ConnectingChemistry

BRENNTAG

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

Hydrogen Peroxide 20 - <35%

Version 5.2 Print Date 2018/08/07

Revision date / valid from 2018/08/07 **MSDS code: MYYY664**

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

1.1. Product identifier

Trade name	:	Hydrogen Peroxide 20 - <35%
Substance name	:	hydrogen peroxide solution
Index-No.	:	008-003-00-9
CAS-No.	:	7722-84-1
EC-No.	:	231-765-0
EU REACH-Reg. No.	:	01-2119485845-22-xxxx

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

Use of the Substance/Mixture	:	At this time we do not yet have information on identified uses. They will be included in this safety data sheet when available.
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 UK Limited Alpha House, Lawnswood Business Park GB LS16 6QY Leeds
Telephone	:	+44 (0) 113 3879 200
Telefax	:	+44 (0) 113 3879 280
E-mail address	:	msds@brenntag.co.uk

1.4. Emergency telephone number

Emergency telephone number	:	Emergency only telephone number (open 24 hours): +44 (0) 1865 407333 (N.C.E.C. Culham)

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**
Acute toxicity (Oral)	Category 4	---	H302

Serious eye damage	Category 1	---	H318

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	:	H302	Harmful if swallowed.
		H318	Causes serious eye damage.
Precautionary statements			
Prevention	:	P264	Wash skin thoroughly after handling.
		P270	Do not eat, drink or smoke when using this product.
		P280	Wear protective gloves/ eye protection/ face protection.
Response	:	P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
		P310	Immediately call a POISON CENTER/doctor.
Disposal	:	P501	Dispose of contents/ container to an approved waste disposal plant.

Additional Labelling:

Acquisition, possession or use by the general public is restricted.

Hazardous components which must be listed on the label:

• hydrogen peroxide solution

2.3. Other hazards

For Results of PBT and vPvB assessment see section 12.5.

SECTION 3: Composition/information on ingredients

3.1. Substances

Chemical nature : Aqueous solution

Hazardous components	Amount [%]	Classification (REGULATION (EC) No 1272/2008)	
		Hazard class / Hazard category	Hazard statements
hydrogen peroxide solution			
Index-No. : 008-003-00-9 CAS-No. : 7722-84-1 EC-No. : 231-765-0 EU REACH-Reg. No. : 01-2119485845-22-xxxx	>= 20 - < 35	Ox. Liq.1 Acute Tox.4 Acute Tox.4 Skin Corr.1A STOT SE3	H271 H332 H302 H314 H335

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

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice : Take off all contaminated clothing immediately.

If inhaled : Remove to fresh air. If symptoms call a physician.

In case of skin contact : Wash off immediately with plenty of water. If skin irritation persists, call a physician.

In case of eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 10 minutes. Consult an eye specialist immediately. Go to an ophthalmic hospital if possible.

If swallowed : Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Call a physician immediately. If a person vomits when lying on his back, place him in the recovery position.

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

Symptoms : 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 : No information available.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Spray generously with water.

Unsuitable extinguishing media : Do not use other extinguishing media.

5.2. Special hazards arising from the substance or mixture

Specific hazards during firefighting : Oxygen released on exothermic decomposition may support combustion in case of surrounding fire. Heating will cause a pressure rise - with risk of bursting

5.3. Advice for firefighters

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.Wear appropriate body protection (full protective suit)

Further advice : Cool closed containers exposed to fire with water spray.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 : Use personal protective equipment. Keep away unprotected persons. Avoid contact with skin and eyes. Do not breathe vapours or spray mist. For personal protection see section 8.

6.2. Environmental precautions

Environmental precautions : Do not flush into surface water or sanitary sewer system. Local authorities should be advised if significant spillages cannot be contained.

6.3. Methods and materials for containment and cleaning up

Methods and materials for containment and cleaning up : Prevent further leakage or spillage if safe to do so. Dilute with plenty of water. Collect spillage with non-combustible absorbent material (e.g. sand, diatomaceous earth, vermiculite, sepiolite). Keep in suitable, closed containers for

disposal. Do not keep the container sealed. Risk of closed containers bursting if strongly heated. Flush away residuals with plenty of water.

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

6.4. Reference to other sections

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

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling : Do not keep the container sealed. Ensure adequate ventilation. Avoid formation of aerosol. 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. Avoid contact with the skin and the eyes. Do not breathe vapours or spray mist.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Store in a receptacle equipped with a vent. Suitable materials for containers: Stainless steel; glass; Plastic container of HDPE; Unsuitable materials for containers: Iron; Copper

Advice on protection against fire and explosion : Not combustible. Oxidising. Keep away from combustible material. Heating will cause a pressure rise - with risk of bursting

Further information on storage conditions : Store in cool place. Keep in a well-ventilated place. Protect against light. Protect from contamination.

Advice on common storage : Keep away from food, drink and animal feedingstuffs. Keep away from combustible material. Materials to avoid: Reducing agents

7.3. Specific end use(s)

Specific use(s) : No information available.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Component:	hydrogen peroxide solution	CAS-No. 7722-84-1

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

DNEL Workers, Acute - local effects, Inhalation	:	3 mg/m3
DNEL Workers, Long-term - local effects, Inhalation	:	1.4 mg/m3
DNEL Consumers, Acute - local effects, Inhalation	:	1.93 mg/m3
DNEL Consumers, Long-term - local effects, Inhalation	:	0.21 mg/m3

Predicted No Effect Concentration (PNEC)

Fresh water	:	0.0126 mg/l
Marine water	:	0.0126 mg/l
Intermittent releases	:	0.0138 mg/l
Sediment	:	0.047 mg/kg dry weight (d.w.)
Soil	:	0.0019 mg/kg
Sewage treatment plant (STP)	:	4.66 mg/l

Other Occupational Exposure Limit Values

UK. EH40 Workplace Exposure Limits (WELs), Short Term Exposure Limit (STEL):
2 ppm, 2.8 mg/m3

UK. EH40 Workplace Exposure Limits (WELs), Time Weighted Average (TWA):
1 ppm, 1.4 mg/m3

ELV (IE), Time Weighted Average (TWA):
1 ppm, 1.5 mg/m3

ELV (IE), Short Term Exposure Limit (STEL):
2 ppm, 3 mg/m3

8.2. Exposure controls

Appropriate engineering controls

Refer to protective measures listed in sections 7 and 8.

Personal protective equipment

Respiratory protection

Advice	:	Use respirator with appropriate filter if vapours or aerosol are released. Combination filter:NO-P3

Hand protection

Advice	:	The glove material has to be impermeable and resistant to the product / the substance / the preparation. Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact). Protective gloves should be replaced at first signs of wear. The following materials are suitable:
Material	:	butyl-rubber
Break through time	:	>= 8 h
Glove thickness	:	0.5 mm
Material	:	natural rubber
Break through time	:	>= 8 h
Glove thickness	:	0.5 mm
Material	:	polychloroprene
Break through time	:	>= 8 h
Glove thickness	:	0.5 mm

Eye protection

Advice	:	Tightly fitting safety goggles

Skin and body protection

Advice	:	Wear personal protective equipment.

Environmental exposure controls

General advice	:	Do not flush into surface water or sanitary sewer system. Local authorities should be advised if significant spillages cannot be contained.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Form	:	liquid
Colour	:	colourless
Odour	:	odourless
Odour Threshold	:	no data available
pH	:	2 - 3 (20 °C)
Solidification point	:	ca. 0 °C
Boiling point/boiling range	:	ca. 100 °C
Flash point	:	Not applicable
Evaporation rate	:	no data available
Flammability (solid, gas)	:	Not applicable
Upper explosion limit	:	no data available
Lower explosion limit	:	no data available
Vapour pressure	:	18 hPa (20 °C)
Relative vapour density	:	1.2
Density	:	ca. 1.1 g/cm3 (20 °C)
Water solubility	:	completely miscible
Partition coefficient: n-octanol/water	:	log Kow -1.57 (25 °C) log Pow, calculated on the pure substance
Auto-ignition temperature	:	no data available
Thermal decomposition	:	no data available
Viscosity, dynamic	:	no data available
Explosivity	:	Product is not explosive.
Oxidizing properties	:	no data available

9.2. Other information

No further information available.

SECTION 10: Stability and reactivity

10.1. Reactivity

Advice	:	Reacts with copper, aluminum, zinc and their alloys.

10.2. Chemical stability

Advice	:	Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

Hazardous reactions	:	Oxygen released on exothermic decomposition may support combustion in case of surrounding fire.

10.4. Conditions to avoid

Conditions to avoid	:	Keep away from direct sunlight.

10.5. Incompatible materials

Materials to avoid	:	Reducing agents, Metals, alkalis, Organic materials, Impurities, Combustible materials

10.6. Hazardous decomposition products

Hazardous decomposition products	:	Oxygen

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Data for the product		
Acute toxicity		
Oral		
Acute toxicity estimate	:	1429 mg/kg) (Calculation method)
Inhalation		
Acute toxicity estimate	:	> 20 mg/l (vapour) (Calculation method)
Dermal		
no data available		
Irritation		
Skin		
no data available		

Eyes

no data available

Sensitisation

no data available

CMR effects

CMR Properties

Carcinogenicity	:	no data available
Mutagenicity	:	no data available
Reproductive toxicity	:	no data available

Specific Target Organ Toxicity

Single exposure

no data available

Repeated exposure

no data available

Other toxic properties

Repeated dose toxicity

no data available

Aspiration hazard

no data available

Component: hydrogen peroxide solution CAS-No. 7722-84-1

Acute toxicity

Oral

LD50	:	445 mg/kg (Rat, female) (US-EPA method)The toxicological value for the pure substance was calculated on basis of a value for an aqueous solution.
LD50	:	418 mg/kg (Rat, male) (US-EPA method)The toxicological value for the pure substance was calculated on basis of a value for an aqueous solution.

Inhalation

No valid data available.

Dermal

LD50	:	> 2000 mg/kg (Rabbit) The toxicological value for the pure substance was calculated on basis of a value for an aqueous solution.

Irritation

Skin

Result	:	corrosive effects (Rabbit)

Eyes

Result	:	Causes serious eye damage. (Rabbit)

Sensitisation

Result	:	not sensitizing (Guinea pig)

CMR effects

CMR Properties

Carcinogenicity	:	Not classified due to inconclusive data.
Mutagenicity	:	In vitro tests showed mutagenic effects In vivo tests did not show mutagenic effects
Teratogenicity	:	no data available
Reproductive toxicity	:	Not classified due to lack of data.

Specific Target Organ Toxicity

Single exposure

Inhalation	:	Target Organs: Respiratory systemMay cause respiratory irritation.

Repeated exposure

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

Other toxic properties

Repeated dose toxicity		
NOAEL	:	100 ppm (Mouse)(Oral; 90 d)
NOAEL	:	2 ppm (Rat)(Inhalation; vapour; 28 d)

Aspiration hazard
Not applicable,

SECTION 12: Ecological information

12.1. Toxicity

Component:	hydrogen peroxide solution	CAS-No. 7722-84-1
Acute toxicity		
Fish		
LC50	:	16.4 mg/l (Pimephales promelas; 96 h)
LC50		35 mg/l (Leuciscus idus melanotus; 24 h)
Toxicity to daphnia and other aquatic invertebrates		
EC50	:	2.4 mg/l (Daphnia magna; 48 h) (semi-static test)
algae		
EC50	:	2.6 mg/l (Skeletonema costatum (marine diatom); 72 h) (End point: Growth rate)
EC50		4.3 mg/l (Chlorella vulgaris (Fresh water algae); 72 h) (End point: Growth rate)
Bacteria		
	:	466 mg/l (activated sludge; 30 min) (OECD Test Guideline 209)

12.2. Persistence and degradability

Component:	hydrogen peroxide solution	CAS-No. 7722-84-1

Persistence and degradability		
Persistence		
Result	:	(Related to: Air) The product can be degraded by abiotic (e.g. chemical or photolytic) processes. Decomposition under release of oxygen.
Biodegradability		
Result	:	(aerobic; activated sludge; Exposure Time: < 2 min)Readily biodegradable.
Result	:	(aerobic; Fresh water; Exposure Time: 0.3 - 5 d)Readily biodegradable.
Result	:	(anaerobic; Soil)Not applicable

12.3. Bioaccumulative potential

Component:	hydrogen peroxide solution	CAS-No. 7722-84-1
Bioaccumulation		
Result	:	log Kow -1.57 ((calculated))
	:	Does not bioaccumulate.

12.4. Mobility in soil

Component:	hydrogen peroxide solution	CAS-No. 7722-84-1
Mobility		
Water	:	The product is mobile in water enviroment., The product is water soluble.
Soil	:	Not expected to adsorb on soil., not volatile
Air	:	not volatile

12.5. Results of PBT and vPvB assessment

Component:	hydrogen peroxide solution	CAS-No. 7722-84-1
Results of PBT and vPvB assessment		
Result	:	The PBT or vPvB criteria of Annex XIII to the REACH Regulation does not apply to inorganic substances.

12.6. Other adverse effects

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.
Contaminated packaging	:	Empty contaminated packagings thoroughly. They can be recycled after thorough and proper cleaning. Packagings that cannot be cleaned are to be disposed of in the same manner as the product.
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

2014

14.2. UN proper shipping name

ADR	:	HYDROGEN PEROXIDE, AQUEOUS SOLUTION
RID	:	HYDROGEN PEROXIDE, AQUEOUS SOLUTION
IMDG	:	HYDROGEN PEROXIDE, AQUEOUS SOLUTION

14.3. Transport hazard class(es)

ADR-Class (Labels; Classification Code; Hazard identification No; Tunnel restriction code)	:	5.1 5.1, 8; OC1; 58; (E)
RID-Class (Labels; Classification Code; Hazard identification No)	:	5.1 5.1, 8; OC1; 58
IMDG-Class (Labels; EmS)	:	5.1 5.1, 8; F-H, S-Q

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

IMDG : Not applicable.

SECTION 15: Regulatory information

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

Component:	**hydrogen peroxide solution**	**CAS-No. 7722-84-1**

EU. Regulation No 1451/2007 [Biocides], Annex I, OJ (L 325) : EC Number: , 231-765-0; Listed

WGK (DE) : WGK 1: slightly hazardous to water: 288

Notification status
hydrogen peroxide solution:

Regulatory List	Notification	Notification number
AICS	YES	
DSL	YES	
EINECS	YES	231-765-0
ENCS (JP)	YES	(1)-419
IECSC	YES	
ISHL (JP)	YES	(1)-419
KECI (KR)	YES	97-1-2
KECI (KR)	YES	KE-20204
NZIOC	YES	HSR001326
NZIOC	YES	HSR001450
NZIOC	YES	HSR001449
PHARM (JP)	YES	
PICCS (PH)	YES	
TSCA	YES	

15.2. Chemical safety assessment

no data available

SECTION 16: Other information

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

H271	May cause fire or explosion; strong oxidizer.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.

Abbreviations and Acronyms

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
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
GHS	Globally Harmonized System of Classification and Labelling of Chemicals
LC50	median lethal concentration
LOAEC	lowest observed adverse effect concentration
LOAEL	lowest observed adverse effect level
LOEL	lowest observed effect level
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
OECD	Organisation for Economic Cooperation and Development
OEL	occupational exposure limit
PBT	persistent, bioaccumulative and toxic
PNEC	predicted no-effect concentration
STOT	specific target organ toxicity
SVHC	substance of very high concern
UVCB	substance of unknown or variable composition, complex reaction products or biological materials
vPvB	very persistent and very bioaccumulative

Further information

Key literature references and sources for data	:	Supplier information and data from the "Database of registered substances" of the European Chemicals Agency (ECHA) were used to create this safety data sheet.

Methods used for product classification	:	The classification for human health, physical and chemical hazards and environmental hazards were derived from a combination of calculation methods and if available test data.
Hints for trainings	:	The workers have to be trained regularly on the safe handling of the products based on the information provided in the Safety Data Sheet and the local conditions of the workplace. National regulations for the training of workers in the handling of hazardous materials must be adhered to.
Other information	:	Restricted to professional users. Attention - Avoid exposure - obtain special instructions before use. 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.

Hydrogen Peroxide 20 - <35%

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	Distribution of substance	3	4, 8, 9, 10, 11, 12, 14, 15, 16, 17	0, 1, 8, 12, 14, 15, 21, 25, 27, 29, 31, 32, 34, 35, 37, 39	8a, 8b, 9	1, 2, 4, 6a, 6b, 6c	NA	ES278
2	Use in cleaning agents	21	NA	21, 35	NA	8a, 8b, 8d, 8e	NA	ES377
3	Use in cleaning agents	22	NA	21, 35	4, 10, 11, 13, 19	8a, 8b, 8d, 8e	NA	ES400
4	Use in agrochemicals	3	1, 2, 8	0, 20, 37	1, 2, 3, 4	4, 6b	NA	ES327
5	Use in agrochemicals	21	1, 2, 8	20, 37	NA	8a, 8b, 8d, 8e	NA	ES366
6	Use in agrochemicals	22	1, 2, 8	0, 20, 37	1, 2, 3, 4	8a, 8b, 8e, 8d	NA	ES362
7	Use in laboratories	3	8, 9	NA	15	4	NA	ES16676
8	Use in laboratories	22	8, 9	NA	15	8a	NA	ES16678
9	Use in cosmetics	21	NA	39	NA	8b	NA	ES408
10	Use in cosmetics	22	NA	39	19	8b	NA	ES404
11	Use as a bleach	3	5, 6a, 6b	23, 24, 26, 34	1, 2, 3, 4, 13, 19	4, 6b	NA	ES287
12	Use as a bleach	21	5, 6a, 6b	23, 24, 26, 34	NA	8a, 8b, 8e	NA	ES316
13	Use as a bleach	22	5, 6a, 6b	23, 24, 26, 34	1, 2, 3, 4, 13, 19	8a, 8b, 8e	NA	ES312
14	Industrial use	3	4, 8, 9, 10, 11, 12, 14, 15, 16, 17	0, 1, 2, 8, 9a, 12, 14, 15, 20, 21, 23, 25, 26, 27, 29, 31, 32, 33, 34, 35, 37, 39	1, 2, 3, 4, 5, 7, 10, 12, 13, 14, 15	1, 2, 4, 6a, 6b, 6c, 6d	NA	ES142

1. Short title of Exposure Scenario 1: 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	SU4: Manufacture of food products SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys) SU11: Manufacture of rubber products SU12: Manufacture of plastics products, including compounding and conversion SU14: Manufacture of basic metals, including alloys SU15: Manufacture of fabricated metal products, except machinery and equipment SU16: Manufacture of computer, electronic and optical products, electrical equipment SU17: General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
Chemical product category	PC0: Other PC1: Adhesives, sealants PC8: Biocidal products (e.g. Disinfectants, pest control) PC12: Fertilizers PC14: Metal surface treatment products, including galvanic and electroplating products PC15: Non-metal-surface treatment products PC21: Laboratory chemicals PC25: Metal working fluids PC27: Plant protection products PC29: Pharmaceuticals PC31: Polishes and wax blends PC32: Polymer preparations and compounds PC34: Textile dyes, finishing and impregnating products; including bleaches and other processing aids PC35: Washing and cleaning products PC37: Water treatment chemicals PC39: Cosmetics, personal care products
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	ERC1: Manufacture of substances ERC2: Formulation of preparations 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) ERC6b: Industrial use of reactive processing aids ERC6c: Industrial use of monomers for manufacture of thermoplastics
Activity	Note: this Exposure Scenario is only relevant for an appropriated use according to the quality grade of the substance delivered

2.1 Contributing scenario controlling environmental exposure for: ERC1, ERC2, ERC4, ERC6a, ERC6b, ERC6c		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 90%.
Technical conditions and	Air	Generally closed systems.

measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	In case of leaks, wash away with plenty of water and flush to industrial wastewater treatment system., Do not release wastewater directly into environment.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Waste has to be treated as industrial waste and should be incinerated in thermal combustion.
	Highly reactive., Decomposition in the waste and during treatment., Seal and return containers., No environmental emissions are expected.	

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 90%.
	Physical Form (at time of use)	liquid
Frequency and duration of use	Frequency of use	8 hours/day
	Frequency of use	220 days/year
Technical conditions and measures to control dispersion from source towards the worker	Provide extraction ventilation at points where emissions occur.	
	Provide local exhaust ventilation (LEV). (Efficiency: 90 %)(PROC8a, PROC9)	
	Provide local exhaust ventilation (LEV). (Efficiency: 97 %)(PROC8b)	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear protective gloves/ protective clothing/ eye protection/ face protection. Wash thoroughly after open handling of the product. Remove and wash contaminated clothing before re-use. Wash off any skin contamination immediately.	

3. Exposure estimation and reference to its source

Environment

No environmental emissions are expected.

Workers

PROC8a, PROC8b, PROC9: ECETOC TRA worker v3

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC8a	(70% w/w)	Inhalation worker exposure	0.99mg/m³	---
PROC8b	(90% w/w)	Inhalation worker exposure	0.21mg/m³	---
PROC9	(90% w/w)	Inhalation worker exposure	0.71mg/m³	---

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

These measures involve good personal and housekeeping practices (i.e. regular cleaning), no eating and smoking at the workplace, wearing of standard working clothes and shoes.

1. Short title of Exposure Scenario 2: Use in cleaning agents		
Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)	
Chemical product category	PC21: Laboratory chemicals PC35: Washing and cleaning products	
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8b: Wide dispersive indoor use of reactive substances in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems ERC8e: Wide dispersive outdoor use of reactive substances in open systems	
2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8b, ERC8d, ERC8e		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 12%
Amount used	Regional use tonnage (tons/year):	6210 ton(s)/year
	Annual amount per site	12.42 ton(s)/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	2,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 %
	Emission or Release Factor: Water	0.8 %
	Emission or Release Factor: Soil	0 %
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No specific measures identified.
	Water	Wastewater from professional and private cleaning should be sent to the public sewerage system where it will decompose
Conditions and measures related to external treatment of waste for disposal	Waste treatment	If container is empty, trash as regular municipal waste.
	Disposal methods	Dispose of via regular municipal waste.
	Highly reactive., Decomposition in the waste and during treatment., No environmental emissions are expected.	
2.2 Contributing scenario controlling consumer exposure for: PC21, PC35		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 12%
	Physical Form (at time of use)	liquid
Amount used	Covers concentrations up to	0.11 kg
Frequency and duration of use	Exposure duration per event	20 min
	Frequency of use	365 days/year

Frequency of use	1 Times per day

3. Exposure estimation and reference to its source

Environment

EUSES

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	Fresh water	PEC	0.0037mg/L	---
---	---	Marine water	PEC	0.294µg/L	---
---	---	Soil	PEC	0.111µg/kg	---
---	---	Sewage treatment plant (STP)	PEC	0.0095mg/L	---

Consumers

ConsExpo 4.1

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
---	Spray cleaning, (7% w/w)	Consumer inhalation exposure	0.002mg/m³	---
---	Cleaning surfaces by wiping, brushing, (7% w/w)	Consumer inhalation exposure	1.07mg/m³	---
---	Sanitary cleaner, (16% w/w)	Consumer inhalation exposure	1.16mg/m³	---

Consumers normally do not come into contact with products containing more than 12% w/w of the substance. It is recommended that consumers use gloves and safety glasses when handling pure or barely diluted products. Under normal conditions of use oral exposure to bleaches can be neglected.

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

For further information on the assessment method, see:
http://www.rivm.nl/en/healthanddisease/productsafety/ConsExpo.jsp
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

1. Short title of Exposure Scenario 3: Use in cleaning agents		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Chemical product category	PC21: Laboratory chemicals PC35: Washing and cleaning products	
Process categories	PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC10: Roller application or brushing PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring PROC19: Hand-mixing with intimate contact and only PPE available	
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8b: Wide dispersive indoor use of reactive substances in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems ERC8e: Wide dispersive outdoor use of reactive substances in open systems	
2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8b, ERC8d, ERC8e		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 12%
Amount used	Regional use tonnage (tons/year):	6210 ton(s)/year
	Annual amount per site	12.42 ton(s)/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	2,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 %
	Emission or Release Factor: Water	0.8 %
	Emission or Release Factor: Soil	0 %
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No specific measures identified.
	Water	Wastewater from professional and private cleaning should be sent to the public sewerage system where it will decompose
Conditions and measures related to external treatment of waste for disposal	Waste treatment	If container is empty, trash as regular municipal waste.
	Disposal methods	Dispose of via regular municipal waste.
	Highly reactive., Decomposition in the waste and during treatment., No environmental emissions are expected.	
2.2 Contributing scenario controlling worker exposure for: PROC4, PROC10, PROC11, PROC13, PROC19		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 12%
	Physical Form (at time of	liquid

	use)	
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	8 hours/day
	Frequency of use	220 days/year
	For a single worker	
Technical conditions and measures to control dispersion from source towards the worker	Provide extraction ventilation at points where emissions occur.	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear protective gloves/ protective clothing/ eye protection/ face protection. Wash thoroughly after open handling of the product. Remove and wash contaminated clothing before re-use. Wash off any skin contamination immediately.	

3. Exposure estimation and reference to its source

Environment

EUSES

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	Fresh water	PEC	0.0037mg/L	---
---	---	Marine water	PEC	0.294µg/L	---
---	---	Soil	PEC	0.111µg/kg	---
---	---	Sewage treatment plant (STP)	PEC	0.0095mg/L	---

Workers

ConsExpo 4.1

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
---	Spray cleaning, (7% w/w)	Inhalation worker exposure	0.002mg/m³	---
---	Cleaning surfaces by wiping, brushing, (7% w/w)	Inhalation worker exposure	1.07mg/m³	---
---	Sanitary cleaner, (12% w/w)	Inhalation worker exposure	1.16mg/m³	---
---	Using cleaner containing H2O2, (7% w/w)	Inhalation worker exposure	1.07mg/m³	---

Some products that are on the market contain more than 12% w/w. It is recommended that consumers use gloves and safety glasses when handling pure or barely diluted products. Good industrial hygiene practice has to be followed if oral exposure is not expected for workers.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

These measures involve good personal and housekeeping practices (i.e. regular cleaning), no eating and smoking at the workplace, wearing of standard working clothes and shoes.

1. Short title of Exposure Scenario 4: Use in agrochemicals		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Sectors of end-use	SU1: Agriculture, forestry, fishery SU2: Mining, (including offshore industries) SU8: Manufacture of bulk, large scale chemicals (including petroleum products)	
Chemical product category	PC0: Other PC20: Products such as pH-regulators, flocculants, precipitants, neutralization agents PC37: Water treatment chemicals	
Process categories	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises	
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles ERC6b: Industrial use of reactive processing aids	
2.1 Contributing scenario controlling environmental exposure for: ERC4, ERC6b		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
Amount used	Regional use tonnage (tons/year):	2645 ton(s)/year
	Annual amount per site	4.93 ton(s)/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	2,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0.1 %
	Emission or Release Factor: Water	0.05 %
	Emission or Release Factor: Soil	0.8 %
Conditions and measures related to external treatment of waste for disposal	Waste treatment	No specific waste treatment required/proposed
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 35%
	Physical Form (at time of use)	liquid
Technical conditions and measures to control dispersion from source towards the worker	Provide extraction ventilation at points where emissions occur.	
	Provide local exhaust ventilation (LEV). (Efficiency: 90 %)(PROC3, PROC4)	
Conditions and measures related to personal protection, hygiene	Wear protective gloves/ protective clothing/ eye protection/ face protection. Wash thoroughly after open handling of the product.	

and health evaluation	Remove and wash contaminated clothing before re-use. Wash off any skin contamination immediately.
	Wear respiratory protection (Efficiency: 90 %)(PROC3, PROC4)

3. Exposure estimation and reference to its source

Environment

EUSES

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	Fresh water	PEC	0.0085mg/L	---
---	---	Marine water	PEC	0.775µg/L	---
---	---	Soil	PEC	0.113µg/kg	---
---	---	Sewage treatment plant (STP)	PEC	0.088mg/L	---

Workers

PROC1, PROC2, PROC3, PROC4: ECETOC TRA worker v3

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	(50% w/w), Indoor use	Inhalation worker exposure	0.007mg/m³	---
PROC2	(50% w/w), Indoor use	Inhalation worker exposure	0.708mg/m³	---
PROC3	(50% w/w), Indoor use	Inhalation worker exposure	0.213mg/m³	---
PROC4	(50% w/w), Indoor use	Inhalation worker exposure	0.354mg/m³	---
PROC1	(50% w/w), Outdoor use	Inhalation worker exposure	0.005mg/m³	---
PROC2	(50% w/w), Outdoor use	Inhalation worker exposure	0.496mg/m³	---
PROC3	(50% w/w), Outdoor use	Inhalation worker exposure	0.149mg/m³	---
PROC4	(50% w/w), Outdoor use	Inhalation worker exposure	0.248mg/m³	---

Workers handling concentrated solutions containing 35% w/w or more are obliged to use appropriate dermal protection. Good industrial hygiene practice has to be followed if oral exposure is not expected for workers.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

These measures involve good personal and housekeeping practices (i.e. regular cleaning), no eating and smoking at the workplace, wearing of standard working clothes and shoes.

1. Short title of Exposure Scenario 5: Use in agrochemicals	
Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Sectors of end-use	SU1: Agriculture, forestry, fishery SU2: Mining, (including offshore industries) SU8: Manufacture of bulk, large scale chemicals (including petroleum products)
Chemical product category	PC20: Products such as pH-regulators, flocculants, precipitants, neutralization agents PC37: Water treatment chemicals
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8b: Wide dispersive indoor use of reactive substances in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems ERC8e: Wide dispersive outdoor use of reactive substances in open systems

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8b, ERC8d, ERC8e		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
Amount used	Regional use tonnage (tons/year):	2645 ton(s)/year
	Annual amount per site	4.93 ton(s)/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	2,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0.1 %
	Emission or Release Factor: Water	0.05 %
	Emission or Release Factor: Soil	0.8 %
Conditions and measures related to external treatment of waste for disposal	Waste treatment	No specific waste treatment required/proposed

2.2 Contributing scenario controlling consumer exposure for: , PC20, PC37		
No consumer exposure anticipated		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 50%

3. Exposure estimation and reference to its source

Environment

EUSES

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	Fresh water	PEC	0.0085mg/L	---
---	---	Marine water	PEC	0.775µg/L	---
---	---	Soil	PEC	0.113µg/kg	---
---	---	Sewage treatment plant (STP)	PEC	0.088mg/L	---

Consumers

No consumer exposure anticipated.

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

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

1. Short title of Exposure Scenario 6: Use in agrochemicals	
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sectors of end-use	SU1: Agriculture, forestry, fishery SU2: Mining, (including offshore industries) SU8: Manufacture of bulk, large scale chemicals (including petroleum products)
Chemical product category	PC0: Other PC20: Products such as pH-regulators, flocculants, precipitants, neutralization agents PC37: Water treatment chemicals
Process categories	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8b: Wide dispersive indoor use of reactive substances in open systems ERC8e: Wide dispersive outdoor use of reactive substances in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8b, ERC8d, ERC8e		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
Amount used	Regional use tonnage (tons/year):	2645 ton(s)/year
	Annual amount per site	4.93 ton(s)/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	2,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0.1 %
	Emission or Release Factor: Water	0.05 %
	Emission or Release Factor: Soil	0.8 %

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 35%
Technical conditions and measures to control dispersion from source towards the worker	Provide extraction ventilation at points where emissions occur.	
	Provide local exhaust ventilation (LEV). (Efficiency: 90 %)(PROC3, PROC4)	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear protective gloves/ protective clothing/ eye protection/ face protection. Wash thoroughly after open handling of the product. Remove and wash contaminated clothing before re-use. Wash off any skin contamination immediately.	
	Wear respiratory protection (Efficiency: 90 %)(PROC3, PROC4)	

3. Exposure estimation and reference to its source

Environment

EUSES

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	Fresh water	PEC	0.0085mg/L	---
---	---	Marine water	PEC	0.775µg/L	---
---	---	Soil	PEC	0.113µg/kg	---
---	---	Sewage treatment plant (STP)	PEC	0.088mg/L	---

Workers

PROC1, PROC2, PROC3, PROC4: ECETOC TRA worker v3

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	(50% w/w)	Inhalation worker exposure	0.007mg/m³	---
PROC2	(50% w/w)	Inhalation worker exposure	0.708mg/m³	---
PROC3	(50% w/w)	Inhalation worker exposure	0.213mg/m³	---
PROC4	(50% w/w)	Inhalation worker exposure	0.354mg/m³	---
PROC1	(50% w/w)	Inhalation worker exposure	0.005mg/m³	---
PROC2	(50% w/w)	Inhalation worker exposure	0.496mg/m³	---
PROC3	(50% w/w)	Inhalation worker exposure	0.149mg/m³	---
PROC4	(50% w/w)	Inhalation worker exposure	0.248mg/m³	---

Good industrial hygiene practice has to be followed if oral exposure is not expected for workers. Workers handling concentrated solutions containing 35% w/w or more are obliged to use appropriate dermal protection.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

These measures involve good personal and housekeeping practices (i.e. regular cleaning), no eating and smoking at the workplace, wearing of standard working clothes and shoes.

1. Short title of Exposure Scenario 7: Use in laboratories	
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals
Process categories	PROC15: Use as laboratory reagent
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

2.1 Contributing scenario controlling environmental exposure for: ERC4
No exposure assessment presented for the environment

2.2 Contributing scenario controlling worker exposure for: PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 70%
	Physical Form (at time of use)	liquid
	Vapour pressure	0.5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours	
Other operational conditions affecting workers exposure	Indoor	
	Assumes use at not more than 20°C above ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	Handle in a fume cupboard or under extract ventilation. (Efficiency: 90 %)	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear respiratory protection Wear suitable coveralls to prevent exposure to the skin. Wear suitable gloves tested to EN374. Use suitable eye protection.	

3. Exposure estimation and reference to its source

Environment

No exposure assessment presented for the environment.

Workers

PROC15: ECETOC TRA

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC15	Indoor use	Worker - inhalative, long-term	---	0.1 - 0.5

Qualitative approach used to conclude safe use. Dermal exposure is not considered to be relevant.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

These measures involve good personal and housekeeping practices (i.e. regular cleaning), no eating and smoking at the workplace, wearing of standard working clothes and shoes.

1. Short title of Exposure Scenario 8: Use in laboratories	
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals
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

No exposure assessment presented for the environment

2.2 Contributing scenario controlling worker exposure for: PROC15

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 70%
	Physical Form (at time of use)	liquid
	Vapour pressure	0.5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours	
Other operational conditions affecting workers exposure	Indoor	
	Assumes use at not more than 20°C above ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	Handle in a fume cupboard or under extract ventilation. (Efficiency: 90 %)	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear respiratory protection Wear suitable coveralls to prevent exposure to the skin. Wear suitable gloves tested to EN374. Use suitable eye protection.	

3. Exposure estimation and reference to its source

Environment

No exposure assessment presented for the environment.

Workers

PROC15: ECETOC TRA

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC15	Indoor use	Worker - inhalative, long-term	---	0.1 - 0.5

Qualitative approach used to conclude safe use. Dermal exposure is not considered to be relevant.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

These measures involve good personal and housekeeping practices (i.e. regular cleaning), no eating and smoking at the workplace, wearing of standard working clothes and shoes.

1. Short title of Exposure Scenario 9: Use in cosmetics		
Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)	
Chemical product category	PC39: Cosmetics, personal care products	
Environmental Release Categories	ERC8b: Wide dispersive indoor use of reactive substances in open systems	
Activity	Use for hair bleaching and dyeing and tooth bleaching, This use is exempted from registration according to Art.2 (5)(6) of the REACH regulation (EC) No 1907/2006. Therefore the conditions and measures described in this Exposure Scenario are only intended for a technical function of the substance	
2.1 Contributing scenario controlling environmental exposure for: ERC8b		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 18%
Amount used	Regional use tonnage (tons/year):	6210 ton(s)/year
	Annual amount per site	12.42 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	2,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 %
	Emission or Release Factor: Water	0.8 %
	Emission or Release Factor: Soil	0 %
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No specific measures identified.
	Water	Wastewater from professional and private cleaning should be sent to the public sewerage system where it will decompose
Conditions and measures related to external treatment of waste for disposal	Disposal methods	If container is empty, trash as regular municipal waste., Dispose of via regular municipal waste.
	Highly reactive., Decomposition in the waste and during treatment., No environmental emissions are expected.	
2.2 Contributing scenario controlling consumer exposure for: PC39		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 18%
	Physical Form (at time of use)	liquid
Frequency and duration of use	Intermittent use/release	
3. Exposure estimation and reference to its source		

Environment

EUSES

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	Fresh water	PEC	0.0037mg/L	---
---	---	Marine water	PEC	0.294µg/L	---
---	---	Soil	PEC	0.111µg/kg	---
---	---	Sewage treatment plant (STP)	PEC	0.0095mg/L	---

Consumers

No consumer exposure anticipated.

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

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

1. Short title of Exposure Scenario 10: Use in cosmetics		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Chemical product category	PC39: Cosmetics, personal care products	
Process categories	PROC19: Hand-mixing with intimate contact and only PPE available	
Environmental Release Categories	ERC8b: Wide dispersive indoor use of reactive substances in open systems	
Activity	Use for hair bleaching and dyeing and tooth bleaching, This use is exempted from registration according to Art.2 (5)(6) of the REACH regulation (EC) No 1907/2006. Therefore the conditions and measures described in this Exposure Scenario are only intended for a technical function of the substance	
2.1 Contributing scenario controlling environmental exposure for: ERC8b		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 18%
Amount used	Regional use tonnage (tons/year):	6210 ton(s)/year
	Annual amount per site	12.42 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	2,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 %
	Emission or Release Factor: Water	0.8 %
	Emission or Release Factor: Soil	0 %
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No specific measures identified.
	Water	Wastewater from professional and private cleaning should be sent to the public sewerage system where it will decompose
Conditions and measures related to external treatment of waste for disposal	Disposal methods	If container is empty, trash as regular municipal waste., Dispose of via regular municipal waste.
	Highly reactive., Decomposition in the waste and during treatment., No environmental emissions are expected.	
2.2 Contributing scenario controlling worker exposure for: PROC19		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 18%
Frequency and duration of use	Intermittent use/release	
Technical conditions and measures to control dispersion from source towards the worker	Provide extraction ventilation at points where emissions occur.	
Conditions and measures related to personal protection, hygiene	Wear protective gloves/ protective clothing/ eye protection/ face protection.	

and health evaluation	Wash thoroughly after open handling of the product. Remove and wash contaminated clothing before re-use. Wash off any skin contamination immediately.

3. Exposure estimation and reference to its source

Environment

EUSES

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	Fresh water	PEC	0.0037mg/L	---
---	---	Marine water	PEC	0.294µg/L	---
---	---	Soil	PEC	0.111µg/kg	---
---	---	Sewage treatment plant (STP)	PEC	0.0095mg/L	---

Workers

Not to be assessed.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

These measures involve good personal and housekeeping practices (i.e. regular cleaning), no eating and smoking at the workplace, wearing of standard working clothes and shoes.

1. Short title of Exposure Scenario 11: Use as a bleach		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Sectors of end-use	SU5: Manufacture of textiles, leather, fur SU6a: Manufacture of wood and wood products SU6b: Manufacture of pulp, paper and paper products	
Chemical product category	PC23: Leather treatment products PC24: Lubricants, greases, release products PC26: Paper and board dye, finishing and impregnation products: including bleaches and other processing aids PC34: Textile dyes, finishing and impregnating products; including bleaches and other processing aids	
Process categories	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC13: Treatment of articles by dipping and pouring PROC19: Hand-mixing with intimate contact and only PPE available	
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles ERC6b: Industrial use of reactive processing aids	
2.1 Contributing scenario controlling environmental exposure for: ERC4, ERC6b		
Activity	Pulp bleaching	
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 35%
Amount used	Regional use tonnage (tons/year):	43600 ton(s)/year
	Annual amount per site	9810 ton(s)/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	17,500 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	360
	Emission or Release Factor: Air	0.001 %
	Emission or Release Factor: Water	0.009 %
	Emission or Release Factor: Soil	0.0001 %
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to	Air	Optional passing of waste air through activated carbon filters.
	Water	Optional pre-treatment of wastewater by steam stripping, must be treated by :, Biological wastewater treatment, ozonation or liquid phase carbon adsorption

prevent/limit release from the site		
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Waste has to be treated as industrial waste and should be incinerated in thermal combustion.
	Highly reactive., Seal and return containers., No environmental emissions are expected.	

2.2 Contributing scenario controlling environmental exposure for: ERC4, ERC6b

Activity	Other bleaching	
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 35%
Amount used	Regional use tonnage (tons/year):	2025 ton(s)/year
	Annual amount per site	405 ton(s)/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	2,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	0.001 %
	Emission or Release Factor: Water	0.009 %
	Emission or Release Factor: Soil	0 %
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Optional passing of waste air through activated carbon filters.
	Water	Optional pre-treatment of wastewater by steam stripping, must be treated by :, Biological wastewater treatment, ozonation or liquid phase carbon adsorption
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Waste has to be treated as industrial waste and should be incinerated in thermal combustion.
	Highly reactive., Seal and return containers., No environmental emissions are expected.	

2.3 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC13, PROC19

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 35%
	Physical Form (at time of use)	liquid
Frequency and duration of use	Frequency of use	8 hours/day
	Frequency of use	220 days/year
Technical conditions and measures to control dispersion from source towards the worker	Provide extraction ventilation at points where emissions occur.	
	Provide local exhaust ventilation (LEV). (Efficiency: 90 %)(PROC2, PROC3, PROC4, PROC13)	
Conditions and measures related to personal protection, hygiene	Wear protective gloves/ protective clothing/ eye protection/ face protection. Wash thoroughly after open handling of the product.	

and health evaluation	Remove and wash contaminated clothing before re-use. Wash off any skin contamination immediately.

3. Exposure estimation and reference to its source

Environment

EUSES

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	Pulp bleaching	Fresh water	PEC	0.0098mg/L	---
---	Pulp bleaching	Marine water	PEC	0.001mg/L	---
---	Pulp bleaching	Soil	PEC	0.154µg/kg	---
---	Pulp bleaching	Sewage treatment plant (STP)	PEC	0.098mg/L	---
---	Other bleaching	Fresh water	PEC	0.004mg/L	---
---	Other bleaching	Marine water	PEC	0.0004mg/L	---
---	Other bleaching	Soil	PEC	0.128µg/kg	---
---	Other bleaching	Sewage treatment plant (STP)	PEC	0.042mg/L	---

Workers

PROC1, PROC2, PROC3, PROC4, PROC13: ECETOC TRA worker v3

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	(35% w/w)	Inhalation worker exposure	0.005mg/m³	---
PROC2	(35% w/w)	Inhalation worker exposure	0.05mg/m³	---
PROC3	(35% w/w)	Inhalation worker exposure	0.149mg/m³	---
PROC4	(35% w/w)	Inhalation worker exposure	0.248mg/m³	---
PROC13	(35% w/w)	Inhalation worker exposure	0.496mg/m³	---

Good industrial hygiene practice has to be followed if oral exposure is not expected for workers. Workers handling concentrated solutions containing 35% w/w or more are obliged to use appropriate dermal protection.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

These measures involve good personal and housekeeping practices (i.e. regular cleaning), no eating and smoking at the workplace, wearing of standard working clothes and shoes.

1. Short title of Exposure Scenario 12: Use as a bleach		
Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)	
Sectors of end-use	SU5: Manufacture of textiles, leather, fur SU6a: Manufacture of wood and wood products SU6b: Manufacture of pulp, paper and paper products	
Chemical product category	PC23: Leather treatment products PC24: Lubricants, greases, release products PC26: Paper and board dye, finishing and impregnation products: including bleaches and other processing aids PC34: Textile dyes, finishing and impregnating products; including bleaches and other processing aids	
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8b: Wide dispersive indoor use of reactive substances in open systems ERC8e: Wide dispersive outdoor use of reactive substances in open systems	
2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8b, ERC8e		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 35%
Amount used	Regional use tonnage (tons/year):	43600 ton(s)/year
	Annual amount per site	9810 ton(s)/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	17,500 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	360
	Emission or Release Factor: Air	0.001 %
	Emission or Release Factor: Water	0.009 %
	Emission or Release Factor: Soil	0 %
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Waste has to be treated as industrial waste and should be incinerated in thermal combustion.
	Highly reactive., Seal and return containers., No environmental emissions are expected.	
2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8b, ERC8e		
Activity	Other bleaching	
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 35%
Amount used	Regional use tonnage (tons/year):	2025 ton(s)/year
	Annual amount per site	405 ton(s)/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	2,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100

Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	0.01 %
	Emission or Release Factor: Water	0.009 %
	Emission or Release Factor: Soil	0 %
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Optional passing of waste air through activated carbon filters.
	Water	Optional pre-treatment of wastewater by steam stripping, must be treated by :, Biological wastewater treatment, ozonation or liquid phase carbon adsorption
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Waste has to be treated as industrial waste and should be incinerated in thermal combustion.
	Highly reactive., Seal and return containers., No environmental emissions are expected.	

2.3 Contributing scenario controlling consumer exposure for: PC23, PC24, PC26, PC34

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 35%
Amount used	Amount used per event	0.1 l
Frequency and duration of use	Exposure duration per event	10 min
	Frequency of use	4 events/week

3. Exposure estimation and reference to its source

Environment

EUSES

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	Pulp bleaching	Fresh water	PEC	0.0098mg/L	---
---	Pulp bleaching	Marine water	PEC	0.001mg/L	---
---	Pulp bleaching	Soil	PEC	0.154µg/kg	---
---	Pulp bleaching	Sewage treatment plant (STP)	PEC	0.098mg/L	---
---	Other bleaching	Fresh water	PEC	0.004mg/L	---
---	Other bleaching	Marine water	PEC	0.0004mg/L	---
---	Other bleaching	Soil	PEC	0.128µg/kg	---
---	Other bleaching	Sewage treatment plant (STP)	PEC	0.042mg/L	---

Consumers

Based on EU Risk Assessment Report, European Commission 2003

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
---	---	Consumer inhalation	0.13mg/m³	---

		exposure		

Under normal conditions of use oral exposure to bleaches can be neglected. Consumers normally do not come into contact with products containing more than 12% w/w of the substance. Some products that are on the market contain more than 12% w/w. It is recommended that consumers use gloves and safety glasses when handling pure or barely diluted products.

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

If the local conditions deviate significantly from the values in the EU RAR, then further site specific evaluation is required
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

1. Short title of Exposure Scenario 13: Use as a bleach		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Sectors of end-use	SU5: Manufacture of textiles, leather, fur SU6a: Manufacture of wood and wood products SU6b: Manufacture of pulp, paper and paper products	
Chemical product category	PC23: Leather treatment products PC24: Lubricants, greases, release products PC26: Paper and board dye, finishing and impregnation products: including bleaches and other processing aids PC34: Textile dyes, finishing and impregnating products; including bleaches and other processing aids	
Process categories	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC13: Treatment of articles by dipping and pouring PROC19: Hand-mixing with intimate contact and only PPE available	
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8b: Wide dispersive indoor use of reactive substances in open systems ERC8e: Wide dispersive outdoor use of reactive substances in open systems	
2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8b, ERC8e		
Activity	Pulp bleaching	
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 35%
Amount used	Regional use tonnage (tons/year):	43600 ton(s)/year
	Annual amount per site	9810 ton(s)/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	17,500 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
	Other data. Other information	Pulp bleaching:
Other given operational conditions affecting environmental exposure	Number of emission days per year	360
	Emission or Release Factor: Air	0.001 %
	Emission or Release Factor: Water	0.009 %
	Emission or Release Factor: Soil	0 %
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and	Air	Optional passing of waste air through activated carbon filters.
	Water	Optional pre-treatment of wastewater by steam stripping, must be treated by :, Biological wastewater treatment, ozonation or liquid phase

releases to soil Organizational measures to prevent/limit release from the site		carbon adsorption
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Waste has to be treated as industrial waste and should be incinerated in thermal combustion.
	Highly reactive., Seal and return containers., No environmental emissions are expected.	

2.2 Contributing scenario controlling environmental exposure for: ERC8a, ERC8b, ERC8e

Activity	Other bleaching	
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 35%
Amount used	Regional use tonnage (tons/year):	2025 ton(s)/year
	Annual amount per site	405 ton(s)/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	2,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	0.01 %
	Emission or Release Factor: Water	0.009 %
	Emission or Release Factor: Soil	0 %
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Optional passing of waste air through activated carbon filters.
	Water	Optional pre-treatment of wastewater by steam stripping, must be treated by :, Biological wastewater treatment, ozonation or liquid phase carbon adsorption
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Waste has to be treated as industrial waste and should be incinerated in thermal combustion.
	Highly reactive., Seal and return containers., No environmental emissions are expected.	

2.3 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC13, PROC19

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 35%
	Physical Form (at time of use)	liquid
Frequency and duration of use	Frequency of use	8 hours/day
	Frequency of use	220 days/year
Technical conditions and measures to control dispersion from source towards the worker	Provide extraction ventilation at points where emissions occur.	
	Provide local exhaust ventilation (LEV). (Efficiency: 80 %)(PROC2, PROC3, PROC4, PROC13, PROC19)	

Conditions and measures related to personal protection, hygiene and health evaluation	Wear protective gloves/ protective clothing/ eye protection/ face protection. Wash thoroughly after open handling of the product. Remove and wash contaminated clothing before re-use. Wash off any skin contamination immediately.

3. Exposure estimation and reference to its source

Environment

EUSES

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	Pulp bleaching	Fresh water	PEC	0.0098mg/L	---
---	Pulp bleaching	Marine water	PEC	0.001mg/L	---
---	Pulp bleaching	Soil	PEC	0.154µg/kg	---
---	Pulp bleaching	Sewage treatment plant (STP)	PEC	0.098mg/L	---
---	Other bleaching	Fresh water	PEC	0.004mg/L	---
---	Other bleaching	Marine water	PEC	0.0004mg/L	---
---	Other bleaching	Soil	PEC	0.128µg/kg	---
---	Other bleaching	Sewage treatment plant (STP)	PEC	0.042mg/L	---

Workers

PROC1, PROC2, PROC3, PROC4, PROC13, PROC19: ECETOC TRA worker v3

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	(35% w/w)	Inhalation worker exposure	0.005mg/m³	---
PROC2	(35% w/w)	Inhalation worker exposure	0.496mg/m³	---
PROC3	(35% w/w)	Inhalation worker exposure	0.298mg/m³	---
PROC4	(35% w/w)	Inhalation worker exposure	0.992mg/m³	---
PROC13	(35% w/w)	Inhalation worker exposure	0.34mg/m³	---
PROC19	(35% w/w)	Inhalation worker exposure	0.85mg/m³	---

Workers handling concentrated solutions containing 35% w/w or more are obliged to use appropriate dermal protection. Good industrial hygiene practice has to be followed if oral exposure is not expected for workers.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

These measures involve good personal and housekeeping practices (i.e. regular cleaning), no eating and smoking at the workplace, wearing of standard working clothes and shoes.

1. Short title of Exposure Scenario 14: Industrial use	
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU4: Manufacture of food products SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys) SU11: Manufacture of rubber products SU12: Manufacture of plastics products, including compounding and conversion SU14: Manufacture of basic metals, including alloys SU15: Manufacture of fabricated metal products, except machinery and equipment SU16: Manufacture of computer, electronic and optical products, electrical equipment SU17: General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
Chemical product category	PC0: Other PC1: Adhesives, sealants PC2: Adsorbents PC8: Biocidal products (e.g. Disinfectants, pest control) PC9a: Coatings and paints, thinners, paint removers PC12: Fertilizers PC14: Metal surface treatment products, including galvanic and electroplating products PC15: Non-metal-surface treatment products PC20: Products such as pH-regulators, flocculants, precipitants, neutralization agents PC21: Laboratory chemicals PC23: Leather treatment products PC25: Metal working fluids PC26: Paper and board dye, finishing and impregnation products: including bleaches and other processing aids PC27: Plant protection products PC29: Pharmaceuticals PC31: Polishes and wax blends PC32: Polymer preparations and compounds PC33: Semiconductors PC34: Textile dyes, finishing and impregnating products; including bleaches and other processing aids PC35: Washing and cleaning products PC37: Water treatment chemicals PC39: Cosmetics, personal care products
Process categories	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) PROC7: Industrial spraying PROC10: Roller application or brushing PROC12: Use of blowing agents in manufacture of foam PROC13: Treatment of articles by dipping and pouring PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation

	PROC15: Use as laboratory reagent
Environmental Release Categories	ERC1: Manufacture of substances ERC2: Formulation of preparations 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) ERC6b: Industrial use of reactive processing aids ERC6c: Industrial use of monomers for manufacture of thermoplastics ERC6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
Activity	Note: this Exposure Scenario is only relevant for an appropriated use according to the quality grade of the substance delivered

2.1 Contributing scenario controlling environmental exposure for: ERC1

Activity	Manufacture	
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 35% - 90 %
Amount used	Annual site tonnage	75000 ton(s)/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	7,000 m3/d
	Dilution Factor (River)	300
	Dilution Factor (Coastal Areas)	1,000
Other given operational conditions affecting environmental exposure	Number of emission days per year	360
	Emission or Release Factor: Air	0.01 %
	Emission or Release Factor: Water	0.3 %
	Emission or Release Factor: Soil	0.01 %
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Passing of waste air through activated carbon filters
	Water	Optional pre-treatment of wastewater by steam stripping, must be treated by :, Biological wastewater treatment, ozonation or liquid phase carbon adsorption
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Waste has to be treated as industrial waste and should be incinerated in thermal combustion.
	Highly reactive., Decomposition in the waste and during treatment., Seal and return containers., No environmental emissions are expected.	

2.2 Contributing scenario controlling environmental exposure for: ERC6a

Activity	Chemical synthesis.	
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 35% - 90 %
Amount used	Annual site tonnage	8950 ton(s)/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	10,000 m3/d

	Dilution Factor (River)	40
	Dilution Factor (Coastal Areas)	400
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	0.1 %
	Emission or Release Factor: Water	0.7 %
	Emission or Release Factor: Soil	0.01 %
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Passing of waste air through activated carbon filters
	Water	Optional pre-treatment of wastewater by steam stripping, must be treated by :, Biological wastewater treatment, ozonation or liquid phase carbon adsorption
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Waste has to be treated as industrial waste and should be incinerated in thermal combustion.
	Highly reactive., Decomposition in the waste and during treatment., Seal and return containers., No environmental emissions are expected.	

2.3 Contributing scenario controlling environmental exposure for: ERC2, ERC4, ERC6a, ERC6b, ERC6c, ERC6d

Activity	Chemical applications	
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 35% - 90 %
Amount used	Annual site tonnage	1010 ton(s)/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	2,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	0.1 %
	Emission or Release Factor: Water	0.5 %
	Emission or Release Factor: Soil	0.1 %
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Passing of waste air through activated carbon filters
	Water	Optional pre-treatment of wastewater by steam stripping, must be treated by :, Biological wastewater treatment, ozonation or liquid phase carbon adsorption
Conditions and measures related	Waste treatment	Waste has to be treated as industrial waste and

to external treatment of waste for disposal		should be incinerated in thermal combustion.
	Highly reactive., Decomposition in the waste and during treatment., Seal and return containers., No environmental emissions are expected.	

2.4 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC10, PROC12, PROC13, PROC14, PROC15

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 35% - 90 %
	Physical Form (at time of use)	liquid
Frequency and duration of use	Frequency of use	8 hours/day
	Frequency of use	220 days/year
Technical conditions and measures to control dispersion from source towards the worker	Provide extraction ventilation at points where emissions occur.	
	Provide local exhaust ventilation (LEV). (Efficiency: 90 %)(PROC2, PROC3, PROC4, PROC5, PROC7, PROC10, PROC13, PROC14, PROC15)	
	Provide local exhaust ventilation (LEV). (Efficiency: 80 %)(PROC12)	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear protective gloves/ protective clothing/ eye protection/ face protection. Wash thoroughly after open handling of the product. Remove and wash contaminated clothing before re-use. Wash off any skin contamination immediately.	

3. Exposure estimation and reference to its source

Environment

ERC1, ERC2, ERC6d, ERC6c, ERC4, ERC6a, ERC6b: EUSES

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC1	Manufacture	Fresh water	PEC	0.009mg/L	---
ERC6a	Chemical synthesis.	Fresh water	PEC	0.0063mg/L	---
ERC2, ERC4, ERC6a, ERC6b, ERC6c, ERC6d	Chemical applications	Fresh water	PEC	0.0086mg/L	---
ERC1	Manufacture	Marine water	PEC	0.0015mg/L	---
ERC6a	Chemical synthesis.	Marine water	PEC	0.0006mg/L	---
ERC2, ERC4, ERC6a, ERC6b, ERC6c, ERC6d	Chemical applications	Marine water	PEC	0.0008mg/L	---
ERC1	Manufacture	Soil	PEC	0.145µg/kg	---
ERC6a	Chemical synthesis.	Soil	PEC	0.151µg/kg	---
ERC2, ERC4, ERC6a, ERC6b, ERC6c, ERC6d	Chemical applications	Soil	PEC	0.117µg/kg	---
ERC1	Manufacture	Sewage treatment plant (STP)	PEC	0.63mg/L	---
ERC6a	Chemical synthesis.	Sewage treatment plant (STP)	PEC	0.146mg/L	---
ERC2, ERC4, ERC6a, ERC6b, ERC6c, ERC6d	Chemical applications	Sewage treatment plant (STP)	PEC	0.059mg/L	---

Workers

PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC10, PROC12, PROC13, PROC14, PROC15:

ECETOC TRA worker v3

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	(90% w/w)	Inhalation worker exposure	0.014mg/m³	---
PROC2	(90% w/w)	Inhalation worker exposure	0.142mg/m³	---
PROC3	(70% w/w)	Inhalation worker exposure	0.298mg/m³	---
PROC4, PROC5, PROC15	(70% w/w)	Inhalation worker exposure	0.496mg/m³	---
PROC7, PROC14	(60% w/w)	Inhalation worker exposure	0.425mg/m³	---
PROC10	(60% w/w)	Inhalation worker exposure	0.85mg/m³	---
PROC12	(60% w/w)	Inhalation worker exposure	0.34mg/m³	---
PROC13	(60% w/w)	Inhalation worker exposure	0.85mg/m³	---

Good industrial hygiene practice has to be followed if oral exposure is not expected for workers. Workers handling concentrated solutions containing 35% w/w or more are obliged to use appropriate dermal protection.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

These measures involve good personal and housekeeping practices (i.e. regular cleaning), no eating and smoking at the workplace, wearing of standard working clothes and shoes.