

SAFETY DATA SHEET

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

1.1 Product identifier

- Product Name: Sodium Hypochlorite
- Datasheet Number: SDS 014
- Chemical Name: Sodium hypochlorite, solution 14 - 15% Cl active
- Synonyms: Hypochlorous acid, sodium salt
- CAS No.: 7681-52-9
- EC No.: 231-668-3
- REACH Registration Number: 01-2119488154-34-XXXX

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

- Use of the substance/mixture: Pool / spa treatment
- Use advised against: No information available

1.3 Details of the supplier of the safety data sheet

- Name of Supplier: Plastica Ltd
- Address of Supplier: Perimeter House
Napier Road
St Leonards-on-Sea
East Sussex
United Kingdom
TN38 9NY
- Telephone: +44 (0) 1424 857857
- Email: info@plasticapools.net

1.4 Emergency telephone number

- Emergency Telephone: 0800 043 0891 (technical)
0800 043 0892 (emergency)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

- Classification (REGULATION (EC) No 1272/2008) [CLP/GHS]: Met. Corr. 1, H290; Skin Corr. 1B, H314; Eye Dam. 1, H318; Aquatic Acute 1, H400; Aquatic Chronic 2, H411; EUH031
- Additional information: For full text of Hazard and EU Hazard statements: see section 16

2.2 Label elements



Signal Word: Danger

Hazard statements

- H290 - May be corrosive to metals.
- H314 - Causes severe skin burns and eye damage.
- H410 - Very toxic to aquatic life with long lasting effects.

Precautionary statements

- P102 - Keep out of reach of children.
- P273 - Avoid release to the environment.
- P280 - Wear protective gloves/protective clothing/eye protection/face protection.

SECTION 2: Hazards identification (....)

P303+P361+P353+P310 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Immediately call a POISON CENTER or doctor/physician.

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 or doctor/physician.

P501 - Dispose of contents/container to an authorised waste collection point

Supplemental Hazard information (EU)

EUH031 - Contact with acids liberates toxic gas.

2.3 Other hazards

- Not a PBT according to REACH Annex XIII
- Not a vPvB according to REACH Annex XIII
- Has not been identified as having endocrine disrupting properties

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical Name	Conc.	CAS No.	EC No.	Classification (REGULATION (EC) No 1272/2008) [CLP/GHS]	SCL/ M-Factor/ ATE	REACH Registration Number	WEL/ OEL
Sodium hypochlorite, solution ... % Cl active	10 - 15%	7681-52-9	231-668-3	Met. Corr. 1, H290 Skin Corr. 1B, H314 Eye Dam. 1, H318 STOT SE 3, H335 Aquatic Acute 1, H400 Aquatic Chronic 1, H410	EUH031: C ≥ 5 % M=10 M(Chronic)=1	01-2119488154 -34-XXXX	No
Sodium hydroxide; Caustic soda	< 1 %	1310-73-2	215-185-5	Met. Corr. 1, H290 Skin Corr. 1A, H314 Eye Dam. 1, H318	Eye Irrit. 2 H319: 0,5 % ≤ C < 2 % Skin Corr. 1A H314: C ≥ 5 % Skin Corr. 1B H314: 2 % ≤ C < 5 % Skin Irrit. 2 H315: 0,5 % ≤ C < 2 %	01-2119457892 -27-XXXX	Yes

3.2 Mixtures

- Not applicable

SECTION 4: First aid measures

4.1 Description of first aid measures

- Rescuers should put on approved personal protective equipment (PPE) before administering first aid
- Rescuers should take suitable precautions to avoid becoming casualties themselves

Contact with eyes

If substance has got into eyes, immediately wash out with plenty of water for several minutes

Irrigate eyes thoroughly whilst lifting eyelids

Remove contact lenses, if present and easy to do. Continue rinsing.

Get immediate medical advice/attention.

Contact with skin

After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of soap and water

Contaminated clothing should be laundered before reuse

SECTION 4: First aid measures (....)

Get immediate medical advice/attention.

Ingestion

Rinse mouth with water (do not swallow)
Give plenty of water to drink
Do NOT induce vomiting.
Never give anything by mouth to an unconscious person
Get immediate medical advice/attention.

Inhalation

If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
When in doubt or symptoms persist, seek medical attention

4.2 Most important symptoms and effects, both acute and delayed**Contact with eyes**

Causes redness and swelling
May cause severe damage with formation of corneal ulcers and permanent impairment of vision.

Contact with skin

May cause severe burns with permanent skin damage which are slow to heal.
May cause blistering of the skin

Ingestion

May cause burns to mouth and throat
May cause perforation of the oesophagus and stomach

Inhalation

May cause respiratory tract irritation.
May cause shortness of breath
May cause coughing
Aspiration may cause pulmonary oedema and pneumonitis

4.3 Indication of any immediate medical attention and special treatment needed

- Treat symptomatically

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

- Suitable extinguishing media: Not flammable. In case of fire use extinguishing media appropriate to surrounding conditions
- Unsuitable extinguishing media: High volume water jet

5.2 Special hazards arising from the substance or mixture

- In a fire or if heated, a pressure increase will occur and the container may burst
- Gives off irritating or toxic fumes (or gases) in a fire.
- Decomposition products may include chlorine, hydrogen chloride gas, chlorine oxides

5.3 Advice for firefighters

- Evacuate the area and keep personnel upwind
- Keep container(s) exposed to fire cool, by spraying with water
- Collect contaminated fire extinguishing water separately. This MUST not be discharged into drains. Prevent fire extinguishing water from contaminating surface or ground water.
- Special protective equipment: Wear self-contained breathing apparatus (SCBA). Wear full protective clothing including chemical protection suit.

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

- Rescuers should take suitable precautions to avoid becoming casualties themselves
- Only trained and authorised personnel should carry out emergency response
- Personal precautions for non-emergency personnel: Ensure adequate ventilation; Do not breathe dust/fume/gas/mist/vapours/spray.; Wear protective clothing as per section 8; Wash thoroughly after handling.
- Personal precautions for emergency responders: Evacuate the area and keep personnel upwind; Wear self-contained breathing apparatus (SCBA); Wear suitable protective clothing, eye/face protection and gloves; Butyl rubber are recommended

6.2 Environmental precautions

- Avoid release to the environment.
- Do not allow to enter public sewers and watercourses
- If contamination of drainage systems or water courses is unavoidable, immediately inform appropriate authorities

6.3 Methods and material for containment and cleaning up

- Stop leak if safe to do so.
- Absorb spillage in inert material and shovel up
- Place in sealable container
- Seal containers and label them
- Ventilate the area and wash spill site after material pick-up is complete
- Seek expert advice for removal and disposal of all contaminated materials and wastes

6.4 Reference to other sections

- See section(s): 7, 8 & 13
-

SECTION 7: Handling and storage**7.1 Precautions for safe handling**

- Use only in well ventilated areas
- Do not breathe dust/fume/gas/mist/vapours/spray.
- Avoid contact with skin and eyes
- Wear goggles giving complete eye protection
- Wear protective clothing as per section 8
- Contaminated clothing should be laundered before reuse
- Use good personal hygiene practices
- Do not eat, drink or smoke when using this product.
- Wash thoroughly after handling.
- Ensure eyewash stations and safety showers are nearby

7.2 Conditions for safe storage, including any incompatibilities

- Keep in an area equipped with impermeable flooring.
- Store in a cool, dry well-ventilated place. Keep container tightly closed.
- Keep only in the original container
- Storage containers should not be made from iron, copper, aluminium, stainless steel
- Suitable packaging materials: polyethylene, polyvinylchloride
- Keep in vented containers
- Protect from light
- Keep away from food, drink and animal feedingstuffs
- Incompatible with acids, ammonium compounds, acetic anhydride, organic materials, combustible material, hydrogen peroxide, metal salts, copper, nickel, iron

7.3 Specific end use(s)

SECTION 7: Handling and storage (....)

- Pool / spa treatment
-

SECTION 8: Exposure controls/personal protection**8.1 Control parameters**

- If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace exposure - Measurement of exposure by inhalation to chemical agents - Strategy for testing compliance with occupational exposure limit values). European Standard EN 14042 (Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents). European Standard EN 482 (Workplace exposure. General requirements for the performance of procedures for the measurement of chemical agents). Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Sodium hypochlorite

DNEL (inhalational) 1.55 mg/m³ Industry, Long Term, Systemic Effects
DNEL (inhalational) 3.1 mg/m³ Industry, Acute/Short Term, Systemic Effects
DNEL (inhalational) 1.55 mg/m³ Industry, Long Term, Local Effects
DNEL (inhalational) 3.1 mg/m³ Industry, Acute/Short Term, Local Effects
DNEL (inhalational) 1.55 mg/m³ Consumer, Long Term, Systemic Effects
DNEL (inhalational) 3.1 mg/m³ Consumer, Acute/Short Term, Systemic Effects
DNEL (inhalational) 1.55 mg/m³ Consumer, Long Term, Local Effects
DNEL (inhalational) 3.1 mg/m³ Industry, Acute/Short Term, Local Effects
DNEL (oral) 260 µg/kg bw/day Consumer, Long Term, Systemic Effects
PNEC aqua (freshwater) 210 ng/L
PNEC aqua (intermittent releases, freshwater) 260 ng/L
PNEC aqua (marine water) 42 ng/L
PNEC (STP) 4.69 mg/L
PNEC secondary poisoning (food) 11.1 mg/kg

Sodium Hydroxide

WEL (short term) 2 mg/m³ (UK)
DNEL (inhalational) 1 mg/m³ Industry, Long Term, Local Effects
DNEL (inhalational) 1 mg/m³ Consumer, Long Term, Local Effects

8.2 Exposure controls

- Selection and use of personal protective equipment should be based on a risk assessment of exposure potential
- Engineering controls
Engineering controls should be provided which maintain airborne concentrations below the relevant guidelines
Use local exhaust ventilation and/or enclosures.
- Respiratory protection
In case of insufficient ventilation, wear suitable respiratory equipment
Where an air-purifying respirator is suitable, use EN 141 or EN 405, type B
- Eye/face protection
Wear goggles giving complete eye protection approved to standard EN 166.
If risk of splashing, wear face-shield approved to standard EN 166 1B39N
- Skin protection
Wear chemical resistant clothing approved to standard EN 13034 or BS EN 14605
Wear protective gloves. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and standard EN 374.
The selection of a suitable glove depends on work conditions and whether the product is present on its own or in combination with other substances. Breakthrough time is dependent on the characteristics of the brand of glove used and the supplier should be consulted.

SECTION 8: Exposure controls/personal protection (....)

Butyl rubber, polyvinylchloride or polychloroprene are recommended

Glove material: Butyl rubber, polyvinylchloride or polychloroprene

Thickness: 0.5 mm

Breakthrough time: 8 h

Reference: Supplier

- Hygiene measures
 - Do not eat, drink or smoke when using this product.
 - Use good personal hygiene practices
 - Wash thoroughly after handling.
 - Contaminated clothing should be laundered before reuse
 - Contaminated work clothing should not be allowed out of the workplace.
 - Ensure eyewash stations and safety showers are nearby
- Thermal hazards
 - Not applicable
- Environmental exposure controls
 - Do not empty into drains
 - Do not allow to penetrate the ground/soil.



SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

- Physical state: Liquid
- Colour: Green/yellow
- Odour: Smells of chlorine
Odour threshold 1 - 3 ppm (value for chlorine)
- Melting point/freezing point: ca. -30 - -20 °C 13 (16% solution)
- Boiling point or initial boiling point and boiling range: ca. 100 °C (1013 hPa) (13 - 16% solution)
- Flammability: Not flammable
- Lower and upper explosion limit: Not applicable
- Flash point: Not applicable
- Auto-ignition temperature: No data available
- Decomposition temperature: > 111 °C
- pH: > 11
- Kinematic viscosity: No data available
- Dynamic viscosity: 3 - 4 mPa.s @ 20 °C (13 - 16% solution)
- Solubility: Miscible with water
- Partition coefficient n-octanol/water (log value): Log Kow -3.42 @ 20 °C
- Vapour pressure: ca. 20 hPa (20 °C) (13 - 16% solution)
- Density and/or relative density: 1.11 g/cm³ @ 20 °C (10% solution)
- Relative vapour density: No information available
- Particle characteristics: Not applicable

9.2 Other information

- May be corrosive to metals

SECTION 10: Stability and reactivity

10.1 Reactivity

SECTION 10: Stability and reactivity (....)

- Contact with acids liberates toxic gas.
- May be corrosive to metals

10.2 Chemical stability

- May decompose on exposure to heat and light

10.3 Possibility of hazardous reactions

- Reacts with acids liberating toxic gas (chlorine)
- Reacts with metals (decomposition with formation of oxygen)

10.4 Conditions to avoid

- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- Keep away from direct sunlight
- Decomposes above 111 °C

10.5 Incompatible materials

- Incompatible with acids, ammonium compounds, acetic anhydride, organic materials, combustible material, hydrogen peroxide, metal salts, copper, nickel, iron

10.6 Hazardous decomposition products

- Decomposition products may include chlorine, hydrogen chloride gas, chlorine oxides

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

- Acute Toxicity
Based on available data, the classification criteria are not met

Substances

Chemical Name	LD ₅₀ (oral, rat)	LC ₅₀ (inhalation, rat)	LD ₅₀ (dermal, rabbit)
Sodium hypochlorite	1 100 mg/kg	(1 h) > 10.5 mg/L (chlorine)	20 000 mg/kg
Sodium hydroxide	No data available	No data available	No data available

- Skin corrosion/irritation
Causes severe skin burns

Substances

Chemical Name	Irritation/corrosion
Sodium hypochlorite	Adverse effect observed (corrosive)
Sodium hydroxide	Adverse effect observed (corrosive)

- Serious eye damage/irritation
Causes serious eye damage

Substances

Chemical Name	Irritation/corrosion
Sodium hypochlorite	Adverse effect observed (irreversible damage)
Sodium hydroxide	Adverse effect observed (irreversible damage)

- Respiratory or skin sensitisation
Based on available data, the classification criteria are not met

SECTION 11: Toxicological information (....)

Substances

Chemical Name	Skin sensitisation	Respiratory sensitisation
Sodium hypochlorite	No adverse effect observed (not sensitising)	No data available
Sodium hydroxide	No adverse effect observed (not sensitising)	No data available

- Germ cell mutagenicity
No evidence of mutagenic effects

Substances

Chemical Name	Toxicity - In Vitro	Toxicity - In Vivo
Sodium hypochlorite	No adverse effect observed (negative)	No adverse effect observed (negative)
Sodium hydroxide	No data available	No study available

- Carcinogenicity
No evidence of carcinogenic effects

Substances

Chemical Name	NOAEL (oral, rat)	NOAEC (inhalation, rat)	NOAEL (dermal, rat)
Sodium hypochlorite	No data available	No data available	No data available
Sodium hydroxide	No data available	No data available	No data available

- Reproductive toxicity
No evidence of reproductive effects

Substances

Chemical Name	NOAEL (oral, rat)	NOAEC (inhalation, rat)	NOAEL (dermal, rat)
Sodium hypochlorite	5 mg/kg (Effect on fertility)	No data available	No data available
Sodium hydroxide	No data available	No data available	No data available

- Specific target organ toxicity (STOT) - single exposure
Based on available data, the classification criteria are not met

Substances

Chemical Name	Route	Remarks
Sodium hypochlorite	Respiratory	Adverse effect observed (irritating)
Sodium hydroxide	Respiratory	No data available

- Specific target organ toxicity (STOT) - repeated exposure
Based on available data, the classification criteria are not met

Substances

Chemical Name	NOAEL (oral, rat)	NOAEC (inhalation, rat)	NOAEL (dermal, rat)
Sodium hypochlorite	50 mg/kg bw/day	No data available	No data available
Sodium hydroxide	No data available	No data available	No data available

- Aspiration hazard
Based on available data, the classification criteria are not met
- Contact with eyes
Causes redness and swelling
May cause severe damage with formation of corneal ulcers and permanent impairment of vision.
- Contact with skin
May cause severe burns with permanent skin damage which are slow to heal.
May cause blistering of the skin

SECTION 11: Toxicological information (....)

- Ingestion
 - May cause burns to mouth and throat
 - May cause perforation of the oesophagus and stomach
- Inhalation
 - May cause respiratory tract irritation.
 - May cause shortness of breath
 - May cause coughing
 - Aspiration may cause pulmonary oedema and pneumonitis

11.2 Information on other hazards

- Does not contain any substances with endocrine disrupting properties

SECTION 12: Ecological information

12.1 Toxicity

- Very toxic to aquatic life with long lasting effects.
- M factor (Acute) 10
- M factor (Chronic) 1

Substances

Chemical Name	LC ₅₀ (fish)	EC ₅₀ (aquatic invertebrates)	EC ₅₀ (aquatic algae)
Sodium hypochlorite	(5 days) 50 µg/L	(48 h) 26 - 141 µg/L	(72 h) 18.3 - 36.5 µg/L
Sodium hydroxide	No data available	(48 h) 40.4 mg/L	No data available

12.2 Persistence and degradability

- Aquatic half-life (fresh water) < 1 days

Substances

Chemical Name	Biodegradation
Sodium hypochlorite	Not applicable, inorganic
Sodium hydroxide	Not applicable, inorganic

12.3 Bioaccumulative potential

- Bioaccumulation is not expected

Substances

Chemical Name	Bioconcentration Factor (BCF)	Log Kow
Sodium hypochlorite	No data available	-3.42 @ 20 °C
Sodium hydroxide	Low potential for bioaccumulation	Not applicable, inorganic

12.4 Mobility in soil

- Mobile in soils

Substances

Chemical Name	Adsorption/desorption
Sodium hypochlorite	Koc 0.001 @ 20°C
Sodium hydroxide	Low potential for adsorption

12.5 Results of PBT and vPvB assessment

- Not a PBT according to REACH Annex XIII
- Not a vPvB according to REACH Annex XIII

12.6 Endocrine disrupting properties

SECTION 12: Ecological information (....)

- Has not been identified as having endocrine disrupting properties

12.7 Other adverse effects

- Do not empty into drains
 - Do not allow to penetrate the ground/soil.
-

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

- Disposal should be in accordance with local, state or national legislation
- Do not discharge into drains or the environment, dispose to an authorised waste collection point
- Do not reuse empty containers without commercial cleaning or reconditioning
- Contaminated water can be neutralised with a sodium thiosulphate solution

13.2 Classification

- The waste must be identified according to the List of Wastes (2000/532/EC)
 - Hazardous Property Code(s): HP 8 Corrosive; HP 14 Ecotoxic
-

SECTION 14: Transport information**14.1 UN number or ID number**

- UN No.: 1791

14.2 UN proper shipping name

- Proper Shipping Name: HYPOCHLORITE SOLUTION

14.3 Transport hazard class(es)

- Hazard Class: 8

14.4 Packing group

- Packing Group: II

14.5 Environmental hazards

- MARINE POLLUTANT/ENVIRONMENTALLY HAZARDOUS

14.6 Special precautions for user

- No information available

14.7 Maritime transport in bulk according to IMO instruments

- Not applicable

14.8 Road/Rail (ADR/RID)

- ADR UN No.: 1791
- Proper Shipping Name: HYPOCHLORITE SOLUTION
- ADR Hazard Class: 8
- ADR Packing Group: II
- Tunnel Code: (E)

14.9 Sea (IMDG)

- IMDG UN No.: 1791

SECTION 14: Transport information (....)

- Proper Shipping Name: HYPOCHLORITE SOLUTION
- IMDG Hazard Class: 8
- IMDG Packing Group: II

14.10 Air (ICAO/IATA)

- ICAO UN No.: 1791
- Proper Shipping Name: HYPOCHLORITE SOLUTION
- ICAO Hazard Class: 8
- ICAO Packing Group: II

SECTION 15: Regulatory information**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

- This safety data sheet is provided in compliance with REACH Regulation (EC) No 1907/2006 (as amended by Regulation (EU) 2020/878) and UK REACH
- The GB Classification, Labelling and Packaging Regulation (GB CLP) applies in Great Britain
- Regulation (EC) No. 1272/2008 on the classification, labelling and packaging of substances and mixtures (CLP Regulation) applies in Europe
- This product is covered by EU Directive 2012/18/EU (the Seveso III Directive)
- This product is subject to the Offensive Weapons Act 2019, Part 1: Corrosive products and substances
- Restrictions on use according to Annex XVII to REACH Regulation: Entry 3 - Liquid substances or mixtures which are regarded as dangerous

15.2 Chemical safety assessment

- No information available

SECTION 16: Other information

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is, to the best of PLASTICA'S limited knowledge and belief, accurate, and reliable as of the date of authorisation of this safety data sheet. However, no representation, warranty or guarantee is made as to its accuracy, reliability or completeness. It is the user's responsibility to be satisfied as to the suitability and completeness of such information for the product as used.

Sources of data: Information from published literature and supplier safety data sheets

Revision No. 2.0.0. Revised June 2022.

Changes made: Changes to classification and pdated to conform to latest version of REACH

Training advice

- Workers must be informed of the presence of hazardous ingredients and trained in the proper use and handling of this product as required under applicable regulations

Text not given with phrase codes where they are used elsewhere in this safety data sheet:

- H290: May be corrosive to metals
- H314: Causes severe skin burns and eye damage
- H318: Causes serious eye damage
- H335: May cause respiratory irritation
- H400: Very toxic to aquatic life
- H410: Very toxic to aquatic life with long lasting effects
- H411: Toxic to aquatic life with long lasting effects
- EUH031: Contact with acids liberates toxic gas

Acronyms

- ATE: Acute Toxicity Estimate

SECTION 16: Other information (....)

- CAS: Chemical Abstracts Service
- DNEL: Derived No-Effect Level
- EC: European Community
- EC₅₀: Effective Concentration, 50%
- GHS: Globally Harmonised System
- LOAEC: Lowest observed adverse effect concentration
- LOAEL: Lowest Observed Adverse Effect Level
- LC₅₀: Lethal Concentration, 50%
- LD₅₀: Lethal Dose, 50%
- NOAEC: No observed adverse effect concentration
- NOAEL: No observed adverse effect level
- OEL: Occupational Exposure Limit
- PBT: Persistent, Bioaccumulative and Toxic
- PNEC: Predicted No-Effect Concentration
- REACH: Registration, Evaluation, Authorisation and Restriction of Chemicals
- SCL: Specific Concentration Limit
- SVHC: Substances of Very High Concern
- vPvB: very Persistent and very Bioaccumulative
- WEL: Workplace Exposure Limit

--- end of safety datasheet ---

Sodium hypochlorite, solution 14 - 15% Cl active

No.	Short title	Main User Group (SU)	Sector of Use (SU)	Product Category (PC)	Process Category (PROC)	Environmental Release Category (ERC)	Article Category (AC)	Specified
1	Manufacture of substance	3	8	NA	1, 2, 3, 4, 8a, 8b, 9	1	NA	ES447
2	Formulation & (re)packing of substances and mixtures	3	10	NA	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15	2	NA	ES9179
3	Use in cleaning agents	3	4	35	5, 7, 8a, 9, 10, 13	6b	NA	ES9191
4	Use in cleaning agents	22	NA	35	5, 9, 10, 11, 13, 15	8a, 8b, 8d, 8e	NA	ES538
5	Use in sewage water treatment	3	23	20, 37	1, 2, 3, 4, 5, 8a, 8b, 9	6b	NA	ES9187
6	Use in paper industry	3	6b	26	1, 2, 3, 4, 5, 8a, 8b, 9	6b	NA	ES9189
7	Use as an intermediate	3	8, 9	19	1, 2, 3, 4, 8a, 8b, 9	6a	NA	ES9182
8	Use in textile industry	3	5	34	1, 2, 3, 4, 5, 8a, 8b, 9, 13	6b	NA	ES9185
9	Industrial use	3	4, 5, 6a, 6b, 8, 9, 10, 11	NA	1, 2, 3, 4, 5, 8a, 8b, 9, 13, 14	6a, 6b, 6d	NA	ES523
10	Consumer use	21	NA	34, 35, 37	NA	8a, 8b, 8d, 8e	NA	ES653

Sodium hypochlorite, solution 14 - 15% Cl active

1. Short title of Exposure Scenario 1: Manufacture of substance

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products)
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 substances

2.1 Contributing scenario controlling environmental exposure for: ERC1

Substance is a unique structure, Non-hydrophobic.
, Low potential 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
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
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	Substance release to air can be excluded
	Water	Risk from environmental exposure is driven by freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste water
	Soil	Substance release to soil can be excluded
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
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, PROC8a, PROC8b, PROC9

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 14 - 15% Cl active

	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
Human factors not influenced by risk management	Body weight	70 kg
	Respiration volume under conditions of use	10 m3/day
	Light activity	
Other operational conditions affecting workers exposure	Indoor or outdoor use	
	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 (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.	
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

PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, Relevant for all PROCs: 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/m ³	0.4548
PROC1, PROC2, PROC3, PROC4	General exposures	worker - inhalation, short-term - local and systemic	0.540mg/m ³	0.1742
PROC1, PROC2, PROC3, PROC4	Laboratory activities	worker - inhalation, short-term - local and systemic	0.252mg/m ³	0.081
PROC1, PROC2, PROC3, PROC4	Equipment maintenance	worker - inhalation, short-term - local and systemic	0.480mg/m ³	0.155
PROC8a, PROC8b, PROC9	---	worker - inhalation, short-term - local and systemic	0.498mg/m ³	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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may

Sodium hypochlorite, solution 14 - 15% Cl active

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 14 - 15% Cl active

1. Short title of Exposure Scenario 2: Formulation & (re)packing of substances and mixtures

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU 10: Formulation
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)</p> <p>PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities</p> <p>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletisation</p> <p>PROC15: Use as laboratory reagent</p>
Environmental Release Categories	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 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 influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
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	Substance release to air can be excluded
	Water	Risk from environmental exposure is driven by freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste water
	Soil	Substance release to soil can be excluded
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
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,

Sodium hypochlorite, solution 14 - 15% Cl active

PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
	Physical Form (at time of use)	Liquid, 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
Human factors not influenced by risk management	Body weight	70 kg
	Respiration volume under conditions of use	10 m3/day
	Light activity	
Other operational conditions affecting workers exposure	Indoor or outdoor use	
	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 (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. 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

PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: 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/m ³	0.4548
PROC1, PROC2, PROC3, PROC4, PROC5	General exposures	worker - inhalation, short-term - local and systemic	0.540mg/m ³	0.1742
PROC1, PROC2, PROC3, PROC4, PROC5	Laboratory activities	worker - inhalation, short-term - local and systemic	0.252mg/m ³	0.081

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PROC1, PROC2, PROC3, PROC4, PROC5	Equipment maintenance	worker - inhalation, short-term - local and systemic	0.480mg/m ³	0.155
PROC8a, PROC8b, PROC9	---	worker - inhalation, short-term - local and systemic	0.498mg/m ³	0.161
PROC14	---	Worker - inhalative, long-term	0.23mg/m ³	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 14 - 15% Cl active

1. Short title of Exposure Scenario 3: Use in cleaning 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 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) 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 reactive processing aids
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: ERC6b

Substance is a unique structure, Non-hydrophobic.
, Low potential 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
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
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	Substance release to air can be excluded
	Water	Risk from environmental exposure is driven by freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste water
	Soil	Substance release to soil can be excluded
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
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: PROC5, PROC7, PROC8a, PROC9, PROC10, PROC13

Product characteristics	Concentration of the Substance in	Covers percentage substance in the product up to 25 %.
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Sodium hypochlorite, solution 14 - 15% Cl active

	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
Human factors not influenced by risk management	Body weight	70 kg
	Respiration volume under conditions of use	10 m3/day
	Light activity	
Other operational conditions affecting workers exposure	Indoor use	
	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 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

PROC5, PROC7, PROC8a, PROC9, PROC10, PROC13: Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC5, PROC8a	---	Worker - inhalative, long-term - local	1.25mg/m ³	0.81
PROC7	---	Worker - inhalative, long-term - local	1.20mg/m ³	0.77
PROC9	---	Worker - inhalative, long-term - local	0.91mg/m ³	0.59
PROC10	---	Worker - inhalative, long-term - local	1.00mg/m ³	0.65
PROC13	---	Worker - inhalative, long-term - local	0.70mg/m ³	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

Sodium hypochlorite, solution 14 - 15% Cl active

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 14 - 15% Cl active

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	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	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

Substance is a unique structure, Non-hydrophobic.
, Low potential 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
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
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	Substance release to air can be excluded
	Water	Risk from environmental exposure is driven by freshwater., Do not release wastewater directly into environment., Do not let product enter drains., Onsite wastewater treatment required
	Soil	Substance release to soil can be excluded
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
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: PROC5, PROC9, PROC10, PROC13, PROC15

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 10%
	Physical Form (at time of	Liquid, moderate fugacity

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	use)	
	Vapour pressure	25 hPa
Frequency and duration of use	Exposure duration per day	8 h
	Frequency of use	5 days/week
Other operational conditions affecting workers exposure	Indoor or outdoor use	
	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	Ensure that no inhalable aerosols are generated Regular inspection and maintenance of equipment and machines. Ensure that the task is not carried out overhead. The work place and work methods shall be organized in such a way that direct contact with the product is prevented or minimized.	
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

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
	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 affecting workers exposure	Indoor or outdoor use	
	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. The work place and work methods shall be organized in such a way that direct contact with the product is prevented or minimized.	
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

PROC11: EASE v2.0

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Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC11	---	Worker - inhalative, long-term - systemic	0.0017mg/m ³	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 14 - 15% Cl active

1. Short title of Exposure Scenario 5: Use in sewage water treatment

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU23: Electricity, steam, gas water supply and sewage treatment
Chemical product category	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 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 controlling 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 factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
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	Substance release to air can be excluded
	Water	Risk from environmental exposure is driven by freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste water
	Soil	Substance release to soil can be excluded
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
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

Product characteristics	Concentration of the Substance in	Covers percentage substance in the product up to 25 %.
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Sodium hypochlorite, solution 14 - 15% Cl active

	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
Human factors not influenced by risk management	Body weight	70 kg
	Respiration volume under conditions of use	10 m3/day
	Light activity	
Other operational conditions affecting workers exposure	Indoor use	
	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 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

PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9: Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - local	0.02mg/m ³	0.01
PROC2, PROC3	---	Worker - inhalative, long-term - local	1.10mg/m ³	0.71
PROC4	---	Worker - inhalative, long-term - local	1.20mg/m ³	0.77
PROC5, PROC8a, PROC8b	---	Worker - inhalative, long-term - local	1.25mg/m ³	0.81
PROC9	---	Worker - inhalative, long-term - local	0.91mg/m ³	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 14 - 15% Cl active

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.

Sodium hypochlorite, solution 14 - 15% Cl active

1. Short title of Exposure Scenario 6: Use in paper industry

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 dye, finishing and impregnation 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 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 controlling environmental exposure for: ERC6b

Substance is a unique structure, Non-hydrophobic.
, Low potential 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
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
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	Substance release to air can be excluded
	Water	Risk from environmental exposure is driven by freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste water
	Soil	Substance release to soil can be excluded
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
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

Sodium hypochlorite, solution 14 - 15% Cl active

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
	Physical Form (at time of use)	Liquid, 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
Human factors not influenced by risk management	Body weight	70 kg
	Respiration volume under conditions of use	10 m3/day
	Light activity	
Other operational conditions affecting workers exposure	Indoor use	
	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 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

PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9: Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - local	0.02mg/m ³	0.01
PROC2, PROC3	---	Worker - inhalative, long-term - local	1.10mg/m ³	0.71
PROC4	---	Worker - inhalative, long-term - local	1.20mg/m ³	0.77
PROC5, PROC8a, PROC8b	---	Worker - inhalative, long-term - local	1.25mg/m ³	0.81
PROC9	---	Worker - inhalative, long-term - local	0.91mg/m ³	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 14 - 15% Cl active

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.

Sodium hypochlorite, solution 14 - 15% Cl active

1. Short title of Exposure Scenario 7: Use as an intermediate

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 resulting in manufacture of another substance (use of intermediates)

2.1 Contributing scenario controlling environmental exposure for: ERC6a

Substance is a unique structure, Non-hydrophobic.
, Low potential 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
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
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	Substance release to air can be excluded
	Water	Risk from environmental exposure is driven by freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste water
	Soil	Substance release to soil can be excluded
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
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, PROC8a, PROC8b, PROC9

Product characteristics	Concentration of the	Covers percentage substance in the product up to
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Sodium hypochlorite, solution 14 - 15% Cl active

	Substance in Mixture/Article	25 %.
	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
Human factors not influenced by risk management	Body weight	70 kg
	Respiration volume under conditions of use	10 m3/day
	Light activity	
Other operational conditions affecting workers exposure	Indoor use	
	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 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

PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9: Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - local	0.02mg/m ³	0.01
PROC2, PROC3	---	Worker - inhalative, long-term - local	1.10mg/m ³	0.71
PROC4	---	Worker - inhalative, long-term - local	1.20mg/m ³	0.77
PROC8a, PROC8b	---	Worker - inhalative, long-term - local	1.25mg/m ³	0.81
PROC9	---	Worker - inhalative, long-term - local	0.91mg/m ³	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 14 - 15% Cl active

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 14 - 15% Cl active

1. Short title of Exposure Scenario 8: Use in textile industry

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
Chemical product category	PC34: Textile dyes, finishing and impregnating products; including bleaches and other processing aids
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)</p> <p>PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities</p> <p>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC13: Treatment of articles by dipping and pouring</p>
Environmental Release Categories	ERC6b: Industrial use of reactive processing aids

2.1 Contributing scenario controlling environmental exposure for: ERC6b

Substance is a unique structure, Non-hydrophobic.
, Low potential 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
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
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	Substance release to air can be excluded
	Water	Risk from environmental exposure is driven by freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste water
	Soil	Substance release to soil can be excluded
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
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,

Sodium hypochlorite, solution 14 - 15% Cl active

PROC5, PROC8a, PROC8b, PROC9, PROC13

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
	Physical Form (at time of use)	Liquid, 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
Human factors not influenced by risk management	Body weight	70 kg
	Respiration volume under conditions of use	10 m3/day
	Light activity	
Other operational conditions affecting workers exposure	Indoor use	
	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 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

PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC13: Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - local	0.02mg/m ³	0.01
PROC2, PROC3	---	Worker - inhalative, long-term - local	1.10mg/m ³	0.71
PROC4	---	Worker - inhalative, long-term - local	1.20mg/m ³	0.77
PROC5, PROC8a, PROC8b	---	Worker - inhalative, long-term - local	1.25mg/m ³	0.81
PROC9	---	Worker - inhalative, long-term - local	0.91mg/m ³	0.59

Sodium hypochlorite, solution 14 - 15% Cl active

PROC13	---	Worker - inhalative, long-term - local	0.70mg/m ³	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

Sodium hypochlorite, solution 14 - 15% Cl active

1. Short title of Exposure Scenario 9: 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 SU5: Manufacture of textiles, leather, fur SU6a: Manufacture of wood and wood products SU6b: Manufacture of pulp, paper and paper products SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals SU 10: Formulation SU11: Manufacture of rubber 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 PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletisation
Environmental Release Categories	ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates) ERC6b: Industrial use of reactive processing aids 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: ERC6a, ERC6b, ERC6d

Substance is a unique structure, Non-hydrophobic.
, Low potential to bioaccumulate.

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 15%
Amount used	Amounts used in the EU (tonnes/year)	999999 ton(s)/year
Frequency and duration of use	Continuous exposure	360 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and	Air	Substance release to air can be excluded

Sodium hypochlorite, solution 14 - 15% Cl active

releases to soil Organizational measures to prevent/limit release from the site	Water	Risk from environmental exposure is driven by freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste water
	Soil	Substance release to soil can be excluded
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
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, PROC13, PROC14		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 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
Other operational conditions affecting workers exposure	Indoor or outdoor use	
	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 (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.	
Risk management measures are based on qualitative risk characterisation.		
2.3 Contributing scenario controlling worker exposure for: PROC8a, PROC8b, PROC9		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 5%
	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
Human factors not influenced by risk management	Exposed skin area	Two hands 820 cm²
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EN		

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Other operational conditions affecting workers exposure	Indoor or outdoor use
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	In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection In the case of hazardous fumes, wear self contained breathing apparatus. Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear chemically resistant gloves. (Efficiency: 90 %)

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

Relevant for all PROCs: 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/m ³	0.4548

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 14 - 15% Cl active

1. Short title of Exposure Scenario 10: Consumer use

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical product category	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
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

Substance is a unique structure, Non-hydrophobic.
, Low potential 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
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
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	Substance release to air can be excluded
	Water	Risk from environmental exposure is driven by freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste water
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
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 consumer exposure for: PC35: Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)

Product characteristics	Concentration of the 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
Frequency and duration of use	Exposure duration	7.5 min
	Frequency of use	4 Times per day

Sodium hypochlorite, solution 14 - 15% Cl active

Other given operational conditions affecting consumers exposure	Indoor use	
	Room size	4 m3
	Ventilation rate per hour	0.5
2.3 Contributing scenario controlling consumer exposure for: PC35		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 0% - 0,5%
	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 area	Palm of one Hand 420 cm²
Other given operational conditions affecting consumers exposure	Indoor use	
	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 controlling consumer exposure 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 risk management	Exposed skin area	Two hands 820 cm²
Other given operational conditions affecting consumers exposure	Indoor use	
	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.
2.5 Contributing scenario controlling consumer exposure for: PC37		
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		
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Sodium hypochlorite, solution 14 - 15% Cl active

Qualitative approach used to conclude safe use.

Consumers

PC34, PC35: 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, short-term - local	0.035mg/kg bw/day	< 1
PC35	Hard surface cleaning	Consumer - dermal, short-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 ES