

Ghost Poultice

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

Version 12.0

Print Date 2017/10/26

Revision date / valid from 2017/10/26

MSDS code: MSHY100

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

1.1. Product identifier

Trade name : Ghost Poultice
 Substance name : Ghost Poultice
 CAS-No. : 7681-52-9
 EC-No. : 231-668-3
 EU REACH-Reg. No. : 01-2119488154-34-xxxx

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

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

1.3. Details of the supplier of the safety data sheet

Company : Tensid UK Ltd
 Unit 1, Craven Court, Canada Road
 Byfleet. Kt14 7JL
 Telephone : +44 (0) 1932 564133
 E-mail address : info@tensid.com

1.4. Emergency telephone number

Emergency telephone number : Emergency only telephone number (open 24 hours):
 +44 (0) 1932 564133

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 |
| Corrosive to metals | Category 1 | --- | H290 |
| Skin corrosion | Category 1B | --- | H314 |

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| | | | |
|--------------------------|------------|-----|------|
| Acute aquatic toxicity | Category 1 | --- | H400 |
| Chronic aquatic toxicity | Category 2 | --- | H411 |
| | | --- | |


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

Most important adverse effects

- Human Health : See section 11 for toxicological information.
- Physical and chemical hazards : See section 9/10 for physicochemical information.
- Potential environmental effects : See section 12 for environmental information.

2.2. Label elements

Labelling according to Regulation (EC) No 1272/2008

- : 
- 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
- Prevention : P273 Avoid release to the environment.
P260 Do not breathe gas/ mist/ vapours/ spray.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
- Response : P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P310 IF exposed or concerned: Immediately call a POISON CENTER/doctor.

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P313 Get medical advice/ attention.

Disposal : P501 Dispose of contents/ container in accordance with the local/regional/international regulations.

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 : Aqueous solution

| Hazardous components | Amount [%] | Classification (REGULATION (EC) No 1272/2008) | |
|--------------------------------------|--------------|--|-------------------|
| | | Hazard class / Hazard category | Hazard statements |
| sodium hypochlorite, solution | | | |
| Index-No. : 017-011-00-1 | >= 10 - < 20 | Met. Corr.1 | H290 |
| CAS-No. : 7681-52-9 | | Skin Corr.1B | H314 |
| EC-No. : 231-668-3 | | STOT SE3 | H335 |
| EU REACH- : 01-2119488154-34-xxxx | | Aquatic Acute1 | H400 |
| Reg. No. | | Aquatic Chronic1 | H410 |
| sodium hydroxide | | | |
| Index-No. : 011-002-00-6 | < 1 | Met. Corr.1 | H290 |
| CAS-No. : 1310-73-2 | | Skin Corr.1A | H314 |
| EC-No. : 215-185-5 | | | |
| EU REACH- : 01-2119457892-27-xxxx | | | |
| Reg. No. | | | |

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

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice : Take off all contaminated clothing immediately.

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

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| | |
|-------------------------|---|
| | 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 plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician immediately. |
| 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 | : Rinse mouth with water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Call a physician immediately. |

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

| | |
|----------|---|
| Symptoms | : See Section 11 for more detailed information on health effects and symptoms. If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach. |
| Effects | : See Section 11 for more detailed information on health effects and symptoms. Causes severe skin burns and eye damage. |

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

| | |
|-----------|--------------------------|
| Treatment | : Treat symptomatically. |
|-----------|--------------------------|

SECTION 5: Firefighting measures

5.1. Extinguishing media

| | |
|--------------------------------|---|
| Suitable extinguishing media | : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. The product itself does not burn. |
| Unsuitable extinguishing media | : High volume water jet |

5.2. Special hazards arising from the substance or mixture

| | |
|--------------------------------------|--|
| Specific hazards during firefighting | : Heating or fire can release toxic gas. |
| Hazardous combustion products | : 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 advice | : Cool closed containers exposed to fire with water spray. Heating will cause a pressure rise - with risk of |

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bursting. Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions : Use personal protective equipment. Wear respiratory protection. Keep away unprotected persons. Provide adequate ventilation. Danger of slipping if spilled Avoid contact with skin, eyes and clothing. 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

Methods and materials for containment and cleaning up : 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".

6.4. Reference to other sections

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

SECTION 7: Handling and storage

7.1. Precautions for safe handling

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

7.2. Conditions for safe storage, including any incompatibilities

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| | |
|---|---|
| Requirements for storage areas and containers | : Keep in an area equipped with alkali resistant flooring. Keep only in the original container. Store in a receptacle equipped with a vent. |
| Advice on protection against fire and explosion | : The product is not flammable. Normal measures for preventive fire protection. |
| Further information on storage conditions | : Keep in a well-ventilated place. Protect against light. Store in cool place. |
| Advice on common storage | : Keep away from food, drink and animal feedingstuffs. Do not store together with acids and ammonium salts. |
| Suitable packaging materials | : Polyethylene, Polyvinylchloride |
| Unsuitable packaging materials | : , Iron, Copper, Aluminium, Stainless steel |

7.3. Specific end use(s)

Specific use(s) : No information available.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

| | | |
|-------------------|-----------------|--------------------------|
| Component: | chlorine | CAS-No. 7782-50-5 |
|-------------------|-----------------|--------------------------|

Other Occupational Exposure Limit Values

UK. EH40 Workplace Exposure Limits (WELs), Short Term Exposure Limit (STEL):
0.5 ppm, 1.5 mg/m³

EU. Indicative Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, Short Term Exposure Limit (STEL):
0.5 ppm, 1.5 mg/m³
Indicative

ELV (IE), Short Term Exposure Limit (STEL):
0.5 ppm, 1.5 mg/m³
Indicative OELV

| | | |
|-------------------|-------------------------|--------------------------|
| Component: | sodium hydroxide | CAS-No. 1310-73-2 |
|-------------------|-------------------------|--------------------------|

Other Occupational Exposure Limit Values

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

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

| | | |
|-------------------|--------------------------------------|--------------------------|
| Component: | sodium hypochlorite, solution | CAS-No. 7681-52-9 |
|-------------------|--------------------------------------|--------------------------|

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

DNEL

Workers, Acute - systemic effects, Acute - local effects, Inhalation : 3.1 mg/m³

DNEL

Workers, Long-term - systemic effects, Long-term - local effects, Inhalation : 1.55 mg/m³

DNEL

Workers, Long-term - local effects, Skin contact : 0.5 %

DNEL

Consumers, Long-term - systemic effects, Long-term - local effects, Inhalation : 1.55 mg/m³

DNEL

Consumers, short-term, Inhalation : 3.1 mg/m³

DNEL

Consumers, Long-term - systemic effects, Ingestion : 0.26 mg/kg bw/day

Predicted No Effect Concentration (PNEC)

Fresh water : 0.21 µg/l

Marine water : 0.042 µg/l

Sewage treatment plant (STP) : 0.03 mg/l

Intermittent releases : 0.26 µg/l

Soil :

Exposition is not expected.

Marine sediment :

Exposition is not expected.

Fresh water sediment :

Exposition is not expected.

8.2. Exposure controls

Appropriate engineering controls

Refer to protective measures listed in sections 7 and 8.

Personal protective equipment

Respiratory protection

Advice : Use respirator with appropriate filter if vapours or aerosol are released.
Respiratory protection complying with EN 141.
Recommended Filter type:
Combination filter:B-P2
Combination filter:B-P3
In case of intensive or longer exposure use self-contained breathing apparatus.

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 : Tightly fitting safety goggles
Ensure that eyewash stations and safety showers are close to the workstation location.

Skin and body protection

Advice : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific workplace.
Wear appropriate chemical resistant clothing and boots.
alkali resistant protective clothing

Environmental exposure controls

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

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

| | |
|--|--|
| Form | : liquid |
| Colour | : yellow to green |
| Odour | : of Chlorine |
| Odour Threshold | : no data available |
| pH | : > 11 |
| Melting point/range | : ca. -30 - -20 °C 13 - 16% solution |
| Boiling point/boiling range | : ca. 100 °C (1013 hPa) 13 - 16% solution |
| Flash point | : Not applicable |
| Evaporation rate | : no data available |
| Flammability (solid, gas) | : Not applicable |
| Upper explosion limit | : Not applicable |
| Lower explosion limit | : Not applicable |
| Vapour pressure | : ca. 20 hPa (20 °C) 13 - 16% solution |
| Relative vapour density | : no data available |
| Density | : 1.11 g/cm ³ (20 °C) 10% solution 1.317 g/cm ³ (20 °C) 15% solution 1.24 g/cm ³ (20 °C) 20% solution |
| Water solubility | : completely miscible |
| Partition coefficient: n-octanol/water | : log Kow -3.42 (20 °C) |
| Auto-ignition temperature | : no data available |

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Thermal decomposition : > 111 °C
 Viscosity, dynamic : 3 - 4 mPa.s (20 °C) 13 - 16% solution
 Explosivity : Product is not explosive.
 Oxidizing properties : Oxidizing agents

9.2. Other information

Corrosion to metals : Corrosive to metals

SECTION 10: Stability and reactivity

10.1. Reactivity

Advice : Contact with acids liberates toxic gas.

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 : Keep away from open flames, hot surfaces and sources of ignition. Keep away from direct sunlight.
 Thermal decomposition : > 111 °C

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 products : Hydrogen chloride gas, Chlorine, chlorine oxides

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Data for the product

Acute toxicity

Oral

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Please find this information in the listing of the component/components below in this section.

Inhalation

Not classified based on the calculation method according to CLP regulation.

Dermal

Not classified based on the calculation method according to CLP regulation.

Irritation

Skin

Result : Causes severe skin burns and eye damage.

Eyes

Result : Causes eye burns.

Sensitisation

Result : Not classified based on the calculation method according to CLP regulation.

CMR effects

CMR Properties

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

Specific Target Organ Toxicity

Single exposure

Remarks : Not classified based on the calculation method according to CLP regulation.

Repeated exposure

Remarks : Not classified based on the calculation method according to CLP regulation.

Other toxic properties

Repeated dose toxicity

no data available

Genotoxicity in vitro

Result : negative (Ames test; Salmonella typhimurium) (OECD Test Guideline 471)
 ambiguous (Chromosome aberration test in vitro; Chinese hamster fibroblasts) (OECD Test Guideline 473)

Genotoxicity in vivo

Result : negative (Chromosome aberration test in vivo; Mouse) (OECD Test Guideline 474)
 negative (Chromosome aberration test in vivo; Mouse) (OECD Test Guideline 475)
 ambiguous (Effects on sperm morphology and melotic micronuclei; Mouse)

Teratogenicity

NOAEL : 5.7 mg/kg
 Teratog. (Rat)Test substance
 Chlorine

Reproductive toxicity

NOAEL : 5 mg/kg
 Parent (Rat)(Oral)Effects on fertilityTest substance
 Chlorine

Specific Target Organ Toxicity

Single exposure

Inhalation : Target Organs: Respiratory systemMay cause respiratory irritation.Experience with human exposure

Repeated exposure

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

Other toxic properties

Repeated dose toxicity

NOAEL : 50 mg/kg
 (Rat)(Oral; 90 Days) (OECD Test Guideline 408)

Aspiration hazard

No aspiration toxicity classification,

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

Data for the product

Chronic toxicity

Chronic aquatic toxicity

Result : Very toxic to aquatic life with long lasting effects.

Component: sodium hypochlorite, solution **CAS-No.** 7681-52-9

Acute toxicity

Fish

LC50 : 0.06 mg/l (Salmo gairdneri; 96 h)
 NOEC : 0.04 mg/l (Menidia peninsulae (tidewater silverside); 96 h)

Toxicity to daphnia and other aquatic invertebrates

EC50 : 0.141 mg/l (Daphnia magna (Water flea); 48 h)

algae

NOEC : 0.0021 mg/l (algae; 7 Days) Fresh water

Bacteria

EC50 : > 3 mg/l (activated sludge; 3 h)

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Chronic toxicity

Fish

NOEC : 0.04 mg/l (Menidia peninsulae (tidewater silverside); 28 d)

Aquatic invertebrates

NOEC : 0.007 mg/l (Eastern oyster (Crassostrea virginica); 15 d) Marine water

M-Factor

M-Factor (Acute Aquat. Tox.) : 10
 M-Factor (Chron. Aquat. Tox.) : 1

12.2. Persistence and degradability

Component: sodium hypochlorite, solution **CAS-No. 7681-52-9**

Persistence and degradability

Persistence

Result : The product can be degraded by abiotic (e.g. chemical or photolytic) processes.
 decomposition by hydrolysis.
 Half-life in fresh-water < 1 day

Biodegradability

Result : The methods for determining the biological degradability are not applicable to inorganic substances.

12.3. Bioaccumulative potential

Component: sodium hypochlorite, solution **CAS-No. 7681-52-9**

Bioaccumulation

Result : log Kow -3.42 (20 °C)
 : Does not bioaccumulate.

12.4. Mobility in soil

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| | | |
|-------------------|--------------------------------------|--------------------------|
| Component: | sodium hypochlorite, solution | CAS-No. 7681-52-9 |
|-------------------|--------------------------------------|--------------------------|

Mobility

Water : The product is mobile in water environment.
 Soil : Highly mobile in soils
 Air : not volatile (Henry's Constant)

12.5. Results of PBT and vPvB assessment

Data for the product

Results of PBT and vPvB assessment

Result : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

| | | |
|-------------------|--------------------------------------|--------------------------|
| Component: | sodium hypochlorite, solution | CAS-No. 7681-52-9 |
|-------------------|--------------------------------------|--------------------------|

Results of PBT and vPvB assessment

Result : The PBT or vPvB criteria of Annex XIII to the REACH Regulation does not apply to inorganic substances.

12.6. Other adverse effects

| | | |
|-------------------|--------------------------------------|--------------------------|
| Component: | sodium hypochlorite, solution | CAS-No. 7681-52-9 |
|-------------------|--------------------------------------|--------------------------|

Additional ecological information

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

SECTION 13: Disposal considerations

13.1. Waste treatment methods

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

Contaminated packaging : Dispose of contaminated packaging in the same way as the product. In accordance with local and national regulations. Empty containers retain residue and can be dangerous.

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

14.3. Transport hazard class(es)

ADR-Class : 8
 (Labels; Classification Code; Hazard identification No; Tunnel restriction code) 8; C9; 80; (E)
 RID-Class : 8
 (Labels; Classification Code; Hazard identification No) 8; C9; 80
 IMDG-Class : 8
 (Labels; EmS) 8; F-A, S-B

14.4. Packaging group

ADR : II
 RID : II
 IMDG : II

14.5. Environmental hazards

Environmentally hazardous according to ADR : yes
 Environmentally hazardous according to RID : yes
 Marine Pollutant according to IMDG-Code : yes

14.6. Special precautions for user

Not applicable.

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

IMDG : Not applicable.

SECTION 15: Regulatory information

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

Data for the product

EU. REACH, Annex XVII, : Point Nos.: , 3; Listed Marketing and Use

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Restrictions (Regulation 1907/2006/EC)

EU. Directive 2012/18/EU (SEVESO III) Annex I : Lower-tier requirements: 100 tonnes; Part 1: Categories of dangerous substances; E1: Hazardous to the Aquatic Environment in Category Acute 1 or Chronic 1
Upper-tier requirements: 200 tonnes; Part 1: Categories of dangerous substances; E1: Hazardous to the Aquatic Environment in Category Acute 1 or Chronic 1
Lower-tier requirements: 200 tonnes; Part 1: Categories of dangerous substances; E2: Hazardous to the Aquatic Environment in Category Chronic 2
Upper-tier requirements: 500 tonnes; Part 1: Categories of dangerous substances; E2: Hazardous to the Aquatic Environment in Category Chronic 2

Component: sodium hydroxide CAS-No. 1310-73-2

Notification status sodium hydroxide:

| Regulatory List | Notification | Notification number |
|-----------------|--------------|---------------------|
| AICS | YES | |
| DSL | YES | |
| EINECS | YES | 215-185-5 |
| ENCS (JP) | YES | (1)-410 |
| IECSC | YES | |
| ISHL (JP) | YES | (1)-410 |
| KECI (KR) | YES | 97-1-136 |
| KECI (KR) | YES | KE-31487 |
| NZIOC | YES | HSR001547 |
| PICCS (PH) | YES | |
| TSCA | YES | |

Component: sodium hypochlorite, solution CAS-No. 7681-52-9

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

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

EU. Regulation No 1451/2007 [Biocides], Annex I, OJ (L 325) : EC Number: , 231-668-3; Listed

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EU. Directive 2012/18/EU (SEVESO III) Annex I : Lower-tier requirements: 100 tonnes; Part 1: Categories of dangerous substances; E1: Hazardous to the Aquatic Environment in Category Acute 1 or Chronic 1
Upper-tier requirements: 200 tonnes; Part 1: Categories of dangerous substances; E1: Hazardous to the Aquatic Environment in Category Acute 1 or Chronic 1

UK. Releases to air and water (UK ISR) : Annual reporting level threshold: 10,000 kg

WGK (DE) : WGK 2: water endangering: 815; Classification source is Annex 2.

Notification status

sodium hypochlorite, solution:

| Regulatory List | Notification | Notification number |
|-----------------|--------------|---------------------|
| AICS | YES | |
| DSL | YES | |
| EINECS | YES | 231-668-3 |
| ENCS (JP) | YES | (1)-237 |
| IECSC | YES | |
| ISHL (JP) | YES | (1)-237 |
| KECI (KR) | YES | KE-31506 |
| NZIOC | YES | HSR003698 |
| PICCS (PH) | YES | |
| TSCA | YES | |

15.2. Chemical safety assessment

no data available

SECTION 16: Other information

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

| | |
|------|---|
| H290 | May be corrosive to metals. |
| 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. |
| H411 | Toxic to aquatic life with long lasting effects. |

Abbreviations and Acronyms

| | |
|------------|-------------------------|
| BCF | bioconcentration factor |
|------------|-------------------------|

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| | |
|---------------|---|
| BOD | biochemical oxygen demand |
| CAS | Chemical Abstracts Service |
| CLP | Classification, Labelling and Packaging |
| CMR | carcinogenic, mutagenic or toxic to reproduction |
| COD | chemical oxygen demand |
| DNEL | derived no-effect level |
| EINECS | European Inventory of Existing Commercial Chemical Substances |
| ELINCS | European List of Notified Chemical Substances |
| GHS | Globally Harmonized System of Classification and Labelling of Chemicals |
| LC50 | median lethal concentration |
| LOAEC | lowest observed adverse effect concentration |
| LOAEL | lowest observed adverse effect level |
| LOEL | lowest observed effect level |
| NLP | no-longer polymer |
| NOAEC | no observed adverse effect concentration |
| NOAEL | no observed adverse effect level |
| NOEC | no observed effect concentration |
| NOEL | no observed effect level |
| OECD | Organisation for Economic Cooperation and Development |
| OEL | occupational exposure limit |
| PBT | persistent, bioaccumulative and toxic |
| PNEC | predicted no-effect concentration |
| STOT | specific target organ toxicity |
| SVHC | substance of very high concern |
| UVCB | substance of unknown or variable composition, complex reaction products or biological materials |
| vPvB | very persistent and very bioaccumulative |

Further information

- Key literature references and sources for data : Supplier information and data from the "Database of registered substances" of the European Chemicals Agency (ECHA) were used to create this safety data sheet.
- Methods used for product classification : The classification for human health, physical and chemical hazards and environmental hazards were derived from a combination of calculation methods and if available test data.
- Hints for trainings : The workers have to be trained regularly on the safe handling of the products based on the information provided in the Safety Data Sheet and the local conditions of the workplace. National regulations for the training of workers in the handling of hazardous materials must be adhered to.
- Other information : 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.

SODIUM HYPOCHLORITE ≥ 10 - $\leq 15\%$

| 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 | 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 | 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 ≥ 10 - $\leq 15\%$

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 | <p>PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</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> |
| 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 m ³ /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 m ³ /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 |
|-------------------------|----------------------|--|

SODIUM HYPOCHLORITE ≥ 10 - $\leq 15\%$

| | | |
|--|---|---------------------------|
| | 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 m ³ /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

SODIUM HYPOCHLORITE ≥ 10 - $\leq 15\%$

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.

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 ≥ 10 - $\leq 15\%$

1. Short title of Exposure Scenario 2: 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: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises 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,

SODIUM HYPOCHLORITE ≥ 10 - $\leq 15\%$

PROC8a, PROC8b, PROC9

| | | |
|--|---|--|
| 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 m ³ /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.

SODIUM HYPOCHLORITE ≥ 10 - $\leq 15\%$ **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

SODIUM HYPOCHLORITE ≥ 10 - $\leq 15\%$

1. Short title of Exposure Scenario 3: 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 [mixing] of preparations and/ or re-packaging (excluding alloys) |
| Process categories | <p>PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition</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 | Waste treatment | External treatment and disposal of waste should |

SODIUM HYPOCHLORITE ≥ 10 - $\leq 15\%$

| | | |
|---|--|---|
| to external treatment of waste for disposal | | 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

| | | |
|--|---|--|
| 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 m ³ /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 |

SODIUM HYPOCHLORITE ≥ 10 - $\leq 15\%$

| | | | | |
|-----------------------------------|-----------------------|--|------------------------|-------|
| PROC1, PROC2, PROC3, PROC4, PROC5 | Laboratory activities | worker - inhalation, short-term - local and systemic | 0.252mg/m ³ | 0.081 |
| 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 ≥ 10 - $\leq 15\%$

1. Short title of Exposure Scenario 4: 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 |
| 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 %. |
|-------------------------|-----------------------------------|--|

SODIUM HYPOCHLORITE ≥ 10 - $\leq 15\%$

| | | |
|--|---|---------------------------|
| | 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 |
| Human factors not influenced by risk management | Body weight | 70 kg |
| | Respiration volume under conditions of use | 10 m ³ /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 ≥ 10 - $\leq 15\%$

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 ≥ 10 - $\leq 15\%$

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 |
| 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 |

SODIUM HYPOCHLORITE ≥ 10 - $\leq 15\%$

| | | |
|--|---|-------------|
| | 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

SODIUM HYPOCHLORITE ≥ 10 - $\leq 15\%$

| 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 ≥ 10 - $\leq 15\%$

1. Short title of Exposure Scenario 6: 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: Recycling |
| Chemical product category | PC20: Products such as pH-regulators, flocculants, precipitants, neutralization agents PC37: Water treatment chemicals |
| Process categories | PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises 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 m ³ /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 m ³ /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 ≥ 10 - $\leq 15\%$

PROC5, PROC8a, PROC8b, PROC9

| | | |
|--|---|--|
| 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 m ³ /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 |

SODIUM HYPOCHLORITE ≥ 10 - $\leq 15\%$

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

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 ≥ 10 - $\leq 15\%$

1. Short title of Exposure Scenario 7: 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 | <p>PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition</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> |
| 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 | Waste treatment | External treatment and disposal of waste should comply with applicable local and/or national |

SODIUM HYPOCHLORITE ≥ 10 - $\leq 15\%$

disposal

regulations.

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

| | | |
|--|---|--|
| 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 m ³ /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- | 0.91mg/m ³ | 0.59 |

SODIUM HYPOCHLORITE ≥ 10 - $\leq 15\%$

term - local

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

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 ≥ 10 - $\leq 15\%$

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: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition</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 m ³ /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 m ³ /d |
| Conditions and measures related | Waste treatment | External treatment and disposal of waste should |

SODIUM HYPOCHLORITE ≥ 10 - $\leq 15\%$

| | | |
|---|--|---|
| to external treatment of waste for disposal | | 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

| | | |
|--|---|--|
| 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 m ³ /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, | --- | Worker - inhalative, long-term - local | 1.25mg/m ³ | 0.81 |

SODIUM HYPOCHLORITE ≥ 10 - $\leq 15\%$

| | | | | |
|--------|-----|--|-----------------------|------|
| PROC8b | | | | |
| PROC9 | --- | Worker - inhalative, long-term - local | 0.91mg/m ³ | 0.59 |
| 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

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 ≥ 10 - $\leq 15\%$

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 [mixing] of preparations and/ or re-packaging (excluding alloys) SU11: Manufacture of rubber products |
| Process categories | PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) 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 | Air | Substance release to air can be excluded |
| | | |

SODIUM HYPOCHLORITE ≥ 10 - $\leq 15\%$

| | | |
|---|--|---|
| prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site | Water | 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 m ³ /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 cm ² |

SODIUM HYPOCHLORITE ≥ 10 - $\leq 15\%$

| | |
|--|---|
| 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 ≥ 10 - $\leq 15\%$

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 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 ≥ 10 - $\leq 15\%$

| | | |
|--|---|---|
| Other given operational conditions affecting consumers exposure | Indoor use | |
| | Room size | 4 m ³ |
| | 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 cm ² |
| Other given operational conditions affecting consumers exposure | Indoor use | |
| | Room size | 4 m ³ |
| | 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 cm ² |
| Other given operational conditions affecting consumers exposure | Indoor use | |
| | Room size | 4 m ³ |
| | 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 | | |
| 70000000233 / Version 12.0 | | |
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SODIUM HYPOCHLORITE ≥ 10 - $\leq 15\%$

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 | 1.68 $\mu\text{g}/\text{m}^3$ | 0.000108 |
| PC35 | Hard surface cleaning | Consumer - inhalative, long-term - systemic | 1.68 $\mu\text{g}/\text{m}^3$ | 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