



# Chlorine

## Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878  
Reference number: EIGA022

Issue date: 16/01/2013 Revision date: 25/02/2025 Supersedes version of: 20/11/2024 Version: 1.5

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

#### 1.1. Product identifier

Product form : Substance  
Name : Chlorine  
Trade name : Chlorine 2.8; Chlorine 4.0; Chlorine 5.0;  
EC Index-No. : 017-001-00-7  
EC-No. : 231-959-5  
CAS-No. : 7782-50-5  
REACH registration No. : 01-2119486560-35  
Product code : 000010021781  
Formula : Cl<sub>2</sub>

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

##### 1.2.1. Relevant identified uses

Relevant identified uses : See the list of identified uses and exposure scenarios in the annex of the safety data sheet.  
Perform risk assessment prior to use.

Use of the substance/mixture : Biocidal uses.  
Formulation of mixtures with gas in pressure receptacles.  
Use as an Intermediate (transported, on-site isolated).  
Using gas as feedstock in chemical processes.  
Using gas alone or in mixtures for the calibration of analysis equipment.  
Using gas for metal treatment.  
Electronic component manufacture  
Odour agents  
Raw material for pharmaceutical products  
Water treatment

Title	Life cycle stage	Use descriptors
Industrial uses, closed contained conditions (ES Ref.: EIGA022-1)		PROC1, PROC2, PROC3, PROC4, PROC8b, PROC9, ERC2, ERC4, ERC6b

Full text of use descriptors: see section 16

##### 1.2.2. Uses advised against

Uses advised against : Consumer use.  
Uses other than those listed above are not supported, contact your supplier for more information on other uses.

#### 1.3. Details of the supplier of the safety data sheet

Linde Gas GmbH  
Carl-von-Linde-Platz 1  
A-4651 Stadl-Paura  
Austria  
T +43 50 4273  
[office@at.linde-gas.com](mailto:office@at.linde-gas.com)

#### 1.4. Emergency telephone number

Emergency number : UMCO/NCEC: +44 1865 407333 (English); +49 89 220 61012 (German)

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### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

##### Classification according to Regulation (EC) No. 1272/2008 [CLP]

Physical hazards	Oxidising Gases, Category 1	H270	
	Gases under pressure : Liquefied gas	H280	
Health hazards	Skin corrosion/irritation, Category 2	H315	
	Serious eye damage/eye irritation, Category 2	H319	
	Acute toxicity (inhalation:gas) Category 2	H330	
	Specific target organ toxicity – Single exposure, Category 3, Respiratory tract irritation	H335	
Environmental hazards	Hazardous to the aquatic environment – Acute Hazard, Category 1	H400	(M=100)

Full text of H- and EUH-statements: see section 16

##### Adverse physicochemical, human health and environmental effects

No additional information available

#### 2.2. Label elements

##### Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP)



Signal word (CLP)

: Danger

Hazard statements (CLP)

: H270 - May cause or intensify fire; oxidiser.  
H280 - Contains gas under pressure; may explode if heated.  
H315 - Causes skin irritation.  
H319 - Causes serious eye irritation.  
H330 - Fatal if inhaled.  
H400 - Very toxic to aquatic life.

EUH-statements

: EUH071 - Corrosive to the respiratory tract.

EUH071 supersedes H335 when assigned in the classification.

Precautionary statements (CLP)

- Prevention

: P220 - Keep away from clothing and other combustible materials.  
P244 - Keep valves and fittings free from oil and grease.  
P260 - Do not breathe gas, vapours.  
P273 - Avoid release to the environment.

- Response

: P280 - Wear eye protection, face protection, protective clothing, protective gloves.  
P302+P352 - IF ON SKIN: Wash with plenty of water.  
P304+P340+P315 - IF INHALED : Remove person to fresh air and keep comfortable for breathing. Get immediate medical advice.  
P305+P351+P338+P315 - IF IN EYES : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice.  
P332+P313 - If skin irritation occurs: Get medical advice/attention.

- Storage

: P370+P376 - In case of fire: Stop leak if safe to do so.  
P403 - Store in a well-ventilated place.  
P405 - Store locked up.

#### 2.3. Other hazards

Other hazards

: Not classified as PBT or vPvB. The substance/mixture has no endocrine disrupting properties.

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### SECTION 3: Composition/information on ingredients

#### 3.1. Substances

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP] ATE, EUH-statements, M-Factors
Chlorine	CAS-No.: 7782-50-5 EC-No.: 231-959-5 EC Index-No.: 017-001-00-7 REACH-no: 01-2119486560-35	100	Ox. Gas 1, H270 Press. Gas (Liq.), H280 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Acute Tox. 2 (Inhalation:gas), H330 (ATE=146.5 ppmv/4h) STOT SE 3, H335 Aquatic Acute 1, H400 (M=100) EUH071

#### Specific concentration limits:

Name	Product identifier	Specific concentration limits
Chlorine	CAS-No.: 7782-50-5 EC-No.: 231-959-5 EC Index-No.: 017-001-00-7 REACH-no: 01-2119486560-35	(1 ≤ C ≤ 100) STOT SE 3; H335

Full text of H- and EUH-statements: see section 16

*Contains no other components or impurities which will influence the classification of the product.*

#### 3.2. Mixtures

Not applicable

### SECTION 4: First aid measures

#### 4.1. Description of first aid measures

First-aid measures after inhalation	: Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Perform cardiopulmonary resuscitation if breathing stopped.
First-aid measures after skin contact	: Remove contaminated clothing. Drench affected area with water for at least 15 minutes. In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.
First-aid measures after eye contact	: Immediately flush eyes thoroughly with water for at least 15 minutes.
First-aid measures after ingestion	: Ingestion is not considered a potential route of exposure.

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

Most important symptoms and effects, both acute and delayed	May cause irritation to cornea (with temporary disturbance to vision). May cause irritation to skin. Material is destructive to tissue of the mucuous membranes and upper respiratory tract. Cough, shortness of breath, headache, nausea. See section 11.
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#### 4.3. Indication of any immediate medical attention and special treatment needed

Obtain medical assistance. Treat with corticosteroid spray as soon as possible after inhalation.

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### SECTION 5: Firefighting measures

#### 5.1. Extinguishing media

- Suitable extinguishing media : Water spray or fog. Product does not burn, use fire control measures appropriate for the surrounding fire.
- Unsuitable extinguishing media : Do not use water jet to extinguish.

#### 5.2. Special hazards arising from the substance or mixture

- Reactivity in case of fire : No reactivity hazard other than the effects described in sub-sections below.
- Specific hazards : Supports combustion.  
Exposure to fire may cause containers to rupture/explode.
- Hazardous combustion products : None that are more hazardous than the product itself.

#### 5.3. Advice for firefighters

- Specific methods : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems.  
If possible, stop flow of product.  
Use water spray or fog to knock down fire fumes if possible.  
Move containers away from the fire area if this can be done without risk.
- Special protective equipment for fire fighters : Wear gas tight chemically protective clothing in combination with self contained breathing apparatus.  
Standard EN 943-2: Protective clothing against liquid and gaseous chemicals, aerosols and solid particles. Gas-tight chemical protective suits for emergency teams.  
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

##### 6.1.1. For non-emergency personnel

- Emergency procedures : Act in accordance with local emergency plan. Try to stop release. Evacuate area. Eliminate ignition sources. Ensure adequate air ventilation. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Stay upwind. See section 8 of the SDS for more information on personal protective equipment.

##### 6.1.2. For emergency responders

- Emergency procedures : Monitor concentration of released product. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. See section 5.3 of the SDS for more information.

#### 6.2. Environmental precautions

Try to stop release. Reduce vapour with fog or fine water spray.

#### 6.3. Methods and material for containment and cleaning up

- Methods and material for containment and cleaning up : Hose down area with water.  
Wash contaminated equipment or sites of leaks with copious quantities of water.

#### 6.4. Reference to other sections

See also sections 8 and 13.

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### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

Safe use of the product

- : Avoid contact with aluminium.
- Use no oil or grease.
- Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
- Avoid exposure, obtain special instructions before use.
- Do not smoke while handling product.
- Keep equipment free from oil and grease. For more guidance, refer to the EIGA Doc. 33 - Cleaning of Equipment for Oxygen Service downloadable at <http://www.eiga.eu>.
- Avoid suck back of water, acid and alkalis.
- Only experienced and properly instructed persons should handle gases under pressure.
- Ensure the complete gas system was (or is regularly) checked for leaks before use.
- Installation of a cross purge assembly between the container and the regulator is recommended.
- Purge system with dry inert gas (e.g. helium or nitrogen) before gas is introduced and when system is placed out of service.
- The product must be handled in accordance with good industrial hygiene and safety procedures.
- Consider pressure relief device(s) in gas installations.
- Do not breathe gas.
- Avoid release of product into work area.
- Use only lubricants and sealings approved for the specific gas service.

Safe handling of the gas receptacle

- : Refer to supplier's container handling instructions.
- Do not allow backfeed into the container.
- Protect containers from physical damage; do not drag, roll, slide or drop.
- When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders.
- Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use.
- If user experiences any difficulty operating valve discontinue use and contact supplier.
- Never attempt to repair or modify container valves or safety relief devices.
- Damaged valves should be reported immediately to the supplier.
- Keep container valve outlets clean and free from contaminants particularly oil and water.
- Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment.
- Close container valve after each use and when empty, even if still connected to equipment.
- Never attempt to transfer gases from one cylinder/container to another.
- Never use direct flame or electrical heating devices to raise the pressure of a container.
- Do not remove or deface labels provided by the supplier for the identification of the content of the container.
- Suck back of water into the container must be prevented.
- Open valve slowly to avoid pressure shock.

#### 7.2. Conditions for safe storage, including any incompatibilities

Conditions for safe storage, including any incompatibilities

- : Segregate from flammable gases and other flammable materials in store.
- Store locked up.
- Observe all regulations and local requirements regarding storage of containers.
- Containers should not be stored in conditions likely to encourage corrosion.
- Container valve guards or caps should be in place.
- Containers should be stored in the vertical position and properly secured to prevent them from falling over.
- Stored containers should be periodically checked for general condition and leakage.
- Keep container below 50°C in a well ventilated place.
- Store containers in location free from fire risk and away from sources of heat and ignition.
- Keep away from combustible materials.

#### 7.3. Specific end use(s)

None.

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### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

##### 8.1.1 National occupational exposure and biological limit values

Chlorine (7782-50-5)	
<b>EU - Indicative Occupational Exposure Limit (IOEL)</b>	
Local name	Chlorine
IOEL STEL	1.5 mg/m <sup>3</sup>
	0.5 ppm
Regulatory reference	COMMISSION DIRECTIVE 2006/15/EC
<b>Austria - Occupational Exposure Limits</b>	
Local name	Chlor
MAK (OEL TWA)	1.5 mg/m <sup>3</sup>
	0.5 ppm
OEL C	1.5 mg/m <sup>3</sup>
	0.5 ppm
Regulatory reference	BGBl. II Nr. 156/2021

##### 8.1.2. Recommended monitoring procedures

No additional information available

##### 8.1.3. Air contaminants formed

No additional information available

##### 8.1.4. DNEL and PNEC

Chlorine (7782-50-5)	
<b>DNEL/DMEL (Workers)</b>	
Acute - systemic effects, inhalation	1.5 mg/m <sup>3</sup>
Acute - local effects, inhalation	1.5 mg/m <sup>3</sup>
Long-term - systemic effects, inhalation	0.75 mg/m <sup>3</sup>
Long-term - local effects, inhalation	0.75 mg/m <sup>3</sup>
<b>PNEC (Water)</b>	
PNEC aqua (freshwater)	0.00021 mg/l
PNEC aqua (marine water)	0.000042 mg/l
PNEC aqua (intermittent, freshwater)	0.00026 mg/l
<b>PNEC (STP)</b>	
PNEC sewage treatment plant	0.03 mg/l

##### 8.1.5. Control banding

No additional information available

#### 8.2. Exposure controls

##### Appropriate engineering controls

Appropriate engineering controls:

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Provide adequate general and local exhaust ventilation. Consider the use of a work permit system e.g. for maintenance activities. Product to be handled in a closed system and under strictly controlled conditions. Preferably use permanent leak-tight installations (e.g. welded pipes). Gas detectors should be used when toxic gases may be released. Systems under pressure should be regularly checked for leakages. Ensure exposure is below occupational exposure limits (where available).

### Personal protection equipment

#### Personal protective equipment:

A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered: PPE compliant to the recommended EN/ISO standards should be selected.

#### Personal protective equipment symbol(s):



### Eye and face protection

#### Eye protection:

Wear goggles and a face shield when transfilling or breaking transfer connections. Provide readily accessible eye wash stations and safety showers. Standard EN 166 - Personal eye-protection - specifications

### Skin protection

#### Hand protection:

Wear working gloves when handling gas containers. Wear chemically resistant protective gloves. Standard EN 374 - Protective gloves against chemicals. Standard EN 388 - Protective gloves against mechanical risks, performance level 1 or higher. Recommended types include wrist gloves from leather or synthetic material with equivalent performance, fabric gloves, fabric gloves with leather palms. Standard EN 511 - Cold insulating gloves, performance level 1 or higher. Recommended types include insulated gauntlets or gloves specifically selected to prevent liquid penetration and ingress of cryogenic liquids and to provide mechanical resistance. Permeation time: minimum >30min short term exposure: material / thickness Chloroprene rubber (Neoprene®) (CR) / 0,4 [mm]. Permeation time: minimum >480min long term exposure : material / thickness Fluoroelastomer (Viton®) (FKM) / 0,7 [mm]. Consult glove manufacturer's product information on material suitability and material thickness. The breakthrough time of the selected gloves must be greater than the intended use period.

### Respiratory protection

#### Respiratory protection:

Recommended: Filter B (grey). Self contained breathing apparatus is recommended, where unknown exposure may be expected, e.g. during maintenance activities on installation systems. Gas filters may be used if all surrounding conditions e.g. type and concentration of the contaminant(s) and duration of use are known. Use gas filters with full face mask, where exposure limits may be exceeded for a short-term period, e.g. connecting or disconnecting containers. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask. Gas filters do not protect against oxygen deficiency. Standard EN 14387 - Gas filter(s), combined filter(s) and standard EN136, full face masks . Keep self contained breathing apparatus readily available for emergency use.

### Thermal hazards

#### Thermal hazard protection:

None in addition to the above sections.

### Environmental exposure controls

#### Environmental exposure controls:

Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

#### Other information:

Keep suitable chemically resistant protective clothing readily available for emergency use. Standard EN943-1 - Full protective suits against liquid, solid and gaseous chemicals. Wear safety shoes while handling containers. Standard EN ISO 20345 - Personal protective equipment - Safety footwear.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Appearance	
Physical state	: Gas
Colour	: Greenish gas.
Form	: Liquefied gas
Odour	: Pungent.

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Odour threshold	: Odour threshold is subjective and inadequate to warn of overexposure.
Melting point	: -101 °C
Freezing point	: Not applicable
Boiling point	: -34 °C
Flammability	: Non flammable.
Oxidising properties	: Oxidiser.
Explosive limits	: Not known.
Lower explosion limit	: Not applicable.
Upper explosion limit	: Not applicable.
Flash point	: Not applicable for gases and gas mixtures.
Auto-ignition temperature	: Non flammable.
Decomposition temperature	: Not applicable.
pH	: If dissolved in water pH-value will be affected.
Viscosity, kinematic	: Not applicable for gases and gas mixtures.
Viscosity, dynamic	: 13.3 mPa·s Not applicable for gases and gas mixtures.
Solubility in water	: 8620 mg/l
Partition coefficient n-octanol/water (Log Kow)	: Not applicable for inorganic products.
Partition coefficient n-octanol/water (Log Pow)	: Not applicable for gas mixtures.
Vapour pressure	: 6.8 bar(a)
Vapour pressure at 50°C	: 14.3 bar(a)
Critical pressure	: 7991 kPa
Density	: 1.409 g/cm <sup>3</sup> 20.0 °C
Relative density	: 1.6
Relative vapour density at 20°C	: Not applicable.
Relative gas density	: 2.5
Particle characteristics	: Not applicable Not applicable for gases and gas mixtures. Nanoforms are not relevant for gases and gas mixtures.

## 9.2. Other information

### 9.2.1. Information with regard to physical hazard classes

Ci	: 0.7
Critical temperature	: 144 °C

### 9.2.2. Other safety characteristics

Molecular mass	: 71 g/mol
Gas group	: Press. Gas (Liq.)
Additional information	: Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

### 10.2. Chemical stability

Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

Violently oxidises organic material.

### 10.4. Conditions to avoid

Avoid moisture in installation systems.

### 10.5. Incompatible materials

May react violently with alkalis. With water causes rapid corrosion of some metals. Reacts with water to form corrosive acids. Moisture. May react violently with combustible materials. May react violently with reducing agents. Keep equipment free from oil and grease. For more guidance, refer to the EIGA Doc. 33 - Cleaning of Equipment for Oxygen Service downloadable at <http://www.eiga.eu>. For additional information on compatibility refer to ISO 11114.



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### 10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## SECTION 11: Toxicological information

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

Acute toxicity	: Fatal if inhaled.
Acute toxicity (oral)	: Not classified
Acute toxicity (dermal)	: Not classified
Acute toxicity (inhalation)	: Inhalation:gas: Fatal if inhaled.

#### Chlorine (7782-50-5)

LC50 Inhalation - Rat [ppm]	293 ppm/1h (ADR) 146.5 ppm/4h (CLP)
Skin corrosion/irritation	: Causes skin irritation. pH: If dissolved in water pH-value will be affected.
Serious eye damage/irritation	: Causes serious eye irritation. pH: If dissolved in water pH-value will be affected.
Respiratory or skin sensitisation	: No known effects from this product.
Germ cell mutagenicity	: No known effects from this product.
Carcinogenicity	: No known effects from this product.
Reproductive toxicity	: Not classified
Toxic for reproduction : Fertility	: No known effects from this product.
Toxic for reproduction : unborn child	: No known effects from this product.
STOT-single exposure	: May cause inflammation of the respiratory system. Severe corrosion to the respiratory tract at high concentrations.
Target organ(s)	: Respiratory tract.
STOT-repeated exposure	: No known effects from this product.
Aspiration hazard	: Not applicable for gases and gas mixtures.

#### Chlorine (7782-50-5)

Viscosity, kinematic	Not applicable for gases and gas mixtures.
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### 11.2. Information on other hazards

#### 11.2.1. Endocrine disrupting properties

No additional information available

#### 11.2.2. Other information

Other information	: Delayed fatal pulmonary oedema possible,The substance/mixture has no endocrine disrupting properties.
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## SECTION 12: Ecological information

### 12.1. Toxicity

Assessment	: Very toxic to aquatic life.
Hazardous to the aquatic environment, short-term (acute)	: Very toxic to aquatic life.
Hazardous to the aquatic environment, long-term (chronic)	: Not classified
Not rapidly degradable	

#### Chlorine (7782-50-5)

LC50 96 h - Fish [mg/l]	0.032 mg/l
EC50 48h - Daphnia magna [mg/l]	0.141 mg/l
EC50 72h - Algae [mg/l]	0.001 - 0.01

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### 12.2. Persistence and degradability

#### Chlorine (7782-50-5)

Assessment	Not applicable for inorganic products.
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### 12.3. Bioaccumulative potential

#### Chlorine (7782-50-5)

Partition coefficient n-octanol/water (Log Pow)	Not applicable for gas mixtures.
Partition coefficient n-octanol/water (Log Kow)	Not applicable for inorganic products.
Assessment	No data available.

### 12.4. Mobility in soil

#### Chlorine (7782-50-5)

Assessment	Because of its high volatility, the product is unlikely to cause ground or water pollution. Partition into soil is unlikely.
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### 12.5. Results of PBT and vPvB assessment

Assessment : Not classified as PBT or vPvB.

### 12.6. Endocrine disrupting properties

Other adverse effects : May cause pH changes in aqueous ecological systems.  
Assessment : The substance/mixture has no endocrine disrupting properties.

### 12.7. Other adverse effects

Other adverse effects : May cause pH changes in aqueous ecological systems.  
Effect on the ozone layer : No effect on the ozone layer.  
Effect on global warming : No known effects from this product.

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Waste treatment methods : Contact supplier if guidance is required. Ensure that the emission levels from local regulations or operating permits are not exceeded. Refer to the EIGA code of practice Doc.30 "Disposal of Gases", downloadable at <http://www.eiga.eu> for more guidance on suitable disposal methods. Must not be discharged to atmosphere. Return unused product in original container to supplier.

List of hazardous waste codes (from Commission Decision 2000/532/EC as amended)

HP Code : 16 05 04 \*: Gases in pressure containers (including halons) containing hazardous substances.

HP2 - "Oxidising:" waste which may, generally by providing oxygen, cause or contribute to the combustion of other materials.

HP5 - "Specific Target Organ Toxicity (STOT)/Aspiration Toxicity:" waste which can cause specific target organ toxicity either from a single or repeated exposure, or which cause acute toxic effects following aspiration.

HP6 - "Acute Toxicity:" waste which can cause acute toxic effects following oral or dermal administration, or inhalation exposure.

HP4 - "Irritant – skin irritation and eye damage:" waste which on application can cause skin irritation or damage to the eye.

HP14 - "Ecotoxic:" waste which presents or may present immediate or delayed risks for one or more sectors of the environment

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### 13.2. Additional information

External treatment and disposal of waste should comply with applicable local and/or national regulations.

## SECTION 14: Transport information

In accordance with ADR / IMDG / IATA / ADN / RID

ADR	IMDG	IATA	ADN	RID
<b>14.1. UN number or ID number</b>				
UN 1017	UN 1017	UN 1017	UN 1017	UN 1017
<b>14.2. UN proper shipping name</b>				
CHLORINE (Chlorine)	CHLORINE (Chlorine)	Chlorine (Chlorine)	CHLORINE (Chlorine)	CHLORINE (Chlorine)
<b>Transport document description</b>				
UN 1017 CHLORINE (Chlorine), 2.3 (5.1+8), (C/D), ENVIRONMENTALLY HAZARDOUS	UN 1017 CHLORINE (Chlorine), 2.3 (5.1+8), MARINE POLLUTANT/ENVIRONMENTALLY HAZARDOUS	UN 1017 Chlorine (Chlorine), 2.3 (5.1+8), ENVIRONMENTALLY HAZARDOUS	UN 1017 CHLORINE (Chlorine), 2.3 (5.1+8), ENVIRONMENTALLY HAZARDOUS	UN 1017 CHLORINE (Chlorine), 2.3 (5.1+8), ENVIRONMENTALLY HAZARDOUS
<b>14.3. Transport hazard class(es)</b>				
2.3 (5.1, 8)	2.3 (5.1, 8)	2.3 (5.1, 8)	2.3 (5.1, 8)	2.3 (5.1, 8)
				
<b>14.4. Packing group</b>				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
<b>14.5. Environmental hazards</b>				
Dangerous for the environment: Yes	Dangerous for the environment: Yes Marine pollutant: Yes	Dangerous for the environment: Yes	Dangerous for the environment: Yes	Dangerous for the environment: Yes
No supplementary information available				

### 14.6. Special precautions for user

#### Overland transport

Classification code (ADR)	: 2TOC
Limited quantities (ADR)	: 0
Excepted quantities (ADR)	: E0
Packing instructions (ADR)	: P200
Mixed packing provisions (ADR)	: MP9
Portable tank and bulk container instructions (ADR)	: (M), T50
Portable tank and bulk container special provisions (ADR)	: TP19
Tank code (ADR)	: P22DH(M)
Tank special provisions (ADR)	: TA4, TT9, TT10
Vehicle for tank carriage	: AT
Transport category (ADR)	: 1

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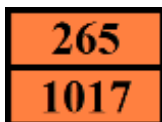
according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878

Special provisions for carriage - Loading, unloading and handling (ADR) : CV9, CV10, CV36

Special provisions for carriage - Operation (ADR) : S14

Hazard identification number (Kemler No.) : 265

Orange plates :



Tunnel restriction code (ADR) : C/D

### Transport by sea

Limited quantities (IMDG) : 0

Excepted quantities (IMDG) : E0

Packing instructions (IMDG) : P200

Tank instructions (IMDG) : T50

Tank special provisions (IMDG) : TP19

EmS-No. (Fire) : F-C

EmS-No. (Spillage) : S-U

Stowage category (IMDG) : D

Stowage and handling (IMDG) : SW2

Segregation (IMDG) : SG6, SG19

Properties and observations (IMDG) : Non-flammable, toxic and corrosive yellow gas with a pungent odour. Corrosive to glass and to most metals. Much heavier than air (2.4). Highly irritating to skin, eyes and mucous membranes. Powerful oxidant which may cause fire.

### Air transport

PCA Limited quantities (IATA) : Forbidden

PCA limited quantity max net quantity (IATA) : Forbidden

PCA packing instructions (IATA) : Forbidden

PCA max net quantity (IATA) : Forbidden

CAO packing instructions (IATA) : Forbidden

CAO max net quantity (IATA) : Forbidden

Special provisions (IATA) : A2

ERG code (IATA) : 2PX

### Inland waterway transport

Classification code (ADN) : 2TOC

Limited quantities (ADN) : 0

Excepted quantities (ADN) : E0

Equipment required (ADN) : PP, EP, TOX, A

Ventilation (ADN) : VE02

Number of blue cones/lights (ADN) : 2

### Rail transport

Classification code (RID) : 2TOC

Limited quantities (RID) : 0

Excepted quantities (RID) : E0

Packing instructions (RID) : P200

Mixed packing provisions (RID) : MP9

Portable tank and bulk container instructions (RID) : T50(M)

Portable tank and bulk container special provisions (RID) : TP19

Tank codes for RID tanks (RID) : P22DH(M)

Special provisions for RID tanks (RID) : TU38, TE22, TE25, TA4, TT9, TT10, TM6

Transport category (RID) : 1

Special provisions for carriage - Loading, unloading and handling (RID) : CW9, CW10, CW36

Hazard identification number (RID) : 265

### 14.7. Maritime transport in bulk according to IMO instruments

Not applicable

# Chlorine

## Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878

### SECTION 15: Regulatory information

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

##### 15.1.1. EU-Regulations

###### REACH Annex XVII (Restriction List)

Not listed on REACH Annex XVII

###### REACH Annex XIV (Authorisation List)

Not listed on REACH Annex XIV (Authorisation List)

###### REACH Candidate List (SVHC)

Contains no substance(s) listed on the REACH Candidate List

###### PIC Regulation (Prior Informed Consent)

Not listed on the PIC list (Regulation EU 649/2012)

###### POP Regulation (Persistent Organic Pollutants)

Not listed on the POP list (Regulation EU 2019/1021)

###### Ozone Regulation (1005/2009)

Not listed on the Ozone Depletion list (Regulation EU 2024/590)

###### VOC Directive (2004/42)

Restrictions on use : None.

###### Seveso Directive (Disaster Risk Reduction)

Seveso Directive : 2012/18/EU (Seveso III) : Listed.

Seveso III Part II (Named dangerous substances)	Qualifying quantity (tonnes)	
	Lower-tier	Upper-tier
Chlorine	10	25

###### Explosives Precursors Regulation (2019/1148)

Contains no substance(s) listed on the Explosives Precursors list (Regulation EU 2019/1148 on the marketing and use of explosives precursors)

###### Drug Precursors Regulation (273/2004)

Contains no substance(s) listed on the Drug Precursors list (Regulation EC 273/2004 on the manufacture and the placing on market of certain substances used in the illicit manufacture of narcotic drugs and psychotropic substances)

##### 15.1.2. National regulations

Ensure all national/local regulations are observed.

Safety data sheet in accordance with commission regulation (EU) No 2020/878.

Council Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work

Directive 2016/425/EEC on personal protective equipment

Directive 2014/34/EU on equipment and protective systems intended for use in potentially explosive atmospheres (ATEX)

Only products that comply with the food regulations (EC) No. 1333/2008 and (EU) No. 231/2012 and are labelled as such may be used as food additives.

This Safety Data Sheet has been produced to comply with Regulation (EU) 2015/830.

#### 15.2. Chemical safety assessment

A CSA has been carried out.

### SECTION 16: Other information

#### Indication of changes:

Safety data sheet in accordance with commission regulation (EU) No 2020/878.

Abbreviations and acronyms:	
ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways

# Chlorine

## Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878

Abbreviations and acronyms:	
	ADR - Agreement concerning the International Carriage of Dangerous Goods by Road
	ATE - Acute Toxicity Estimate
BLV	Biological limit value
BOD	Biochemical oxygen demand (BOD)
CAO	Cargo Aircraft only / Cargo Aircraft only
CAS-No.	Chemical Abstract Service number
	CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
COD	Chemical oxygen demand (COD)
	CSA - Chemical Safety Assessment
DMEL	Derived Minimal Effect level
DNEL	Derived-No Effect Level
EC50	Median effective concentration
EC	European Inventory of Existing Commercial Chemical Substances
ED	Endocrine disruptor
	EINECS - European Inventory of Existing Commercial Chemical Substances
EN	European Standard
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
IOELV	Indicative Occupational Exposure Limit Value
LC50	Median lethal concentration
LD50	Median lethal dose
LOAEL	Lowest Observed Adverse Effect Level
NOAEC	No-Observed Adverse Effect Concentration
NOAEL	No-Observed Adverse Effect Level
NOEC	No-Observed Effect Concentration
N.O.S.	Not Otherwise Specified
OECD	Organisation for Economic Co-operation and Development
OEL	Occupational Exposure Limit
PBT	Persistent Bioaccumulative Toxic
PCA	Passenger and Cargo Aircraft / Passenger and Cargo Aircraft
PNEC	Predicted No-Effect Concentration
	PPE - Personal Protection Equipment
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
	RMM - Risk Management Measures
STP	Sewage treatment plant
ThOD	Theoretical oxygen demand (ThOD)
TLM	Median Tolerance Limit

# Chlorine

## Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878

### Abbreviations and acronyms:

TRGS	Technical Rules for Hazardous Substances
STOT-RE	Specific Target Organ Toxicity-Repeated Exposure
STOT-SE	Specific Target Organ Toxicity-Single Exposure
UFI	Unique Formula Identifier
	UN - United Nations
VOC	Volatile Organic Compounds
vPvB	Very Persistent and Very Bioaccumulative
WGK	Water Hazard Class

Training advice	: Users of breathing apparatus must be trained. Ensure operators understand the toxicity hazard.
Other information	: Classification in accordance with the procedures and calculation methods of Regulation (EC) 1272/2008 (CLP). Key literature references and sources of data are maintained in EIGA doc 169 : 'Classification and Labelling Guide', downloadable at <a href="http://www.Eiga.eu">http://www.Eiga.eu</a> .

### Full text of H- and EUH-statements:

Acute Tox. 2 (Inhalation:gas)	Acute toxicity (inhalation:gas) Category 2
Aquatic Acute 1	Hazardous to the aquatic environment – Acute Hazard, Category 1
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
Ox. Gas 1	Oxidising Gases, Category 1
Press. Gas (Liq.)	Gases under pressure : Liquefied gas
Skin Irrit. 2	Skin corrosion/irritation, Category 2
STOT SE 3	Specific target organ toxicity – Single exposure, Category 3, Respiratory tract irritation
H270	May cause or intensify fire; oxidiser.
H280	Contains gas under pressure; may explode if heated.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H335	May cause respiratory irritation.
H400	Very toxic to aquatic life.
EUH071	Corrosive to the respiratory tract.

### Full text of use descriptors

ERC2	Formulation into mixture
ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC6b	Use of reactive processing aid at industrial site (no inclusion into or onto article)
PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

# Chlorine

## Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878

### Full text of use descriptors

PROC4	Chemical production where opportunity for exposure arises
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

The classification complies with  
DISCLAIMER OF LIABILITY

- : ATP 12
- : Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out. Details given in this document are believed to be correct at the time of going to press. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.

Safety Data Sheet (SDS), EU AT

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

### Annex to the safety data sheet

This Annex documents the Exposure Scenarios (ESs) related to the identified uses of the registered substance. The ESs detail protective measures for workers and the environment in addition to those described in sections 7, 8, 11, 12 and 13 of the SDS that are required to ensure that the potential exposure to workers and the environment remains within acceptable levels for each of the identified uses.

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# Chlorine

## Annex to the safety data sheet: Exposure scenario

Reference number: EIGA022 CAS-No.: 7782-50-5 Product form: Substance Physical state: Gas

### 1. EIGA022-1: Industrial uses, closed contained conditions

#### 1.1. Title section

##### Industrial uses, closed contained conditions

ES Ref.: EIGA022-1  
Revision date: 10/1/2016

Processes, tasks, activities covered	Industrial uses, including product transfers and associated laboratory activities within different closed or contained systems
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Environment	Use descriptors
CS1	ERC2, ERC4, ERC6b

Worker	Use descriptors
CS2	PROC1
CS3	PROC2, PROC3, PROC4, PROC8b, PROC9

#### 1.2. Conditions of use affecting exposure

##### 1.2.1. Control of environmental exposure: ERC2, ERC4, ERC6b

ERC2	Formulation into mixture
ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC6b	Use of reactive processing aid at industrial site (no inclusion into or onto article)

Product (article) characteristics	
Physical form of product	See section 9 of the SDS, No additional information
Concentration of substance in product	≤ 100 %

Amount used, frequency and duration of use (or from service life)	
The actual tonnage handled per site is not considered to influence the immissions as such for this scenario as there is practically no release	
Emission Days (days/year)	365
Covers frequency up to:	Continuous release

Technical and organisational conditions and measures	
Soil emission controls are not applicable as there is no direct release to soil	
Wastewater emission controls are not applicable as there is no direct release to wastewater	
Ensure operatives are trained to minimise releases	

Conditions and measures related to sewage treatment plant	
Size of the sewage treatment plant (STP)	2000 m <sup>3</sup> /d

# Chlorine

## Annex to the safety data sheet: Exposure scenario

Reference number: EIGA022 CAS-No.: 7782-50-5 Product form: Substance Physical state: Gas

Conditions and measures related to treatment of waste (including article waste)	
No additional information	

Other conditions affecting environmental exposure	
Dilution of STP emissions at least:	10 Rivers
Dilution of STP emissions at least:	100 Coastal zones

### 1.2.2. Control of worker exposure: PROC1

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
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Product (article) characteristics	
Physical form of product	See section 9 of the SDS, No additional information
Concentration of substance in product	≤ 100 %

Amount used (or contained in articles), frequency and duration of use/exposure	
The actual tonnage handled per shift is not considered to influence the exposure as such for this scenario. Instead, the combination of the scale of operation and level of containment/automation (as reflected in the technical conditions) is the main determinant of the process-intrinsic emission potential.	
Exposure duration	≤ 8 h/day
Covers frequency up to:	5 days/week

Technical and organisational conditions and measures	
Handle product within a closed system	
Apply a good standard of general or controlled ventilation when maintenance activities are carried out.	
Ensure operatives are trained to minimise exposure	
Ensure supervision is in place to check that the RMMs are in place and are being used correctly and that the OCs are being followed	

Conditions and measures related to personal protection, hygiene and health evaluation	
See section 8 of the SDS.	

Other conditions affecting workers exposure	
Indoor or outdoor use	

### 1.2.3. Control of worker exposure: PROC2, PROC3, PROC4, PROC8b, PROC9

PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
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# Chlorine

## Annex to the safety data sheet: Exposure scenario

Reference number: EIGA022 CAS-No.: 7782-50-5 Product form: Substance Physical state: Gas

PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Product (article) characteristics	
Physical form of product	See section 9 of the SDS, No additional information
Concentration of substance in product	≤ 100 %

Amount used (or contained in articles), frequency and duration of use/exposure	
The actual tonnage handled per shift is not considered to influence the exposure as such for this scenario. Instead, the combination of the scale of operation and level of containment/automation (as reflected in the technical conditions) is the main determinant of the process-intrinsic emission potential.	
Exposure duration	≤ 8 h/day
Covers frequency up to:	5 days/week

Technical and organisational conditions and measures	
Handle product within a closed system	
Fill containers at dedicated fill points supplied with local extract ventilation.	
Ensure samples are obtained under containment or extract ventilation.	
Drain down and flush system prior to equipment break-in or maintenance.	
During indoor processes or in cases where natural ventilation is not sufficient, LEV should be in place at points where emissions could occur. Outdoor, LEV is not generally required.	
Apply a good standard of general or controlled ventilation when maintenance activities are carried out.	
Ensure operatives are trained to minimise exposure	
Ensure supervision is in place to check that the RMMs are in place and are being used correctly and that the OCs are being followed	

Conditions and measures related to personal protection, hygiene and health evaluation	
Face mask with type B filter. Self-contained breathing apparatus should be worn in case of medium confinement/insufficient oxygen/in case of large uncontrolled emissions/in all circumstances when the mask and cartridge do not give adequate protection. Wear suitable gloves tested to EN374. Neoprene rubber (HNBR)	Personal protection measures have to be applied in case of potential exposure only.
Wear suitable coveralls to prevent exposure to the skin	
See section 8 of the SDS.	

Other conditions affecting workers exposure	
Indoor or outdoor use	

# Chlorine

## Annex to the safety data sheet: Exposure scenario

Reference number: EIGA022 CAS-No.: 7782-50-5 Product form: Substance Physical state: Gas

### **1.3. Exposure estimation and reference to its source**

#### **1.3.1. Environmental release and exposure: ERC2, ERC4, ERC6b**

The exposure of aquatic, terrestrial, sediment and sewage treatment microorganisms is considered to be negligible because the substance partitions primarily to air when released to the environment.

#### **1.3.2. Worker exposure: PROC1**

When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposure of workers and indirect human exposure via the environment is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.

#### **1.3.3. Worker exposure: PROC2, PROC3, PROC4, PROC8b, PROC9**

When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposure of workers and indirect human exposure via the environment is not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.

### **1.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES**

#### **1.4.1. Environment**

Guidance - Environment

Check that RMMs and OCs are as described above or of equivalent efficiency

#### **1.4.2. Health**

Guidance - Health

Check that RMMs and OCs are as described above or of equivalent efficiency

**End of document**