SAFETY DATA SHEET (SDS)

in accordance with Regulation (EC) No 1907/2006 (REACH), Annex II — Regulation (EU) 2020/878

Date: 19.11.2026 | Version: 24 | EN

chlorine

molecular chlorine

CAS 7782-50-5

Cl_2 | EC 231-959-5

MOLAR MASS	LOGP
70.90	1.6

HAZARD CLASSIFICATION (GHS / CLP)



Danger

H270 | H331 | H335 | H315 | H319 | H400

Hazard class scope limited to the harmonised classification (CLP Annex VI); classes outside the harmonised entry may require supplier self-classification (CLP Art. 4(3)) — verify with the supplier safety data sheet.

1. Identification of the substance/mixture and of the company/undertaking

1.1 Substance name	chlorine
1.1 IUPAC name	molecular chlorine
1.1 CAS number	7782-50-5
1.1 EC number	231-959-5
1.1 PubChem CID	24526
1.1 InChIKey	KZBUYRJDOAKODT-UHFFFAOYSA-N
1.1 SMILES	ClCl
1.1 Molecular formula	Cl_2 [7]
1.1 Molar mass	70.90 g/mol [7]
1.1 Exact mass	69.9377 Da [7]

1.2 Uses

For laboratory and research purposes. Not for use in the production of food, medicines or cosmetics without appropriate authorisation.

1.3 Details of the supplier

REFERENCE COPY — NO SUPPLIER DETAILS — NOT FOR DISTRIBUTION	Supplier details are not included in this reference copy. The supplier placing the substance on the market must complete this section and remains responsible for the sheet under REACH. MolGod.org prepares documentation and is not the supplier of this substance.

1.4 Emergency telephone number

Emergency telephone	112 (EU-wide emergency number)

Contact the poison centre designated in the country of placing on the market (CLP Art. 45).

2. Hazards identification

GHS:



PPE:



Danger

Hazard statements (H) [3][4][9]

H270	May cause or intensify fire; oxidiser
H331	Toxic if inhaled
H335	May cause respiratory irritation
H315	Causes skin irritation
H319	Causes serious eye irritation
H400	Very toxic to aquatic life

Precautionary statements (P) [3][4][9]

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P220	Keep away from clothing and other combustible materials
P261	Avoid breathing dust/fume/gas/mist/vapours/spray
P264	Wash thoroughly after handling
P271	Use only outdoors or in a well-ventilated area
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 water
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes; Remove contact lenses, if present and easy to do. Continue rinsing
P311	Call a POISON CENTER or doctor/physician
P312	Call a POISON CENTER or doctor/physician if you feel unwell
P321	Specific treatment
P332+P313	If skin irritation occurs: Get medical advice/attention
P337+P313	If eye irritation persists: Get medical advice/attention
P370+P378	In case of fire: Use appropriate media to extinguish
P391	Collect spillage
P403+P233	Store in a well-ventilated place: Keep container tightly closed
P405	Store locked up
P501	Dispose of contents/container to an approved waste collection point

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Hazard class scope limited to the harmonised classification (CLP Annex VI); classes outside the harmonised entry may require supplier self-classification (CLP Art. 4(3)) — verify with the supplier safety data sheet.

3. Composition/information on ingredients

Substance type	pure substance
CAS Number	7782-50-5
EC number	231-959-5
Molecular formula	Cl_2
Concentration	≥99% (typical reagent-grade purity — to be confirmed by the supplier's specification)
Clp index no	017-001-00-7
Specific concentration limits / M-factor (CLP Annex VI Table 3)	M-factor: 100 [3]

4. First aid measures



Inhalation

Move the affected person to fresh air. Keep at rest. Call a physician. Semi-sitting position. Give oxygen if available. If not breathing: artificial respiration (qualified personnel only). [1][2][13]

Skin contact

Remove contaminated clothing. Rinse skin with soap and water (min. 15 minutes). [1][2][13]

Eye contact

Rinse eyes with running water (min. 15 minutes). Remove contact lenses if possible. If irritation persists — consult an ophthalmologist. [1][2][13]

Ingestion

Do NOT induce vomiting (unless directed by a physician). Rinse mouth with water. Never give anything by mouth to an unconscious person. Emergency number: 112 (EU-wide). Contact the poison centre designated in your country (CLP Art. 45). [1][2][13]

Symptoms and effects

cough, shortness of breath, headache, dizziness; skin redness and irritation; eye irritation and watering. [3][9]

Notes for physician

Requires verification

Emergency numbers: Emergency: 112 (EU-wide). Poison centre: as designated in the country of placing on the market (CLP Art. 45).

5. Firefighting measures

Suitable extinguishing media	Water in LARGE quantities (cooling). Water mist. [1][2][13]
Unsuitable extinguishing media	CO2 and dry powder (ineffective for an oxidiser). [1][2][13]
Specific hazards	Thermal decomposition products: HCl (hydrogen chloride). [14]
Advice for firefighters	Use self-contained breathing apparatus (SCBA). Full protective suit. [1][2][13]

6. Accidental release measures

Personal precautions	Use personal protective equipment (see Section 8). Avoid breathing gas. [1][2][13]
Environmental precautions	Prevent entry into sewers, groundwater and surface water. [1][2][13]
Methods for containment and cleaning up	Ventilate the area. Stop the flow if it is safe to do so. [1][2][13]
Related sections	8; 13

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7. Handling and storage

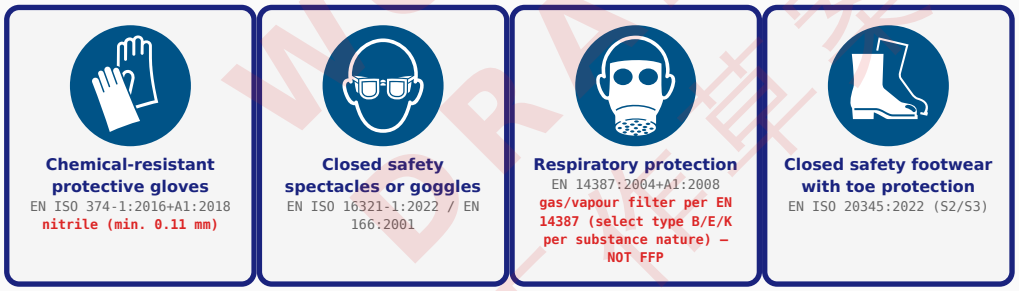
Precautions	Work in a fume hood or with adequate ventilation. No eating, drinking or smoking in the work area. [1][2][13]
Storage temperature	Store at room temperature (15-25°C) or as indicated on the label. [1][2][13]
Humidity	Store in a dry place (<60% RH). [1][2][13]
Light	Protect from direct sunlight. [1][2][13]
Incompatible materials	Strong oxidizers, strong acids, strong bases. [14]

8. Exposure controls/personal protection

8.1 Control parameters

OEL — NDS (Poland)	NDS = 0.7 mg/m³ (TWA) · NDSCh = 1.5 mg/m³ (STEL) — Rozp. MRiPS Dz.U. 2024 poz.1017 [20]
OEL (EU)	The EU OEL value has not been verified against the available dataset — check the IOELV/BOELV directives; do not assume the absence of a value.
DNEL	No data available.
PNEC	No data available.

8.2 Personal protective equipment (PPE) [5][6][15]



9. Physical and chemical properties

Property (item 9.1)	Value	Source
Physical state	Gaz (w warunkach normalnych)	
Colour	Yellowish-green gas [7]	
Odour	Suffocating odor [7]	
pH (1% aqueous solution)	Not applicable	
Melting point	-101.11°C (experimental data) [7]	
Boiling point	-33.8112°C [8] [7]	
Flash point	Not applicable (REACH 9.1(h))	
Flammability	No data available.	
Lower and upper explosion limit	No data available.	
Density (20°C)	Not applicable (REACH 9.1(q))	
Vapour pressure	777.267 kPa (5830 mmHg, 25°C) (experimental data) [7]	
Relative vapour density	2.45 [19]	

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Property (item 9.1)	Value	Source
Dynamic viscosity	0.134 mPa·s [7]	
Kinematic viscosity	Not applicable (REACH 9.1(l))	
Refractive index nD^{20}	1.3834 (experimental data) [7]	
Auto-ignition temperature	No data available.	
Decomposition temperature	No data available.	
Water solubility	6.3 g/L, 25°C [7]	
Particle characteristics	Not applicable (REACH 9.1(r))	
Partition coefficient n-octanol/water (log value)	1.6	
Molar mass	70.90 g/mol [7]	
Molecular formula	Cl_2 [7]	
Lipinski rule (RO5)	PASS	

Where a property above reads "No data available", no measured value was found in the public sources consulted for this substance. The property has not been determined by MolGod.org and no value is inferred. "Not applicable" means the property has no meaning for this substance in the form supplied.

10. Stability and reactivity

Reactivity	Stable under normal storage and handling conditions.
Chemical stability	May undergo violent catalytic decomposition on contact with heavy metals (Mn, Fe, Cu, Cr) or contaminants. [14]
Hazardous reactions	Catalytic decomposition may proceed violently, releasing large amounts of oxygen, which accelerates the fire of surrounding combustible materials. [14]
Conditions to avoid	Temperature >50°C, UV light, heavy metals, organic contaminants. Decomposition releasing oxygen (O_2) and heat. [14]
Incompatible materials	Strong oxidizers, strong acids, strong bases.
Decomposition products	Thermal decomposition products: HCl (hydrogen chloride).

11. Toxicological information

LD50 (oral)	No data available.
LD50 (dermal)	No data available.
LC50 (inhalation)	LC50 368 mg/m³ (30 min) (mouse) [7]
Skin irritation	Category 2 — skin irritation.
Eye irritation	Category 2 — eye irritation.
Sensitisation	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) [3][9]
Mutagenicity	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) [3][9]
Carcinogenicity	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) [3][9]
IARC classification (carcinogenicity)	No individual IARC monograph for this CAS — this is not confirmation of the absence of carcinogenicity (cf. CLP/GHS classification in section 2).
Reproductive toxicity	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) [3][9]
STOT — single exposure	Category 3 (H335): May cause respiratory irritation. [3][9]
STOT — repeated exposure	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) [3][9]

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Aspiration hazard	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) [3][9]

12. Ecological information

Aquatic toxicity	Harmonised classification (CLP Annex VI): H400 — Very toxic to aquatic life (Aquatic Acute 1) (M-factor for acute/chronic cat. 1 — to be verified per Table 3 of Annex VI, if assigned.). LC_{50} (fish): 0.014 mg/L (Oncorhynchus mykiss, 96 h). EC_{50} (Daphnia): 0.0186 mg/L (Daphnia magna, 24 h). EC_{50} (algae): 5.1 mg/L (Macrocystis pyrifera, 96 h) [18]
Persistence / biodegradability	No data available.
Bioaccumulative potential	log Kow = 1.6. Low bioaccumulation potential (log Kow < 4.5 — PBT/vPvB screening criterion per ECHA Guidance R.11). [16][17]
Mobility in soil	No data available.
PBT/vPvB assessment	Insufficient data to assess PBT/vPvB.
Endocrine disrupting properties	No information.

13. Disposal considerations

Disposal method	Hand over for disposal to licensed contractors in accordance with national and local regulations. Do not discharge into sewers.
Waste code (EWC)	16 05 06* — Laboratory and analytical chemicals (e.g. chemical reagents) containing hazardous substances. Verification of the EWC code required. [12]
Packaging	Cleaned packaging may be recycled. Contaminated packaging must be treated as hazardous waste.

14. Transport information



Class 5.1 — Oxidising substances



Class 6.1 — Toxic substances

UN number	UN 1017 [11]
Proper shipping name	Chlorine [11]
Transport hazard class	2.3 [11]
Environmental hazard	CLP classification (H400) indicates aquatic environmental hazard — marine pollutant marking may be required; confirm per ADR 2.2.9 / IMDG criteria [3]
Special precautions	Handle as dangerous goods according to the assigned class (ADR/IMDG/IATA); apply the precautions appropriate to that class.
CN/HS code	CN/HS code: verification required in the Eurostat Combined Nomenclature.
Notes	UN number per the indicated source. Verify the transport class and packing group in ADR Table A / UN Model Regulations before shipment. [11]
Subsidiary hazard (class)	5.1+8
Environmentally hazardous (mark: fish and tree)	Yes

15. Regulatory information

SVHC status	SVHC status not verified against the available dataset — check the current ECHA Candidate List; do not assume absence. [1]
REACH Annex XIV	Not verified against the ECHA Authorisation List — check REACH Annex XIV. [1]

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REACH Annex XVII	Not confirmed in the available Annex XVII dataset — verify against the current ECHA list before placing on the market; do not assume absence of restriction. [1]

16. Other information

`Substance type: oxidizer`

Legal status of classification: harmonised under CLP Annex VI — Reg. (EC) No 1272/2008 (as at the date of issue).Entries with an entry-into-force date after 19.11.2026 were omitted as future (not yet applicable).

Data aggregated automatically from public reference databases (PubChem, ECHA, NIST and others).

Scientific citations (10)

Which halogen to choose? Comparing the effects of chlorine and fluorine as bioisosteric substituents in drug design.. (2026). DOI: 10.1039/d5sc07348k

et al.. *Multisite atomic-chlorine-passivation stabilizes perovskite interfaces for efficient H₂O₂ photosynthesis from seawater.*. (2026). DOI: 10.1038/s41467-026-70503-2

et al.. *Sustainable chlorine cycle enabled by single atom catalysis.*. (2025). DOI: 10.1038/s41467-025-65505-5

et al.. *Chlorine radical-mediated electrochemical propylene epoxidation from seawater.*. (2026). DOI: 10.1038/s41467-026-70733-4

et al.. *Planar hexacoordinate chlorine.*. (2026). DOI: 10.1039/d5sc09167e

Full text of H statements

H270	May cause or intensify fire; oxidiser
H331	Toxic if inhaled
H335	May cause respiratory irritation
H315	Causes skin irritation
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H400	Very toxic to aquatic life

Full text of P statements

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P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes; Remove contact lenses, if present and easy to do. Continue rinsing
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Abbreviations

ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE	Acute Toxicity Estimate
CAS	Chemical Abstracts Service
CLP	Classification, Labelling and Packaging (Reg. (EC) 1272/2008)
CMR	Carcinogenic, Mutagenic, toxic to Reproduction
DNEL	Derived No-Effect Level
EC	European Community number
EPI	Personal protective equipment
GHS	Globally Harmonized System
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods Code
SDS	Safety Data Sheet
LC50	Lethal Concentration, 50%
LD50	Lethal Dose, 50%
NDS	Maximum admissible concentration (workplace, PL)
NDSCh	Short-term exposure limit (PL)
OEL	Occupational Exposure Limit
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals (Reg. (EC) 1907/2006)
STOT	Specific Target Organ Toxicity
SVHC	Substance of Very High Concern
TPSA	Topological Polar Surface Area
vPvB	very Persistent and very Bioaccumulative

Version history

v24 (19.11.2026)	Based on ECHA harmonised classification (Annex VI to CLP, ATP 23).

References

[1] EP and Council. Reg.(EC) No 1907/2006 (REACH). Art.31, Annex II. OJ EU L 396/2006. URL: https://eur-lex.europa.eu/eli/reg/2006/1907/oj Accessed: 2026-11-19.

[2] European Commission. Reg.(EU) 2020/878 — amending Annex II REACH. OJ EU L 203/2020. From 01.01.2023. URL: https://eur-lex.europa.eu/eli/reg/2020/878/oj Accessed: 2026-11-19.

[3] EP and Council. Reg.(EC) 1272/2008 (CLP) + ATP 23. OJ EU L 353/2008. (2026-07-07) URL: https://eur-lex.europa.eu/eli/reg/2008/1272/oj Accessed: 2026-11-19.

[4] United Nations. GHS Rev.9. ST/SG/AC.10/30/Rev.9. New York and Geneva: United Nations, 2021. URL: https://unece.org/transport/dangerous-goods/ghs-rev9-2021 Accessed: 2026-11-19.

[5] ISO. ISO 7010:2019 — Graphical symbols. Safety signs. URL: https://www.iso.org/standard/72424.html Accessed: 2026-11-19.

[6] ISO. ISO 3864-1:2011 — Safety colours and safety signs. URL: https://www.iso.org/standard/51021.html Accessed: 2026-11-19.

[7] PubChem. National Center for Biotechnology Information (NIH/NLM), chemical compound database. URL: https://pubchem.ncbi.nlm.nih.gov/compound/24526

[8] NIST. Chemistry WebBook, SRD 69. National Institute of Standards and Technology. URL: https://webbook.nist.gov/cgi/cbook.cgi?ID=7782-50-5

[9] ECHA. European Chemicals Agency — harmonised classification inventory (CLP Annex VI). URL: https://echa.europa.eu

[10] ECHA. REACH Registration Dossier (registered substance, acute toxicity study record). Helsinki: European Chemicals Agency. URL: https://echa.europa.eu/registration-dossier

[11] UNECE. European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), 2025 edition (ECE/TRANS/352). Geneva: United Nations. URL: https://unece.org/adr

[12] European Commission. Decision 2000/532/EC establishing a list of wastes (European Waste Catalogue). OJ EU L 226/3. URL: https://eur-lex.europa.eu/eli/dec/2000/532/oj

[13] European Chemicals Agency (ECHA). Guidance on the Compilation of Safety Data Sheets. Version 4.0. Helsinki: European Chemicals Agency, 2020. URL: https://echa.europa.eu/documents/10162/2324906/sds_en.pdf

[14] Urben, P.G., ed. Bretherick's Handbook of Reactive Chemical Hazards. 8th ed. Oxford: Academic Press.

[15] CEN. Personal protective equipment standards (EN ISO 374-1, EN 166, EN 149, EN 14387, EN ISO 20345). Brussels: European Committee for Standardization.

[16] ECHA. Guidance on Information Requirements and Chemical Safety Assessment, Chapter R.11: PBT/vPvB Assessment. Helsinki: European Chemicals Agency. URL: https://echa.europa.eu/guidance-documents/guidance-on-information-requirements-and-chemical-safety-assessment

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[17] European Parliament and Council. Regulation (EC) No 1907/2006 (REACH), Annex XIII — Criteria for the identification of PBT and vPvB substances. OJ EU L 396/2006 (consolidated). URL: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02006R1907-20140410

[18] U.S. EPA. ECOTOX Knowledgebase. Washington, DC: U.S. Environmental Protection Agency. URL: https://cfpub.epa.gov/ecotox/

[19] MOL-GOD. Value obtained by calculation from the molecular formula/molecular weight (the specific quantity and its formula are indicated at the respective field). Calculated value, not an experimental measurement. URL: https://www.nist.gov/pml/atomic-weights-and-isotopic-compositions-relative-atomic-masses

[20] MRiPS Regulation of 12.06.2018 — NDS/NDN. Journal of Laws 2024 item 1017. URL: https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20240001017 Accessed: 2026-11-19.

External links

NIST: https://webbook.nist.gov/cgi/cbook.cgi?ID=7782-50-5

NFPA 704 (supplementary information — NFPA/USA system; not a required element of an EU safety data sheet under REACH Annex II)



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Author: www.MolGod.org — platform for automated safety data sheets (SDS).
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