

MATERIAL SAFETY DATA

SODIUM HYPOCHLORITE

Release date 08.02.2006

Review: 22.03.2023

Version EN: 9.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

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

1.1. Product identifier

SODIUM HYPOCHLORITE
REACH no. 01-2119488154-34-0022
Index no. 017-011-00-1
CAS: 7681-52-9
EC: 231-668-3

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

Identified uses: Identified use: Bleaching agent in pulp and paper, textile industry.
An oxidizing agent in the chemical industry.

Formulation (SN2)

Industrial use of sodium chlorate(I) (SN3) as an intermediate. Use of sodium chlorate(I) in the textile industry (SN4).

Industrial application in the treatment of wastewater, cooling and heating water (SN5). Industrial application in the pulp and paper industry (SN6).

Industrial use as a cleaning agent (SN7). Professional use as a cleaning agent (SN8) Consumer use (SN9).

Uses advised against: Not specified.

1.3. Data of the supplier of the MSDS

Distributor:

TOMCHEM Sp. z o.o.
ul. Niesięcin 5A
95-050 Konstancin Łódzki
tel. 42 683-11-83
tel./fax.: 42-636-43-18

E-mail address of the person responsible for the material safety data sheet: z.tomek@poczta.fm.

1.4. Emergency phone number 112 (general emergency phone), 998 (fire department), 999 (medical emergency);

SECTION 2: Identification of hazards

2.1. Classification of the substance or mixture

acc. to Regulation 1272/2008:

Met. Corr. 1; H290 Skin

Corr. 1B; H314 Eye

Dam. 1; H318 Aquatic

Acute 1; H400

Aquatic Chronic 1; H411

Hazard for human health

Causes severe skin burns and eye damage. May cause respiratory irritation.

Hazards for the environment

Very toxic to aquatic life with long lasting effects.

Physical and chemical hazards

May be corrosive to metals.

2.2. Label elements

Pictographs:

MATERIAL SAFETY DATA

SODIUM HYPOCHLORITE

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.



Warnings: Hazard

Hazard statement:

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 phrases:

P260 - Do not breathe dust/fume/gas/mist/vapors/spray.

P273 - Do not release to the environment.

P280 - Wear protective gloves/protective clothing/eye protection/face protection.

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

P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.

P310 - Call a POISON CENTER or doctor/physician

P403+P233 - Store in a well-ventilated place. Store the container closed tightly.

EUH031 - releases toxic gases on contact with acids

2.3. Other hazards

Appendix XIII to the Regulation REACH - Criteria of identification of persistent, bioaccumulative and toxic substances (PBT) and very persistent and very bioaccumulative substances (vPvB) - not applicable

Substances with endocrine disrupting properties (according to the criteria of Commission Delegated Regulation (EU) 2017/2100, Commission Regulation (EU) 2018/605) - not applicable

SECTION 3: Composition/information on ingredients

3.1. Substances

Aqueous solution of sodium hypochlorite containing min. 155 g/l free chlorine i.e. 13%. Contains added alkali [sodium hydroxide and sodium carbonate max. 30 g/l converted to NaOH having a stabilizing effect on the product.

Dangerous additives:

Product identifier	Content %	Hazard class and category codes	Hazard statement codes and supplementary phrases	- Specific threshold - M coefficient - Estimated Acute Toxicity (ATE)
Sodium hypochlorite CAS: 7681-52-9 EC: 231-668-3 Index no. 017-011-00-1 REACH no. 01-2119488154-34-0022	≤50	Skin Corr. 1B Eye Dam. 1 Aquatic Acute 1 Aquatic Chronic 1	H314 H290 H318 H400 H411 EUH031	M=10 M=1 EUH031: ≥ 5 %

MATERIAL SAFETY DATA

SODIUM HYPOCHLORITE

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

Sodium carbonate CAS: 497-19-8 EC: 207-838-8 Index no. 011-005-00-2 REACH no. 01-2119485498-19-XXXX	appro x. 2	Eye Irrit. 2	H319	-
Sodium hydroxide* CAS: 1310-73-2 EC: 215-185-5 Index no. 011-002-00-6 REACH no. 01-2119457892-27-XXXX	Appro x. 2	Skin Corr. 1 A	H314	Skin Corr. 1A; H314: C ≥ 5 % Skin Corr. 1B; H314 2 % ≤ C < 5 % Skin Irrit. 2; H315: 0.5 % ≤ C < 2 % Eye Irrit.2; H319: 0.5 % ≤ C < 2 %

Full text of H statements in section 16

*substance with a specific NDS value.

3.2. Mixtures

Not applicable.

SECTION 4: First aid measures

4.1. Description of first aid measures In case of skin contact:

Remove all soiled clothing, wash the skin with plenty of water. Apply a sterile dressing to the burned area. Do not use any antacids. Consult a doctor.

Contact with eyes:

Flush eyes for several minutes (approx. 15 min.) with plenty of water, keep the eyelids wide open. Avoid heavy jets because of a risk of a damage to the cornea, contact the doctor.

If inhaled:

In case of dizziness or nausea remove a victim to a fresh air; contact a doctor is the symptoms persist. If shortness of breath occurs, administer the oxygen.

If swallowed:

Immediately spit out the mouth. Give a large amount of water to drink. Do not induce vomiting (risk of perforation), contact a doctor immediately. Never administer anything into the mouth if a victim is unconscious.

4.2. The most significant acute and delayed symptoms and effects of the exposure

No information

4.3. Recommendations regarding immediate doctor's aid and detailed procedure of treatment of a victim.

Decision on how to proceed is made by a doctor after assessment of the condition of the affected person.

SECTION 5: Firefighting

5.1. Extinguishing media

Suitable extinguishing media: dry extinguishing powders, carbon dioxide (snow extinguisher), sand or earth. Apply extinguishing methods adjusted to adjacent area.

Inappropriate extinguishing media: Heavy water stream.

5.2. Special hazards arising from the substance or mixture

In the event of fire, under the influence of high temperatures certain toxic decomposition products are released, including chlorine, chlorine dioxide. Due to its strong oxidizing properties in contact with many organic substances, hydrogen, powdered metals poses a fire-explosive hazard.

5.3. Advice for firefighters

Containers in a fire area must be cooled down with a water spray. If this is possible remove the containers from the hazard zone. Note - water must not enter the interior of the container. In case of fire in a confined area

MATERIAL SAFETY DATA

SODIUM HYPOCHLORITE

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

use protective clothing and compressed air breathing apparatus. Do not enable penetration of the ground waters and the sewage system.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: notify the relevant services of the accident. Remove everyone, who is not involved into the rescue operation, from the emergency liquidation area. Avoid contact with releasing liquid. Do not breath vapors.

For persons providing aid. Assure required ventilation, apply the PPE.

6.2. Environment protection measures

Prevent from spreading and penetration of the sewage system and reservoirs; inform local authorities if it is impossible to assure safety.

6.3. Methods and materials for preventing the spread of contamination and for disposal Prevent the spread and dispose of by collecting on non-flammable absorbent material (sand, sawdust, diatomaceous earth, universal absorbent), place the contaminated material in properly labeled containers for disposal in accordance with applicable regulations.

6.4. References to other sections

Waste treatment - section 13 of the MSDS.

Personal protective equipment - section 8 of the sheet.

SECTION 7: Handling and storage

7.1. Precautions regarding safe handling

Avoid contact with eyes. Work in accordance with safety and hygiene rules: do not eat or drink, do not smoke in the workplace, wash hands after use, remove contaminated clothing and protective equipment before entering eating areas.

7.2. Conditions for safe storage, including information on any incompatibilities Store in a cool (storage temperature from 15°C to 25°C), dry, well-ventilated (with emergency mechanical ventilation) room in a properly labeled closed original container. Avoid direct sunlights and sources of heat. Avoid hot areas and open flames. Store away from strong reducing agents, acids, light metals, powdered metals. Keep away from humidity.

7.3. Specific end use(s)

Uses according to section 1.2 - no additional recommendations See attached exposure scenario.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure standards for occupational hazards in accordance with Regulation of the Minister of Family, Labor and Social Policy dated 12 June 2018 on the highest permissible concentrations and intensities of factors harmful to health in the work environment (Journal of Laws item 1286 as amended).

MATERIAL SAFETY DATA

SODIUM HYPOCHLORITE

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

Ingredients for which exposure limits are binding:

Name and CAS number of the chemical (substance)	Maximum permissible concentration (in mg/m ³) as a function of exposure time during the work shift			Number of fibers (in cm) ³	Remarks: Notation of the substance: "skin"
	NDS	NDSch	NDSP		
chlorine [CAS: 7782-50-5]	0.7	1.5	-	-	-
Sodium hydroxide [CAS: 1310-73-2]	0.5	1	-	-	-

Based on the chemical safety assessment carried out for the registration dossier and risk control in the use of the substance, the following dose levels of the substance were determined for exposure by various routes without causing harmful effects in the human body (DNEL):

- for workers and the general population (by inhalation) :
 - acute, short-term chronic exposure DNEL : 3.1 mg/ m³
 - acute, short-term local exposure DNEL : 3.1 mg/ m³
 - long-term chronic exposure DNEL : 1.55 mg/ m³
 - long-term local exposure DNEL : 1.55 mg/ m³
- for workers and the general population (through the skin) :
 - long-term local exposure DNEL : 0.5%
- for the general population (oral route) :
 - long-term DNEL : 0.25 mg/kg bw/day

The PNEC (Predicted No Effect Concentration) was also established PNEC for the aquatic environment:

- for potable water PNEC : 0.21 µg/l
- for seawater PNEC : 0.042 µg/l
- for water (intermittent release) PNEC : 0.26 µg/l
- for water transferred to the treatment plant: PNEC: 0.03 µg/l
- PNEC for living organisms for the oral route : 11.1 mg/kg food

8.2. Exposure controls

See Appendix to the Material Safety Data Sheet: exposure scenarios for identified uses.

Appropriate technical control measures: it is necessary to use general ventilation in the room.

Personal protective equipment - individual protective equipment:



Eyes / face protection:

Use protective goggles or a face shield (according to standard EN 166).

Skin protection:

Hands protection:

Use chemical-resistant protective gloves made of PVC or equivalent according to EN-PN 374:2005.

Material of the gloves:

Selection of adjusted gloves depends on the material but also on a brand and quality assured by a manufacturer. Resistance of the material the gloves are made from may be determined after tests. Accurate gloves destroying time must be determined by a manufacturer.

Other:

Use protective work clothing (according to EN 344) - wash regularly.

MATERIAL SAFETY DATA

SODIUM HYPOCHLORITE

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

Airways protection:

Avoid inhalation of product vapors. Under the conditions of exceeding the NDS (the highest permissible concentration) of the components in the working environment, use individual respiratory protection equipment - a mask or a half-mask complete with a filter and a type B or universal vapor absorber (class 2) according to EN 141.

Thermal hazards:

Not applicable.

Environment exposure control

Do not enable spreading in the environment and penetration of the sewage and water courses.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

a)	State:	Liquid
b)	Color	Yellow-green
c)	Smell	Sharp, suffocating
d)	Melting / solidification temperature <i>(not applicable to gases)</i>	-28.9°C ÷ -17°C
e)	Boiling temp or Preliminary boiling temperature and range of boiling temperatures:	No data
f)	Flammability of materials <i>(applies to gases, liquids, solids)</i>	The substance is not flammable
g)	Lower and upper explosive limits <i>(not applicable to solids)</i>	Not applicable - poses no explosion hazard of its own
h)	Flash point <i>(not applicable to gases, aerosols and solids)</i>	No data
i)	Self-ignition temperature <i>(applies to gases and liquids only)</i>	It is not self-inflamatory
j)	Decomposition temperature <i>(applies only to self-reactive substances and mixtures, organic peroxides and other substances and mixtures that can decompose)</i>	25°C
k)	pH <i>(not applicable to gases)</i>	>11
l)	Kinematic viscosity <i>(applies to liquids only)</i>	No data
m)	Solubility	Total solubility in water
n)	Partition coefficient n- octanol/water (log ratio value)	-3.42
o)	Vapor pressure	2500Pa
p)	Density or relative density <i>(applies to liquids and solids only)</i>	1,3 +/- 0,001 g/cm ³

MATERIAL SAFETY DATA

SODIUM HYPOCHLORITE

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

q)	Relative vapor density (applies to gases and liquids only)	No data
r)	Particle characteristics (applies to solids only)	Not applicable

9.2. Other information

a)	Viscosity (dynamically)	6,4mPa.s
----	-------------------------	----------

SECTION 10: Stability and reactivity

10.1. Reactivity

When reacting with acid, it generates heat and releases chlorine gas. Heavily oxidizing material. Has a corrosive effect on most metals, especially when exposed to moisture. It reacts explosively with hydrogen, powdered metals and many organic substances. Sodium hypochlorite decomposes when exposed to:

- heating
- contact with acids
- sunlight

10.2. Chemical stability

Perishable product. It easily decomposes with the release of toxic oxidizing substances (at 25° C oxygen is released, at 35° C chlorine, at 100° C chlorine dioxide).

10.3. Hazardous reactions

Substances that react dangerously with sodium hypochlorite: combustible materials, strong acids, reducing agents, organic compounds, amines, ammonium salts, cellulose, metals.

10.4. Conditions to be avoided

Avoid elevated temperatures (exceeding 25°C), direct sunlight, hot surfaces and open flames. Keep away from humidity.

10.5. Incompatible materials

Light metals: zinc, tin, aluminum and their alloys react to release hydrogen. Heavy metals: nickel, chromium, manganese and iron accelerate the decomposition of hypochlorite. Acids (violent reactions with the release of chlorine)....

10.6. Hazardous products of decomposition

In contact with incompatible materials, under conditions of increased temperature, light or pollution the substance decomposes with the formation of: chlorine, chlorine dioxide.

SECTION 11: Toxicological Information

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

a)	Acute toxicity	On the basis of the available data the criteria of classification are not satisfied Toxicological data: oral, rat Concentration of the substance: 12,5% w/w Dose estimates: LD50: 1100 mg/kg based on active chlorine. Skin: rabbit Concentration of the substance: 12.5% w/w Dose: 7, 5; 10,4, 14,43, 20 g/kg Observation time: 14 days Dose estimates: LD50: 20,000 mg/kg based on active chlorine. Inhalation: rat Concentration of the substance: 10.5% w/w Exposure time: 1h Dose estimates: LD50 10,500 mg/kg based on active chlorine
----	----------------	---

MATERIAL SAFETY DATA

SODIUM HYPOCHLORITE

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

b)	Caustic / skin irritation	Causes severe skin burns to skin: rabbits and guinea pigs Concentration: 5% w/w Dose: 0.5 mg Observation time: 1h, 4h, 24h, 48h Result: corrosive effect.
c)	Serious damage to eyes/eye irritation:	Causes serious eye damage to eyes: rabbits and guinea pigs Concentration: 5% w/w Dose: 0.5 mg Observation time: 24h, 48h, 72h. Result: respiratory irritant: mice Concentration: 10% w/w (aerosol) Result: LD50= 0,5ppm Result: strong irritant effect
d)	Skin / airways sensitizing:	On the basis of the available data the criteria of classification are not satisfied
e)	Mutagenic for reproductive cells:	On the basis of the available data the criteria of classification are not satisfied
f)	Carcinogenicity:	On the basis of the available data the criteria of classification are not satisfied
g)	Reproductive toxicity	On the basis of the available data the criteria of classification are not satisfied
h)	Specific target organ toxicity - single exposure	May cause respiratory irritation.
i)	Specific target organ toxicity - repeated	On the basis of the available data the criteria of classification are not satisfied
j)	Hazards arising from aspiration	On the basis of the available data the criteria of classification are not satisfied

11.2. Information on other hazards

Information on exposure hazards:

Skin contact: chemical burns, hard-to-heal wounds.

Eye contact: chemical burns - risk of permanent eye damage.

Respiratory system: chemical burns of the mucous membranes of the nose, throat and distal segments of the respiratory system, Gastrointestinal tract: chemical burns of the mouth, tongue, throat, distal segments of the gastrointestinal tract with the risk of perforation.

Delayed direct and chronic effects of short-term and long-term exposure:

No data

Effects of interaction:

No data

SECTION 12: Ecological information

12.1. Toxicity

Very toxic to aquatic life with long lasting effects.

Do not allow the product to enter drains or ground waters, sewage system and watercourses. Acute toxicity to fish

Lepomis macrochirus: LC50: 0.06 mg/l, 96h

Oncorhynchus kisutch, coho salmon: LC50: 0.032 mg/l, 96h

A conclusion: For the CHEMICAL SAFETY ASSESSMENT, the values LC50= 0.06 mg/l (for fresh water) and LC50= 0.032 mg/l (for seawater) were used sequentially.

Acute toxicity (short-term):

MATERIAL SAFETY DATA

SODIUM HYPOCHLORITE

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

Animals: invertebrates

Daphnia magna (fresh water) Estimated dose: EC50=

0.141 mg/l/48h

Magnitude estimated from observations: LC50 = 0.026mg/l/48h for seawater Species: daphnia

Cerodaphnia dubia

Exposure time: 48h

Dose estimates: EC50= 0.035 mg/l Acute toxicity to

algal population growth:

Species: Myriophyllum spicatum

Exposure time: 4dni

Dose estimates: ErC50 = 0.1 - 0.4 mg and NOEC =0.02mg/l Chronic

toxicity to fish:

Animals: fish

Species: Menidia Peninsulae (salt water)

Exposure time: 28 days

Dose estimates: NOEC: 0.04 mg/l (freshwater) Chronic

toxicity to invertebrates:

Animals: Algae: Periphyton (fresh water)

Exposure time: 7 days

Dose estimates: NOEC: 0.0021mg/l

To classify and assess environmental risks, the range was adopted : 0.01<LC50< 0.1 mg/l

On this basis, the M-factor was estimated: 10.

12.2. Persistence and degradability Degradation

coefficient in water 0.0475 (1.14h) Degradation

coefficient in soil Not applicable

Degradation coefficient in aqueous sediment Not applicable

Degradation coefficient in air 114.6

Sodium chlorate(I) is subject to the hydrolysis reaction in water. It is not possible to determine the biodegradation rate in soil and sediment because sodium chlorate(I) is an inorganic substance. Decomposition in air is mainly due to photolysis and oxidation reactions.

12.3. Bio-accumulation

Does not meet the criteria : octanol/water partition coefficient - log Kow = - 3.42

12.4. Mobility in a soil

Does not meet criteria : calculated adsorption coefficient log KOC =from - 2.97 to 1.12

12.5. Results of assessment of the PBT and the vPvB properties

The substance does not meet the PBT and vPvB criteria.

12.6. Endocrine disrupting properties

A substance that does not disrupt the endocrine system.

12.7. Other harmful effects

No data

SECTION 13: Wastes disposal

13.1. Methods of wastes utilization

Disposal of waste and disposable packaging should be handled by specialized companies. Store the residues in the original containers. Dispose acc. to regulations in force. Empty, cleaned packaging should be disposed of in accordance with applicable regulations.

Determine waste codes at the place of production in accordance with the Ordinance of the Minister of Climate dated 2 January 2020 on the waste catalog (Journal of Laws, item 10):

Community regulations:

Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives.

MATERIAL SAFETY DATA

SODIUM HYPOCHLORITE

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

SECTION 14: Transport information

14.1. UN number or ID number

ADR/RID/IMDG/IATA: UN 1791

14.2. UN proper shipping name

ADR/RID: HYPROCHLORINE IN
SOLUTION IMDG: HYPOCHLORITE SOLUTION
IATA: Hypochlorite solution

14.3. Transport hazard class

ADR/RID/IMDG/IATA: 8

14.4. Packages group

ADR/RID/IMDG/IATA: II

14.5. Hazards for the environment

ADR/RID/IMDG/IATA: yes

14.6. Special precautions for users

transport always in closed containers that are upright, labeled and secured.

14.7. Sea transport in bulk according to IMO instruments

No information

SECTION 15: Regulatory information

15.1. Specific legal regulations regarding the safety, the health and the environment protection for a substance or a mixture.

1. Regulation (EC) No. 1907/2006 dated 18 December 2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), as amended.
2. Commission Regulation (EU) 2020/878 of 18 June 2020 amending Annex II to Regulation (EC) No. 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)
3. Regulation (EC) No. 1272/2008 of the European Parliament and of the Council dated 16 December 2008 (CLP) as amended.
4. Law dated 25 February 2011 on chemical substances and their mixtures (i.e. Journal of Laws 2019, item 1225).
5. Law dated 28 May 2020 on amendments to the Law on chemical substances and their mixtures and some other laws (Journal of Laws 2020, item 1337).
6. Law of 14 December 2012 on waste (i.e. Journal of Laws 2019, item 701). (Journal of (Laws, No. 2019, item 701).
7. Law dated 13 June 2013 on package and waste management (i.e. Journal of Laws of Laws 2019, item 542).
8. Regulation of the Minister of Climate of 2 January 2020 on the waste catalog (Journal of Laws 2020, item 10).
9. Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives.
10. Announcement of the Speaker of the Sejm of the Republic of Poland dated 20 December 2019 on the announcement of the consolidated text of the Law on Transportation of Hazardous Goods (Journal of Laws 2020, item 154).
11. ADR Agreement 2019 - Government Statement of 18 February 2019 on the entry into force of the amendments to Annexes A and B to the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), done at Geneva on 30 September 1957 (Journal Laws, item 769).
12. Ordinance of the Minister of Labor and Social Policy dated 12 June 2018 on permissible concentrations and strengths of compounds / substances harmful for health in the work environment (Journal of Laws, item 1286 as amended).
13. Ordinance of the Minister of Health dated 30 December 2004 on safety and hygiene of work related to existence of chemical agents at the work environment (i.e. (Journal of (Laws, No. 2016, item 1488).
14. Ordinance of the Minister of Health dated 9 December 2003 on substances which pose serious hazard for the environment (Journal of Laws No. 217, item 2172).

SODIUM HYPOCHLORITE

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

15.2. Assessment of the chemical safety

A chemical safety assessment was conducted for the substance.

Appendix XIV to the Regulation REACH – List of substances subject of the permit procedure: not applicable

SVHC - Substance of very high concern waiting for permit: Not applicable

Appendix XVII to the Regulation REACH – Restrictions concerning production, entering into the market and application of some of hazardous substances: not applicable

SECTION 16: Other Information

H statements:

H290 - May be corrosive to metals.

H314 - Causes severe skin burns and eye damage

H315 - Causes skin irritation

H318 - Causes serious eye damage

H319 - Causes serious eye irritation

H335 - May cause airway irritation

H400 - Very toxic to aquatic organisms.

H410 - Very toxic to aquatic life with long lasting effects

EUH031 - releases toxic gases on contact with acids

Description of applied abbreviations, acronyms and symbols:

Met. Corr. 1 - substance or mixture corrosive to metals cat. 1

Skin Corr. 1B – Caustic for skin 1A.

Skin Corr. 1B – Caustic for skin 1B.

Skin Irrit. 2 – skin irritating, cat. 2

Eye Dam. 1 - Serious eye damage cat. 1

Eye Irrit. 2- Eye irritation cat. 2

STOT SE 3 – Specific target organ toxicity - single exposure STOT cat. 3

Aquatic Acute 1 - hazardous to the aquatic environment cat.1

Aquatic Chronic 1 - hazardous to the aquatic environment cat.1 NDS - Maximum Permissible Concentration.

NDSP – The Highest Upper Limit Concentration

NDSch – The Highest Temporary Concentration

DNEL - derived dose level (concentration) at which no harmful changes are observed. PNEC: Predicted No Effect Concentration

LC50 - (lethal concentration) - median lethal concentration, a statistically determined concentration of a substance, after exposure to which 50 percent of the organisms (exposed to the substance) can be expected to die during the exposure or during a specified contractual post-exposure period.

LD50 - (lethal dose) - medial lethal dose, the statistically determined size of a single dose of a substance, after administration of which 50% of exposed test organisms can be expected to die.

EC50 - (effective concentration) - medial effective concentration, statistically calculated concentration that induces in the environmental medium the specified effect in 50% of the experimental organisms under specified conditions

NOEC (no observed effects concentration) - the highest concentration for which there is no statistically or biologically significant increase in the frequency or severity of the effects of the substance in the test organisms relative to the control sample.

vPvB - Very persistent and very bioaccumulative substance

PBT - persistent, bioaccumulative and toxic substances

ADR – European agreement on the road transport of hazardous goods.

RID – Regulations Concerning the International Carriage of Dangerous Goods by Rail

IMDG – International Maritime Dangerous Goods Code

IATA – Regulation on the transport of dangerous goods issued by the International Air Transport Association

MATERIAL SAFETY DATA

SODIUM HYPOCHLORITE

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

Changes to the previous version:

Section:	Description:
Section 2	Change in classification and labeling
Section 3	Change in classification

Trainings:

Before commence of work with the product, an employee must take part in an obligatory OHS training since chemical agents are involved. Perform, document and familiarize employees with the results of risk assessment in the workplace with reference to the presence of chemical agents.

RESOURCES

Annex to Regulation (EU) 2020/878 dated 18 June 2020. Legal regulations referred to in section 15 of the MSDS.

Information of the Office for Chemical Substances.

Information contained in the MSDS concern exclusively the product named in the title. The data contained in the data sheet should be considered only as an aid to the safe use of the product: **sodium hypochlorite**. Since conditions of storage and transport are beyond our control, we cannot give legal guarantees. Each time follow statutory regulations as well as regulations stipulated by potential third parties. The MSDS does not comprise an assessment of hazard at job. The product should not be used for purposes other than those laid down in the Section 1 without prior consultation with **TOMCHEM F.H.U.**

Developed at SPIN-DORADTWO www.spin-doradztwo.pl for **TOMCHEM F.H.U.**

MATERIAL SAFETY DATA**SODIUM HYPOCHLORITE**

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

EXPOSURE SCENARIO**SN2**

1. Title	Formulation
Application sector [SU]:	Not applicable
Process categories [PROC]:	PROC1 Use in closed process, no likelihood of exposure PROC2 Use in a closed process with occasional, controlled exposure PROC3 Use in a closed batch process (synthesis or manufacturing) PROC4 Use in batch and other process (synthesis) where the possibility of exposure arises PROC5 Mixing in batch processes for the manufacture of preparations or articles (multistage and/or significant contact with the substance) PROC8b Transfer of substances or a preparation (loading/unloading) to/from vessels/large containers in rooms not intended for this goal PROC8a Transfer of substances or preparations (loading/unloading) from/to vessels/large containers in places not intended for this purpose, PROC9 Transfer of substance or preparation into small containers (dedicated filling line with weighing) PROC14 Manufacturing preparations or products by tableting, pressing, extrusion, granulation PROC15 Use as a laboratory reagent
Category of product obtained by formulation [PC].	PC8 Biocidal products (e.g. disinfectants, pest control products) PC19 Intermediates PC34 Textile dyeing, finishing and impregnation products, including bleaches and other excipients PC20; Products such as pH adjusters, flocculants, precipitants, sludge, neutralizing agents PC37; Water treatment chemicals PC26 Paper and board dyeing, finishing and impregnation products: including bleaches and other excipients
Category of the product [AC]	Not applicable
Environmental Release Category [ERC]:	ERC2 Formulation of preparations
Technical function of the substance in the process	Bleach Intermediate Oxidizer cleaner/disinfectant
2. Operating conditions and risk management measures	
The purpose of this Exposure Scenario (SN) is for the manufacturer to communicate the necessary	

MATERIAL SAFETY DATA**SODIUM HYPOCHLORITE**

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0

This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

minimum information regarding operational conditions and risk control measures for the safe use of the substance by the downstream user. Both participants in the supply chain are required to supplement each other's knowledge in this regard in order to improve this SN. A set of operating conditions and risk control measures relating to the worker's activities related to the use of the substance, is called a related scenario.

2.1 Related scenario (1) - environmental exposure control for: ERC2

Characteristics of the substance	Inorganic substance, non-hydrophobic, biodegradable with concentration < 25% active chlorine (mainly 12-14%)
Quantities used	1195.23 kt/yr 24% active chlorine ; number of production facilities: >63
Maximum regional tonnage:	342.58 kT/yr 24% active chlorine
Frequency and duration of use/exposure	Continuous release; 360 days a year
Environmental factors that do not affect risk management	Fresh water: dilution factor of 10 Seawater: dilution factor of 100
Other operational conditions of exposure for the environment	Confined spaces/open space Substance in solution non-volatile (no possibility of release into the atmosphere). The substance in the wastewater is determined as total residual chlorine, the value of which should not exceed: 1.0-10-13 mg/L No possibility of release into the soil.
Conditions and technical measures at the process level to prevent the release	Any available measures to minimize the risk of releasing the effluent gas (the substance reacts violently with organic and inorganic compounds subject to decomposition).
Operational conditions and on-site control measures to reduce or limit spillage/spill, air emissions and release into land	The only route of environmental flare is fresh water. Required sub-treatment plant at each site of operations with the substance. Minimize the risk of releasing undissolved chlorine from the sub-treatment plant to the municipal treatment plant.
Organizational measures to limit/prevent release from the site of use	Well-trained team of operators; monitoring of concentrations at production site to avoid uncontrolled release of a substance
Conditions and measures related to the discharge of wastewater to their municipal treatment plant	A sub-treatment plant is required where complete elimination of substances must take place before the wastewater goes to the municipal sewage treatment plant
Conditions and measures related to external treatment or recovery of waste for disposal.	Disposal of the resulting waste should take place by the relevant entity acting in accordance with national/local legislation.

2.2 Related scenario (2) - worker exposure control for: PROC 1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15.

General handling conditions for all substance activities

G12 - concentration of substances up to 25% active chlorine

G2 - daily exposure frequency: 8h/day OC8 - indoors

Individual conditions of conduct for specific activities

Related scenario	Duration	Concentration	Risk control measures
PROC1	No special conditions required	No special conditions required	Handling of the substances in confined spaces [E47].
PROC2	Does not require using	Does not require using	Use ventilation in areas

MATERIAL SAFETY DATA**SODIUM HYPOCHLORITE**

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

	of special conditions	of special conditions	enabling emissions. [E54]. Process under low pollution conditions
PROC3	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under conditions of a low pollution
PROC4	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under conditions of a low pollution
PROC5	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under conditions of a low pollution
PROC8a	Avoid operating with exposure exceeding 6h .	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under conditions of a low pollution
PROC8b	Avoid operating with exposure exceeding 6h	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under conditions of a low pollution
PROC9	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under low pollution conditions
PROC14	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under low pollution conditions
PROC 15	No special conditions required	No special conditions required	Use ventilation in areas that allow formation of emissions. [E54]

3. Estimation of exposure and relation to its source**3.1 Environment**

EE8 - The qualitative approach used to evaluate the use can be found in Annex II (at the end of this MSDS).
Predicted Environmental Concentration (PEC):

MATERIAL SAFETY DATA**SODIUM HYPOCHLORITE**

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

	<p>The substance does not produce emissions because it is subject to a reduction reaction to sodium chloride during the process. In wastewater treatment plants, active chlorine is eliminated due to reactions with organic compounds. Referring to the qualitative assessment (Annex II of this Safety Data Sheet), the worst-case exposure-inducing concentration used as PEC occurs in wastewater treatment plants and is 1.0-10-13 mg/l. PEC for other components of the environment has no reference, as the substance reacts rapidly with organic and inorganic compounds and decomposes. Indirect exposure to humans via the environment (oral route) Sodium chlorate(I) does not enter the environment from its processing sites, as it is subject to complete elimination in wastewater sub-treatment plants, consequently, there is no possibility of direct exposure for humans to sodium chlorate(I)through environmental components. Due to its physical and chemical properties, there is no possibility of direct human exposure to the substance through the food chain</p>
--	---

3.2 Human health

Exposure route	Concentration		RISK OCCURRENCE CHARACTERISTICS (RCR)		
	Value	Unit	Inhalation	Skin	Total
Chronic local - PROC1	0.02	mg/m3	0.01	-	-
Chronic local - PROC2	1.10	mg/m3	0.71	-	-
Chronic local - PROC3	1.10	mg/m3	0.71	-	-
Chronic local - PROC4	1.20	mg/m3	0.77	-	-
Chronic local - PROC5	1.25	mg/m3	0.81	-	-
Chronic local - PROC8a	1.25	mg/m3	0.81	-	-
Chronic local - PROC8b	1.25	mg/m3	0.81	-	-
Chronic local - PROC9	0.91	mg/m3	0.59	-	-
Chronic Local -	0.23	mg/m3	0.15	-	-

MATERIAL SAFETY DATA

SODIUM HYPOCHLORITE

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

PROC14					
Chronic local - PROC15	0.70	mg/m3	0.45	-	-
4. Guidance to the downstream user on assessing whether he/she is working in accordance with the principles set out in this exposure scenario					
The above guidelines are based on the general assumptions of the operating conditions and Risk Control Measures and may not apply to all substance operations. If CHARACTERISTICS OF RISK (RCR) >1; additional risk control measures should be implemented.					

MATERIAL SAFETY DATA**SODIUM HYPOCHLORITE**

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

SN3

1. Title	Industrial use of sodium chlorate(I) as an intermediate product
Application sector [SU]:	SU8 Bulk, large-scale production of chemicals (including petroleum products) SU9 Production of high-value chemicals
Process categories [PROC]:	PROC1 Use in closed process, no likelihood of exposure PROC2 Use in a closed process with occasional, controlled exposure PROC3 Use in a closed batch process (synthesis or manufacturing) PROC4 Use in batch and other process (synthesis) where the possibility of exposure arises PROC8b Transfer of substances or a preparation (loading/unloading) to/from vessels/large containers in rooms not intended for this goal PROC8a Transfer of substances or preparations (loading/unloading) from/to vessels/large containers in places not intended for it, PROC9 Transfer of substance or preparation into small containers (by dedicated line for filling with weighing)
Category of the product (PC)	PC19 Intermediates
Category of the product [AC]	Not applicable
Environmental Release Category [ERC]:	ERC6a Industrial use resulting in other substances (use of intermediates).
Technical function of the substance in the process	Intermediate
2. Operating conditions and risk management measures	
Goal of this Exposure Scenario (ES) is to provide the manufacturer with the necessary minimum information on operational conditions and risk control measures for the safe use of the substance by the downstream user. Both participants in the supply chain are required to supplement each other's knowledge in this regard in order to improve this SN. Set of operational conditions and Risk Control Measures relating to a worker's activities involving the use of substances is called a related scenario.	
2.1 Related scenario (1) - environmental exposure control for : ERC6a	
Characteristics of the substance	Inorganic substance, non-hydrophobic, biodegradable with a concentration of < 15% active chlorine (mainly 3-5%)
Quantities used	26% of the total total substance requirement (75.96kT/year in terms of chlorine)
Frequency and duration of use/exposure	Continuous release; 360 days a year
Environmental factors that do not affect risk management	Fresh water: dilution factor 10 Sea water: dilution factor 100
Other operational conditions of exposure for the environment	Reactions with organic intermediates in closed, sealed installations. Sodium chlorate(I) is injected into the installation through closed /sealed dosing systems. No possibility of release into the environment. In the worst case scenario, in wastewater, total residual chlorine should be below 1.0-10-13 mg/l
Conditions and technical measures at the process level to prevent the release	All available measures to minimize risks as specified in integrated permits or

MATERIAL SAFETY DATA**SODIUM HYPOCHLORITE**

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

	established by other national/local laws. Gases from the degassing process should be subjected to the combustion process before being released into the atmosphere.		
Operational conditions and on-site control measures to reduce or limit spillage/spill, air emissions and release into land.	The substance must be completely reduced to sodium chloride in the course of the process to avoid the penetration of the non-reduced form into the environment. Do not allow formation of chlorine which could cause the formation of mixtures of strongly alkaline nature		
Organizational measures to limit/prevent release from place where they are applied	Prevent the release into the environment in accordance with applicable local and state law		
Conditions and measures related to the discharge of wastewater to their municipal treatment plant	A sub-treatment plant is required where complete elimination of substances must take place before the wastewater goes to the municipal wastewater treatment plant.		
Conditions and measures related to external treatment or recovery of waste in in order to remove them.	Reduce emissions by burning them in accordance with applicable local and state laws		
2.2 Related scenario (2) - worker exposure control for: PROC 1, 2, 3, 4, 8a, 8b, 9.			
General handling conditions for all substance activities			
G12 - concentration of the substance up to 25% active chlorine G2 - daily frequency of exposure: 8h/day OC8 - indoors			
Individual conditions of conduct for specific activities			
Related scenario	Duration	Concentration	Risk control measures
PROC1	No special conditions required	No special conditions required	Handling of the substances in confined spaces [E47].
PROC2	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under conditions of a low pollution
PROC3	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under conditions of a low pollution
PROC4	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under conditions of a low pollution
PROC8a	Avoid operating with exposure exceeding 6h .	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under conditions of a low pollution
PROC8b	Avoid conducting operations with exposure	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54].

MATERIAL SAFETY DATA**SODIUM HYPOCHLORITE**

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

	exceeding 6h		Process under conditions of a low pollution
PROC9	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under conditions of a low pollution

3. Estimation of exposure and relation to its source**3.1 Human health**

Exposure route	Concentration		RISK OCCURRENCE CHARACTERISTICS (RCR)		
	Value	Unit	Inhalation	Skin	Total
Chronic local - PROC1	0.02	mg/m3	0.01	-	-
Chronic local - PROC2	1.10	mg/m3	0.71	-	-
Chronic local - PROC3	1.10	mg/m3	0.71	-	-
Chronic local - PROC4	1.20	mg/m3	0.77	-	-
Chronic local - PROC8a	1.25	mg/m3	0.81	-	-
Chronic local - PROC8b	1.25	mg/m3	0.81	-	-
Chronic local - PROC9	0.91	mg/m3	0.59	-	-

4. Guidance to the downstream user on assessing whether he/she is working in accordance with the principles set out in this exposure scenario

The above guidelines are based on general assumptions of operational conditions and Risk Control Measures and may not be applicable to all substance operations.

MATERIAL SAFETY DATA**SODIUM HYPOCHLORITE**

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

SN4

1. Title	Use of sodium chlorate(I) in the textile industry
Application sector [SU]:	SU5 Manufacture of textiles, leather and furs
Process categories [PROC]:	PROC1 Use in closed process, no likelihood of exposure PROC2 Use in a closed process with occasional, controlled exposure PROC3 Use in a closed batch process (synthesis or manufacturing) PROC4 Use in batch and other process (synthesis) where the possibility of exposure arises PROC5 Mixing in batch processes for the manufacture of preparations or articles (multistage and/or significant contact with the substance) PROC8b Transfer of substances or a preparation (loading/unloading) to/from vessels/large containers in rooms not intended for this goal PROC8a Transfer of substances or preparations (loading/unloading) from/to vessels/large containers in places not intended for this purpose, PROC9 Transfer of substances or preparations into small containers (dedicated filling line with weighing). PROC13 Treatment of industrial products by soaking or flooding
Category of the product (PC)	PC34 Dyes and products for finishing and impregnation of textile products
Category of the product [AC]	Not applicable
Environmental Release Category [ERC]:	ERC6b Industrial application of reactive auxiliary measures
Technical function of the substance in the process	bleach
2. Operating conditions and risk management measures	
Goal of this Exposure Scenario (ES) is to provide the manufacturer with the necessary minimum information regarding operational conditions and risk control measures for the safe use of the substance by the downstream user. Both participants in the supply chain are required to supplement each other's knowledge in this regard in order to improve this SN. Set of operational conditions and risk control measures relating to a worker's activities involving use of substances is called a related scenario.	
2.1 Related scenario (1) - environmental exposure control for : ERC6b	
Characteristics of the substance	Inorganic substance, non-hydrophobic, biodegradable with a concentration of < 15% active chlorine (mainly 3-5%)
Quantities used	12.05kT/year per chlorine in Europe in 1994
Frequency and duration of use/exposure	Continuous release; 360 days a year
Environmental factors that do not affect risk management	Fresh water: dilution factor 10 Sea water: dilution factor 100
Other operational conditions of exposure for the environment	The process of removing substances from wastewater includes use of sulfates.

MATERIAL SAFETY DATA**SODIUM HYPOCHLORITE**

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

	No possibility of release into the environment. In the worst case, in wastewater, the total residual chlorine should be below 1.0E-13 mg/l		
Conditions and technical measures at the process level to prevent the release	All available risk minimization measures specified in integrated permits or established by other national/local laws. Gases from the degassing process should be subjected to the combustion process before releasing them into the atmosphere.		
Operational conditions and control measures at the site of application to reduce or limit spills/spillage, emissions to the air and release to the ground.	Wool chlorination is carried out in an acidic environment that produces chlorine gas, hence the need for a high degree of separation of production centers from the local community in order to prevent direct contact with the releasing chlorine.		
Organizational measures to limit/prevent release from the site of use	Prevent the release into the environment in accordance with applicable local and state law		
Conditions and measures related to the discharge of wastewater to their municipal treatment plant	A sub-treatment plant is required where complete elimination of substances must take place before the wastewater goes to the municipal sewage treatment plant		
Conditions and measures related to external cleaning or recovery of waste for disposal	Reduce emissions by burning them in accordance with applicable local and/or state laws		
2.2 Related scenario (2) - worker exposure control for: PROC 1, 2, 3, 4, 9, 13			
General handling conditions for all substance activities:			
G12 - concentration of substances up to 25% active chlorine G2 - daily exposure frequency: 8h/day OC8 - indoors			
Individual conditions of conduct for specific activities			
Related scenario	Duration	concentration	Risk control measures
PROC1	No special conditions required	No special conditions required	Handling of the substances in confined spaces [E47].
PROC2	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under low pollution conditions
PROC3	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54 Process under low pollution conditions
PROC4	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under low pollution conditions
PROC5	No special conditions required	No special conditions required	Use ventilation in areas that allow formation of emissions. [E54]. Process under conditions of

MATERIAL SAFETY DATA**SODIUM HYPOCHLORITE**

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

			a low pollution
PROC8a	Avoid operating with exposure exceeding 6h .	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under low pollution conditions
PROC9	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under low pollution conditions
PROC13	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under low contamination conditions. Minimize user exposure through local closed ventilation or appropriate equipment

3. Estimation of exposure and relation to its source**3.1 Human health**

Exposure route	Concentration		RISK OCCURRENCE CHARACTERISTICS (RCR)		
	Value	Unit	Inhalation	Skin	Total
Chronic local - PROC1	0.02	mg/m3	0.01	-	-
Chronic local - PROC2	1.10	mg/m3	0.71	-	-
Chronic local - PROC3	1.10	mg/m3	0.71	-	-
Chronic local - PROC5	1.25	mg/m3	0.81	-	-
Chronic local - PROC8a	1.25	mg/m3	0.81	-	-
Chronic local - PROC8b	1.25	mg/m3	0.81	-	-
Chronic local - PROC9	0.91	mg/m3	0.59	-	-
Chronic local - PROC13	0.70	mg/m3	0.45	-	-

MATERIAL SAFETY DATA

SODIUM HYPOCHLORITE

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

3.2 Environment protection

EE8 - The qualitative approach used to evaluate the use can be found in Annex II (at the end of this MSDS).
Predicted Environmental Concentration (PEC):
In case of the substance's use in the textile industry, no significant release into the environment is expected due to the operational conditions used at the various production stages as well as the rapid decomposition of sodium chlorate(I).
With reference to the qualitative assessment (Annex II to this Safety Data Sheet), the worst-case exposure-inducing concentration, expressed as PEC, occurs in wastewater treatment plants and is 1.0E-13 mg/l. PEC for other components of the environment is not relevant, as it reacts rapidly with organic and inorganic compounds subject to rapid elimination. Indirect human exposure via the environment (oral route) Sodium chlorate(I) does not enter the environment from its processing sites, as it is completely eliminated in wastewater sub-treatment plants, consequently there is no possibility of direct human exposure to sodium chlorate(I). Due to the physical and chemical properties, there is no possibility of direct human exposure to the substance through the food chain.

4. Guidance to the downstream user on assessing whether he/she is working in accordance with the principles set out in this exposure scenario

The above guidelines are based on the general assumptions of the operating conditions and Risk Control Measures and may not apply to all substance operations. If CHARACTERISTICS OF RISK (RCR) >1; additional risk control measures should be implemented.

MATERIAL SAFETY DATA**SODIUM HYPOCHLORITE**

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

SN5

1. Title	Industrial application in the treatment of wastewater, cooling and heating water
Application sector [SU]:	SU23 Electricity, steam, gas, water supply and sewage treatment
Process categories [PROC]:	PROC1 Use in closed process, no likelihood of exposure PROC2 Use in a closed process with occasional, controlled exposure PROC3 Use in a closed batch process (synthesis or manufacturing) PROC4 Use in batch and other process (synthesis) where the possibility of exposure arises PROC5 Mixing or blending in batch processes for preparation of preparations and articles (multi-stage and/or significant contact), industrial conditions; PROC8b Transfer of substances or a preparation (loading/unloading) to/from vessels/large containers in rooms not intended for this goal PROC8a Transfer of substances or preparations (loading/unloading) from/to vessels/large containers in places not intended for this purpose, PROC9 Transfer of substance or preparation to small containers (dedicated filling line with weighing)
Category of the product (PC)	PC8 Biocidal products (e.g. disinfectants, pest control measures) PC20 Products such as pH adjusters, flocculants, precipitants, antacids, other unspecified PC 37 Water treatment chemicals
Category of the product [AC]	Not applicable
Environmental Release Category [ERC]:	ERC6b Industrial application of reactive auxiliary measures
Technical function of the substance in the process	Oxidant pH regulator biocide
2. Operating conditions and risk management measures	
Goal of this Exposure Scenario (ES) is to provide the manufacturer with the necessary minimum information regarding operational conditions and risk control measures for the safe use of the substance by the downstream user. Both participants in the supply chain are required to supplement each other's knowledge in this regard in order to improve this SN. Set of operational conditions and risk control measures relating to a worker's activities involving use of substances is called a related scenario.	
2.1 Related scenario (1) - environmental exposure control for: ERC6b	
Characteristics of the substance	Inorganic substance, non-hydrophobic, biodegradable with a concentration of < 15% active chlorine (mainly 3-5%)
Quantities used	15.18kT/year (converted to chlorine 9.55kT/year) in Europe in 1994 (Cooling Water:

MATERIAL SAFETY DATA

SODIUM HYPOCHLORITE



Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0

This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

	consumption sodium chlorate(I) approx. 5.58kT/year in terms of for chlorine, consumption of chlorine gas approx. 4.80 kT/year).		
Frequency and duration of use	Continuous release; 360 days a year		
Environmental factors that do not affect risk management	Fresh water: dilution factor 10 Sea water: dilution factor 100		
Other operational conditions of exposure for the environment	The water cooling process should take place in accordance with the IPPC integrated permit and in accordance with the BAT (best available technique) for the water cooling process. Specific operating conditions should be accordant with the above permits. The process of disinfection of wastewater and water requires the use of dosage: 5-40mgCl ₂ /l. The amount of chlorine used should be selected to minimize the risk of chlorine entering the environment. At worst, in wastewater, the total residual chlorine should be below 1.0-10-13 mg/l		
Conditions and technical measures at the process level to prevent the release	The possibility of release is not expected, however, preventive measures are recommended		
Operational conditions and on-site control measures for reduction or limitation of spills/spills, emissions into the air and release into the ground.	Sodium chlorate(I) should be completely reduced to sodium chloride, preventing its critical release into the environment		
Organizational measures restricting/preventing release from the application site	Prevent the release into the environment in accordance with applicable local and state law		
Conditions and measures related to the discharge of wastewater to their municipal treatment plant	A sub-treatment plant is required, where complete elimination of substances must take place before the wastewater goes to the municipal treatment plant		
Conditions and measures related to external treatment or recovery of waste for disposal	Disposal and disposal of waste should be carried out by entities authorized to do so in accordance with the law (local/national)		
2.2 Related scenario (2) - worker exposure control for: PROC 1, 2, 3, 4, 5, 8a, 8b, 9.			
General handling conditions for all substance activities:	G12 - concentration of substances up to 25% active chlorine G2 - daily exposure frequency: 8h/day OC8 - indoors		
Individual conditions of conduct for specific activities			
Related scenario	Duration	Concentration	Risk control measures
PROC1	No special conditions required	No special conditions required	Handling the substance under confined conditions [E47].
PROC2	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under low pollution conditions
PROC3	Does not require using	Does not require using	Use ventilation in areas that allow

MATERIAL SAFETY DATA**SODIUM HYPOCHLORITE**

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

	of special conditions	of special conditions	formation of emissions. [E54] Process under low pollution conditions
PROC4	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under low pollution conditions
PROC5	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under low pollution conditions
PROC8a	Avoid operating with exposure exceeding 6h .	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under low pollution conditions
PROC8b	Avoid operating with exposure exceeding 6h	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under low pollution conditions
PROC9	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under low pollution conditions

3. Estimation of exposure and relation to its source**3.1 Human health**

Exposure way	Concentration		RISK OCCURRENCE CHRAKTERISTICS (RCR)		
	Value	Unit	Inhalation	Skin	Total
Chronic local - PROC1	0.02	mg/m3	0.01	-	-
Chronic local - PROC2	1.10	mg/m3	0.71	-	-
Chronic local - PROC3	1.10	mg/m3	0.71	-	-
Chronic local - PROC4	1.20	mg/m3	0.71	-	-
Chronic local - PROC5	1.25	mg/m3	0.81	-	-
Chronic Local -	1.25	mg/m3	0.81	-	-

MATERIAL SAFETY DATA

SODIUM HYPOCHLORITE

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

PROC8a					
Chronic local - PROC8b	1.25	mg/m3	0.81	-	-
Chronic local - PROC9	0.91	mg/m3	0.59	-	-
3.2 Environment protection			<p>EE8 - The qualitative approach used to evaluate the use can be found in Annex II (at the end of this MSDS). Predicted Environmental Concentration (PEC): The release of sodium chlorate(I) into the aquatic environment is generally at a low level due to the rapid destruction of the substance in contact with organic compounds. Due to the violent reaction of the substance and organic substances, the total residual chlorine is inactivated with a rate of disappearance that increases with the concentration of the substance. Referring to the qualitative assessment (Annex II of this Material Safety Data Sheet), the worst-case exposure-inducing concentration used as PEC occurs in wastewater treatment plants and equals 1.0-10-13 mg/l. The PEC for other environmental components is not relevant because it reacts rapidly with organic and inorganic compounds subject to elimination. Indirect human exposure via the environment (oral route) Sodium chlorate(I) does not enter the environment from its processing sites because it is completely eliminated in wastewater sub-treatment plants, consequently there is no possibility of direct human exposure to sodium chlorate(I). Due to its physical and chemical properties Due to the physical and chemical properties, there is no possibility of direct exposure of a man to the substance through the food chain.</p>		
4. Guidance to the downstream user on assessing whether he/she is working in accordance with the principles set out in this exposure scenario					
The above guidelines are based on general assumptions of operational conditions and Risk Control Measures and may not be applicable to all substance operations. In case of RISK CONCERNS (RCR) >1; additional risk control measures should be implemented.					

MATERIAL SAFETY DATA**SODIUM HYPOCHLORITE**

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

SN6

1. Title	Industrial application in the pulp and paper industry
Application sector [SU]:	SU6b Manufacture of pulp, leather and fur
Process categories [PROC]:	PROC1 Use in closed process, no likelihood of exposure PROC2 Use in a closed process with occasional, controlled exposure PROC3 Use in a closed batch process (synthesis or manufacturing) PROC4 Use in batch and other process (synthesis) where the possibility of exposure arises PROC5 Mixing or blending in batch processes for preparation of formulations and articles (multistage and/or significant contact), industrial conditions; PROC8b Transfer of substances or a preparation (loading/unloading) to/from vessels/large containers in rooms not intended for this goal PROC8a Transfer of substances or preparations (loading/unloading) from/to vessels/large containers in places not intended for this purpose, PROC9 - Transfer of substances or preparations into small containers (due to dedicated filling line with weighing).
Category of the product (PC)	PC26 Products for staining, finishing and impregnation: including bleaches and other excipients
Category of the product [AC]	Not applicable
Environmental Release Category [ERC]:	ERC6b Industrial application of reactive auxiliary substances
Technical function of the substance in the process	bleach oxidizer
2. Operating conditions and risk management measures	
Goal of this Exposure Scenario (ES) is to provide the manufacturer with the necessary minimum information regarding operational conditions and risk control measures for the safe use of the substance by the downstream user. Both participants in the supply chain are required to supplement each other's knowledge in this regard in order to improve this SN. Set of operational conditions and risk control measures relating to a worker's activities involving use of substances is called a related scenario.	
2.1 Related scenario (1) - environmental exposure control for : ERC6b	
Characteristics of the substance	Inorganic substance, non-hydrophobic, biodegradable with a concentration of < 15% active chlorine (mainly 3-5%)
Quantities used	17.43kT/year of sodium chlorate and 8.53kT/year of chlorine were used in Europe in 1994 for cellulose and paper products.
Frequency and duration of use	Continuous release; 360 days a year
Environmental factors that do not affect risk management	Fresh water: dilution factor 10 Sea water: dilution factor 100
Other operational conditions of exposure for the environment	The concentration of sodium chlorate(I) in process systems during the cleaning process is

MATERIAL SAFETY DATA

SODIUM HYPOCHLORITE



Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0

This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

	<p>low and marked quantities of free sodium chlorate at the end of the process are residual. Not expected to be released into the environment. In the worst case scenario, in wastewater, total residual chlorine should be below 1.0-10-13 mg/l</p>		
Conditions and technical measures at the process level to prevent the release	<p>The following applications in the pulp and paper process are anticipated: - disinfection of paper machines - removal of moisture from resins</p>		
Operational conditions and control measures at the site of application to reduce or limit spills/spillage, emissions to the air and release to the ground.	<p>Sodium chlorate(I) should be completely reduced to sodium chloride, preventing its critical release into the environment</p>		
Organizational measures to limit/prevent release from the site of use	<p>Products containing sodium chlorate(I)sodium chlorate referred to in this scenario have, among other things, biocidal properties. Information on technical measures at the process level is codified in Directive No. 98/8/EC; in Poland, in the Law on Biocidal Products dated 13 September 2002</p>		
Conditions and measures related to the discharge of wastewater to their municipal treatment plant	<p>A sub-treatment plant is required, where complete elimination of substances must take place before the wastewater goes to the municipal treatment plant</p>		
Conditions and measures related to external treatment or recovery of waste for disposal.	<p>Disposal and disposal of waste should be carried out by entities authorized to do so in accordance with the law (local/national)</p>		
2.2 Related scenario (2) - worker exposure control for: PROC 1, 2, 3, 4, 5, 8a, 8b, 9			
General handling conditions for all substance activities:			
G12 - concentration of substances up to 25% active chlorine			
G2 - daily exposure frequency: 8h/day OC8 - indoors			
Individual conditions of conduct for specific activities			
Related scenario	Duration	Concentration	Risk control measures
PROC1	No special conditions required	No special conditions required	Handling the substance under confined conditions [E47].
PROC2	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under low pollution conditions
PROC3	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54 Process under low pollution conditions
PROC4	No special conditions required	No special conditions required	Use ventilation in areas that allow formation of emissions. [E54]. Process under conditions of

MATERIAL SAFETY DATA

SODIUM HYPOCHLORITE

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

			a low pollution
PROC5	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under low pollution conditions
PROC8a	Avoid operating with exposure exceeding 6h .	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under low pollution conditions
PROC8b	Avoid operating with exposure exceeding 6h .	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under low pollution conditions
PROC9	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under low pollution conditions

3. Estimation of exposure and relation to its source

3.1 Environment

EE8 - The qualitative approach used to evaluate the use can be found in Annex II (at the end of this MSDS).
Predicted Environmental Concentration (PEC):
Referring to the qualitative assessment (Annex II of this Material Safety Data Sheet), the worst-case exposure-inducing concentration used as PEC occurs in wastewater treatment plants and equals 1.0-10-13 mg/l.
PEC for other environmental components has no reference because it reacts violently with organic and inorganic compounds subject to elimination. Indirect exposure to humans through the environment (oral route)
Sodium chlorate(I) does not enter the environment from its processing sites because it is subject to complete elimination in wastewater sub-treatment plants, consequently, there is no possibility of direct exposure for humans to sodium chlorate(I).
Also, no potential exposure to sodium chlorate(I) is expected in production areas due to the lack of emissions of unreacted sodium chlorate(I).
Due to the physical and chemical properties, there is no possibility of direct human exposure to the substance through the food chain.

3.2 Human health

See Annex III (at the end of this Material Safety Data Sheet) for more information regarding the models used in the exposure calculations for your application.

MATERIAL SAFETY DATA**SODIUM HYPOCHLORITE**

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

Exposure way	Concentration		RISK OCCURRENCE CHARACTERISTICS (RCR)		
	Value	Unit	Inhalation	Skin	Total
Chronic local - PROC1	0.02	mg/m3	0.01	-	-
Chronic local - PROC2	1.10	mg/m3	0.71	-	-
Chronic local - PROC3	1.10	mg/m3	0.71	-	-
Chronic local - PROC4	1.20	mg/m3	0.71	-	-
Chronic local - PROC5	1.25	mg/m3	0.81	-	-
Chronic local - PROC8a	1.25	mg/m3	0.81	-	-
Chronic local - PROC8b	1.25	mg/m3	0.81	-	-
Chronic local - PROC9	0.91	mg/m3	0.59	-	-
4. Guidance to the downstream user on assessing whether he/she is working in accordance with the principles set out in this exposure scenario					
The above guidelines are based on general assumptions of operating conditions and risk control measures and may not be applicable to all operations involving the substance. In case of RISK (RCR) >1; additional risk control measures should be implemented.					

MATERIAL SAFETY DATA**SODIUM HYPOCHLORITE**

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

SN7

1. Title	Industrial use of sodium chlorate(I) as a cleaning agent
Application sector [SU]:	SU4 Food manufacturing
Process categories [PROC]:	PROC5 Mixing or blending in batch processes preparation of preparations and articles (multi-stage and/or significant contact), industrial conditions; PROC7 Industrial spraying PROC8a Transfer of substances or preparations (loading/unloading) from/to vessels/large containers in places not intended for this purpose, PROC9 Transfer of substances or preparations into small containers (dedicated filling line with weighing). PROC10 Application by brush or roller PROC13 Treatment of industrial products by dipping or pouring
Category of the product (PC)	PC35 Washing and cleaning agents (including those based on solvents.
Category of the product [AC]	Not applicable
Environmental Release Category [ERC]:	ERC6b Industrial application of reactive auxiliary substances
Technical function of the substance in the process	Other: cleaning agent
2. Operating conditions and risk management measures	
Goal of this Exposure Scenario (ES) is to provide the manufacturer with the necessary minimum information regarding operational conditions and risk control measures for the safe use of the substance by the downstream user. Both participants in the supply chain are required to supplement each other's knowledge in this regard in order to improve this SN. A set of operating conditions and risk control measures relating to the worker's activities related to the use of the substance, is called a related scenario.	
2.1 Related scenario (1) - environmental exposure control for : ERC6b	
Characteristics of the substance	Inorganic substance, non-hydrophobic, biodegradable with a concentration of < 15% active chlorine (mainly 3-5%)
Quantities used	250-400T/yr of sodium chlorate(I) solution (5% - ego solution)
Frequency and duration of use/exposure	Continuous release; 360 days a year
Environmental factors that do not affect risk management	Fresh water: dilution factor 10 Sea water: dilution factor 100
Other operational conditions of exposure for the environment.	Avoid release to the environment or municipal wastewater treatment plants although the substance reacts to reduce with organic compounds found in industrial and municipal wastewater therefore no release to the environment is expected At worst, in wastewater, the total residual chlorine should be below 1.0-10-13 mg/l
Conditions and technical measures at the process level to prevent the release	The products containing sodium chlorate(I) referred to in this scenario have, among other things, biobased properties. Information on technical measures at the process level, have been standardized

MATERIAL SAFETY DATA**SODIUM HYPOCHLORITE**

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

	in the Directive No. 98/8/EC; in Poland, in the Biobased Products Act dated 13 September 2002.		
Operational conditions and on-site control measures to reduce or limit spillage/spill, air emissions AND release into the soil	Sodium chlorate(I) should be completely reduced to sodium chloride, preventing its critical release into the environment		
Organizational measures to limit/prevent release from the site of use	Products containing sodium chlorate(I)sodium chlorate referred to in this scenario have, among other things, biocidal properties. Information on technical measures at the process level, unified in the Directive No. 98/8/EC; in Poland, in the Biobased Products Act dated 13 September 2002.		
Conditions and measures related to the discharge of wastewater to their municipal treatment plant	A sub-treatment plant is required, where complete elimination of substances must take place before the wastewater goes to the municipal treatment plant		
Conditions and measures related to external treatment or recovery of waste for disposal.	Disposal and disposal of waste should be carried out by entities authorized to do so in accordance with the law (local/national)		
2.2 Related scenario (2) - worker exposure control for: PROC 5, 7, 8a, 9, 10, 13.			
General handling conditions for all substance activities			
G12 - concentration of substances up to 25% active chlorine G2 - daily exposure frequency: 8h/day OC8 - indoors			
Individual conditions of conduct for specific activities			
Related scenario	Duration	Concentration	Risk control measures
PROC5	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under conditions of a low pollution
PROC7	OC28 - Avoid performing activities with exposure exceeding 4h	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under medium contamination conditions. Minimize user exposure through local closed-circuit ventilation or appropriate equipment.
PROC8a	Avoid operating with exposure exceeding 6h .	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under conditions of a low pollution
PROC9	Does not require using	Does not require using	Use ventilation in areas

MATERIAL SAFETY DATA**SODIUM HYPOCHLORITE**

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

	of special conditions	of special conditions	enabling emissions. [E54]. Process under conditions of a low pollution
PROC10	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under conditions of average pollution.
PROC13	No special conditions required	No special conditions required	Use ventilation in areas that allow emissions to occur. [E54]. Process under medium contamination conditions. Minimize user exposure through local closed-circuit ventilation or appropriate equipment.

3. Estimation of exposure and relation to its source**3.1 Human health**

Exposure way	Concentration		RISK OCCURRENCE CHARACTERISTICS (RCR)		
	Value	Unit	Inhalation	Skin	Total
Chronic local - PROC5	1.25	mg/m3	0.81	-	-
Chronic local - PROC7	1.20	mg/m3	0.77	-	-
Chronic local - PROC8a	1.25	mg/m3	0.81	-	-
Chronic local - PROC9	0.91	mg/m3	0.59	-	-
Chronic local - PROC10	1.00	mg/m3	0.65	-	-
Chronic local - PROC13	0.70	mg/m3	0.45	-	-

3.2 Environment

EE8 - The qualitative approach used to evaluate the use can be found in Annex II (at the end of this MSDS). Predicted Environmental Concentration (PEC): With reference to the qualitative assessment (Annex II to this Safety Data Sheet), the worst-case

MATERIAL SAFETY DATA

SODIUM HYPOCHLORITE

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

case exposure-inducing concentration used as PEC occurs in wastewater treatment plants and is 1.0-10-13 mg/l.
PEC for other environmental components has no reference because it reacts violently with organic and inorganic compounds subject to elimination. Indirect human exposure via the environment (oral route). Sodium chlorate(I) does not enter the environment from its processing sites because it is completely eliminated in wastewater sub-treatment plants, consequently there is no possibility of direct human exposure to sodium chlorate(I). Also, no potential exposure to sodium chlorate(I) is expected in production areas due to the lack of emissions of unreacted sodium chlorate(I). Due to the physical and chemical properties, there is no possibility of direct human exposure to the substance through the food chain.

4. Guidance to the downstream user on assessing whether he/she is working in accordance with the principles set out in this exposure scenario

The above guidelines are based on general assumptions of operational conditions and Risk Control Measures and may not be applicable to all substance operations. In case of RISK CONCERNS (RCR) >1; additional risk control measures should be implemented.

MATERIAL SAFETY DATA**SODIUM HYPOCHLORITE**

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

SN8

1. Title	Professional use as a cleaning agent
Application sector [SU]:	SU4 Food manufacturing
Process categories [PROC]:	PROC5 Mixing in batch processes for the manufacture of preparations or articles (multistage and/or significant contact with the substance) PROC7 Spraying in industrial conditions and processes PROC9 Transfer of substances or preparations into small containers (dedicated filling line with weighing). PROC10 Brush or roller application PROC11 Non-industrial spray application PROC13 Treatment of industrial products by soaking or flooding PROC15 Use as a laboratory reagent
Category of the product (PC)	PC35 Washing and cleaning agents (including products based on solvents)
Category of the product [AC]	Not applicable
Environmental Release Category [ERC]:	ERC8a; Large-scale, indoor use of open systems excipients. ERC8b; Large-scale, indoor use of reactive substances in open systems ERC8d; Large-scale, outdoor use of open systems excipients. ERC8e; Large-scale, outdoor use of reactive substances in open systems
Technical function of the substance in the process	Other: cleaning agent
2. Operating conditions and risk management measures	
Goal of this Exposure Scenario (ES) is to provide the manufacturer with the necessary minimum information regarding operational conditions and risk control measures for the safe use of the substance by the downstream user. Both participants in the supply chain are required to supplement each other's knowledge in this regard in order to improve this SN. A set of operating conditions and risk control measures relating to the worker's activities related to the use of the substance, is called a related scenario.	
2.1 Related scenario (1) - environmental exposure control for : ERC8a; ERC8b; ERC8d; ERC8e;	
Characteristics of the substance	Inorganic substance, non-hydrophobic, biodegradable with a concentration of < 15% active chlorine (mainly 3-5%)
Quantities used	250-400T/yr of sodium chlorate(I) solution (5% - ego solution)
Frequency and duration of use/exposure	Continuous release; 360 days a year
Environmental factors that do not affect risk management	Fresh water: dilution factor 10 Sea water: dilution factor 100
Other operational conditions of exposure for the environment	Avoid release to the environment or municipal sewage treatment plants although the substance is subject to a reduction reaction with the organic compounds found in industrial and municipal wastewater, hence

MATERIAL SAFETY DATA**SODIUM HYPOCHLORITE**

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

	no releases to the environment is expected In the worst case scenario, in wastewater, the total residual chlorine should be below 1.0-10-13 mg/l		
Conditions and technical measures at the process level to prevent the release	Products containing sodium chlorate(I)sodium chlorate referred to in this scenario have, among other things, biocidal properties. Information on technical measures at the process level, unified in the Directive No. 98/8/EC; in Poland, in the Biobased Products Act dated 13 September 2002.		
Operational conditions and control measures at the site of application to reduce or limit spills/spillage, emissions to the air and release to the ground.	Sodium chlorate(I) should be completely reduced to sodium chloride, preventing its critical release into the environment		
Organizational measures to limit/prevent release from the site of use	Products containing sodium chlorate(I)sodium chlorate referred to in this scenario have, among other things, biocidal properties. Information on technical measures at the process level, unified in the Directive No. 98/8/EC; in Poland, in the Biobased Products Act dated 13 September 2002.		
Conditions and measures related to the discharge of wastewater to their municipal treatment plant	A sub-treatment plant is required, where complete elimination of substances must take place before the wastewater goes to the municipal treatment plant		
Conditions and measures related to external treatment or recovery of waste for disposal	Disposal and disposal of waste should be carried out by entities authorized to do so in accordance with the law (local/national)		
2.2 Related scenario (2) - worker exposure control for: PROC 5, 7, 9, 10, 11, 13, 15			
General handling conditions for all substance activities			
G12 - concentration of the substance up to 25% active chlorine G2 - daily frequency of exposure: 8h/day OC8 - indoors			
Individual conditions of conduct for specific activities			
Related scenario	Duration	Concentration	Risk control measures
PROC5	No special conditions required	No special conditions required	Provide efficient general ventilation: - natural: doors windows, etc. - mechanical: with a powered fan that exchanges air with the environment [E1]. Process under low pollution conditions
PROC9	No special conditions required	No special conditions required	Provide efficient general ventilation: - natural: doors windows, etc.

MATERIAL SAFETY DATA**SODIUM HYPOCHLORITE**

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

			- mechanical: with a powered fan that exchanges air with the environment [E1]. Process under low pollution conditions
PROC10	OC28 - Avoid performing activities with exposure exceeding 4h	No special conditions required	Provide efficient general ventilation: - natural: doors windows, etc. - mechanical: with a powered fan that exchanges air with the environment [E1]. Process under low pollution conditions
PROC11	OC27 - Avoid performing activities with exposure exceeding 1h	No special conditions required	Provide efficient general ventilation: - natural: doors windows, etc. - mechanical: with a powered fan that exchanges air with the environment [E1]. Process under in low contamination environment
PROC13	OC28 - Avoid performing activities with exposure exceeding 4h	No special conditions required	Provide efficient general ventilation: - natural: doors windows, etc. - mechanical: with a powered fan that exchanges air with the environment [E1]. Process under in low contamination environment
PROC15	No special conditions required	No special conditions required	Provide efficient general ventilation: - natural: doors windows, etc. - mechanical: with a powered fan that exchanges air with the environment [E1]
3. Estimation of exposure and relation to its source			
3.1 Human health			
Exposure way	Concentration	RISK OCCURRENCE CHARACTERISTICS (RCR)	

MATERIAL SAFETY DATA

SODIUM HYPOCHLORITE

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

	Value	Unit	Inhalation	Skin	Total
Chronic local - PROC5	1.25	mg/m3	0.81	-	-
Chronic local - PROC9	1.10	mg/m3	0.71	-	-
Chronic local - PROC10	1.20	mg/m3	0.77	-	-
Chronic local - PROC11	1.00	mg/m3	0.65	-	-
Chronic local - PROC13	1.20	mg/m3	0.77	-	-
Chronic local - PROC15	0.85	mg/m3	0.55	-	-

3.2 Environment

EE8 - The qualitative approach used to evaluate the use can be found in Annex II (at the end of this MSDS).
Predicted Environmental Concentration (PEC):
Referring to the qualitative assessment (Annex II of this Material Safety Data Sheet), the worst-case exposure-inducing concentration used as PEC occurs in wastewater treatment plants and equals 1.0E-13 mg/l. The PEC for other environmental components is not relevant because it reacts rapidly with organic and inorganic compounds subject to elimination. Indirect human exposure via the environment (oral route). Sodium chlorate(I) does not enter the environment from its processing sites because it is completely eliminated in wastewater sub-treatment plants, consequently there is no possibility of direct human exposure to sodium chlorate(I). Also, no potential exposure to sodium chlorate(I) is expected in production areas due to the lack of emissions of unreacted sodium chlorate(I). Due to the physical and chemical properties, there is no potential for direct human exposure to the substance through the food chain

4. Guidance to the downstream user on assessing whether he/she is working in accordance with the principles set out in this exposure scenario

The above guidelines are based on general assumptions of operational conditions and Risk Control Measures and may not be applicable to all substance operations. In case of RISK CONCERNS (RCR) >1; additional risk control measures should be implemented

MATERIAL SAFETY DATA**SODIUM HYPOCHLORITE**

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

SN9

1. Title	Consumer uses of sodium chlorate(I)
Application sector [SU]:	Not applicable
Process categories [PROC]:	Not applicable
Category of the product (PC)	PC34 Staining, finishing and impregnation products textile products, including bleach and other excipients PC35 Washing and cleaning agents (including products based on solvents) PC 37 Water treatment chemicals
Category of the product [AC]	Not applicable
Environmental Release Category [ERC]:	ERC8a Widely dispersed application, in rooms, of excipients in open systems ERC8b Widely dispersed application, in rooms, of reactive substances in open systems ERC8d Widely dispersed use, outdoors, of excipients in open systems ERC8e - Widely dispersed use, outdoors, of excipients in open systems
Technical function of the substance in the process	Other: cleaning agent Bleach oxidixer
2. Conditions of use of the substance (mixture) causing exposure - related exposure scenarios	
Goal of this Exposure Scenario (SN) is for the manufacturer to provide the necessary minimum information regarding operational conditions and risk control measures for the safe use of sodium chlorate(I) in selected products by the consumer. Both participants in the supply chain are required to supplement each other's knowledge in this regard in order to improve this SN. A set of operating conditions and risk control measures relating to consumer activities, associated with the end use of sodium chlorate(I) is called a related scenario.	
2.1 Related scenario (1) - environmental exposure control for : Use of the substance as a product component in open systems indoors (ERC8a, 8b) or outdoors (ERC8d, 8e)	
In aqueous solutions of sodium chlorate(I) intended for consumer end-use, the concentration of the main component does not exceed 5% w/w. Considering the type of use and disposal methods of consumer products containing sodium chlorate(I), the environmental exposure in such cases is considered skippable.	
Characteristics of the product	The main component of the product is an inorganic substance, without hydrophobic properties, biodegradable with a concentration of < 25% active chlorine (mainly 12-14%); in consumer applications - product concentration < 5%
Quantities used	Not applicable
Frequency and duration of use/exposure	365 days/year - continuously
Environmental factors that do affect risk management	Fresh water: dilution factor of 10 Seawater: dilution factor of 100
Other operational conditions of exposure for the environment	Avoid release into the environment or municipal wastewater treatment plants although the substance is subject to reduction reaction with organic compounds

MATERIAL SAFETY DATA**SODIUM HYPOCHLORITE**

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

	found in industrial and municipal wastewater, hence, it is therefore not expected to be released into the environment. In the worst-case scenario, in wastewater, the total residual chlorine should be less than 1.0-10-13 mg/L.
Conditions and technical measures at the process level to prevent the release	Products containing sodium chlorate(I)sodium chlorate referred to in this scenario have, among other things, biocidal properties. Information on technical measures at the process level, unified in the Directive No. 98/8/EC; in Poland, in the Biobased Products Act dated 13 September 2002.
Operational conditions and on-site control measures for reduction or limitation of spills/spills, emissions to the air AND release to the ground	Sodium chlorate(I) should be completely reduced to sodium chloride, preventing its critical release into the environment
Organizational measures to limit/prevent release from the site of use	Prevent release to the environment in accordance with national legislation on Biobased products (the aforementioned Law)
Conditions and measures related to the discharge of wastewater to their municipal treatment plant	Domestic wastewater is directed to the city's treatment plant and treated there
Conditions and measures related to external treatment or recovery of waste for disposal.	As described in Section 13 of the Material Safety Data Sheet
2.2 Related scenario (2) - consumer exposure control for : End-use applications of substances in washing products, cleaning products, water treatment products and dye baths, including bleaching, (PC34, 35, 37)	
This related scenario refers to operational conditions and risk control measures for activities performed by the consumer with the final use of sodium chlorate(I) in sundry products, covered by the aforementioned categories	
Characteristics of the product	The main ingredient of the product is an inorganic substance that does not exhibit hydrophobic properties, biodegradable with < 25% active chlorine (mostly 12-14%); in consumer applications concentration in the product < 5%
Quantities used	Not applicable
Frequency and duration of use/exposure	From one contact a day to a dozen contacts a week
Human factors that do not affect risk management	The substance in the afore mentioned product category should not be used by consumers who are allergic to the dermal irritation that can occur with concentrated sanitary cleaning products.
Other operational conditions affecting consumer exposure	It is advisable to use the mixture in confined spaces with a large volume and effective natural or forced ventilation; it is safest to use the mixture in open spaces and low concentrations of the main ingredient
Conditions and technical measures at the process level to prevent the release	Apply technical measures and rules of conduct described in leaflets and product information labels
Technical conditions to control dispersion from source to consumer	Recommended use of protective gloves, chemical goggles and recommended

MATERIAL SAFETY DATA

SODIUM HYPOCHLORITE

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

working clothes, significantly protecting against dermal exposure

3. Estimation of exposure and relation to its source

Environment exposure assessment

No release to the environment is expected. In an extreme case, the qualitative environmental exposure assessment model in Annex II of this material safety data sheet can be used.

Estimation of consumer exposure. Information from the Hazard Assessment Report issued in November 2007 was used to estimate consumer exposure for this exposure scenario. The primary sources of exposure to Sodium Chlorate(I) of the general public were considered to be products used in households and drinking water.

The degree of absorption by the dermal route is estimated as a variable value, in the range: $1 \div 10\%$, and products containing $5 \div 10\%$ of sodium chlorate(I) show an irritating effect. Products for consumer use contain less than 5% of this substance. In practice, considerably diluted, aqueous solutions of such products are used - in extreme situations (e.g., in textile bleaching baths), the concentration of sodium chlorate(I) is reduced to as low as 0.05%.

Cleaning products can also be a source of consumer exposure by inhalation. Aerosol formation can occur particularly easily when products are used in spray form. Exposure by the inhalation route can be cumulative, given the components of the carrier in the compressed gas.

Another route of exposure for the general public may be the oral route from the use of sodium chlorate(I) as an ingredient in disinfectants for drinking water. It is estimated that about 50% of the population in EU countries consume treated water in this way. The magnitude of the dose of this substance has been estimated at 0.003 mg/kg body weight/day.

Quantitative risk characterization for consumers (general public)

The degree of RCR risk control was calculated based on the DNELs for each exposure route and the highest possible concentrations of the substance likely to occur during the use of the products in the categories covered by this scenario.

The exposure level was related to diluted products with a sodium chlorate(I) concentration of

:0.5 % > c > 0.05 %.

Effect of exposure	Exposure way	Exposure estimation	DNEL	RCR
Systemic, chronic	Skin	-	-	-
	inhalation	1.68E-03 mg/m ³	1.55 mg/m ³	1.08·10 ⁻⁰⁴
	food	0.003 mg/kg/day	0.26 mg/kg/day	0.011
Local, chronic	Skin	<0.5 % w/w (in the mixture)	0.5 % w/w (in the mixture)	≤1

4. Guidance to the consumer on how to assess whether they are working in accordance with the principles set out in this exposure scenario

In order to prevent consumer exposure to uncontrolled as to the consequences of contact with the main ingredient of the products, i.e. sodium chlorate(I), the manufacturer recommends familiarizing oneself with the above mentioned rules before use of these products.

MATERIAL SAFETY DATA

SODIUM HYPOCHLORITE

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

Appendix I to the Material Safety

QUALITATIVE EXPOSURE ASSESSMENT FOR HUMAN HEALTH (FOR SCENARIOS 2-8)

Qualitative exposure assessment of sodium chlorate with respect to corrosivity and respiratory irritation. In the absence of dose-response data, a qualitative assessment was made with respect to corrosivity and respiratory irritation in accordance with Chapter R8 (R.8.6) of the ECHA Handbook. According to the Technical Guidance Part E Table 3-1, all indicated risk control measures and operational conditions must be implemented to control the likelihood of exposure to the respiratory corrosive and irritant properties of sodium chlorate(I).

GENERAL RISK CONTROL MEASURES

risk control measures and operating conditions	
General	Personal protection equipment (PPE)
<ul style="list-style-type: none">- proper packaging- limited number of workers exposed- breakdown of the process in terms of where emissions occur- effective elimination of pollution- high efficiency of general ventilation;- minimize manual handling;- avoid contact with equipment soiled (by the substance) and tools- Frequent cleaning/cleaning of equipment and work area.- control of the implementation of the listed risk control measures and operational conditions.- trainings for employees;- high standard of personal hygiene	<ul style="list-style-type: none">- adjusted gloves;- work clothes made of suitable material that constitutes a barrier in case of contact with the substance;- use adjusted breathing apparatus;- full face shield;- eye protection.

QUALITATIVE EXPOSURE ASSESSMENT FOR THE ENVIRONMENT (FOR SCENARIOS 2-8)

Environmental elements: water and sediment

The release of sodium chlorate(I) from its production sites, into the environment, is negligible. In general, free chlorine in industrial wastewater is determined as a residual chlorine, but it is not possible to determine what percentage of residual chlorine comes from sodium chlorate(I). Where residual chlorine is measured: in wastewater, results are obtained:

PEC_{local} od 0,000006mg/l do 0,07mg/l

However, the determined value of residual chlorine is not authoritative due to the reaction of free chlorine with organic compounds in the wastewater leading to its elimination with a decay rate proportional to the concentration. Therefore, for the model assessment of environmental exposure, the residual chlorine concentration is not taken into account, but only the value of free chlorine concentration which is used to determine the predicted environmental concentration of PEC. Based on experimental data, it has been proven that the concentration of sodium chlorate(I) poured into the municipal sewer system (at a concentration of 10-35mg/l) disappears completely within one hour. In the worst case, a concentration of 1.0E-13mg/l was recorded at the end of the sewer system. However, in case of rivers, seas, the rate of decomposition is nothing less than in the urban sewer system, however, the concentration observed there does not exceed the accepted limit of critical concentration: 1.0E-13 mg/l. Due to the reaction of sodium chlorate(I) with organic and inorganic compounds, no environmental exposure is expected for sediments.

Elements of the soil (including secondary poisoning)

Possible exposure pathways for soil are: through contaminated sewage sludge or through direct exposure of chlorinated water to soil. Based on modeling, it was estimated that there is no possibility of contact

MATERIAL SAFETY DATA

SODIUM HYPOCHLORITE

Release date 08.02.2006

Review: 20.01.2021

Version EN: 8.0



This MSDA is accordant to Regulation EC 1907/2006 dated 18.12.2006 – REACH and 2020/878 dated 18.06.2010.

of the sodium chlorate(I) from households with sewage sludge (applications require a sub-treatment plant, where the substance must be completely eliminated before the wastewater is sent to a municipal sewage treatment plant), since the substance decomposes in contact with organic compounds. In addition, the substance is well soluble in water and does not exhibit sorption properties on active sewage sludge. Therefore, soil contamination in contact with sewage sludge is excluded from further environmental exposure assessment.

so-called secondary poisoning is also excluded from the environmental exposure assessment due to the fact that the substance breaks down rapidly in contact with organic compounds.

Atmospheric elements

Aqueous dilutions of sodium chlorate(I) are non-volatile hence no possibility of vapor penetration into the air.

Due to the fact that there are no sufficient methods that can determine the concentration of substances in the air for model exposure estimation, it is not possible to use the methodology as for the determination of substances in water and soil.