

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

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$

Version 7.1

Print Date 2019/11/25

Revision date / valid from 2019/11/25

MSDS code: MYYY760

SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1. Product identifier**

Trade name : HYDROGEN PEROXIDE ≥ 35 - $< 50\%$
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 : Industrial use
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 (Inhalation)	Category 4	---	H332

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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

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 + H332 Harmful if swallowed or if inhaled.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H335 May cause respiratory irritation.

Precautionary statements

Prevention : P261 Avoid breathing vapours/spray.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response : P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
P302 + P352 IF ON SKIN: Wash with plenty of water.
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$ **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

		Classification (REGULATION (EC) No 1272/2008)	
Hazardous components	Amount [%]	Hazard class / Hazard category	Hazard statements
hydrogen peroxide solution			
Index-No. : 008-003-00-9	≥ 35 - < 50	Ox. Liq.1	H271
CAS-No. : 7722-84-1		Acute Tox.4	H332
EC-No. : 231-765-0		Acute Tox.4	H302
EU REACH- : 01-2119485845-22-xxxx		Skin Corr.1A	H314
Reg. No.		STOT SE3	H335
		Aquatic Chronic3	H412

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

SECTION 4: First aid measures**4.1. Description of first aid measures**

General advice	: Take off all contaminated clothing immediately. If symptoms call a physician.
If inhaled	: Move to fresh air in case of accidental inhalation of vapours. If breathing is irregular or stopped, administer artificial respiration. If unconscious, place in recovery position and seek medical advice. Call a physician immediately.
In case of skin contact	: After contact with skin, wash immediately with plenty of water. If irritation persists, call a physician.
In case of eye contact	: Rinse immediately with plenty of water, also under the eyelids,

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for at least 10 minutes. Consult an eye specialist immediately. Go to an ophthalmic hospital if possible.

If swallowed : Rinse mouth with water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. 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 : Treat symptomatically.

SECTION 5: Firefighting measures**5.1. Extinguishing media**

Suitable extinguishing media : Water spray jet

Unsuitable extinguishing media : High volume water jet, Carbon dioxide (CO₂)

5.2. Special hazards arising from the substance or mixture

Specific hazards during firefighting : The product itself does not burn. 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 : Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Cool closed containers exposed to fire with water spray.

SECTION 6: Accidental release measures**6.1. Personal precautions, protective equipment and emergency procedures**

Personal precautions : Use personal protective equipment. Keep away unprotected persons. Ensure adequate ventilation. Avoid contact with skin

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and eyes. Do not breathe vapours or spray mist.

6.2. Environmental precautions

Environmental precautions : Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration. If the product contaminates rivers and lakes or drains inform respective authorities. If material reaches soil inform authorities responsible for such cases.

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 : Keep container firmly closed but do not keep it gas-tight. To this a packaging with ventilation cap is to be used. Ensure adequate ventilation. Avoid formation of aerosol. Use personal protective equipment. Avoid contact with skin, eyes and clothing. Do not breathe vapours or spray mist. Emergency eye wash fountains and emergency showers should be available in the immediate vicinity.

Hygiene measures : Keep away from food, drink and animal feedingstuffs. Smoking, eating and drinking should be prohibited in the application area. Wash hands before breaks and at the end of workday. Take off all contaminated clothing immediately.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Store in original container. Keep away from direct sunlight.

Advice on protection against fire and explosion : The product is not flammable. Heating will cause a pressure rise - with risk of bursting

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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 : Do not keep the container sealed. Keep in a dry place. Store in cool place. Keep in a well-ventilated place.

Advice on common storage : Keep away from food, drink and animal feedingstuffs. Keep away from combustible material.

Suitable packaging materials : Stainless steel, PTFE, polyethylene

Unsuitable packaging materials : , Copper, Aluminium, Zinc, Iron

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

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Intermittent releases	: 0.0138 mg/l
Sewage treatment plant (STP)	: 4.66 mg/l
Fresh water sediment	: 0.047 mg/kg dry weight (d.w.)
Marine sediment	: 0.047 mg/kg dry weight (d.w.)
Soil	: 0.0023 mg/kg dry weight (d.w.)

Other Occupational Exposure Limit Values

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

UK. EH40 Workplace Exposure Limits (WELs), as amended, 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, (15 minutes)

8.2. Exposure controls**Appropriate engineering controls**

Refer to protective measures listed in sections 7 and 8.

Personal protective equipment*Respiratory protection*

Advice : Required, if exposure limit is exceeded (e.g. OEL).
Respiratory protection complying with EN 141.
Recommended Filter type:
ABEK-filter
When aerosol or mist is formed use suitable respiratory protection.
ABEK-P2-filter

Hand protection

Advice : Wear suitable gloves.
Protective gloves should be replaced at first signs of wear.
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).

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Material : Protective gloves complying with EN 374.

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 (EN166)

Skin and body protection

Advice : Acid resistant protective clothing.

Environmental exposure controls

General advice : Do not flush into surface water or sanitary sewer system.
Avoid subsoil penetration.
If the product contaminates rivers and lakes or drains inform respective authorities.
If material reaches soil inform authorities responsible for such cases.

SECTION 9: Physical and chemical properties**9.1. Information on basic physical and chemical properties**

Form : liquid
Colour : colourless
Odour : pungent
Odour Threshold : no data available
pH : 2 - 4 (20 °C)
Melting point/range : ca. -33 °C
Boiling point/boiling range : ca. 108 °C 35% solution
ca. 109 °C

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ca. 114 °C 50% solution

Flash point	: Not applicable
Evaporation rate	: no data available
Flammability (solid, gas)	: Not applicable
Upper explosion limit	: Not applicable
Lower explosion limit	: Not applicable
Vapour pressure	: ca. 13 hPa (20 °C)
Relative vapour density	: no data available
Density	: ca. 1.13 g/cm ³ (20 °C) 35% solution
Water solubility	: completely miscible
Partition coefficient: n-octanol/water	: log K _{ow} -1.57 (20 °C) (calculated)
Auto-ignition temperature	: Not applicable
Thermal decomposition	: To avoid thermal decomposition, do not overheat.
Viscosity, dynamic	: no data available
Explosivity	: Product is not explosive.
Oxidizing properties	: Oxidizing agents

9.2. Other information

Molecular weight	: 34.01 g/mol
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SECTION 10: Stability and reactivity**10.1. Reactivity**

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

Advice	: Stable under recommended storage conditions.
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10.3. Possibility of hazardous reactions

Hazardous reactions	: Gives off hydrogen by reaction with metals.
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10.4. Conditions to avoid

Conditions to avoid	: Heat, flames and sparks. Keep away from direct sunlight. Generation of gas from decomposition causes
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Thermal decomposition : pressure in closed systems
: To avoid thermal decomposition, do not overheat.

10.5. Incompatible materials

Materials to avoid : Keep away from combustible material. Organic materials, Keep away from strong oxidizing agents and strong reducing agents. Copper, Aluminium, Zinc, Iron, Acetone, alkalis, Bases, Metal oxides

10.6. Hazardous decomposition products

Hazardous decomposition : Oxygen products

SECTION 11: Toxicological information**11.1. Information on toxicological effects****Data for the product****Acute toxicity****Oral**

Acute toxicity estimate : 862.2 - 1231.4 mg/kg) (Calculation method) Classified based on the calculation method according to CLP regulation. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

Acute toxicity estimate : 836.02 mg/kg) (Calculation method)

Inhalation

Acute toxicity estimate : 3.0 - 4.3 mg/l (4 h; dust/mist) (Calculation method) Classified based on the calculation method according to CLP regulation.

Dermal

Acute toxicity estimate : > 2000 mg/kg) (Calculation method) Not classified based on the calculation method according to CLP regulation.

Irritation**Skin**

Result : Classified based on the calculation method according to CLP regulation.

Eyes

Result : Classified based on the calculation method according to CLP regulation.

Sensitisation

no data available

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$ **CMR effects****CMR Properties**

Carcinogenicity	:	Not classified based on the calculation method according to CLP regulation.
Mutagenicity	:	Not classified based on the calculation method according to CLP regulation.
Teratogenicity	:	Not classified based on the calculation method according to CLP regulation.
Reproductive toxicity	:	Not classified based on the calculation method according to CLP regulation.

Specific Target Organ Toxicity**Single exposure**

Remarks	:	Classified based on the calculation method according to CLP regulation.
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Repeated exposure

Remarks	:	Not classified based on the calculation method according to CLP regulation.
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Other toxic properties**Repeated dose toxicity**

no data available

Aspiration hazard

Not applicable,

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.
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.

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 : 431 mg/kg (Rat, male and female) (US-EPA method) The toxicological value for the pure substance was calculated on basis of a value for an aqueous solution.
- 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 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 (Magnusson & Kligman; 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.

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)

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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**Single exposure**

Inhalation : Target Organs: Respiratory system May 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**

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

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$ **Acute toxicity****Fish**

LC50 : 16.4 mg/l (Pimephales promelas; 96 h) (semi-static test)

Toxicity to daphnia and other aquatic invertebrates

EC50 : 2.4 mg/l (Daphnia pulex (Water flea); 48 h) (semi-static test)

algae

NOEC : 0.63 mg/l (Skeletonema costatum (marine diatom); 72 h) (static test; End point: Growth rate)

ErC50 1.38 mg/l (Skeletonema costatum (marine diatom); 72 h) (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) (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.
Decomposition under release of oxygen.

Biodegradability

Result : 100 % (Related to: O₂ consumption; Test substance: 30% solution)(OECD)Readily biodegradable.

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$ **12.3. Bioaccumulative potential**

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

Result : log Kow -1.57 (20 °C)
 : 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 environment.
 Soil : Not expected to adsorb on soil.
 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

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

Result : Product does not contain any organic halogens.

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

SECTION 13: Disposal considerations**13.1. Waste treatment methods**

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

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- Contaminated packaging : Empty contaminated packagings thoroughly. They can be recycled after thorough and proper cleaning. If recycling is not practicable, dispose of in compliance with local regulations.
- : Dispose of contaminated packaging in the same way as the product. In accordance with local and national 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**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 Number; Tunnel restriction code) 5.1, 8; OC1; 58; (E)
- RID-Class : 5.1
(Labels; Classification Code; Hazard Identification Number) 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.

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$ **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****Data for the product**

EU. REACH, Annex XVII, : Point Nos.: , 3; Listed
Marketing and Use
Restrictions (Regulation
1907/2006/EC)

EU. Directive : ; The substance/mixture does not fall under this legislation.
2012/18/EU (SEVESO
III) Annex I

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)

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	

EU. Regulation EU No. : ; The substance/mixture does not fall under this legislation.
649/2012 concerning the
export and import of
dangerous chemicals

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EU. Annexes I and II, Regulation 98/2013/EU on the Marketing and Use of Explosives Precursors : Limit: 12 % w/w; Annex I: Substances which shall not be made available to members of the general public on their own, or in mixtures or substances including them, except if the concentration is equal to or lower than the limit values set out.

; Listed
 Combined Nomenclature (CN) Number(s): 3824 90 97;
 Combined Nomenclature (CN) code for a mixture without constituents; Listed
 Combined Nomenclature (CN) Number(s): 2847 00 00;
 Combined Nomenclature (CN) code for a separate chemically defined compound; Listed

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

EU. Regulation No. 1223/2009 on cosmetic products, Annex III: List of Restricted Substances in Cosmetic Products : Maximum concentration in ready for use preparation: 6 %; Tooth whitening or bleaching products; See the text of the regulation for applicable exceptions or provisions.

Maximum concentration in ready for use preparation: 0.1 %; Oral products (including mouth rinse, tooth paste and tooth whitening or bleaching products); See the text of the regulation for applicable exceptions or provisions.
 Maximum concentration in ready for use preparation: 4 %; Skin products; See the text of the regulation for applicable exceptions or provisions.
 Maximum concentration in ready for use preparation: 2 %; Cosmetic products for eyelashes; See the text of the regulation for applicable exceptions or provisions.
 Maximum concentration in ready for use preparation: 12 %; Hair products; See the text of the regulation for applicable exceptions or provisions.
 Maximum concentration in ready for use preparation: 2 %; Products for hardening nails; See the text of the regulation for applicable exceptions or provisions.

**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	

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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

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

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

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.

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

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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
REACH Auth. No.:	REACH Authorisation Number
REACH AuthAppC. No.	REACH Authorisation Application Consultation Number
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	:	<p>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.</p> <p>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.</p>

|| Indicates updated section.

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$

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	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
2	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
3	Use in cleaning agents	21	NA	21, 35	NA	8a, 8b, 8d, 8e	NA	ES377
4	Use in cleaning agents	22	NA	21, 35	4, 10, 11, 13, 19	8a, 8b, 8d, 8e	NA	ES400
5	Use in agrochemicals	3	1, 2, 8	0, 20, 37	1, 2, 3, 4	4, 6b	NA	ES327
6	Use in agrochemicals	21	1, 2, 8	20, 37	NA	8a, 8b, 8d, 8e	NA	ES366
7	Use in agrochemicals	22	1, 2, 8	0, 20, 37	1, 2, 3, 4	8a, 8b, 8e, 8d	NA	ES362
8	Use in cosmetics	21	NA	39	NA	8b	NA	ES408
9	Use in cosmetics	22	NA	39	19	8b	NA	ES404
10	Use as a bleach	3	5, 6a, 6b	23, 24, 26, 34	1, 2, 3, 4, 13, 19	4, 6b	NA	ES287
11	Use as a bleach	21	5, 6a, 6b	23, 24, 26, 34	NA	8a, 8b, 8e	NA	ES316
12	Use as a bleach	22	5, 6a, 6b	23, 24, 26, 34	1, 2, 3, 4, 13, 19	8a, 8b, 8e	NA	ES312

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$ **1. Short title of Exposure Scenario 1: 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 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 (use UCN codes) 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 tanning, dye, finishing, impregnation and care 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 (including solvent based products) PC37: Water treatment chemicals PC39: Cosmetics, personal care 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 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 tableting, 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

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$

	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	Number of emission days	300

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conditions affecting environmental exposure	per year	
	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 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.	

2.4 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4,

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$ **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	---

WorkersPROC1, 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	0.014mg/m ³	---

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		exposure		
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.

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$ **1. Short title of Exposure Scenario 2: Distribution of substance**

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU4: Manufacture of food products SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals SU 10: Formulation 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 (use UCN codes) 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 (including solvent based 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 measures at process level to	Air	Generally closed systems.

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$

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/m ³	---
PROC8b	(90% w/w)	Inhalation worker exposure	0.21mg/m ³	---
PROC9	(90% w/w)	Inhalation worker exposure	0.71mg/m ³	---

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

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$

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.

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$ **1. Short title of Exposure Scenario 3: 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 (including solvent based 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

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$

Frequency of use	1 Times per day
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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/m ³	---
---	Cleaning surfaces by wiping, brushing, (7% w/w)	Consumer inhalation exposure	1.07mg/m ³	---
---	Sanitary cleaner, (16% w/w)	Consumer inhalation exposure	1.16mg/m ³	---

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

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$ **1. Short title of Exposure Scenario 4: 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 (including solvent based 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

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	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/m ³	---
---	Cleaning surfaces by wiping, brushing, (7% w/w)	Inhalation worker exposure	1.07mg/m ³	---
---	Sanitary cleaner, (12% w/w)	Inhalation worker exposure	1.16mg/m ³	---
---	Using cleaner containing H ₂ O ₂ , (7% w/w)	Inhalation worker exposure	1.07mg/m ³	---

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

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$

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.

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$ **1. Short title of Exposure Scenario 5: 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 (use UCN codes) 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 and wash contaminated clothing before re-use.	
	Wash off any skin contamination immediately.	
	Wear respiratory protection (Efficiency: 90 %)(PROC3, PROC4)	

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$ **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	---

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/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.

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$ **1. Short title of Exposure Scenario 6: 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%
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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	---

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$ **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

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$ **1. Short title of Exposure Scenario 7: 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 (use UCN codes) 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	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**

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$ **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/m ³	---
PROC2	(50% w/w)	Inhalation worker exposure	0.708mg/m ³	---
PROC3	(50% w/w)	Inhalation worker exposure	0.213mg/m ³	---
PROC4	(50% w/w)	Inhalation worker exposure	0.354mg/m ³	---
PROC1	(50% w/w)	Inhalation worker exposure	0.005mg/m ³	---
PROC2	(50% w/w)	Inhalation worker exposure	0.496mg/m ³	---
PROC3	(50% w/w)	Inhalation worker exposure	0.149mg/m ³	---
PROC4	(50% w/w)	Inhalation worker exposure	0.248mg/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.

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$ **1. Short title of Exposure Scenario 8: 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

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$ **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

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$ **1. Short title of Exposure Scenario 9: 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.	

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$

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.

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$ **1. Short title of Exposure Scenario 10: 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; including bleaches and other processing aids
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 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	Waste treatment	Waste has to be treated as industrial waste and should be incinerated in thermal combustion.

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$

disposal	Highly reactive., Seal and return containers., No environmental emissions are 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 m ³ /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 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.	

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$ **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/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.

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$ **1. Short title of Exposure Scenario 11: 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 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; 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

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$

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/m ³	---

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$

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

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$ **1. Short title of Exposure Scenario 12: 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 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; including bleaches and other processing aids
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	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 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

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$

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 m ³ /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.	

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$

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/m ³	---
PROC2	(35% w/w)	Inhalation worker exposure	0.496mg/m ³	---
PROC3	(35% w/w)	Inhalation worker exposure	0.298mg/m ³	---
PROC4	(35% w/w)	Inhalation worker exposure	0.992mg/m ³	---
PROC13	(35% w/w)	Inhalation worker exposure	0.34mg/m ³	---
PROC19	(35% w/w)	Inhalation worker exposure	0.85mg/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.

HYDROGEN PEROXIDE ≥ 35 - $< 50\%$