

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

HYDROGEN PEROXIDE 35% ICELAND/ CAN 22 KG

Version 5.0

Print Date 30.08.2016

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

1.1. Product identifier

Trade name : HYDROGEN PEROXIDE 35% ICELAND/ CAN 22 KG
Substance name : hydrogen peroxide solution
Index-No. : 008-003-00-9
CAS-No. : 7722-84-1
EC-No. : 231-765-0

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

Use of the Substance/Mixture : Identified use: See table in front of appendix for a complete overview of identified uses.
Uses advised against : At this moment we have not identified any uses advised against

1.3. Details of the supplier of the safety data sheet

Company : Brenntag Nordic A/S
Borupvang 5 B
DK 2750 Ballerup
Telephone : +45 43 29 28 00
Telefax : +45 43 29 27 00
E-mail address : SDS.DK@brenntag-nordic.com
Responsible/issuing person : Environment & Quality

1.4. Emergency telephone number

Emergency telephone number : In case of personal injury call:
Denmark: 82 12 12 12 Giftlinien, Bispebjerg Hospital
Finland: Poison Information Centre: (09) 471 977 (direct) or (09) 47 11 (exchange), open 24h/day
Norway: 22 59 13 00 Giftinformasjonen (døgnåpent)
Sweden: +46-8-331231 Giftinformationscentralen (24 hour service)
Outside these countries: Please call your local emergency services

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

HYDROGEN PEROXIDE 35% ICELAND/ CAN 22 KG**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
Skin irritation	Category 2	---	H315
Serious eye damage	Category 1	---	H318
Specific target organ toxicity - single exposure	Category 3	Respiratory system	H335
Chronic aquatic toxicity	Category 3	---	H412

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

Classification according to EU Directives 67/548/EEC or 1999/45/EC

Directive 67/548/EEC or 1999/45/EC	
Hazard symbol / Category of danger	Risk phrases
Harmful (Xn)	R22
Irritant (Xi)	R41, R37/38

For the full text of the R-phrases mentioned in this Section, see Section 16.

Most important adverse effects

- Human Health : May cause respiratory irritation.
Causes skin irritation.
Causes serious eye damage.
- Physical and chemical hazards : The product is not flammable., Oxygen released on exothermic decomposition may support combustion in case of surrounding fire.
- Potential environmental effects : Harmful effects to aquatic organisms also due to pH-shift.

2.2. Label elements**Labelling according to Regulation (EC) No 1272/2008**

Hazard symbols :



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Signal word	:	Danger	
Hazard statements	:	H302 H315 H318 H335 H412	Harmful if swallowed. Causes skin irritation. Causes serious eye damage. May cause respiratory irritation. Harmful to aquatic life with long lasting effects.
Precautionary statements			
Prevention	:	P261 P273 P280	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray. Avoid release to the environment. Wear protective gloves/ eye protection/ face protection.
Response	:	P305 + P351 + P338 P308 + P310 P301 + P312 P304 + P340 P302 + P352	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF exposed or concerned: Immediately call a POISON CENTER/doctor. IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF ON SKIN: Wash with plenty of water/soap.
Storage	:	P403 + P233	Store in a well-ventilated place. Keep container tightly closed.

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

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Hazardous components	Amount [%]	Classification (REGULATION (EC) No 1272/2008)		Classification (67/548/EEC)
		Hazard class / Hazard category	Hazard statements	
hydrogen peroxide solution				
Index-No. : 008-003-00-9	35	Ox. Liq.1	H271	R 5
CAS-No. : 7722-84-1		Acute Tox.4	H332	Oxidizing; O; R 8
EC-No. : 231-765-0		Acute Tox.4	H302	Corrosive; C; R35
EC : 01-2119485845-22-xxxx		Skin Corr.1A	H314	Harmful; Xn;
Registration		STOT SE3	H335	R20/22
		Aquatic Chronic3	H412	

For the full text of the R-phrases mentioned in this Section, see Section 16.

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 : If unconscious place in recovery position and seek medical advice. Remove to fresh air.
- 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.

HYDROGEN PEROXIDE 35% ICELAND/ CAN 22 KG**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 : The product is not flammable. 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 : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Keep in suitable, closed containers for disposal. 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.

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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. Provide sufficient air exchange and/or exhaust in work rooms. Handle in accordance with good industrial hygiene and safety practice. Emergency eye wash fountains and emergency showers should be available in the immediate vicinity. Avoid contact with the skin and the eyes. Never return unused material to storage receptacle.

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 : Suitable materials for containers: Stainless steel; glass; Plastic container of HDPE; Unsuitable materials for containers: Brass; Copper; Iron

Advice on protection against fire and explosion : Not combustible. Oxidizing agent, may cause spontaneous ignition of combustible materials. In concentrations between 20 - 40 %: Liquid with minor oxidizing effect. With catalysts or at elevated temperatures hydrogen peroxide decomposes to water and oxygen.

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

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Component:	hydrogen peroxide solution	CAS-No. 7722-84-1
Derived No Effect Level (DNEL)/Derived Minimal Effect Level (DMEL)		

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DNEL		
Workers, Acute - local effects, Inhalation	:	3 mg/m ³
DNEL		
Workers, Long-term - local effects, Inhalation	:	1,4 mg/m ³
DNEL		
Consumers, Acute - local effects, Inhalation	:	1,93 mg/m ³
DNEL		
Consumers, Long-term - local effects, Inhalation	:	0,21 mg/m ³

Predicted No Effect Concentration (PNEC)

Fresh water	:	0,0126 mg/l
Marine water	:	0,0126 mg/l
Intermittent releases	:	0,0138 mg/l
Sewage treatment plant (STP)	:	4,66 mg/l
Fresh water sediment	:	0,47 mg/kg dry weight (d.w.)
Marine sediment	:	0,47 mg/kg dry weight (d.w.)
Soil	:	0,0023 mg/kg dry weight (d.w.)

Other Occupational Exposure Limit Values

Denmark. Exposure Limit Values, Threshold Limit Values (TLV):
1 ppm, 1,4 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.
Recommended Filter type:B

Hand protection

Advice : Wear suitable gloves.

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The following materials are suitable:
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.

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 suitable protective clothing.

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 : characteristic
Odour Threshold : no data available
pH : $> 2,5$ (20 °C)
Freezing point : ca. -33 °C
Boiling point : ca. 108 °C
Flash point : Not applicable

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Evaporation rate	:	no data available
Flammability (solid, gas)	:	Not applicable
Upper explosion limit	:	Not applicable
Lower explosion limit	:	Not applicable
Vapour pressure	:	no data available
Relative vapour density	:	no data available
Density	:	ca. 1,15 g/cm ³ (20 °C)
Water solubility	:	completely soluble
Partition coefficient: n-octanol/water	:	no data available
Auto-ignition temperature	:	Not applicable
Thermal decomposition	:	no data available
Viscosity, dynamic	:	no data available
Explosivity	:	Product is not explosive.
Oxidizing properties	:	Oxidizing agents

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 : Stabilising additive(s)

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

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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**

Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

Acute toxicity estimate : 1194 mg/kg) (Calculation method)

Inhalation

Strong irritating.
Inhalation of aerosols/vapours may during a couple of hours cause liquid in the lungs (edema).

Acute toxicity estimate : > 20 mg/l (vapour) (Calculation method)

Dermal

no data available

Irritation**Skin**

Result : Skin contact may cause irritation. Prolonged and repeated exposure may cause pain and redness.

Eyes

Result : Strong irritating.
Risk of serious damage to eyes.

Sensitisation

Result : Please find this information in the listing of the component/components below in the MSDS.

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CMR effects
CMR Properties

Carcinogenicity	:	Please find this information in the listing of the component/components below in the MSDS.
Mutagenicity	:	Please find this information in the listing of the component/components below in the MSDS.
Teratogenicity	:	no data available
Reproductive toxicity	:	no data available

Specific Target Organ Toxicity
Single exposure

Inhalation	:	Target Organs: Respiratory system May cause respiratory irritation.
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Repeated exposure

Remark	:	The substance or mixture is not classified as specific target organ toxicant, repeated exposure.
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Other toxic properties
Repeated dose toxicity

no data available

Aspiration hazard

No aspiration toxicity classification,

Further information

Other relevant toxicity information	:	Inhalation of aerosol may cause irritation to the upper respiratory tract.
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Component:	hydrogen peroxide solution	CAS-No. 7722-84-1
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Acute toxicity
Oral

LD50 Oral	:	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.
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LD50 Oral : 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 data available

Dermal

no data available

Sensitisation

Result : not sensitizing (Magnusson & Kligman; Guinea pig)

CMR effects**CMR Properties**

Carcinogenicity : No evidence of carcinogenic effects.

Mutagenicity : In vivo tests did not show mutagenic effects
In vitro tests showed mutagenic effects which were not observed with in vivo test.

Teratogenicity : no data available

Reproductive toxicity : no data available

Genotoxicity in vitro

Result : positive (Chromosome aberration test in vitro; In vitro gene mutation study in mammalian cells; no) (OECD Test Guideline 473)

positive (In vitro gene mutation study in mammalian cells; no) (OECD Test Guideline 476)

Positive as well as negative results were obtained. (Mutagenicity (Escherichia coli - reverse mutation assay); with and without metabolic activation)

Genotoxicity in vivo

Result : negative (In vivo micronucleus test; Mouse)
(Test substance: Hydrogen peroxide solution (35%); intraperitoneal;) (OECD Test Guideline 474)

Specific Target Organ Toxicity

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Single exposure

Inhalation : Target Organs: Respiratory system
May cause respiratory irritation.

Repeated exposure

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

Other toxic properties

Repeated dose toxicity

NOEL : 37 mg/kg

(Mouse, female; Test substance: Hydrogen peroxide solution (35%))
(Oral; 90 d; Subsequent observation period 6 weeks) (OECD Test Guideline 408)
Target Organs: Blood; Symptoms: Depression of body weight, Irritation, Gastrointestinal tract

NOEL : 26 mg/kg

(Mouse, male; Test substance: Hydrogen peroxide solution (35%))
(Oral; 90 d; Subsequent observation period 6 weeks) (OECD Test Guideline 408)
Target Organs: Blood; Symptoms: Depression of body weight, Irritation, Gastrointestinal tract

Aspiration hazard

No aspiration toxicity classification,

SECTION 12: Ecological information

12.1. Toxicity

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

Fish

LC50 : 16,4 mg/l (Pimephales promelas; 96 h)

Toxicity to daphnia and other aquatic invertebrates

EC50 : 2,4 mg/l (Daphnia pulex (Water flea); 48 h) (semi-static test)

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algae

NOEC : 0,63 mg/l (Skeletonema costatum (marine diatom); 72 h) (static test; End point: Growth rate)

Bacteria

EC50 : > 1000 mg/l (activated sludge; 3 h) (static test; OECD Test Guideline 209)

EC50 : 466 mg/l (activated sludge; 30 min) (static test; OECD Test Guideline 209)

Chronic toxicity

Aquatic invertebrates

NOEC : 0,63 mg/l (Daphnia magna (Water flea); 21 d)

12.2. Persistence and degradability

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

Persistence

Result : (Related to: Air)
The product can be degraded by abiotic (e.g. chemical or photolytic) processes.

Biodegradability

Result : 100 %
Readily biodegradable

12.3. Bioaccumulative potential

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

Result : log Kow -1,57
Does not bioaccumulate.

12.4. Mobility in soil

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

Water	:	The product is mobile in water environment., 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
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Results of PBT and vPvB assessment

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

Component:	hydrogen peroxide solution	CAS-No. 7722-84-1
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Adsorbed organic bound halogens (AOX)

Result	:	Product does not contain any organic halogens.
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SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product	:	Eliminate waste in conditions authorized by the regulations. Store waste in containers provided for this purpose. Do not dump in drains, water sheets or the ground.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Dispose of in accordance with local regulations.
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

HYDROGEN PEROXIDE 35% ICELAND/ CAN 22 KG**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 : 5.1
(Labels; Classification Code; Hazard identification No; Tunnel restriction code) 5.1, 8; OC1; 58; (E)
RID-Class : 5.1
(Labels; Classification Code; Hazard identification No) 5.1, 8; OC1; 58
IMDG-Class : 5.1
(Labels; EmS) 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
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EU. Regulation No : EC Number: , 231-765-0; Listed
1451/2007 [Biocides],
Annex I, OJ (L 325)

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EU. Directive 96/82/EC : Threshold quantities established for the application of Article 9: (Seveso II) 200 tonnes; Part 2: Categories of substances and preparations not specifically named in Part 1
Threshold quantities established for the application of Articles 6 and 7: 50 tonnes; Part 2: Categories of substances and preparations not specifically named in Part 1

Notification status**hydrogen peroxide solution:**

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

15.2. Chemical safety assessment

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

SECTION 16: Other information**Full text of R-phrases referred to under sections 2 and 3.**

R 5	Heating may cause an explosion.
R 8	Contact with combustible material may cause fire.
R20/22	Harmful by inhalation and if swallowed.
R22	Harmful if swallowed.
R35	Causes severe burns.
R37/38	Irritating to respiratory system and skin.
R41	Risk of serious damage to eyes.

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.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H412	Harmful to aquatic life with long lasting effects.

Further information

Key literature references : Supplier information and data from the "Database of registered and sources for data substances" of the European Chemicals Agency (ECHA) were

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used to create this safety data sheet.

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.

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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	Use as a bleach	3	5, 6a, 6b	23, 24, 26, 34	1, 2, 3, 4, 13, 19	4, 6b	NA	ES287
2	Use in agrochemicals	3	1, 2, 8	0, 20, 37	1, 2, 3, 4	4, 6b	NA	ES327
3	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

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1. Short title of Exposure Scenario 1: 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 tanning, dye, finishing, impregnation and care 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
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises 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 (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	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	

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	expected.
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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 (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	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 and health evaluation	Wear protective gloves/ protective clothing/ eye protection/ face protection. Wash thoroughly after open handling of the product. Remove contaminated clothing and wash it before reuse. Wash off any skin contamination immediately.	

3. Exposure estimation and reference to its source

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Environment

Used EUSES model.

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: Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	(35% w/w)	Inhalation worker exposure	0,005mg/m ³	---
PROC2	(35% w/w)	Inhalation worker exposure	0,05mg/m ³	---
PROC3	(35% w/w)	Inhalation worker exposure	0,149mg/m ³	---
PROC4	(35% w/w)	Inhalation worker exposure	0,248mg/m ³	---
PROC13	(35% w/w)	Inhalation worker exposure	0,496mg/m ³	---

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.

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1. Short title of Exposure Scenario 2: 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: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
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 and health evaluation	Wear protective gloves/ protective clothing/ eye protection/ face protection. Wash thoroughly after open handling of the product. Remove contaminated clothing and wash it before reuse. Wash off any skin contamination immediately.	
	Wear respiratory protection (Efficiency: 90 %)(PROC3, PROC4)	

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3. Exposure estimation and reference to its source

Environment

Used EUSES model.

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: Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	(50% w/w), Indoor use.	Inhalation worker exposure	0,007mg/m ³	---
PROC2	(50% w/w), Indoor use.	Inhalation worker exposure	0,708mg/m ³	---
PROC3	(50% w/w), Indoor use.	Inhalation worker exposure	0,213mg/m ³	---
PROC4	(50% w/w), Indoor use.	Inhalation worker exposure	0,354mg/m ³	---
PROC1	(50% w/w), Outdoor use.	Inhalation worker exposure	0,005mg/m ³	---
PROC2	(50% w/w), Outdoor use.	Inhalation worker exposure	0,496mg/m ³	---
PROC3	(50% w/w), Outdoor use.	Inhalation worker exposure	0,149mg/m ³	---
PROC4	(50% w/w), Outdoor use.	Inhalation worker exposure	0,248mg/m ³	---

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.

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1. Short title of Exposure Scenario 3: Industrial use

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	<p>SU4: Manufacture of food products</p> <p>SU8: Manufacture of bulk, large scale chemicals (including petroleum products)</p> <p>SU9: Manufacture of fine chemicals</p> <p>SU 10: Formulation</p> <p>SU11: Manufacture of rubber products</p> <p>SU12: Manufacture of plastics products, including compounding and conversion</p> <p>SU14: Manufacture of basic metals, including alloys</p> <p>SU15: Manufacture of fabricated metal products, except machinery and equipment</p> <p>SU16: Manufacture of computer, electronic and optical products, electrical equipment</p> <p>SU17: General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment</p>
Chemical product category	<p>PC0: Other</p> <p>PC1: Adhesives, sealants</p> <p>PC2: Adsorbents</p> <p>PC8: Biocidal products</p> <p>PC9a: Coatings and paints, thinners, paint removers</p> <p>PC12: Fertilizers</p> <p>PC14: Metal surface treatment products, including galvanic and electroplating products</p> <p>PC15: Non-metal-surface treatment products</p> <p>PC20: Products such as ph-regulators, flocculants, precipitants, neutralization agents</p> <p>PC21: Laboratory chemicals</p> <p>PC23: Leather tanning, dye, finishing, impregnation and care products</p> <p>PC25: Metal working fluids</p> <p>PC26: Paper and board dye, finishing and impregnation products: including bleaches and other processing aids</p> <p>PC27: Plant protection products</p> <p>PC29: Pharmaceuticals</p> <p>PC31: Polishes and wax blends</p> <p>PC32: Polymer preparations and compounds</p> <p>PC33: Semiconductors</p> <p>PC34: Textile dyes, finishing and impregnating products</p> <p>PC35: Washing and cleaning products (including solvent based products)</p> <p>PC37: Water treatment chemicals</p> <p>PC39: Cosmetics, personal care products</p>
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC7: Industrial spraying</p> <p>PROC10: Roller application or brushing</p> <p>PROC12: Use of blowing agents in manufacture of foam</p> <p>PROC13: Treatment of articles by dipping and pouring</p> <p>PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletisation</p> <p>PROC15: Use as laboratory reagent</p>
Environmental Release Categories	<p>ERC1: Manufacture of substances</p> <p>ERC2: Formulation of preparations</p> <p>ERC4: Industrial use of processing aids in processes and products, not becoming part of articles</p>

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	<p>ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)</p> <p>ERC6b: Industrial use of reactive processing aids</p> <p>ERC6c: Industrial use of monomers for manufacture of thermoplastics</p> <p>ERC6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers</p>
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 (tons/year):	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 %
	Emission or Release Factor: Water	0,003 %
	Emission or Release Factor: Soil	0 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	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 (tons/year):	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

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Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	0 %
	Emission or Release Factor: Water	0,007 %
	Emission or Release Factor: Soil	0 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	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 (tons/year):	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 %
	Emission or Release Factor: Water	0,005 %
	Emission or Release Factor: Soil	0 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	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

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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 contaminated clothing and wash it before reuse. Wash off any skin contamination immediately.	

3. Exposure estimation and reference to its source

Environment

ERC1, ERC2, ERC6d, ERC6c, ERC4, ERC6a, ERC6b: Used EUSES model.

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: Used ECETOC TRA model.

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Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	(90% w/w)	Inhalation worker exposure	0,014mg/m ³	---
PROC2	(90% w/w)	Inhalation worker exposure	0,142mg/m ³	---
PROC3	(70% w/w)	Inhalation worker exposure	0,298mg/m ³	---
PROC4, PROC5, PROC15	(70% w/w)	Inhalation worker exposure	0,496mg/m ³	---
PROC7, PROC14	(60% w/w)	Inhalation worker exposure	0,425mg/m ³	---
PROC10	(60% w/w)	Inhalation worker exposure	0,85mg/m ³	---
PROC12	(60% w/w)	Inhalation worker exposure	0,34mg/m ³	---
PROC13	(60% w/w)	Inhalation worker exposure	0,85mg/m ³	---

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.