

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

sodium hypochlorite, solution 10 - 15%

Version 9.1 Print Date 2015/03/31

Revision date / valid from 2015/03/31 MSDS code: MSHY100

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

1.1. Product identifier

Trade name : sodium hypochlorite, solution 10 - 15%

Substance name : sodium hypochlorite, solution

Index-No. : 017-011-00-1 CAS-No. : 7681-52-9 EC-No. : 231-668-3

Registration number : 01-2119488154-34-xxxx

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

Use of the : Identified use: See table in front of appendix for a complete

Substance/Mixture overview of identified uses.

Uses advised against : At this moment we have not identified any uses advised

against

1.3. Details of the supplier of the safety data sheet

Company : Brenntag UK & Ireland

Albion House, Rawdon Park GB LS19 7XX Leeds Yeadon

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 : Emergency only telephone number (open 24 hours):

number +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					
Skin corrosion	Category 1B		H314		
Acute aquatic toxicity	Category 1		H400		



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

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

Directive 67/548/EEC or 1999/45/EC				
Hazard symbol / Category of danger Risk phrases				
Corrosive (C)Corrosive (C)	R34			
Dangerous for the environment (N)Dangerous for the environment (N)	R50			
	R31			

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

Most important adverse effects

Human Health : See section 11 for toxicological information.

Physical and chemical : See section 9 for physicochemical information.

hazards

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 : H314 Causes severe skin burns and eye damage.

H400 Very toxic to aquatic life.

Precautionary statements

Prevention : P273 Avoid release to the environment.

P280 Wear protective gloves/ protective clothing/

eye protection/ face protection.

Response : P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do

NOT induce vomiting.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with

water for several minutes. Remove contact lenses, if present and easy to do. Continue

rinsing.

P310 Immediately call a POISON

CENTER/doctor.



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P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

Additional Labelling:

EUH031 Contact with acids liberates toxic gas.

Hazardous components which must be listed on the label:

· sodium hypochlorite, 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 : sodium hypochlorite Aqueous solution

Hazardous components		Amount [%]	Classification (REGULATION (EC) No 1272/2008) Hazard class / Hazard Hazard category statements		Classification (67/548/EEC)		
sodium hypo	chlorite, solution						
Index-No. CAS-No. EC-No. Registration	: 017-011-00-1 : 7681-52-9 : 231-668-3 : 01-2119488154-34-xxxx	>= 10 - <= 15	Met. Corr.1 Skin Corr.1B STOT SE3 Aquatic Acute1 Aquatic Chronic1	H290 H314 H335 H400 H410	R31 Corrosive; C; R34 Irritant; Xi; R37 Dangerous for the environment; N; R50		
sodium hydro	sodium hydroxide						
Index-No. CAS-No. EC-No. Registration	: 011-002-00-6 : 1310-73-2 : 215-185-5 : 01-2119457892-27-xxxx	>= 0 - < 5	Met. Corr.1 Skin Corr.1A	H290 H314	Corrosive; C; R35		

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

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice : Take off all contaminated clothing immediately.



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If inhaled : In case of accident by inhalation: remove casualty to fresh air

and keep at rest. If breathing is irregular or stopped, administer

artificial respiration. Call a physician immediately.

In case of skin contact : Wash off immediately with soap and plenty of water. If irritation

appears or if the contamination is important, seek medical

advice.

In case of eye contact : Rinse immediately with plenty of water, also under the eyelids,

for at least 15 minutes. Consult an eye specialist immediately.

Go to an ophthalmic hospital if possible.

If swallowed : Clean mouth with water and drink afterwards plenty of water.

Never give anything by mouth to an unconscious person. If swallowed, do not induce vomiting - seek medical advice. 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 : Inhalation may provoke the following symptoms: Cough,

Headache, Lung oedema

Effects : Risk of serious damage to the lungs (by aspiration).

4.3. Indication of any immediate medical attention and special treatment needed

Treatment : Treat symptomatically.Later control for pneumonia and lung

oedema.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing

media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. The product

itself does not burn.

Unsuitable extinguishing

media

Exempt

5.2. Special hazards arising from the substance or mixture

Specific hazards during

firefighting

Fire may cause evolution of: Chlorine, Hydrogen chloride gas,

chlorine oxides

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 information : Cool closed containers exposed to fire with water

spray. Heating will cause a pressure rise - with risk of bursting. Collect contaminated fire extinguishing water separately. This must not be discharged into drains.



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SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal precautions : Use personal protective equipment. Wear respiratory

> protection. Keep people away from and upwind of spill/leak. Provide adequate ventilation. Danger of slipping if spilled Avoid contact with skin and eyes. Do not breathe vapour.

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

containment and cleaning

up

Methods and materials for : Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders). Keep in suitable, closed containers for disposal. Do not keep the container sealed.

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

considerations".

Reference to other sections 6.4.

For personal protection see section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling : Do not keep the container sealed. Handle and open container

> with care. Ensure adequate ventilation. Use personal protective equipment. Avoid contact with the skin and the eyes. Do not breathe vapours or spray mist. Use respirator with appropriate filter if vapours or aerosol are released. 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.

Conditions for safe storage, including any incompatibilities

areas and containers

Requirements for storage : Keep in a cool, well-ventilated place. Keep in an area equipped with alkali resistant flooring. Keep only in the original container. Store in a receptacle equipped with a vent. Protect against light.

Advice on protection against fire and explosion : The product is not flammable. Normal measures for preventive fire protection.

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Further information on storage conditions

: Keep in a well-ventilated place. Protect against light. Store in

cool place. Do not keep the container sealed.

Advice on common

storage

: Keep away from food, drink and animal feedingstuffs. Do not

store together with acids and ammonium salts.

German storage class : 8B: Non-combustible substances, corrosive

Storage temperature : -10 - 20 °C

7.3. Specific end use(s)

Specific use(s) : No information available.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Component: sodium hydroxide CAS-No.

1310-73-2

Other Occupational Exposure Limit Values

EH40 WEL, Short Term Exposure Limit (STEL): 2 mg/m3

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

Component: chlorine CAS-No.

7782-50-5

Other Occupational Exposure Limit Values

EU ELV, Short Term Exposure Limit (STEL):

0.5 ppm, 1.5 mg/m3

Indicative

EH40 WEL, Short Term Exposure Limit (STEL):

0.5 ppm, 1.5 mg/m3

ELV (IE), Short Term Exposure Limit (STEL):

0.5 ppm, 1.5 mg/m3

Indicative OELV

8.2. Exposure controls

Appropriate engineering controls



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Refer to protective measures listed in sections 7 and 8.

Personal protective equipment

Respiratory protection

Advice : Use respirator with appropriate filter if vapours or aerosol are

released.

Recommended Filter type: Combination filter:B-P2 Combination filter:B-P3

For low vapor concentrations: EN 136. For higher concentrations:

EN 137

Hand protection

Advice : Protective gloves complying with EN 374.

The glove material has to be impermeable and resistant to the

product / the substance / the preparation.

Take note of the information given by the producer concerning permeability and break through times, and of special workplace

conditions (mechanical strain, duration of contact).

Protective gloves should be replaced at first signs of wear.

Material : butyl-rubber

Break through time : 8 h
Glove thickness : 0.5 mm

Material : Polyvinylchloride

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 : Safety glasses with side-shields conforming to EN166

Tightly fitting safety goggles

Skin and body protection

Advice : alkali resistant protective clothing

(EN 340)

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.



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SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Form : liquid

Colour : yellowish green

Odour : slight chlorine

Odour Threshold : Currently we do not have any information from our

supplier about this.

pH : > 11

Melting point/range : -17 °C

Boiling point/boiling range : 110 °C

Flash point : Not applicable

Evaporation rate : Currently we do not have any information from our

supplier about this.

Flammability (solid, gas) : does not ignite

Upper explosion limit : Not applicable

Lower explosion limit : Not applicable

Vapour pressure : Currently we do not have any information from our

supplier about this.

Relative vapour density : > 1.0

(Air = 1.0)

Density : 1.2 - 1.3 g/cm3

Water solubility : completely soluble

Partition coefficient: n-octanol/water : Currently we do not have any information from our

supplier about this.

Auto-ignition temperature : Not applicable

Thermal decomposition : To avoid thermal decomposition, do not overheat.

Viscosity, dynamic : 3.45 mPa.s (20 °C)

(Aqueous, solution, 15 %)

Explosive properties : EU legislation: Not explosive



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Oxidizing properties : Currently we do not have any information from our

supplier about this.

9.2. Other information

No further information available.

SECTION 10: Stability and reactivity

10.1. Reactivity

Advice : This product is a very reactive substance that can react with

many inorganic and organic compounds.

10.2. Chemical stability

Advice : Decomposes on heating.

Decomposes on exposure to light.

10.3. Possibility of hazardous reactions

Hazardous reactions : May develop chlorine if mixed with acidic solutions.

10.4. Conditions to avoid

Conditions to avoid : Heat.

Thermal decomposition : To avoid thermal decomposition, do not overheat.

10.5. Incompatible materials

Materials to avoid : Acids, ammonium compounds, Acetic anhydride, Organic

materials, Hydrogen peroxide, metal salts, Copper, Nickel, Iron

10.6. Hazardous decomposition products

Hazardous decomposition : Hydrogen chloride gas, Chlorine, chlorine oxides

products

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity		
Oral		
LD50	 2900 - 3400 mg/kg (Mouse) Cause serious burns with severe pains, vomiting, pains in the stomach, possibly chock and damaged kidneys. The burn may occur even if only small amounts have been swallowed. 	
	Dermal	



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LD50 : > 2000 mg/kg (Rabbit)

Irritation

Skin

Result : Severe skin irritation (Rabbit) (OECD Test Guideline 404)

corrosive effects (human)

Eyes

Result : corrosive effects (Rabbit)

Risk of serious damage to eyes.

Sensitisation

Result : not sensitizing (Guinea pig)

Further information

Other relevant toxicity information

: If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach.

SECTION 12: Ecological information

12.1. Toxicity

12.2. Persistence and degradability

Persistence and degradability				
Persistence				
Result	Result : no data available			
Biodegradability				
5				

Result : The methods for determining the biological degradability are not

applicable to inorganic substances.

12.3. Bioaccumulative potential

Bioaccumulation

Result : Bioaccumulation is not expected.



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12.4. Mobility in soil

Mobility

Result : The product is mobile in water environment.

12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment

Result : no data available

12.6. Other adverse effects

Additional ecological information

Result : Do not flush into surface water or sanitary sewer system.

Very toxic to aquatic organisms.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product : Disposal together with normal waste is not allowed. Special

disposal required according to local regulations. Do not let product enter drains. Contact waste disposal services.

Contaminated packaging : Empty contaminated packagings thoroughly. They can be

recycled after thorough and proper cleaning. Packagings that cannot be cleaned are to be disposed of in the same manner

as the product.

European Waste Catalogue Number

No waste code according to the European Waste Catalogue can be assigned for this product, as the intended use dictates

the assignment. The waste code is established in consultation

with the regional waste disposer.

SECTION 14: Transport information

14.1. UN number

1791

14.2. UN proper shipping name

ADR : HYPOCHLORITE SOLUTION RID : HYPOCHLORITE SOLUTION IMDG : HYPOCHLORITE SOLUTION

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14.3. Transport hazard class(es)

ADR-Class : 8

(Labels; Classification Code; Hazard 8; C9; 80; (E)

identification No; Tunnel restriction code)

RID-Class : 8

(Labels; Classification Code; Hazard 8; C9; 80

identification No)

IMDG-Class : 8

(Labels; EmS) 8; F-A, S-B

14.4. Packaging group

ADR : III RID : III IMDG : III

14.5. Environmental hazards

Labeling according to 5.2.1.8 ADR : Fish and tree Labeling according to 5.2.1.8 RID : Fish and tree Labeling according to 5.2.1.6.3 IMDG : Fish and tree

Classification as environmentally : yes

hazardous according to 2.9.3 IMDG

14.6. Special precautions for user

Note : Not applicable

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

IMDG : Not applicable.

SECTION 15: Regulatory information

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

Other regulations : Occupational restrictions: Take note of Dir 92/85/EEC on the

safety and health of pregnant workers at work and of Dir 94/33/EC on the protection of young people at work.

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15.2. Chemical Safety Assessment

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

SECTION 16: Other information



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Full text of R-phrases referred to under sections 2 and 3.

R31	Contact with acids liberates toxic gas.

R34 Causes burns.

R35 Causes severe burns.

R37 Irritating to respiratory system.
R50 Very toxic to aquatic organisms.

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

H314 Causes severe skin burns and eye damage.

H335 May cause respiratory irritation.

H400 Very toxic to aquatic life.

H410 Very toxic to aquatic life with long lasting effects.

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.

Other information : Restricted to professional users. Attention - Avoid exposure -

obtain special instructions before use. The information provided in this Safety Data Sheet is correct to our knowledge at the date of its revision. The information given only describes the products with regard to safety arrangements and is not to be considered as a warranty or quality specification and does not

constitute a legal relationship.

The information contained in this Safety Data Sheet relates only to the specific material designated and may not be valid for such material used in combination with any other material

or in any process, unless specified in the text

|| Indicates updated section.



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No.	Short title	Main User Group (SU)	Sector of Use (SU)	Product Category (PC)	Process Category (PROC)	Environm ental Release Category (ERC)	Article Category (AC)	Specified
1	Manufacture of substance	3	8	NA	1, 2, 3, 4, 8a, 8b, 9	1	NA	ES447
2	Use as an intermediate	3	8, 9	19	1, 2, 3, 4, 8a, 8b, 9	6a	NA	ES9182
3	Formulation & (re)packing of substances and mixtures	3	10	NA	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15	2	NA	ES9179
4	Use in Cleaning Agents	3	4	35	5, 7, 8a, 9, 10, 13	6b	NA	ES9191
5	Use in Cleaning Agents	22	NA	35	5, 9, 10, 11, 13, 15	8a, 8b, 8d, 8e	NA	ES538
6	Use in sewage water treatment	3	23	20, 37	1, 2, 3, 4, 5, 8a, 8b, 9	6b	NA	ES9187
7	Use in paper industry	3	6b	26	1, 2, 3, 4, 5, 8a, 8b, 9	6b	NA	ES9189
8	Use in textile industry	3	5	34	1, 2, 3, 4, 5, 8a, 8b, 9, 13	6b	NA	ES9185
9	Consumer use	21	NA	34, 35, 37	NA	8a, 8b, 8d, 8e	NA	ES653



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1. Short title of Exposure Sco	enario 1: Manufacture of	f substance		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites			
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products)			
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)			
Environmental Release Categories	ERC1: Manufacture of sub	stances		
2.1 Contributing scenario co	ntrolling environmental	exposure for: ERC1		
Substance is a unique structure, N	lon-hydrophobic, Low potent	tial to bioaccumulate		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.		
Amount used	Amounts used in the EU (tonnes/year)	999.999 ton(s)/year		
Frequency and duration of use	Continuous exposure	360 days/year		
	Flow rate of receiving surface water	18,000 m3/d		
Environment factors not influenced by risk management	Dilution Factor (River)	10		
inilidenced by risk management	Dilution Factor (Coastal Areas)	100		
Technical conditions and	Air	Substance release to air can be excluded		
measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Water	Risk from environmental exposure is driven by the freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste water		
Organizational measures to	Soil	Substance release to soil can be excluded		
prevent/limit release from the site				
Conditions and measures related	Type of Sewage Treatment Plant	Municipal sewage treatment plant		
to sewage treatment plant	Flow rate of sewage treatment plant effluent	2,000 m3/d		
Conditions and measures related to external treatment of waste for disposal	Waste treatment External treatment and disposal of waste comply with applicable local and/or nation regulations.			
2.2 Contributing scenario co PROC8a, PROC8b, PROC		re for: PROC1, PROC2, PROC3, PROC4,		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.		
	Physical Form (at time of Liquid, moderate fugacity			
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	use)			
	Vapour pressure	25 hPa		
	Process Temperature	90 °C		
Frequency and duration of use	Exposure duration per day	8 h		
	Frequency of use	5 days/week		
	Body weight	70 kg		
Human factors not influenced by risk management	Respiration volume under conditions of use	10 m3/day		
	Light activity			
Other operational conditions	Indoor/Outdoor use.			
affecting workers exposure Assumes activities are at ambient temperature.				
Technical conditions and measures to control dispersion	Provide a good standard of per hour).	general ventilation (not less than 3 to 5 air changes		
from source towards the worker	1 • •	equipment opening or maintenance.		
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure that no inhalable aerosols are generated Regular inspection and maintenance of equipment and machines. Ensure that the task is not carried out overhead. Ensure containment of the emission source			
Conditions and measures related to personal protection, hygiene and health evaluation	Wear protective gloves/ protective clothing/ eye protection/ face protection. In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection In the case of hazardous fumes, wear self contained breathing apparatus.			

Risk Management Measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

Qualitative approach used to conclude safe use.

Workers

EU RAR

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
Relevant for all PROCs		Worker - inhalative, long-term - local and systemic.	0.705mg/m³	0.4548
PROC1, PROC2, PROC3, PROC4	General exposures	Worker - inhalative, short-term - local and systemic	0.540mg/m³	0.1742
PROC1, PROC2, PROC3, PROC4	Laboratory activities	Worker - inhalative, short-term - local and systemic	0.252mg/m³	0.081
PROC1, PROC2, PROC3, PROC4	Equipment maintenance	Worker - inhalative, short-term - local and systemic	0.480mg/m³	0.155
PROC8a, PROC8b, PROC9		Worker - inhalative, short-term - local and systemic	0.498mg/m³	0.161

Qualitative assessment dermal. Contact is only accidental. The exposure estimate represents the 90th percentile of the exposure distribution.

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



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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.

Exposure values based on the EU Risk Assessment Report on chlorine (2007)

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented. Ensure that gas alarms are installed Change gloves, if duration of activity exceeds breakthrough time



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1. Short title of Exposure Sco	enario 2: Use as an inter	mediate		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites			
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals			
Chemical product category	PC19: Intermediate			
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)			
Environmental Release Categories	ERC6a: Industrial use resuintermediates)	lting in manufacture of another substance (use of		
2.1 Contributing scenario co	ntrolling environmental	exposure for: ERC6a		
Substance is a unique structure, N	lon-hydrophobic, Low potent	ial to bioaccumulate		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.		
Amount used	Amounts used in the EU (tonnes/year)	999.999 ton(s)/year		
Frequency and duration of use	Continuous exposure	360 days/year		
	Flow rate of receiving surface water	18,000 m3/d		
Environment factors not influenced by risk management	Dilution Factor (River)	10		
illindericed by fisk management	Dilution Factor (Coastal Areas)	100		
Technical conditions and	Air	Substance release to air can be excluded		
measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Water	Risk from environmental exposure is driven by the freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste water		
Organizational measures to	Soil	Substance release to soil can be excluded		
prevent/limit release from the site				
Conditions and measures related	Type of Sewage Treatment Plant	Municipal sewage treatment plant		
to sewage treatment plant	Flow rate of sewage treatment plant effluent	2,000 m3/d		
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.		
2.2 Contributing scenario co PROC8a, PROC8b, PROC		re for: PROC1, PROC2, PROC3, PROC4,		
Product characteristics	Concentration of the Substance in the product up to 25 %.			



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	Mixture/Article		
	Physical Form (at time of use)	Liquid, moderate fugacity	
	Vapour pressure	25 hPa	
	Process Temperature	90 °C	
Frequency and duration of use	Exposure duration per day	8 h	
	Frequency of use	5 days/week	
	Body weight	70 kg	
Human factors not influenced by risk management	Respiration volume under conditions of use	10 m3/day	
	Light activity		
Other operational conditions	Indoor use.		
affecting workers exposure	Assumes activities are at ambient temperature., Outdoor location is covered by the worst case inside location		
Technical conditions and		general ventilation (not less than 3 to 5 air changes	
measures to control dispersion from source towards the worker	per hour). Drain down system prior to	equipment opening or maintenance.	
Organizational manauros to	Ensure that no inhalable as		
Organisational measures to prevent /limit releases, dispersion	Regular inspection and maintenance of equipment and machines.		
and exposure	Ensure that the task is not carried out overhead. Ensure containment of the emission source		
Conditions and measures related to personal protection, hygiene and health evaluation	Wear protective gloves/ protective clothing/ eye protection/ face protection. In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection In the case of hazardous fumes, wear self contained breathing apparatus.		
	in the sace of hazardose rames, mear con contained breathing apparatus.		

Risk Management Measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

Qualitative approach used to conclude safe use.

Workers

Advanced REACH Tool (ART model)

Advantod READTH Tool (ART model)				
Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1		Worker - inhalative, long- term - local	0.02mg/m³	0.01
PROC2, PROC3		Worker - inhalative, long- term - local	1.10mg/m³	0.71
PROC4		Worker - inhalative, long- term - local	1.20mg/m³	0.77
PROC8a, PROC8b		Worker - inhalative, long- term - local	1.25mg/m³	0.81
PROC9		Worker - inhalative, long- term - local	0.91mg/m³	0.59

The short-term exposure is covered by the assessment of long-term exposure. Qualitative assessment dermal. Qualitative approach used to conclude safe use.

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



sodium hypochlorite, solution 10 - 15%

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.
Ensure that gas alarms are installed
Change gloves, if duration of activity exceeds breakthrough time



sodium hypochlorite, solution 10 - 15%

Sociality poetitorite, Solution 10 - 1070				
1. Short title of Exposure Scenario 3: Formulation & (re)packing of substances and mixtures				
Main User Groups	SU 3: Industrial uses: Us sites	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites		
Sectors of end-use	SU 10: Formulation			
Process categories	PROC2: Use in closed, or PROC3: Use in closed by PROC4: Use in batch an exposure arises PROC5: Mixing or blending and articles (multistage and PROC8a: Transfer of subvessels/large containers and PROC8b: Transfer of subvessels/large containers and PROC9: Transfer of substilling line, including weigh PROC14: Production of pextrusion, pelletisation	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) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC14: Production of preparations or articles by tabletting, compression,		
Environmental Release Categories	ERC2: Formulation of pre	ERC2: Formulation of preparations		
2.1 Contributing scenario controlling environmental exposure for: ERC2				
Substance is a unique structure, Non-hydrophobic, Low potential to bioaccumulate				
Product characteristics	Concentration of the Substance in	Covers percentage substance in the product up to 25 %.		

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
Amount used	Amounts used in the EU (tonnes/year)	999.999 ton(s)/year
Frequency and duration of use	Continuous exposure	360 days/year
	Flow rate of receiving surface water	18,000 m3/d
Environment factors not influenced by risk management	Dilution Factor (River)	10
Timeshood by northanagoment	Dilution Factor (Coastal Areas)	100
Technical conditions and	Air	Substance release to air can be excluded
measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Water	Risk from environmental exposure is driven by the freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste water
Organizational measures to	Soil	Substance release to soil can be excluded
prevent/limit release from the site		
Conditions and measures related	Type of Sewage Treatment Plant	Municipal sewage treatment plant
to sewage treatment plant	Flow rate of sewage treatment plant effluent	2,000 m3/d
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15



sodium hypochlorite, solution 10 - 15%

	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.	
Product characteristics	Physical Form (at time of use)	Liquid, moderate fugacity	
	Vapour pressure	25 hPa	
	Process Temperature	90 °C	
Frequency and duration of use	Exposure duration per day	8 h	
	Frequency of use	5 days/week	
	Body weight	70 kg	
Human factors not influenced by risk management	Respiration volume under conditions of use	10 m3/day	
	Light activity		
Other operational conditions	Indoor/Outdoor use.		
affecting workers exposure	Assumes activities are at a		
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Drain down system prior to equipment opening or maintenance. Ensure samples are obtained under containment or extract ventilation.		
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure that no inhalable aerosols are generated Regular inspection and maintenance of equipment and machines		
Conditions and measures related to personal protection, hygiene and health evaluation	Wear protective gloves/ protective clothing/ eye protection/ face protection. In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection In the case of hazardous fumes, wear self contained breathing apparatus.		

Risk Management Measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

Qualitative approach used to conclude safe use.

Workers

EU RAR

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15		Worker - inhalative, long- term - local and systemic.	0.705mg/m³	0.4548
PROC1, PROC2, PROC3, PROC4, PROC5	General exposures	Worker - inhalative, short-term - local and systemic	0.540mg/m³	0.1742
PROC1, PROC2, PROC3, PROC4, PROC5	Laboratory activities	Worker - inhalative, short-term - local and systemic	0.252mg/m³	0.081
PROC1, PROC2, PROC3, PROC4,	Equipment maintenance	Worker - inhalative, short-term - local and	0.480mg/m³	0.155
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sodium hypochlorite, solution 10 - 15%

PROC5	systemic		
PROC8a, PROC8b, PROC9	 Worker - inhalative, short-term - local and systemic	0.498mg/m³	0.161
PROC14	 Worker - inhalative, long- term	0.23mg/m³	0.15

Qualitative assessment dermal. Contact is only accidental. The exposure estimate represents the 90th percentile of the exposure distribution.

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.

Exposure values based on the EU Risk Assessment Report on chlorine (2007)

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented. Ensure that gas alarms are installed Change gloves, if duration of activity exceeds breakthrough time



sodium hypochlorite, solution 10 - 15%

1. Short title of Exposure Sco	enario 4: Use in Cleanin	g Agents	
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	
Chemical product category	PC35: Washing and cleani	ng products (including solvent based products)	
Process categories	PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC7: Industrial spraying PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring		
Environmental Release Categories	ERC6b: Industrial use of re	eactive processing aids	
Activity	Note: this Exposure Scenar the quality grade of the sub	rio is only relevant for an appropriated use according to stance delivered	
2.1 Contributing scenario co	ntrolling environmental	exposure for: ERC6b	
Substance is a unique structure, N	lon-hydrophobic, Low potent	tial to bioaccumulate	
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.	
Amount used	Amounts used in the EU (tonnes/year)	999.999 ton(s)/year	
Frequency and duration of use	Continuous exposure	360 days/year	
	Flow rate of receiving surface water	18,000 m3/d	
Environment factors not influenced by risk management	Dilution Factor (River) Dilution Factor (Coastal Areas)	10 100	
Technical conditions and	Air	Substance release to air can be excluded	
measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Water	Risk from environmental exposure is driven by the freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste water	
Organizational measures to	Soil	Substance release to soil can be excluded	
prevent/limit release from the site			
Conditions and measures related	Type of Sewage Treatment Plant	Municipal sewage treatment plant	
to sewage treatment plant	Flow rate of sewage treatment plant effluent	2,000 m3/d	
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
2.2 Contributing scenario co PROC10, PROC13	ntrolling worker exposu	re for: PROC5, PROC7, PROC8a, PROC9,	
Product characteristics	Product characteristics Concentration of the Substance in Mixture/Article Covers percentage substance in the product up to 25 %.		
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sodium hypochlorite, solution 10 - 15%

	Physical Form (at time of use)	Liquid, moderate fugacity	
	Vapour pressure	25 hPa	
	Process Temperature	90 °C	
Frequency and duration of use	Exposure duration per day	8 h	
	Frequency of use	5 days/week	
	Body weight	70 kg	
Human factors not influenced by risk management	Respiration volume under conditions of use	10 m3/day	
	Light activity		
Other operational conditions	Indoor use.		
affecting workers exposure	Assumes activities are at ambient temperature., Outdoor location is covered by the worst case inside location		
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Drain down system prior to equipment opening or maintenance.		
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure that no inhalable aerosols are generated		
Conditions and measures related to personal protection, hygiene and health evaluation	Wear protective gloves/ protective clothing/ eye protection/ face protection. In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection In the case of hazardous fumes, wear self contained breathing apparatus.		

Risk Management Measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

Qualitative approach used to conclude safe use.

Workers

Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC5, PROC8a		Worker - inhalative, long-term - local	1.25mg/m³	0.81
PROC7		Worker - inhalative, long- term - local	1.20mg/m³	0.77
PROC9		Worker - inhalative, long-term - local	0.91mg/m³	0.59
PROC10		Worker - inhalative, long- term - local	1.00mg/m³	0.65
PROC13		Worker - inhalative, long-term - local	0.70mg/m³	0.45

The short-term exposure is covered by the assessment of long-term exposure. Qualitative assessment dermal. Qualitative approach used to conclude safe use.

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



sodium hypochlorite, solution 10 - 15%

be necessary to define appropriate site-specific risk management measures.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

Ensure that gas alarms are installed

Change gloves, if duration of activity exceeds breakthrough time

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ΕN

sodium hypochlorite, solution 10 - 15%

1. Short title of Exposure Scenario 5: Use in Cleaning Agents			
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)		
Chemical product category	PC35: Washing and cleaning products (including solvent based products)		
Process categories	PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10: Roller application or brushing PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring PROC15: Use as laboratory reagent		
Environmental Release Categories	ERC8b: Wide dispersive in ERC8d: Wide dispersive or	door use of processing aids in open systems door use of reactive substances in open systems utdoor use of processing aids in open systems utdoor use of reactive substances in open systems	
2.1 Contributing scenario co	ntrolling environmental	exposure for: ERC8a, ERC8b, ERC8d, ERC8e	
Substance is a unique structure, N	lon-hydrophobic, Low potent	ial to bioaccumulate	
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 10%	
Amount used	Amounts used in the EU (tonnes/year)	999999 ton(s)/year	
Frequency and duration of use	Continuous exposure	360 days/year	
	Flow rate of receiving surface water	18,000 m3/d	
Environment factors not influenced by risk management	Dilution Factor (River)	10	
Time of took management	Dilution Factor (Coastal Areas)	100	
Technical conditions and	Air	Substance release to air can be excluded	
measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and	Water	Risk from environmental exposure is driven by the freshwater., Do not release wastewater directly into environment., Do not let product enter drains., Onsite wastewater treatment required	
releases to soil	Soil	Substance release to soil can be excluded	
Organizational measures to prevent/limit release from the site			
Conditions and measures related	Type of Sewage Treatment Plant	Municipal sewage treatment plant	
to sewage treatment plant	Flow rate of sewage treatment plant effluent	2,000 m3/d	
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
2.2 Contributing scenario co PROC13, PROC15	ntrolling worker exposu	re for: PROC5, PROC9, PROC10, PROC11,	
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 10%	
	Physical Form (at time of use)	Liquid, moderate fugacity	

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sodium hypochlorite, solution 10 - 15%

	Vapour pressure	25 hPa
	Process Temperature	90 °C
Frequency and duration of use	Exposure duration per day	8 h
	Frequency of use	5 days/week
Other operational conditions	Indoor/Outdoor use.	
affecting workers exposure	Assumes activities are at a	mbient temperature.
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.	
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure that no inhalable aerosols are generated Regular inspection and maintenance of equipment and machines. Ensure that the task is not carried out overhead. Avoid direct contact with the chemical/the product/the preparation by establishing organisational measures.	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear protective gloves/ protective clothing/ eye protection/ face protection. In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection Personal measures have to be applied in case of potential exposure only.	
_		

Risk Management Measures are based on qualitative risk characterisation.

2.3 Contributing scenario controlling worker exposure for: PROC11

	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 0% - 0.05%	
Product characteristics	Physical Form (at time of use)	Liquid, moderate fugacity	
	Vapour pressure	25 hPa	
	Process Temperature	90 °C	
Amount used	0.005 kg		
Frequency and duration of use	Exposure duration	120 min	
	Frequency of use	4 Times per day	
Other operational conditions	Indoor/Outdoor use.		
affecting workers exposure	Assumes activities are at ambient temperature.		
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.		
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines. Ensure that the task is not carried out overhead. Avoid direct contact with the chemical/the product/the preparation by establishing organisational measures.		
Conditions and measures related to personal protection, hygiene and health evaluation	Wear protective gloves/ protective clothing/ eye protection/ face protection. In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection		

Risk Management Measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

Qualitative approach used to conclude safe use.

Workers

EASE v2.0



sodium hypochlorite, solution 10 - 15%

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC11		Worker - inhalative, long- term - systemic	0.0017mg/m³	0.0011

Qualitative assessment dermal. Contact is only accidental. Exposure is considered negligible.

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

Ensure that gas alarms are installed

Change gloves, if duration of activity exceeds breakthrough time



sodium hypochlorite, solution 10 - 15%

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial			
Sectors of end-use	Sites			
Sectors of end-use	SU23: Electricity, steam, gas water supply and sewage treatment PC20: Products such as ph-regulators, flocculants, precipitants, neutralization			
Chemical product category	agents PC37: Water treatment ch			
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) 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	ERC6b: Industrial use of reactive processing aids			
2.1 Contributing scenario co	ntrolling environmental	exposure for: ERC6b		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.		
Amount used	Amounts used in the EU (tonnes/year)	999.999 ton(s)/year		
Frequency and duration of use	Continuous exposure	360 days/year		
Environment featers not	Flow rate of receiving surface water	18,000 m3/d		
Environment factors not influenced by risk management	Dilution Factor (River)	10		
	Dilution Factor (Coastal Areas)	100		
Technical conditions and measures at process level	Air	Substance release to air can be excluded		
(source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Water	Risk from environmental exposure is driven by the freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste water		
Organizational measures to	Soil	Substance release to soil can be excluded		
prevent/limit release from the site	T			
Conditions and measures related	Type of Sewage Treatment Plant	Municipal sewage treatment plant		
to sewage treatment plant	Flow rate of sewage treatment plant effluent	2,000 m3/d		
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.		
2.2 Contributing scenario co PROC5, PROC8a, PROC8		ire for: PROC1, PROC2, PROC3, PROC4,		
Product characteristics	Concentration of the Substance in	Covers percentage substance in the product up to 25 %.		



sodium hypochlorite, solution 10 - 15%

	Mixture/Article		
	Physical Form (at time of use)	Liquid, moderate fugacity	
	Vapour pressure	25 hPa	
	Process Temperature	90 °C	
Frequency and duration of use	Exposure duration per day	8 h	
	Frequency of use	5 days/week	
	Body weight	70 kg	
Human factors not influenced by risk management	Respiration volume under conditions of use	10 m3/day	
	Light activity		
Other operational conditions	Indoor use.		
affecting workers exposure	Assumes activities are at a the worst case inside locati	mbient temperature., Outdoor location is covered by on	
Technical conditions and measures to control dispersion	Provide a good standard of per hour).	general ventilation (not less than 3 to 5 air changes	
from source towards the worker	' /	equipment opening or maintenance.	
Organisational measures to	Ensure that no inhalable as	erosols are generated	
prevent /limit releases, dispersion	Regular inspection and maintenance of equipment and machines. Ensure that the task is not carried out overhead.		
and exposure	Ensure containment of the emission source		
Conditions and measures related		otective clothing/ eye protection/ face protection.	
to personal protection, hygiene	In case of odour, gas alarm protection	or insufficient ventilation wear suitable respiratory	
and health evaluation	In the case of hazardous fumes, wear self contained breathing apparatus.		

Risk Management Measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

Qualitative approach used to conclude safe use.

Workers

Advanced REACH Tool (ART model)

7.4.7.4.1.004 (1.4.7.1.1.04.1.)				
Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1		Worker - inhalative, long- term - local	0.02mg/m³	0.01
PROC2, PROC3		Worker - inhalative, long- term - local	1.10mg/m³	0.71
PROC4		Worker - inhalative, long- term - local	1.20mg/m³	0.77
PROC5, PROC8a, PROC8b		Worker - inhalative, long- term - local	1.25mg/m³	0.81
PROC9		Worker - inhalative, long- term - local	0.91mg/m³	0.59

The short-term exposure is covered by the assessment of long-term exposure. Qualitative assessment dermal. Qualitative approach used to conclude safe use.

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



sodium hypochlorite, solution 10 - 15%

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Ensure that gas alarms are installed

Change gloves, if duration of activity exceeds breakthrough time

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.



sodium hypochlorite, solution 10 - 15%

1. Short title of Exposure Sc	enario 7: Use in paper ir	dustry	
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites		
Sectors of end-use	SU6b: Manufacture of pulp	, paper and paper products	
Chemical product category	PC26: Paper and board dy bleaches and other process	re, finishing and impregnation products: including sing 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 PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)		
Environmental Release Categories	ERC6b: Industrial use of re	··	
2.1 Contributing scenario co	ntrolling environmental	exposure for: FRC6b	
Substance is a unique structure, N			
Product characteristics	Concentration of the Substance in Substance in Mixture/Article Covers percentage substance in the product up to 25 %.		
Amount used	Amounts used in the EU (tonnes/year)	999.999 ton(s)/year	
Frequency and duration of use	Continuous exposure	360 days/year	
Environment factors not	Flow rate of receiving surface water	18,000 m3/d	
influenced by risk management	Dilution Factor (River)	10	
	Dilution Factor (Coastal Areas)	100	
Technical conditions and	Air	Substance release to air can be excluded	
measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Water	Risk from environmental exposure is driven by the freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste water	
Organizational measures to prevent/limit release from the site	Soil	Substance release to soil can be excluded	
provontimina roloade from the site	Type of Sewage Treatment Plant	Municipal sewage treatment plant	
Conditions and measures related		<u> </u>	
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2,000 m3/d	

PROC5, PROC8a, PROC8b, PROC9



sodium hypochlorite, solution 10 - 15%

	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.	
Product characteristics	Physical Form (at time of use)	Liquid, moderate fugacity	
	Vapour pressure	25 hPa	
	Process Temperature	90 °C	
Frequency and duration of use	Exposure duration per day	8 h	
	Frequency of use	5 days/week	
	Body weight	70 kg	
Human factors not influenced by risk management	Respiration volume under conditions of use	10 m3/day	
	Light activity		
Other operational conditions	Indoor use.		
affecting workers exposure	Assumes activities are at ambient temperature., Outdoor location is covered by the worst case inside location		
Technical conditions and measures to control dispersion	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).		
from source towards the worker		equipment opening or maintenance.	
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure that no inhalable aerosols are generated Regular inspection and maintenance of equipment and machines. Ensure that the task is not carried out overhead. Ensure containment of the emission source		
Conditions and measures related to personal protection, hygiene and health evaluation	Wear protective gloves/ protective clothing/ eye protection/ face protection. In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection		
prevent /limit releases, dispersion and exposure Conditions and measures related to personal protection, hygiene	Regular inspection and maintenance of equipment and machines. Ensure that the task is not carried out overhead. Ensure containment of the emission source Wear protective gloves/ protective clothing/ eye protection/ face protection. In case of odour, gas alarm or insufficient ventilation wear suitable respiratory		

Risk Management Measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

Qualitative approach used to conclude safe use.

Workers

Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1		Worker - inhalative, long- term - local	0.02mg/m³	0.01
PROC2, PROC3		Worker - inhalative, long- term - local	1.10mg/m³	0.71
PROC4		Worker - inhalative, long- term - local	1.20mg/m³	0.77
PROC5, PROC8a, PROC8b		Worker - inhalative, long- term - local	1.25mg/m³	0.81
PROC9		Worker - inhalative, long- term - local	0.91mg/m³	0.59

The short-term exposure is covered by the assessment of long-term exposure. Qualitative assessment dermal. Qualitative approach used to conclude safe use.



sodium hypochlorite, solution 10 - 15%

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

Ensure that gas alarms are installed

Change gloves, if duration of activity exceeds breakthrough time

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.

Organizational measures to prevent/limit release from the site Soil

Type of Sewage

Treatment Plant

releases to soil



sodium hypochlorite, solution 10 - 15%				
1. Short title of Exposure Sc	enario 8: Use in textile i	ndustry		
Main User Groups	SU 3: Industrial uses: Use sites	s of substances as such or in preparations at industrial		
Sectors of end-use	SU5: Manufacture of textil	es, leather, fur		
Chemical product category	PC34: Textile dyes, finishi	ng and impregnating products		
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC13: Treatment of articles by dipping and pouring			
Environmental Release Categories	ERC6b: Industrial use of reactive processing aids			
2.1 Contributing scenario co	ontrolling environmental	exposure for: ERC6b		
Substance is a unique structure, I	Non-hydrophobic, Low poten	tial to bioaccumulate		
Product characteristics	Concentration of the Substance in Substance in Mixture/Article Covers percentage substance in the product uses 25 %.			
Amount used	Amounts used in the EU (tonnes/year)	999.999 ton(s)/year		
Frequency and duration of use	Continuous exposure	360 days/year		
E. Sarana Markana	Flow rate of receiving surface water	18,000 m3/d		
Environment factors not influenced by risk management	Dilution Factor (River)	10		
Dilution Factor (Coastal Areas)		100		
Technical conditions and	Air	Substance release to air can be excluded		
measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and	Water	Risk from environmental exposure is driven by the freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste		

Conditions and measures related to sewage treatment plant Flow rate of sewage 2,000 m3/d treatment plant effluent External treatment and disposal of waste should Conditions and measures related to external treatment of waste for Waste treatment comply with applicable local and/or national disposal regulations.

Substance release to soil can be excluded

Municipal sewage treatment plant

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC13



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	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.	
Product characteristics	Physical Form (at time of use)	Liquid, moderate fugacity	
	Vapour pressure	25 hPa	
	Process Temperature	90 °C	
Frequency and duration of use	Exposure duration per day	8 h	
	Frequency of use	5 days/week	
	Body weight	70 kg	
Human factors not influenced by risk management	Respiration volume under conditions of use	10 m3/day	
	Light activity		
Other operational conditions	Indoor use.		
affecting workers exposure Assumes activities the worst case ins		mbient temperature., Outdoor location is covered by on	
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Drain down system prior to equipment opening or maintenance.		
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure that no inhalable aerosols are generated Regular inspection and maintenance of equipment and machines. Ensure that the task is not carried out overhead. Ensure containment of the emission source		
Conditions and measures related to personal protection, hygiene and health evaluation	Wear protective gloves/ protective clothing/ eye protection/ face protection. In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection In the case of hazardous fumes, wear self contained breathing apparatus.		
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Risk Management Measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

Qualitative approach used to conclude safe use.

Workers

Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1		Worker - inhalative, long- term - local	0.02mg/m³	0.01
PROC2, PROC3		Worker - inhalative, long- term - local	1.10mg/m³	0.71
PROC4		Worker - inhalative, long- term - local	1.20mg/m³	0.77
PROC5, PROC8a, PROC8b		Worker - inhalative, long- term - local	1.25mg/m³	0.81
PROC9		Worker - inhalative, long- term - local	0.91mg/m³	0.59
PROC13		Worker - inhalative, long- term - local	0.70mg/m³	0.45



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The short-term exposure is covered by the assessment of long-term exposure. Qualitative assessment dermal. Qualitative approach used to conclude safe use.

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented. Ensure that gas alarms are installed Change gloves, if duration of activity exceeds breakthrough time

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1. Short title of Exposure Sco	enario 9: Consumer use				
Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)				
Chemical product category	PC34: Textile dyes, finishing and impregnating products PC35: Washing and cleaning products (including solvent based products) 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 co	ntrolling environmental	exposure for: ERC8a, ERC8b, ERC8d, ERC8e			
Substance is a unique structure, N	Non-hydrophobic, Low potent	ial to bioaccumulate			
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 10%			
Amount used	Amounts used in the EU (tonnes/year)	999999 ton(s)/year			
Frequency and duration of use	Continuous exposure	360 days/year			
	Flow rate of receiving surface water	18,000 m3/d			
Environment factors not influenced by risk management	Dilution Factor (River)	10			
mindeneed by not management	Dilution Factor (Coastal Areas)	100			
Technical conditions and	Air	Substance release to air can be excluded			
measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and	Water	Risk from environmental exposure is driven by the freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste water			
releases to soil Organizational measures to prevent/limit release from the site					
Conditions and measures related	Type of Sewage Treatment Plant	Municipal sewage treatment plant			
to sewage treatment plant	Flow rate of sewage treatment plant effluent	2,000 m3/d			
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.			
2.2 Contributing scenario co purpose cleaners, sanita		osure for: PC35: Cleaners, trigger sprays (all			
purpose cleaners, samta	Concentration of the				
Product characteristics	Substance in Mixture/Article	Concentration of substance in product: 0% - 3%			
	Physical Form (at time of use)	Liquid, moderate fugacity			
	Vapour pressure	25 hPa			
Amount used	Amount used per event	0.005 kg			
	Exposure duration	7.5 min			
Frequency and duration of use	Frequency of use	4 Times per day			
Other given operational					

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conditions affecting consumers	Room size	4 m3	
exposure	Ventilation rate per hour	0.5	
2.3 Contributing scenario co	ntrolling consumer expo	osure for: PC35	
	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 0% - 0,5%	
Product characteristics	Physical Form (at time of use)	Liquid, moderate fugacity	
	Vapour pressure	25 hPa	
Frequency and duration of use	Frequency of use	1 Times per day	
Human factors not influenced by risk management	Exposed skin areas Palm of one Hand 420 cm²		
Other given operational	Indoor use.		
conditions affecting consumers exposure	Room size	4 m3	
	Ventilation rate per hour	0.5	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	Wear impervious chemical resistant protective gloves.	
2.4 Contributing scenario co	ntrolling consumer expo	osure for: PC34	
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 0% - 0.05	
	Physical Form (at time of use)	Liquid, moderate fugacity	
	Vapour pressure	25 hPa	
Frequency and duration of use	Frequency of use	2 days/week	
Human factors not influenced by	Exposed skin areas	Two hands 820 cm ²	
risk management			
Other given operational	Indoor use.		
conditions affecting consumers	Room size	4 m3	
exposure	Ventilation rate per hour	0.5	
Conditions and measures related to protection of consumer (e.g.	Consumer Measures	Wear impervious chemical resistant protective gloves.	

2.5 Contributing scenario controlling consumer exposure for: PC37

2.5 Contributing scenario controlling consumer exposure for. PC57				
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 0% - 0,1%		
	Physical Form (at time of use)	Liquid, moderate fugacity		
	Vapour pressure	25 hPa		
Amount used		2000 ml		
Frequency and duration of use	Frequency of use	1 Times per day		

3. Exposure estimation and reference to its source

Environment

behavioural advice, personal protection and hygiene)

Qualitative approach used to conclude safe use.

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Consumers

EU RAR

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PC34	Laundry bleaching/pre- treatment	Consumer - inhalative, long-term - systemic	1.68µg/m³	0.000108
PC35	Hard surface cleaning	Consumer - inhalative, long-term - systemic	1.68µg/m³	0.000108
PC34	Laundry bleaching/pre- treatment	Consumer - dermal, long-term - local	0.035mg/kg bw/day	< 1
PC35	Hard surface cleaning	Consumer - dermal, long- term - local	0.002mg/kg bw/day	< 1
	Drinking water, adult	Consumer oral, acute	0.0003mg/kg bw/day	
	Drinking water, adult	Consumer oral, long-term	0.003mg/kg bw/day	0.011
	Drinking water, children	Consumer oral, acute	0.0007mg/kg bw/day	
	Drinking water, children	Consumer oral, long-term	0.0033mg/kg bw/day	0.011

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 ${\sf ES}$