

**Chlorine****CL\_022-SE**

2.3 : Toxic gases



5.1 : Oxidizing substances



8 : Corrosive substances

Environmentally  
hazardous substances**Danger****SECTION 1. Identification of the substance/mixture and of the company/undertaking****1.1. Product identifier**

Trade name	: Chlorine , Klor, Klor N25, Klor, N28, Klor N 40 LGC
SDS Nr	: CL_022-SE replaces CL-022-SE 25 / 7 / 2014
Chemical description	: Chlorine CAS No :7782-50-5 EC No :231-959-5 Index No :017-001-00-7
Registration-No.	: 01-2119486560-35-
Chemical formula	: Cl <sub>2</sub>

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

Relevant identified uses	: Industrial and professional. Perform risk assessment prior to use. Test gas/Calibration gas. Chemical reaction / Synthesis. Water treatment. Contact supplier for more information on uses.
Uses advised against	: Consumer use.

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

Company identification	: AIR LIQUIDE GAS AB Lundavägen 151 212 24 Malmö SWEDEN Tfn. 040 - 38 10 00, efter kontorstid 0220- 396 00
E-Mail address )competent person)	: Info.sweden@airliquide.com

**1.4. Emergency telephone number**

Emergency telephone number	: 112
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**SECTION 2. Hazards identification****2.1. Classification of the substance or mixture****Hazard Class and Category Code Regulation EC 1272/2008 )CLP)**

• Health hazards	: Acute toxicity, Inhalation - Category 2 - Danger - (CLP : Acute Tox. 2) - H330 Skin irritation - Category 2 - Warning - (CLP : Skin Irrit. 2) - H315 Eye irritation - Category 2 - Warning - (CLP : Eye Irrit. 2) - H319 Specific Target Organ Toxicity - Single exposure - Respiratory tract irritation - Category 3 - Warning - (CLP : STOT SE 3) - H335
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**SECTION 2. Hazards identification (continued)**

- **Physical hazards** : Oxidizing gases - Category 1 - Danger - (CLP : Ox. Gas 1) - H270  
Gases under pressure - Liquefied gas - Warning - (CLP : Press. Gas) - H280
- **Environmental hazards** : Hazardous to the aquatic environment - Acute hazard - Category 1 - Warning - (CLP : Aquatic Acute 1) - H400  
Hazardous to the aquatic environment - Chronic hazard - Category 1 - Warning - (CLP : Aquatic Chronic 1) - H410

**2.2. Label elements**

Labelling Regulation EC 1272/2008 (CLP)

• **Hazard pictograms**



- **Hazard pictograms code** : GHS06 - GHS03 - GHS09 - GHS04
- **Signal word** : Danger
- **Hazard statements** : H270 - May cause or intensify fire; oxidiser.  
H280 - Contains gas under pressure; may explode if heated.  
H330 - Fatal if inhaled.  
H319 - Causes serious eye irritation.  
H315 - Causes skin irritation.  
H410 - Very toxic to aquatic life with long lasting effects.
- **Supplemental hazard information** : EUH071 - Corrosive to respiratory tract.  
: EUH071 supersedes H335 when assigned in the classification.
- **Precautionary statements**
  - **Prevention** : P260 - Do not breathe gas, vapours.  
P280 - Wear protective gloves/protective clothing/eye protection/face protection.  
P244 - Keep valves and fittings free from oil and grease  
P273 - Avoid release to the environment.  
P220 - Keep away from combustible materials.
  - **Response** : P304+P340+P315 - IF INHALED : Remove person to fresh air and keep comfortable for breathing. Get immediate medical advice / attention.  
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 / attention.  
P302+P352 - IF ON SKIN : Wash with plenty of water.  
P370+P376 - In case of fire : Stop leak if safe to do so.  
P332+P313 - If skin irritation occurs : Get medical advice/attention.
  - **Storage** : P403 - Store in a well-ventilated place.  
P405 - Store locked up.

**2.3. Other hazards**

- : Contact with liquid may cause cold burns/frostbite.

**SECTION 3. Composition/information on ingredients**

**3.1. Substance / 3.2. Mixture**

Substance.

Substance name	Content [Vol-%]	CAS No	EC No	Index No	Registration No.	Classification
Chlorine	100 %	7782-50-5	231-959-5	017-001-00-7	01-2119486560-35-	Acute Tox. 2 (H330) Ox. Gas 1 (H270) Eye irrit. 2 (H319) Skin Irrit. 2 (H315) STOT SE 3 (H335) Press. Gas (Liq.) (H280) Aquatic Acute 1 (H400) (M fact. = 100) Aquatic Chronic 1 (H410) (M fact. = 100)

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**Chlorine****CL\_022-SE****SECTION 3. Composition/information on ingredients )continued)**

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

\* 1: Listed in Annex IV / V REACH, exempted from registration.

\* 2: Registration deadline not expired.

\* 3: Registration not required: Substance manufactured or imported < 1t/y.

Full text of R-phrases see section 16. Full text of H-statements see section 16.

**SECTION 4. First aid measures****4.1. Description of first aid measures**

- Inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
- Skin contact : Remove contaminated clothing. Drench affected area with water for at least 15 minutes.
- Eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes.
- Ingestion : Ingestion is not considered a potential route of exposure.

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

- : May cause irritation to cornea (with temporary disturbance to vision).  
Material is destructive to tissue of the mucuous membranes and upper respiratory tract. Cough, shortness of breath, headache, nausea.  
May cause irritation to skin.  
Refer to section 11.

**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.

**SECTION 5. Fire-fighting measures****5.1. Extinguishing media**

- Suitable extinguishing media : Water spray or fog.  
Foam.
- Unsuitable extinguishing media : Do not use water jet to extinguish.

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

- Specific hazards : Supports combustion.  
Exposure to fire may cause containers to rupture/explode.
- Hazardous combustion products : None.

**5.3. Advice for fire-fighters**

- 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.  
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.

**Chlorine****CL\_022-SE****SECTION 6. Accidental release measures****6.1. Personal precautions, protective equipment and emergency procedures**

- : Try to stop release.
- Evacuate area.
- Monitor concentration of released product.
- Ensure adequate air ventilation.
- Eliminate ignition sources.
- Wear gas tight chemically protective clothing in combination with self contained breathing apparatus.
- Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
- Stay upwind.
- Act in accordance with local emergency plan.

**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**

- : Ventilate area.
- Wash contaminated equipment or sites of leaks with copious quantities of water.
- Hose down area with water.

**6.4. Reference to other sections**

- : See also sections 8 and 13.

**SECTION 7. Handling and storage****7.1. Precautions for safe handling****Safe use of the product**

- : Consider pressure relief device(s) in gas installations.
- Only experienced and properly instructed persons should handle gases under pressure.
- The product must be handled in accordance with good industrial hygiene and safety procedures.
- 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.
- Use no oil or grease.
- Do not smoke while handling product.
- Ensure the complete gas system was (or is regularly) checked for leaks before use.
- Installation of a cross purge assembly between the cylinder 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.
- Avoid suck back of water, acid and alkalis.
- Do not breathe gas.
- Avoid release of product into atmosphere.

**Safe handling of the gas receptacle**

- : Refer to supplier's container handling instructions.
- Open valve slowly to avoid pressure shock.
- Do not allow backfeed into the container.
- Protect cylinders 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 cylinder 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.

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**Chlorine****CL\_022-SE****SECTION 7. Handling and storage )continued)**

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 cylinder contents.

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

: Segregate from flammable gases and other flammable materials in store.  
Keep container below 50°C in a well ventilated 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. Container valve guards or caps should be in place. Store containers in location free from fire risk and away from sources of heat and ignition. Observe all regulations and local requirements regarding storage of containers.  
Containers should not be stored in conditions likely to encourage corrosion. Keep away from combustible materials.

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

: None.

**SECTION 8. Exposure controls/personal protection****8.1. Control parameters****Occupational Exposure Limits****Chlorine**

: ILV (EU) - 15 min - [mg/m<sup>3</sup>] : 1.5  
: ILV (EU) - 15 min - [ppm] : 0.5  
: TWA (SV) OEL 8h [ppm] : 0.5  
: TWA (SV) OEL 8h [mg/m<sup>3</sup>] : 1.5  
: STEL (SV) OEL 15min [mg/m<sup>3</sup>] : 3  
: STEL (SV) OEL 15min [ppm] : 1  
: STEL (DK) OEL 15min [mg/m<sup>3</sup>] : 1.5  
: STEL (DK) OEL 15min [ppm] : 0.5

**DNEL: Derived no effect level )Workers)****Chlorine**

: Inhalation-short term (local) [mg/m<sup>3</sup>] : 1.5  
: Inhalation-short term (systemic) [mg/m<sup>3</sup>] : 1.5  
: Inhalation-long term (local) [mg/m<sup>3</sup>] : 0.75  
: Inhalation-long term (systemic) [mg/m<sup>3</sup>] : 0.75

**PNEC: Predicted no effect concentration****Chlorine**

: Aqua (freshwater) [mg/l] : 0.00021  
: Aqua (marine water) [mg/l] : 0.000042  
: Aquatic, intermittent releases [mg/l] : 0.00026  
: Micro-organisms or PNEC sewage treatment plant (STP) [mg/l] : 0.03

**8.2. Exposure controls****8.2.1. Appropriate engineering controls**

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

**8.2.2. Individual protection measures, e.g. 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.  
Protect eyes, face and skin from liquid splashes.

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### SECTION 8. Exposure controls/personal protection )continued)

- **Eye/face protection** : Wear safety glasses with side shields.  
 Wear goggles and a face shield when transfilling or breaking transfer connections.  
 Standard EN 166 - Personal eye-protection.  
 Provide readily accessible eye wash stations and safety showers.
  
  - **Skin protection**
    - **Hand protection** : Wear working gloves when handling gas containers.  
 Standard EN 388 - Protective gloves against mechanical risk.  
 Wear chemically resistant protective gloves.  
 Standard EN 374 - Protective gloves against chemicals.  
 Permeation time: minimum >30min short term exposure; material / thickness [mm]:  
 Chloroprene rubber (CR) / 0,4  
 Permeation time: minimum >480min long term exposure; material / thickness [mm]:  
 Fluoroelastomer (FKM) / 0,7  
 The breakthrough time of the selected gloves must be greater than the intended use period.  
 Consult glove manufacturer's product information on material suitability and material thickness.
  
    - **Other** : Wear safety shoes while handling containers.  
 Standard EN ISO 20345 - Personal protective equipment - Safety footwear.  
 Keep suitable chemically resistant protective clothing readily available for emergency use.  
 Keep suitable chemically resistant protective clothing readily available for emergency use.  
 Standard EN943-1 - Full protective suits against liquid, solid and gaseous chemicals.
  
  - **Respiratory protection** : 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 and full face mask, where exposure limits may be exceeded for a short-term period, e.g. connecting or disconnecting containers.  
 Recommended: Filter B (grey).  
 Consult respiratory device supplier's product information for the selection of the appropriate device.  
 Gas filters do not protect against oxygen deficiency.  
 Standard EN 14387 - Gas filter(s), combined filter(s) and full face mask - EN 136.  
 Keep self contained breathing apparatus readily available for emergency use.  
 Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.  
 Self contained breathing apparatus is recommended, where unknown exposure may be expected, e.g. during maintenance activities on installation systems.
  
  - **Thermal hazards** : None necessary.
- 8.2.3. Environmental exposure controls** : Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

### SECTION 9. Physical and chemical properties

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

<b>Appearance</b>	
<b>Physical state at 20°C / 101.3kPa</b>	: Gas.
<b>Colour</b>	: Greenish gas.
<b>Odour</b>	: Pungent.
<b>Odour threshold</b>	: Odour threshold is subjective and inadequate to warn for overexposure.
<b>pH value</b>	: If dissolved in water pH-value will be affected.
<b>Molar mass [g/mol]</b>	: 71
<b>Melting point [°C]</b>	: -101
<b>Boiling point [°C]</b>	: -34
<b>Critical temperature [°C]</b>	: 144
<b>Flash point [°C]</b>	: Not applicable for gases and gas-mixtures.

**Chlorine****CL\_022-SE****SECTION 9. Physical and chemical properties )continued)**

Evaporation rate )ether=1)	: Not applicable for gases and gas-mixtures.
Flammability range [vol% in air]	: Non flammable.
Vapour pressure [20°C]	: 6.8 bar
Relative density, gas %air=1%	: 2.5
Relative density, liquid %water=1%	: 1.6
Solubility in water [mg/l]	: 8620
Partition coefficient n-octanol/water [log Kow]	: Not applicable for inorganic gases.
Auto-ignition temperature [°C]	: Not applicable.
Viscosity at 20°C [mPa.s]	: Not applicable.
Explosive Properties	: Not applicable.
Oxidising Properties	: Oxidiser.
- Coefficient of oxygen equivalency %i%	0.7

**9.2. Other information**

Other data	: Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.
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**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 combustible materials.  
May react violently with reducing agents.  
Reacts with water to form corrosive acids.  
May react violently with alkalis.  
With water causes rapid corrosion of some metals.  
Moisture.  
For additional information on compatibility refer to ISO 11114.

**10.6. Hazardous decomposition products**

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

**Chlorine****CL\_022-SE****SECTION 11. Toxicological information****11.1. Information on toxicological effects**

Acute toxicity	: Delayed fatal pulmonary oedema possible.
Rat inhalation LC50 [ppm/4h]	: 146.5
Skin corrosion/irritation	: May cause inflammation of the skin. Severe corrosion to skin at high concentrations.
Serious eye damage/irritation	: Severe corrosion to the eyes at high concentrations.
Respiratory or skin sensitisation	: No known effects from this product.
Carcinogenicity	: No known effects from this product.
Germ cell mutagenicity	: No known effects from this product.
Reproductive toxicity	: No known effects from this product.
STOT-single exposure	: Severe corrosion to the respiratory tract at high concentrations. May cause inflammation of the respiratory system.
STOT-repeated exposure	: No known effects from this product.
Aspiration hazard	: Not applicable for gases and gas-mixtures.

**SECTION 12. Ecological information****12.1. Toxicity**

	: Very toxic to aquatic life.
EC50 48h - Daphnia magna [mg/l]	: 0.141
EC50 72h Algae [mg/l]	: 0.001 - 0.01
LC50-96 h - fish [mg/l]	: 0.032

**12.2. Persistence and degradability**

: Not applicable for inorganic gases.

**12.3. Bioaccumulative potential**

: No data available.

**12.4. Mobility in soil**

: Because of its high volatility, the product is unlikely to cause ground or water pollution.

**12.5. Results of PBT and vPvB assessment**

: Not classified as PBT or vPvB.

**12.6. Other adverse effects**

	: May cause pH changes in aqueous ecological systems.
Effect on the ozone layer	: None.
Effect on global warming	: No known effects from this product.

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

: Must not be discharged to atmosphere.  
Refer to the EIGA code of practice Doc.30 "Disposal of Gases", downloadable at <http://www.eiga.org> for more guidance on suitable disposal methods.  
Ensure that the emission levels from local regulations or operating permits are not exceeded.  
Consult supplier for specific recommendations.

List of hazardous waste codes (from Commission Decision 2001/118/EC) : 16 05 04: Gases in pressure containers (including halons) containing dangerous substances.



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**SECTION 13. Disposal considerations )continued)**

**13.2. Additional information**

: None.

**SECTION 14. Transport information**

UN number : 1017

Labelling ADR, IMDG, IATA



: 2.3 : Toxic gases  
5.1 : Oxidizing substances  
8 : Corrosive substances  
Environmentally hazardous substances

Transport by road/rail )ADR/RID)

Transport by air )ICAO-TI / IATA-DGR)

Transport by sea )IMDG)

Classification code : 2 TOC

H.J. nr : 265

Tunnel Restriction : C/D : Passage forbidden through tunnels of category C when carried in tanks. Passage forbidden through tunnels of category D and E.

Emergency Schedule )EmS) - Fire : F-C

Emergency Schedule )EmS) - Spillage : S-U

**14.6 Special precautions for user**

Packing Instruction(s) : P200

Passenger and Cargo Aircraft : FORBIDDEN.

Cargo Aircraft only : FORBIDDEN.

Special precautions for user : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency.  
Before transporting product containers:  
- Ensure that containers are firmly secured.  
- Ensure cylinder valve is closed and not leaking.  
- Ensure valve outlet cap nut or plug (where provided) is correctly fitted.  
- Ensure valve protection device (where provided) is correctly fitted.  
- Ensure there is adequate ventilation.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not applicable.

UN proper shipping name : CHLORINE

Transport hazard class(es) : 2

Environmental hazards : Environmentally hazardous substance / mixture.

Proper shipping name : CHLORINE

Class : 2.3

Packing instruction : P200

IMDG-Marine pollutant : Marine pollutant.

Proper shipping name )IATA) : CHLORINE

Class : 2.3

**Chlorine****CL\_022-SE****SECTION 15. Regulatory information****15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture**EU legislation

Restrictions on use : None.

Seveso directive 2012/18/EC : Listed.

National legislation

National legislation : Ensure all national/local regulations are observed.

**15.2. Chemical safety assessment**

: A CSA has been carried out.

**SECTION 16. Other information****Indication of changes** : Revised safety data sheet in accordance with commission regulation (EU) No 2015/830.**Training advice** : Users of breathing apparatus must be trained.  
Ensure operators understand the toxicity hazard.**List of full text of H-statements in section 3.** : 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.  
H410 - Very toxic to aquatic life with long lasting effects.**Further information** : This Safety Data Sheet has been established in accordance with the applicable European Union legislation.**DISCLAIMER OF LIABILITY** : Details given in this document are believed to be correct at the time of going to press. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out. 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.**End of document**