total	10000 ton(s)/year
	Fraction used at the main local source.	0,002
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Indoor use. Ambient temperature Ambient pressure.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	90 %
	Sludge Treatment	Disposal or recovery

2.2 Contributing scenario controlling consumer exposure for: PC1, PC8, PC14, PC15, PC18

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 5% - 25%
Amount used	Amount used per event	50 g
Frequency and duration of use	Application duration	4 h
	Frequency of use	1 Times per day
Other given operational conditions affecting consumers exposure	Indoor/Outdoor use.	
	Room size	20 m3
2.3 Contributing scenario controlling consumer exposure for: PC3, PC28		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 25% - 100%
Amount used	Amount used per event	10 g
Frequency and duration of use	Application duration	4 h
	Frequency of use	1 Times per day
Other given operational conditions affecting consumers exposure	Indoor/Outdoor use.	
	Room size	20 m3
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	Avoid contact with skin.
2.4 Contributing scenario controlling consumer exposure for: PC23, PC27, PC30, PC34		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 1% - 5%
Amount used	Amount used per event	50 g
Frequency and duration of use	Application duration	4 h
	Frequency of use	1 Times per day
Other given operational conditions affecting consumers exposure	Indoor/Outdoor use.	
	Room size	20 m3
2.5 Contributing scenario controlling consumer exposure for: PC24, PC31		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 1 %.
Amount used	Amount used per event	50 g
Frequency and duration of use	Application duration	4 h

	Frequency of use	1 Times per day
Other given operational conditions affecting consumers exposure	Indoor/Outdoor use.	
	Room size	20 m3

3. Exposure estimation and reference to its source

Environment

ECETOC TRA model v2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a	---	Sewage treatment plant (STP)	PEC	0,34mg/L	---
ERC8a	---	Fresh water	PEC	0,0447mg/L	---
ERC8a	---	Soil	PEC	0,0003mg/kg	---
ERC8a	---	Marine water	PEC	0,0044mg/L	---

Consumers

ConsExpo 4.1

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PC31	---	Inhalation	10,31mg/m³/day	---
PC31	---	Dermal	2,87mg/kg bw/day	---

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.
Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

The measures reported in this section have not been taken into account in the exposure estimates related to the exposure above.
Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the ES when possible.

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