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

1.1. Product identifier

Trade name	Chlorine
Chemical description	Chlorine
CAS N°	7782-50-5
CE N°	231-959-5
Index N°	017-001-00-7
Registration n°	01-2119486560-35
Chemical formula	Cl_2

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

Relevant identified uses	Industrial and professional See the list of identified uses and exposure scenarios in the annex of the safety data sheet Contact supplier for more information on uses
Uses advised against	For use by industrial and professional users only

1.3. Details of the supplier of the safety data sheet

Company identification	MULTIGAS Route de l'Industrie 102 CH-1564 Domdidier
Phone number	+41 (0) 26 676 94 94
E-mail address	info@multigas.ch

1.4. Emergency telephone numbers

145 (Toxicology Centre Zurich) or +41 (0) 44 251 51 51

+41 (0) 26 676 94 94 (Multigas)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Oxidising Gases, Category 1	H270
Gases under pressure : Liquefied gas	H280
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
Hazardous to the aquatic environment — Acute Hazard, Category 1	H400
Hazardous to the aquatic environment — Chronic Hazard, Category 1	H410

For the complete H-sentences texts mentioned in that chapter, refer to Section 16

2.2. Label elements

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

Hazard pictograms

GHS03 GHS04 GHS06 GHS09

Signal word Danger

Hazard statements

H270	May cause or intensify fire; oxidizer
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
EUH071	Corrosive to the respiratory tract

Precautionary statements

P220	Keep away from combustible materials
P244	Keep valves and fittings free from oil and grease
P260	Do not breathe gas, vapours
P273	Avoid release to the environment
P280	Wear protective gloves, protective clothing, eye protection, face protection
P302+P352	IF ON SKIN: Wash with plenty of soap and water
P304+P340+P315	IF INHALED: Remove victim to fresh air and keep at rest in a position 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
P332+P313	If skin irritation occurs: Get medical advice/attention
P370+P376	In case of fire: stop leak if safe to do so
P410+P403	Protect from sunlight. Store in a well-ventilated place
P405	Store locked up

2.3. Other hazards

Data not available

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	Product identifier	Concentration	Classification
Chlorine	(CAS-No.) 7782-50-5 (EC-No.) 231-959-5 (EC Index-No.) 017-001-00-7 (Registration-No.) 01-2119486560-35	≥ 99.8%	Ox. Gas 1, H270 Press. Gas (Liq.), H280 Acute Tox. 2 (Inhalation: gas), H330 Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335 Aquatic Acute 1, H400 (M=100) Aquatic Chronic 1, H410

For the complete H-sentences texts mentioned in that chapter, refer to Section 16

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

3.2. Mixtures

None

SECTION 4: First aid measures

4.1. Description of first aid measures

General advices	See a doctor. Show this safety data sheet to the attending physician
In case of inhalation	In case of inhalation, remove the person from the contaminated area. In case of respiratory arrest, give artificial respiration. See a doctor
In case of skin contact	Remove contaminated clothing and shoes immediately. Wash with soap and plenty of water. Take victim immediately to hospital. See a doctor
In case of eyes contact	Rinse thoroughly with plenty of water for at least 15 minutes and consult a doctor
In case of ingestion	Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. See a doctor

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

The main known symptoms and effects are described on the labelling (see section 2.2) and or section 11

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

Data not available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

The product itself does not burn

Water spray or water mist. Carbon dioxide. Dry powder. Foam

Unsuitable extinguishing media

Do not use water jet

5.2. Special hazards arising from the substance or mixture

Specific hazards

In case of fire or excessive heat, hazardous decomposition products may form

Exposure to fire may cause containers to rupture/explode

Hazardous combustion products

In the event of fire, thermal decomposition may lead to toxic and/or corrosive fumes: hydrogen chloride (HCl), phosgene, etc.

5.3. Additional information

Wear self-contained breathing apparatus for firefighting if necessary. (Standard EN 137 - Self-contained compressed air device with a full face mask)

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Avoid breathing vapours, spray mists or gases

Provide adequate ventilation

Evacuate personnel to a safe place

Personal protective equipment, see section 8

6.2. Environmental precautions

Avoid further spills and leaks, if this is possible safely. All littering must be avoided in the environment

6.3. Methods and material for containment and cleaning up

Hose down area with water

Keep area evacuated and free from ignition sources until any spilled liquid has evaporated (ground free from frost)

Wash contaminated equipment or sites of leaks with copious quantities of water

6.4. Reference to other sections

See also sections 8 and 13

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Avoid contact with skin and eyes

Avoid breathing vapour or mist

Keep away from sources of ignition - No smoking

For precautions, see section 2.2

7.2. Conditions for safe storage, including any incompatibilities

Store in a cool place. Keep container tightly closed in a dry and well-ventilated place

Content under pressure

7.3. Specific end use(s)

None

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Components with occupational exposure limits

Component	CAS N°	Exposure value type	Value	Source
Chlorine	7782-50-5	TWA	0.5 ppm	SUVA: Limit values of exposure to workstations
			1.5 mg/m³	
		OEL	0.5 ppm	SUVA: Limit values of exposure to workstations
			1.5 mg/m³	

8.2. Exposure controls

8.2.1. Appropriate engineering controls

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

Eye/face protection	Wear goggles and a face shield when transfilling or breaking transfer connections. Standard EN 166 - Personal eye-protection - specifications
Skin / hand protection	Wear protective gloves when handling gas cylinders. Standard EN 388-Protective gloves against mechanical hazards Wear cold insulating gloves when transferring or disconnecting transfer lines Standard EN 511 - Insulating gloves against cold Wearing chemical resistant gloves Standard EN 374-Protective gloves against chemicals **For long-term use** Material: Fluoroélastomère. Glove thickness: 0.7 mm Penetration time: 480 min **For short-term use** Material: Chloroprene rubber Glove thickness: 0.4 mm Penetration time: 30 min Have appropriate, chemical-resistant protective clothing ready for use in emergencies. Standard EN943-1
Respiratory protection	Self-contained breathing apparatus (SCBA) or positive pressure air mask must be used in oxygenated atmospheres. Standard EN 137 - Self-contained compressed air device with a full face mask

8.2.3. Environmental exposure controls

Avoid any spill or leak if it can be done safely

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	
• **Physical state at 20°C / 101.3kPa**	Gas
• **Colour**	Greenish gas
Odour	Pungent
Odour threshold	0.06- 0.2 ppm
pH	Data not available
Melting point / Freezing point	-101°C
Boiling point	-34.1°C
Flash point	Not applicable
Evaporation rate	Data not available
Flammability (solid, gas)	Data not available
Explosive limits	Data not available
Vapour pressure [20°C]	6.8 bar
Vapour pressure [50°C]	14.3 bar

Vapour density	Data not available
Relative density, liquid (water=1)	Data not available
Relative density, gas (air=1)	2.48
Water solubility	7.3 g/l
Partition coefficient n-octanol/water (Log Kow)	Data not available
Auto-ignition temperature	Data not available
Decomposition temperature	Data not available
Viscosity	Data not available
Explosive properties	Data not available
Oxidising properties	Comburant

9.2. Other information

Molar mass	71 g/mol
Critical temperature [°C]	144°C
Relative vapour density	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 the recommended storage conditions

10.3. Possibility of hazardous reactions

Reacts with many chemical compounds
Can react violently with reducing agents
Oxidises organic materials violently
At high temperatures (> 120°C), chlorine reacts spontaneously with iron (chlorine/iron fire)
Reacts violently with ammonia

10.4. Conditions to avoid

Sources of heat / heat - risk of bursting
Sources of ignition, open flames, incandescent metal surfaces, etc.
Water / moisture

10.5. Incompatible materials

Aluminium / Aluminium alloys

Powdered metals

Organic substances (fats, oils)

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

Reacts with water to form hydrochloric acid

SECTION 11: Toxicological information

11.1. Chemical safety assessment

Acute toxicity	Fatal if inhaled Delayed fatal pulmonary oedema possible
Skin corrosion/irritation	Causes serious skin irritation
Serious eye damage/irritation	Causes serious eye irritation
Respiratory or skin sensitisation	Data not available
Germ cell mutagenicity	Data not available
Carcinogenicity	Data not available
Reproductive toxicity	Data not available
STOT-single exposure – Target organ(s)	Severe corrosion to the respiratory tract at high concentrations May cause inflammation of the respiratory system Respiratory tract
STOT-repeated exposure	Data not available
Aspiration hazard	The product is extremely destructive of the tissues of the mucous, the upper respiratory tract of the eyes and the skin

11.2. Information on other hazards

Possibility of lung damage

SECTION 12: Ecological information

12.1. Toxicity

	Exposures at low doses (<15 ppm) cause nasal, ocular and pharyngeal mucosal irritation with no clinical consequence
Assessment	It is estimated that the minimum lethal concentration in man is 430 ppm for exposure exceeding 30 min, and exposure to 1000 ppm is rapidly fatal Very toxic to aquatic life with long lasting effects

12.2. Persistence and degradability

Data not available

12.3. Bioaccumulative potential

Data not available

12.4. Mobility in soil

Data not available

12.5. Results of PBT and vPvB assessment

PBT / vPvB assessment is not available because the chemical safety assessment is not required / is not conducted

12.6. Endocrine disrupting properties

The substance/mixture does not contain components considered to have endocrine disrupting properties in accordance with Article 57(f) of REACH or Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or more

12.7. Other adverse effects

Very toxic to aquatic organisms

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product

Must not be released into the atmosphere

Burn in a chemical incinerator equipped with an afterburner and scrubber

Return to the supplier the product not consumed in its original container

Contaminated container

Eliminate as unused product

Contact the supplier if instructions are needed

OMoD Code

16 05 04

Gases in pressure containers (including halons) containing dangerous substances

SECTION 14: Transport information

14.1. UN number

Transport par road/rail ADR / RID	Transport by sea IMDG	Transport by air IATA
1017	1017	1017

14.2. UN proper shipping name

Transport par road/rail ADR / RID	Transport by sea IMDG	Transport by air IATA
Chlorine	Chlorine	Chlorine

14.3. Transport hazard class(es)

Labelling

ADR/RID **IMDG** **IATA**	2.3 : Toxic gases 5.1 : Oxidizing substances 8 : Corrosive substances Environmentally hazardous substances

14.4. Packing group

ADR/RID **IMDG** **IATA**	Not established

14.5. Environmental hazards

ADR/RID	Environmentally hazardous substance / mixture
IMDG	Marine pollutant
ICAO-TI / IATA-DGR	Environmentally hazardous substance / mixture

14.6. Special precautions for user

Data not available

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable

SECTION 15: Regulatory information

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

This safety data sheet complies with the requirements of Regulation (CE) No. 1907/2006

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

Abbreviations and acronyms

ADR :	European Agreement concerning the International Carriage of Dangerous Goods by Road
CAS :	Chemical Abstract Service number (USA)
CLP :	Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
CSA :	Chemical Safety Assessment
EIGA :	European Industrial Gases Association
EINECS :	European Inventory of Existing Commercial Chemical Substances
EN :	European Standard
ATE :	Acute Toxicity Estimate
IATA :	International Air Transport Association
IMDG Code :	International Maritime Dangerous Goods Code
LC50 :	Lethal Concentration to 50 % of a test population
OMoD :	Swiss Ordinance on the movement of waste
PBT :	Persistent, Bioaccumulative and Toxic
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
STOT-SE :	Specific Target Organ Toxicity - Single Exposure
UN :	United Nations
vPvB :	Very Persistent and Very Bioaccumulative
WGK:	Water Hazards Class

Full text of H, EUH and P statements used in sections 2 and 3

Hazard statements

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Disclaimer of liability

Details given in this document have been prepared based on the most available reliable documents and are believed to be correct at the time of going to press

They do not claim to be exhaustive and should be considered as a guide