

SAFETY DATA SHEET

CHLORINE (Liquefied gas)

Date of issue: 2007. february

Date of revision: 2022.03 25.

1. IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND THE COMPANY / UNDERTAKING

1.1 Product identifier

Product chemical name:	CHLORINE
EC number:	231- 959 – 5
CAS number:	7782 - 50 – 5
INDEX number:	017- 001- 00-7
IUPAC name:	chlorine
Molecular formula:	Cl ₂
Type of product:	mono-constituent substance
REACH registration number	01-2119486560-35

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

The main industrial and professional uses: chemical and petrochemical industry for many synthesis: poly vinyl chloride, non-chlorinated polymers, chloromethane, epichlorohydrin, inorganic chemistry-including hydrochloric acid and sodium hypochlorite; drinking water disinfectants; swimming pool disinfectants; waste water treatment; cooling water disinfection; pulp and paper industry; textile industry.

Table 1 Identified uses

Identified use/ UI number	Sector of end use (SU)	Product category (PC)	Process category (PROC)	Environmental release category (ERC)	Article category (AC)	Exposure scenario
1.	SU 8, 10	Not applicable	PROC 1-4, 8b, 9, 15	ERC 1, 2	Not applicable	ES1: Manufacturing of chlorine.
2.	SU 5, 6b, 8, 9, 13, 14, 16	Not applicable	PROC 1-5, 8a, 8b, 9, 15	ERC 1, 4, 6b	Not applicable	ES2: Industrial use of chlorine: end uses of substance as such or preparations at industrial sites.

Uses advised against: not available

1.3 Details of the supplier of the safety data sheet

Name of the company:	Vinyl Kereskedelmi Kft.
Address:	3524 Miskolc, Adler K. u. 19.
Telephone:	+36 46 432 633
Budapest site:	
1097 Budapest, Illatos u. 19-23.	
Telephone: +36 1 282-6768	
Fax:	+36 1 282-6769
Email of the competent person responsible with SDS:	ehsq@vinyl.hu

1.4 Emergency telephone number

2. HAZARDS IDENTIFICATION

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2.1 Classification of the substance or mixture

GHS –Global Hazardous System Classification according to the European Regulation (EC) no. 1272/2008, as amended:

Hazard class	Code of hazard class and hazard category	Hazard statement
Oxidizing Gases	Ox. Gas 1	H 270 - May cause or intensify fire; oxidiser.
Pressure Gas	Press. Gas	H 280 - Contains gas under pressure; may explode if heated.
Skin Irritation	Skin Irrit. 2	H 315 - Causes skin irritation.
Eye Irritation	Eye Irrit. 2	H 319 - Causes serious eye irritation.
Acute Toxicity	Acute Tox. 3	H 331 - Toxic if inhaled.
Target Organ Toxicity -single exposure	STOT SE 3	H 335 - May cause respiratory irritation.
Hazardous to the aquatic environment	Aquatic Acute 1	H 400 - Very toxic to aquatic life

Risk advice to the human and the environment

Chlorine is a greenish yellow gas (or amber liquid) with an irritating odor. High concentration of chlorine gas may cause an oxygen-deficit atmosphere. Chlorine is an oxidizer, which can act to initiate and sustain the combustion of flammable materials. Chlorine is heavier than air and pockets of this gas can accumulate in lowlying areas.

Chlorine is irritating to nose, throat, skin and eyes, also tearing, coughing and chest pain. Higher levels burn the lungs and can cause a build up of fluid in the lungs (pulmonary edema) and death. Contact can severely burn the eyes and skin. Repeated exposures or a single high exposure may damage the lungs. It can also damage the teeth and causes a skin rash.

2.2 Labels elements

Labeling according to the European Regulation (EC) no. 1272/2008, as amended:

- Name on label: **CHLORINE (liquefied gas)**

- Signal word: **DANGER**

- Hazard symbols:



GHS 03 -oxidizer



GHS 04-gas under pressure



GHS 06 –toxic



GHS 09 – dangerous for environment

Hazards statements:

H 270: May cause or intensify fire; oxidiser.

H 280: Contains gas under pressure; may explode if heated.

H 315: Causes skin irritation.

H 319: Causes serious eye irritation.

H 331: Toxic if inhaled.

H 335: May cause respiratory irritation.

H 400: Very toxic to aquatic life.

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Precautionary statements:

P 220: Keep/Store away from clothing/ incompatible materials –PVC, polyethylene combustible materials.

P 244: Keep reduction valves free from grease and oil.

P 261: Avoid breathing dust/fume/gas/mist/vapours/spray.

P 273: Avoid release to the environment.

P 280: Wear protective gloves/protective clothing/eye protection/face protection.

P 284: Wear respiratory protection.

P 370 + P 376: In case of fire: Stop leak if safe to do so.

P 304 + P 340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P 403: Store in a well ventilated place.

Note U – liquefied gas

“EC label”

2.3 Other hazards

The product does not meet the criteria for classification as PBT, Persistent Bio-accumulative and Toxic or vPvB –very persistent, very bio-accumulative.

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1. Substances

The product is considered:	Substance
Chemical identity of substance:	Chlorine
Classification according to the (EC) Regulation No.1272/2008 – CLP	Ox. Gas 1, H270; Press. Gas, H280; Skin Irrit. 2, H315; Eye Irrit. 2, H319; Acute Tox. 3, H331; STOT SE 3, H335; Aquatic Acute 1, H400.
EINECS no:	231 - 959 – 5
CAS no:	7782 - 50 - 5
INDEX no:	017- 001 - 00 – 7
% Weight:	≥ 99.7
Generic name:	halogen
Impurities:	No impurities relevant for classification and labeling

3.2. Mixtures: not applicable

4. FIRST AID MEASURES

4.1 Description of first-aid measures

Irritant for eye membrane, mucous and breathing system. **Fatal if inhaled.** It is mandatory to request immediately medical assistance, in case of accidental contact with this product - if possible, show the product label. **Remove contaminated clothing.**

If inhaled:

Evacuate the victim from the contaminated area to ventilated place. Administer oxygen or artificial respiration if necessary. Call a physician immediately.

In case of skin contact:

Remove quickly contaminated clothing and shoes. Wash skin with plenty of water. Call a physician or poison control centre. Wash the contaminated clothes before re-using.

In case of eye contact:

Immediately flush eyes with plenty of water, for at least 15 minutes, while moving eye pupils in all directions, to eliminate product remains. Call a physician or poison control centre immediately.

If ingestion: Very unlikely. Chlorine is liquid only below (-34 °C) or at high pressures.

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4.2 Most important symptoms and effects, acute and delayed

Inhalation: Symptoms of chlorine exposure at low concentrations are: cough, dyspnoea, dizziness, headache, irritation (lung, skin), dryness of the pharyngeal mucosa, irritation of the conjunctiva and pharynx, severe pains in chest, fever, fatigue on exertion.

In high concentrations act as a smothering determining cramps of larynx muscles, mucous, inflation. If exposure is prolonged there is a risk of bronchitis, nose bleeds, sore throat, corrosion of the dental enamel, skin rash, severe pains in chest, throat pains and tuberculosis susceptibility. Organs affected: eye, skin, breathing system, central nervous system, teeth.

Skin contact:

Compressed gas run-off from bottles may produce smarting pains and first degree burns—for short exposures, and second degree burns for prolonged exposures. May appear ulcerative injuries, redness, swelling of tissue.

Eye contact:

Causes severe burns. Contact with substance into eyes can cause tissue damage and blindness. The symptoms are: redness, swelling of tissue.

Ingestion: Very unlikely.

4.3 Indication of any immediate medical attention and special treatment needed

It is mandatory to request immediately medical assistance, in case of accidental contact with this product. No known antidote. Treatment for inhalation is symptomatic and supportive. Keep patient at rest until respiratory symptoms subside. Sedation for apprehension or restlessness may be considered as well as diuretics and antibiotics to alleviate edema and protect against secondary infection. Steroid therapy, if given early, has been reported effective in preventing pulmonary edema.

5. FIREFIGHTING MEASURES

5.1 Extinguishing media:

- *recommended* : Water spray in large quantities
- *not recommended*: Foam, extinguishing powder, steam, inert gases, halons

5.2 Special exposure hazards arising from the substance or mixture

Not combustible but many combustible substances burn in chlorine atmosphere as would burn in oxygen. Flammable gases and vapors can form explosion mixtures with chlorine. Moist chlorine can react violently in contact with many materials and generate heat with possible flammable and explosive vapor. Forms explosive mixtures with hydrogen and air (in certain ratios).

The explosion limits of the product are:

- low limit: 11.5 % chlorine and 88.5 % hydrogen
- high limit: 94.2 % chlorine and 5.8 % hydrogen

5.3 Advice for firefighters

Use breathing apparatus and individual protective clothing for interventions.

Since the fire can lead to toxic products of thermal decomposition, use an independent breathing apparatus which will protect the entire face and will operate at the pressure, inside contaminated area or the over pressure. Waste resulting from fire extinguishing must be treated as dangerous waste and will be discarded in a controlled manner according to legislation in force.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personnel protection

Advice for non-emergency personnel:

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Restrict access to the area until completion of the clean-up. Keep unnecessary and unprotected personnel away from entering. Do not touch spilled liquid. Wear self-contained breathing apparatus. *Warning! Direct contact of liquid chlorine with any personal protective equipment item can rapidly destroy the equipment, leading to injury and death.*

Advice for emergency personnel:

Evacuate all uninvolved persons from the danger area. Ventilate area.
Use individual protection equipment and adequate gloves (see chapter 8).

6.2 Environmental protection measures

Isolate area until gas has dispersed. Uncontrollable spillages may require evacuation of surrounding area. Keep material out off water courses and sewers.

Use water spray to reduce vapor, but do not apply water to point leak or spill area. Use general or local exhaust ventilation. Keep combustibles (such as wood, paper, oil) away from spilled material. Inform local authorities in case of accidental spillages.

6.3 Cleaning methods and materials used

Disperse chlorine mist using water jets. Neutralize contaminated waters resulted. If possible, pass gaseous chlorine releases through an absorber with burnt lime to prevent spreading in atmosphere. Remove combustible materials from the area of leakages.

If source of leak is a cylinder and the gas leak cannot be stopped in place, remove the leaking cylinder to a safe place, in the open air and try to repair or allow the cylinder, to empty through a reducing substance such as sodium sulfite, calcium carbonate or hydrated lime solutions. Chlorine gas will disperse to the atmosphere leaving no residue.

If a chlorine container is leaking, try to position it so that gas, rather than liquid leaks out. Chlorine vapors are heavier than air, and pockets of chlorine are likely to be trapped in low lying areas. Use water sprays to cool and disperse the vapors. Collect and neutralize contaminated water. Dispose the waste according to the environmental legislation in force.

6.4. Reference to other sections

Firefighting measures are described in the chapter 5. Individual protection equipment is described in the chapter 8. The disposal consideration is described in the chapter 13.

7. HANDLING AND STORAGE

Handling imposes caution measures specific for a toxic and oxidizer product.

7.1 Precaution for safe handling

Protection measure

Avoid physical damage of the vessels. Avoid striking, slamming or making dirty the bottles. Maximum filling grade of the package is of 1,25 kg/m³ (max 80 % of the volume). Provide water sources, eyewash station, individual respiratory apparatus in the working area; provide local ventilation in confined spaces. Avoid direct contact with product or vapor inhaling. Use individual protection equipment and adequate gloves (see chapter 8).

Advice on general occupational hygiene

Avoid inhalation or ingestion and contact with skin and eyes. General occupational hygiene measures are required to ensure safe handling of the substance. These measures involve good personal and housekeeping practices, no drinking, eating and smoking at the workplace.

7.2. Condition for storage, including incompatibilities

The warehouse will be provided with ventilation in case of failure endowed with catching and neutralization facility. Inside chlorine store will be provided tanks with reducing solutions (see chapter 6 – cleaning method). Store the tubes in vertical position supported on racks. Store chlorine

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tubes/containers away from heat sources, rain or corrosive atmosphere, in a dried area, away from flammable, combustible and/or incompatible substances. Storehouses floor must be sloped towards a run-off, able to collect the whole liquid drained out from the bottles (run off which has to contain a neutralizing substance). This run-off must not be used for water drainage. Be sure that protective valves are closed when the lines and collecting vessels are not used. It is mandatory to periodically check the tightness of the recipients. Recommended transport and storage temperature is of maximum of 40C.

Packaging materials used	Cylinder; barrels; tanks Materials: carbon steel / stainless steel – pressure resistant; packages under the rules applying to the pressure vessels
Recommended	Plastic (teflon - type), elastomers (viton - type), nonmetals (carbon graphite)
Not recommended	Metals (aluminum – type); plastics (nylon, polypropylene)

7.3. Specific end-use(s)

The identified uses are described in the chapter 1.2.

For more information please check the relevant exposure scenario, available in the annex of this safety data sheet.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

8.1. Control parameters

National exposure limits values for chlorine:

VLE = 1.5 mg/mc, exposure period = 15 minutes;

(according to the European Directive 2006/15/CE, concerning establishing a second list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Directives 91/322/EEC and 2000/39/EEC).

DNELs –derived No-Effect levels) for chlorine:

DNEL acute, short term inhalation = 1.5 mg/mc (local and systemic effects)

DNEL long term inhalation = 0.75 mg/mc (local and systemic effects)

PNECs –Predictable No-Effect Concentrations

PNEC water- drinking water = 0,21 µg/l;

PNEC water- sea water = 0,042 µg/l;

PNEC water- intermittent discharges = 0.26 µg/l.

(values extracted from the Chemical Safety Report, included in the REACH dossier).

8.2 Exposure control

8.2.1. Appropriate engineering controls

Provide local and general ventilation systems in the working area and storage spaces. Provide water sources and eyewash station in the proximity of the working area, if is necessary.

8.2.2. Individual protection measures, such as personal protective equipment

Workers will be fully equipped with individual protective equipment. The type and material of which it is made the protective equipment shall respect the national/european legal rules in force, on health and safety at work.

Workers should be required to use impermeable body equipment to prevent any possibility of skin contact with liquid chlorine and to prevent the skin from becoming frozen from contact with vessels containing liquid chlorine.

Respiratory protection

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In case of insufficient ventilation, wear respirator with chlorine filtering cartridge. Self-contained breathing apparatus in medium with insufficient oxygen/in case of large uncontrolled emissions/in all circumstances when the mask and cartridge do not give adequate protection.

Hand protection

Protective gloves – chemical resistant

Suitable materials: neoprene

Unsuitable material: PVC, polyethylene

Eye protection

Employees should be required to use splash-proof safety goggles and face shield where there is any possibility of liquid chlorine contacting the eyes. Contact lenses must not be worn when working around chlorine.

Skin and body protection

All workers will use the protection equipment: overalls; apron / boots of neoprene, viton, butyl rubber.

Direct contact of liquid chlorine on any personal protective equipment item, can rapidly destroy the equipment, leading to injury.

Specific hygiene measures

After working with this product, change protection equipment and wash face and hands with plenty of water and soap. Ensure water sources and eyewash station in the proximity of the working area. It is forbidden to smoke, eat, drink in the working areas.

8.2.3. Environmental Exposure Control

All ventilation systems should be filtered before discharge to atmosphere. Avoid any releasing to the environment. Contain the spillage. For detailed explanations of the risk management measures that adequately control exposure of the environment to the substance please check the relevant exposure scenario, available in the annex of this safety data sheet. Waters contaminated with this product will not be discarded in watercourses, on the ground or in sewages without previous neutralization.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	liquefied gas at pressure of 6.8 ata
Color	yellow greenish
Odor	Suffocating, pungent
pH	not applicable
pKa	No data
Chlorine content	min. 99.7%
Boiling point	-34.05 ° C at ambient pressure
Melting/freezing point	-101.05 ° C at ambient pressure
Flash point	Not applicable
Evaporation rate	No data
Flammability(solid, gas)	Non flammable
Vapor pressure	6780 hPa at 20 ° C
Vapor density	No data
Relative Density at 20 ° C	1,411 g/cm ³ (pressure 10 kg/cm ²)
Solubility(ies)	No data
Solubility in water at 20 ° C	7.41 g/l
Partition coefficient (n-octanol/water) at 20 ° C	log Kow (Pow): -0.85
Auto-ignition temperature	Not applicable
Decomposition temperature	No data
Viscosity at 20 ° C	13.3 mPa · s (dynamic)
Dissociation constant at 20 ° C	K1= 3.2*10 ⁻⁴ mol/dm ³ K2= 3.5*10 ⁻⁸ mol/dm ³

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Particle characteristics	Not applicable
Refractive index	1,0008 -gas; 1,367 -liquid
Explosive properties	Not explosive (see chapter 10)
Oxidizing properties	Yes

9.2. Other information

Partition coefficient log Kow = -0.85 has not important significance in relation to the potential for bioaccumulation. Chlorine has a great potential oxidant and reacts with the organic phase.

10. STABILITY AND REACTIVITY

10.1 Reactivity: This product is stable under normal handling and storing conditions.

10.2 Chemical stability

Store keep and transport the product away from moisture and weather conditions. Store and transport the product separate from incompatible substances.

10.3 Possibility of hazardous reactions

Prohibited storage of chlorine vessels and the same place where can be found tubes containing other substances, which in chlorine presence may form explosive mixtures (hydrogen; ammonia) or together with the tubes containing other inflammable or incompatible substances. During transport and storage will be taken preventive measures against bottles heating under sun rays action or other heat sources at temperatures over 40°C.

10.4 Condition to avoid: Store the product in places away from humidity.

10.5 Materials to avoid

Chlorine is a powerful oxidizing agent which reacts violently with a variety of substances over a broad range of conditions including reducing agents, combustible materials, sodium hydroxide. Metals very fine crushed, water, organic materials, acetylene, glycerin, ether, benzene, active carbon, ethylene, hydrazine, polypropylene, silicon, rubber, substances like: boron, arsenic, fluorine, potassium, carbon disulfide. Nitrogen compounds (ammonia, ammonium compounds and urea) react with chlorine to form highly explosive nitrogen chloride.

10.6 Hazardous decomposition product

Chlorine does not decompose but reacts violently to form hydrochloric acid and other potentially toxic and/ or corrosive substances. Chlorine does not decompose, but reacts violently with organic substances to form hydrochloric acid and other toxic and / or corrosive substances.

11. TOXICOLOGICAL INFORMATION

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

11.1.1 Acute toxicity: oral, inhalation, dermal

Causes serious eye irritation and is fatal if inhaled.

LC50 (as available chlorine)/ oral = 1100 mg/kg body sodium hypochlorite as chlorine available;

LD50/ inhalation/ rat = 0.65 mg/m³ air;

LD50/ dermal/ rabbit = 20000 mg/kg body (the study was performed with sodium hypochlorite 12.5% aqueous solution); For oral and dermal toxicity no specific studies was available. Read across for sodium hypochlorite was performed instead.

11.1.2 Skin corrosion/irritation

The product is irritating /corrosive to the skin. Contact with liquid chlorine will cause skin burn.

11.1.3 Serious eye damage/eye irritation

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Acute inhalation toxicity studies with chlorine gas showed that chlorine is irritating to the eyes. Solutions of chlorine in water contain hypochlorous acid and/or hypochlorite. These solutions is irritating or corrosive to the eyes. Contact with chlorine can produce injury of the cornea and enduring impaired vision and blindness (corrosive effect).

11.1.4 Respiratory or skin sensitization

This substance is irritating for the respiratory tract.

Because sodium hypochlorite does not pose a skin sensitisation hazard and because no human case reports have been found for chlorine showing a sensitisation potential, chlorine is considered to have no skin or respiratory sensitisation hazard.

11.1.5 Germ cell mutagenicity

No mutagenic studies with chlorine are available. Thus, a read across from studies on sodium hypochlorite has been made. Sodium hypochlorite/hypochlorous acid is not considered to be genotoxic/mutagenic or clastogenic.

11.1.6 Carcinogenicity

No indication of carcinogenic effect was observed in studies with chlorine.

11.1.7 Reproductive toxicity

The available studies show that there is no evidence to suggest that sodium hypochlorite and in conclusion also chlorine would present adverse effects on development or fertility.

11.1.8 STOT-single exposure

Oral: No systemic effects were observed in repeated dose exposure studies in rats, mice and monkeys with chlorine gas. Based on the results obtained in the key study the NOEL was determined to be: NOEL /oral/ rat = 50 mg/kg body/day.

Inhalation: Chlorine gas is exclusively handled in closed systems and any exposure to the gas will be accidental and will be by inhalation. No systemic effects were observed in repeated dose exposure studies in rats, mice and monkeys with chlorine gas. NOEC /inhalation/ rat = 1,5 mg/m³

11.1.9 STOT-repeated exposure

Based on available data, the classification criteria are not met.

11.1.10 Aspiration hazard

Based on available data, the classification criteria are not met.

12. ECOLOGICAL INFORMATION

12.1 Toxicity acute for aquatic organisms:

Fish, short-term, freshwater: LC₅₀ = 0.06 mg/L ;

Fish, short-term, saltwater: LC₅₀ = 0.032 mg/L ;

Fish, long-term, freshwater: NOEC = 0.04 mg/L ;

Daphnia magna, short-term, freshwater: LC₅₀ = 0.141 mg/L ;

Daphnia, long-term, saltwater: NOEC = 0.007 mg/L ;

Algae, long-term, freshwater: IC₅₀ = 0.023 mg/L.

12.2 Persistence and degradability

Abiotic degradation

Chlorine is a highly reactive compound, which will react readily in the atmosphere and in soil, and with organic matter. In water, chlorine will form hypochlorous acid and hypochlorite at environmental

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relevant pH. Chlorine discharged to sewer will react to form chloramines. The product is fast biodegradable.

Photo-transformation /Photolysis

Photolysis occurs only during daylight hours. The estimated half-life for this process is approximately 2-4 hours. The chlorine atoms formed by that process can then react with other species present in the atmosphere.

12.3 Bioaccumulative potential

log Kow = -0.85;

Chlorine does not bioaccumulate or bioconcentrate, because of its water solubility and high reactivity.

12.4 Mobility

Water/Soil/Sediments

In water: The adsorption of chlorine to aerosol particles, the volatilisation from water into air and the adsorption of chlorine into soil are very low. Thus, chlorine (as hypochlorite) remains in the aqueous phase where it degrades very rapidly to chloride.

In air: In the atmosphere, chlorine will degrade during daylight, with half-lives ranging from minutes to several hours, depending on latitude, season, and time of day.

In soil: The high water solubility of chlorine can lead to a high mobility in soil, although chlorine as vapor or as aqueous solution is normally irreversibly bound to soil organics within the first few millimeters or centimeters of the soil surface.

12.5 Results of PBT and vPvB

The product does not meet the criteria for classification as PBT, Persistent Bio-accumulative and Toxic or vPvB –very persistent, very bio-accumulative.

12.6 Other adverse effects

Not applicable.

13. DISPOSAL CONSIDERATIONS

13.1 Waste disposal methods

Absorb the product with sulfite, pyrosulphite or alkaline thiosulfate before removal. Waste will be discarded in accordance with the local regulations in force.

13.2 Contaminated packaging

After degassing the packages are recycled.

Degassing will be made by blooming with nitrogen or dried air with connection to a neutralization plant. Packaging that cannot ensure anymore the qualitative and quantitative integrity of the product are destroyed through specific measures in accordance with local regulations in force. The recommendation is to use dedicated containers in order to avoid treatments.

Contaminated packaging waste will not be used to store other products.

13.3 European Regulations applicable

European Directive no. 94/62/EC on packaging and packaging waste as amended;

European Directive no. 91/689/CEE on hazardous waste, as amended.

14. TRANSPORT INFORMATION

14.1 UN number, UN proper shipping name, transport hazard class(es), packing group, environmental hazards

International Transport Regulation: ADR	
- UN no. /HI no.	1017/ 265

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- Class /classification code	2/ 2TOC - gas toxic, oxidizing, corrosive
- Product name	CHLORINE
- Packing group	-
- Transport labelling	2.3 – toxic gas 5.1 – oxidizing 8- corrosive
RID	
- UN no. /HI no.	1017/ 265
- Class /classification code	2/ 2TOC - gas toxic, oxidizing, corrosive
- Product name	CHLORINE
- Packing group	-
-Label	2.3 – toxic gas 5.1 – oxidizing 8- corrosive
IMDG	
- UN no	1017
- Proper shipping name	CHLORINE
- Class	2.3
- Subsidiary risk	8 - corrosive; P – marine pollutant
- Packing group	-
- EmS	F-C; S-U

ICAO/IATA: forbidden

14.2 Environmental hazards

The product is dangerous for the environment and presents the risk of marine pollutant.

14.3. Special precaution for use

Users (customers, carriers) who will moving in the area with the product will respect all the security measures, available in an area with dangerous chemicals.

14.4. Transport in bulk according to Annex II of MARPOL73/78 and the IBC code: No data available

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

The product chlorine is not a persistent organic pollutant (POP), not ozone depleting substance; the product was not included in the SVHC list and no need to be authorized according to the REACH Regulation. The product is subject to SEVESO Directive No. 2012/18/UE.

European legislation:

Regulation (EC) No. 1907/2006 of the European Parliament concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) as amended;
 Regulation (EU) No. 2020/878 amending Annex II to Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH));
 Regulation (EC) No. 1272/2008 of the European Parliament and of the Council on classification, labeling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC and amending Regulation (EC) No.1907/2006 –REACH Council Regulation (EC) No 440/2008 on test methods pursuant to Regulation (EC) No 1907/2006 –REACH;
 Commission Regulation (EC) No 340/2008 on the fees and charges payable to the European Chemicals Agency pursuant to Regulation (EC) No.1907/2006 –REACH;
 Council Directive 98/24/EC concerning the protection of the health and safety of workers from the risks related to chemical agents at work, as amended;

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Directive 91/322/EEC - indicative limit values on establishing indicative limit values by implementing Council Directive 80/1107/EEC on the protection of workers from the risks related to exposure to chemical, physical and biological agents at work, as amended;
Commission Directives 2000/39/EC, 2006/15/CE and 2009/161/UE establishing a first, second and third lists of indicative occupational exposure limit values, in implementation of Council Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work, as amended;
Council Directive 89/656/EEC on the minimum health and safety requirements for the use by workers of personal protective equipment at the workplace;
European Directive 91/689/EEC on hazardous waste;
Directive 2012/18/UE (SEVESO III) on the control of major - accident hazards involving dangerous substances amending and subsequently repealing Council Directive 96/82/CE (SEVESO II);
ADR/RID/IMDG in force.

15.2 Chemical Safety Assessment

A chemical safety assessment was carried out as a part of the substance registration, according to the REACH Regulation.

16. OTHER INFORMATION

16.1. Updates of safety data sheet

Compared with last revision from September 2018, the safety data sheet have been updated according Regulation (EU) No. 2020/878 (version 3. 2022.03.24.)

Compared with last revision from February 2015, the safety data sheet have been updated to the following chapters: 2, 3, 15, 16. (Version 2. 2018.09.29)

16.2 Full text of hazard and precautionary statements stated on Section 2:

H 270: May cause or intensify fire; oxidiser.

H 280: Contains gas under pressure; may explode if heated.

H 315: Causes skin irritation.

H 319: Causes serious eye irritation.

H 331: Toxic if inhaled.

H 335: May cause respiratory irritation.

H 400: Very toxic to aquatic life.

H 410: Very toxic to aquatic life with long lasting effects.

P 220: Keep/Store away from clothing/ incompatible materials –PVC, polyethylene combustible materials.

P 244: Keep reduction valves free from grease and oil.

P 261: Avoid breathing dust/fume/gas/mist/vapours/spray.

P 273: Avoid release to the environment.

P 280: Wear protective gloves/protective clothing/eye protection/face protection.

P 284: Wear respiratory protection.

P 370 + P 376: In case of fire: Stop leak if safe to do so.

P 304 + P 340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P 403: Store in a well ventilated place.

16.3 Legend to abbreviations

CSR: Chemical Safety Report;

PBT: Persistent, Bio-accumulative and Toxic;

vPvB: very persistent, very bio-accumulative ;

VLE: National exposure limits values;

DNEL: Derived No-Effect levels;

SAFETY DATA SHEET

CHLORINE (Liquefied gas)

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PNEC: Predictable No-Effect Concentrations;

NOEC: no observed effect concentration;

NOEL: no observed effect limit;

ADR: European Agreement concerning the International Carriage of Dangerous Goods by road;

RID: Agreement concerning the International Carriage of Dangerous Goods by rail;

IMDG: International Maritime Dangerous Goods Code;

ICAO/IATA: International Air Transport Association.

16.4 Literature references and sources for data

The Safety Data Sheet has been revised according to the Annex of European Regulation No. 878/202025-REACH. Information contained herein was obtained from the documents developed in the REACH registration process, from the technical literature and from our own experience. These characterize the product respecting the safety requirements, however without a guarantee of its particular properties.

It is the client's (transporters/ final users/ downstream users) obligation to take all the necessary caution measures, so that the product can be safely used.

This safety data sheet is accompanied by an annex containing the exposure scenarios developed for the manufacture and uses identified for this product