SAFETY DATA SHEET

1. Identification

Product identifier **Chlorine**

Other means of identification

SDS number AUC-005

Synonyms Liquid Chlorine * Elemental Chlorine * Molecular chlorine * Compressed Chlorine Gas

Recommended use Production of chlorinated inorganic and organic chemicals; bleaching agent for paper, textiles and fabrics; used in water purification, sewage disinfection and food processing.

Recommended restrictions Professional use only

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

Company name	Allied Universal Corporation	
Address	3901 N.W. 115th Avenue Miami, FL 33178 United States	
Telephone	General:	1-305-888-2623
	24-Hour alert:	1-786-522-0207
Website	www.allieduniversal.com	
E-mail	Not available.	
Contact person	Operations Department	
Emergency phone number	CHEMTREC	1-800-424-9300 (US/Canada) +01 703-527-3887 (International)

Supplier Refer to Manufacturer

2. Hazard(s) identification

Physical hazards	Oxidizing gases	Category 1
	Gases under pressure	Liquefied gas
Health hazards	Acute toxicity, inhalation	Category 2
	Skin corrosion/irritation	Category 1
	Serious eye damage/eye irritation	Category 1
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation
Environmental hazards	Hazardous to the aquatic environment, long-term hazard	Category 1

OSHA defined hazards This mixture does not meet the classification criteria according to OSHA HazCom 2012.

Label elements

Signal word Danger

Hazard statement May cause or intensify fire; oxidizer. Contains gas under pressure; may explode if heated. Causes severe skin burns and eye damage. Fatal if inhaled. May cause respiratory irritation. Very toxic to aquatic life.

Precautionary statement

Prevention Keep/Store away from clothing and other combustible materials. Keep reduction valves free from grease and oil. Do not breathe gas. Use only outdoors or in a well-ventilated area. Wear respiratory protection. Wash hands and face thoroughly after handling. Wear protective gloves/clothing and eye/face protection. Avoid release to the environment.

Response	Specific treatment is urgent (see this label). IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician. In case of fire: Stop leak if safe to do so. Collect spillage.
Storage	Store in a well-ventilated place. Keep container tightly closed. Store locked up. Protect from sunlight.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC)	No OSHA defined hazard classes. Other hazards which do not result in classification: Toxic fumes, gases or vapors may evolve on burning. Chlorine is extremely corrosive to most metals in the presence of moisture (> 150 ppm water and/or -40 degrees F dew point) or at high temperatures. Combines with water to produce hydrochloric and hypochlorous acid. Severe, short-term exposures may cause long-lasting respiratory effects, e.g. Reactive Airways Dysfunction (RADS), due to the material's severe irritating properties. Contact with liquefied gas might cause frostbites, in some cases with tissue damage. Direct contact with liquefied gas may cause frostbite and corrosive injury to the eyes.
Supplemental information	Keep away from heat. Make sure valves on gas cylinders are fully opened when gas is used. Open cylinder valve slowly to prevent rapid decompression and damage to valve seat. Use smallest possible amounts in designated areas with adequate ventilation. Liquid chlorine lines must have suitable expansion chambers between block valves due to high coefficient of expansion. Shut flow off at cylinder valve and not just at the regulator after use. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. Secure cylinders in an upright position at all times, close all valves when not in use. Establish written emergency plan and special training where chlorine is used. Regularly inspect and test piping and containers used for chlorine service.

3. Composition/information on ingredients

Substances

Chemical name	Common name and synonyms	CAS number	%
Chlorine	Liquid Chlorine Elemental Chlorine Molecular chlorine Compressed Chlorine Gas	7782-50-5	99.5

4. First-aid measures

Inhalation	Take proper precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment, use the buddy system). IF INHALED: Remove person to fresh air and keep comfortable for breathing. If breathing is difficult, trained personnel should give oxygen. If breathing stops, provide artificial respiration. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediately call a POISON CENTER or doctor/physician.
Skin contact	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Do not rub area of contact. Gently remove clothing or jewelry. Carefully cut around clothing that sticks to the skin. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or doctor/physician. Discard any shoes or clothing items that cannot be decontaminated.
Eye contact	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Take care not to rinse contaminated water into the unaffected eye or onto the face. Do not rub eyes. Immediately call a POISON CENTER or doctor/physician.
Ingestion	Not an expected route of entry under normal conditions of use. If ingestion of a large amount does occur, call a poison control center immediately. Do not induce vomiting. Never give anything by mouth to a victim who is unconscious or is having convulsions.

Most important symptoms/effects, acute and delayed	Fatal if inhaled. Immediately dangerous to life or health (IDLH) at 10 ppm. May cause severe irritation to the nose, throat, and respiratory tract. Symptoms may include coughing, choking and wheezing. Could also cause tightness in the chest, a blue discolouration of the skin (cyanosis), severe headache, nausea, vomiting and fainting. Inhalation could result in pulmonary edema (fluid accumulation). Symptoms of pulmonary edema (chest pain, shortness of breath) may be delayed. May result in unconsciousness and possibly death. Severe, short-term exposures may cause long-lasting respiratory effects, e.g. Reactive Airways Dysfunction (RADS), due to the material's severe irritating properties. With this condition, asthma-like symptoms and increased reactivity of the airways is experienced. Direct skin contact may cause corrosive skin burns, deep ulcerations and possibly permanent scarring. If product is sprayed directly on skin, symptoms of frostbite may be experienced including numbness, prickling and itching. Corrosive to the eyes and may cause severe damage including blindness. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. If product is sprayed directly into the eyes, could cause freezing of the eye.
Indication of immediate medical attention and special treatment needed	Immediate medical attention is required. Fatal if inhaled. Causes chemical burns. Symptoms may be delayed. Keep victim under observation. Medical supervision for minimum 48 hours. Provide general supportive measures and treat symptomatically.
General information	First-aid procedures should be reviewed by appropriate personnel familiar with chlorine and its conditions of use in the workplace. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media	Extinguishing media - small fires: Dry chemicals. Carbon dioxide (CO_2). Extinguishing media - large fires: Water Spray or Fog. Foam.
Unsuitable extinguishing media	Use water with caution. May react with water. Do not use direct water spray or water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	Pressurized container may explode when exposed to heat or flame. May react to cause fire and or explosion upon contact with many organic compounds, ammonia, hydrogen and with many metals at elevated temperatures. Chlorine will support the burning of most combustible materials. Combines with water to produce hydrochloric and hypochlorous acid. Liquefied chlorine can accumulate static charge by flow or agitation, since it has a very low electrical conductivity. Chlorine containers or cylinders may vent rapidly or rupture violently, if exposed to fire or excessive heat for a sufficient period of time. Intense local heat (above 200 deg C) on the steel walls of chlorine cylinders can cause an iron/chlorine fire resulting in rupture of the container. Vapors are heavier than air and may spread along floors. Toxic fumes, gases or vapors may evolve on burning.
Special protective equipment and precautions for firefighters	Firefighters should wear full protective clothing including self contained breathing apparatus. Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. A full-body chemical resistant suit should be worn.
Fire fighting equipment/instructions	Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Move containers from fire area if you can do so without risk. Remove combustible materials. Stop the flow of gas before extinguishing fire, if safe to do so. Use water spray to direct escaping gas away from workers if it is necessary to stop the flow of gas. Cool containers exposed to heat with water spray and remove container, if no risk is involved. Stay away from ends of cylinders and withdraw immediately in case of rising sounds or discolouration of containers. Do not allow run-off from fire fighting to enter drains or water courses. Dike for water control.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	The product itself does not burn. However, material is considered to be an oxidizing gas. Supporter of combustion and can intensify a fire.
Hazardous combustion products	Toxic chemicals are formed when combustible materials burn in chlorine. These may include corrosive hydrogen chloride gas and other chlorine compounds.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Restrict access to area until completion of clean-up. Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Consider initial downwind evacuation for at least 500 meters (1/3 mile). Ensure clean-up is conducted by trained personnel only. Ventilate closed spaces before entering them. Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks). Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Wear appropriate protective equipment and clothing during clean-up. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up

Stop the flow of material, if this is without risk. Use only non-sparking tools. Keep combustibles (wood, paper, oil, etc.) away from spilled material. Remove or isolate incompatible materials as well as other hazardous materials. Do not spray leak with water since a reaction producing corrosive hypochlorous and hydrochloric acids occurs, which can aggravate the leak.

May be absorbed and neutralized into solutions of caustic soda, or lime and placed in polypropylene, polyvinyl chloride, fibreglass or lead containers. Since hypochlorites are formed, the solutions must be treated with a reducing agent such as sodium sulfite before disposal. Do not immerse container in caustic solution.

Large Spills: Large uncontrollable leaks require environmental considerations and possible evacuation of the surrounding area. When possible draw off chlorine to process or disposal system .

Contact the proper local authorities.

For waste disposal, see section 13 of the SDS.

Environmental precautions

Avoid release to the environment. Prevent entry into waterways, sewer, basements or confined areas. Contact local authorities in case of spillage to drain/aquatic environment.

7. Handling and storage

Precautions for safe handling

Establish written emergency plan and special training where chlorine is used.

Use only outdoors or in a well-ventilated area. Wear respiratory protection. Wear protective gloves/clothing and eye/face protection. See Section 8 of the SDS for Personal Protective Equipment. Do not breathe gas. Avoid contact with eyes, skin, and clothing. Regularly inspect and test piping and containers used for chlorine service. Liquid chlorine lines must have suitable expansion chambers between block valves due to high coefficient of expansion. Keep away from heat. Keep/Store away from clothing and other combustible materials. Keep reduction valves free from grease and oil. Use only chlorine compatible lubricants. Use smallest possible amounts in designated areas with adequate ventilation. Shut flow off at cylinder valve and not just at the regulator after use. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. Protect against physical damage. Wash hands after handling and before eating.

Conditions for safe storage, including any incompatibilities

Store in steel pressure cylinders in a cool, dry area outdoors or in well-ventilated, detached or segregated areas of non-combustible construction. Keep container tightly closed. Store locked up. Protect from sunlight. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Do not store near combustible materials. Wood and other organic materials should not be used on floors, structural materials, or ventilation systems in the storage area. Store away from incompatible materials (see Section 10 of the SDS). Secure cylinders in an upright position at all times, close all valves when not in use. Use a "first in - first out" inventory system to prevent full cylinders from being stored for excessive periods of time. Store at temperatures not exceeding 55°C (131°F). For the specified temperature the system pressure is 225 psig (1551 kPa).

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Material	Type	Value
Chlorine (CAS 7782-50-5)	Ceiling	3 mg/m^3 1 ppm

US. ACGIH Threshold Limit Values

Material	Type	Value
Chlorine (CAS 7782-50-5)	STEL	0.4 ppm/0.29 mg/m^3
	TWA	0.1 ppm/1.16 mg/m^3

US. NIOSH: Pocket Guide to Chemical Hazards

Material	Type	Value
Chlorine (CAS 7782-50-5)	Ceiling	1.45 mg/m^3 0.5 ppm

Biological limit values

No biological exposure limits noted for the ingredient(s).

Exposure guidelines

The NIOSH IDLH concentration for Chlorine is 10 ppm.

Appropriate engineering controls	Ensure adequate ventilation, especially in confined areas. Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. In case of insufficient ventilation, wear suitable respiratory equipment.

Individual protection measures, such as personal protective equipment

Eye/face protection	Wear eye/face protection. Chemical goggles are recommended. Wear a full-face respirator, if needed. A full face shield may also be necessary. Eye wash fountains are required.
Skin protection	
Hand protection	Wear appropriate chemical-resistant gloves. Advice should be sought from glove suppliers.
Other	Wear appropriate chemical-resistant clothing. Where contact is likely, wear chemical-resistant gloves, a chemical suit and rubber boots. Eye wash facilities and emergency shower must be available when handling this product.
Respiratory protection	Up to 5 ppm: A NIOSH/MSHA approved air-purifying respirator with the appropriate chemical cartridges or a positive-pressure, air-supplied respirator may be used to reduce exposure. Up to 10 ppm: A SAR (supplied air respirator) operated in a continuous flow mode or powered air purifying respirator with cartridge(s); a full facepiece chemical cartridge respirator with cartridge(s); a gas mask with canister; a full facepiece SCBA (self contained breathing apparatus) ; or a full facepiece SAR may be used to reduce exposure. EMERGENCY OR PLANNED ENTRY INTO UNKNOWN CONCENTRATIONS OR IDLH CONDITIONS: Positive pressure, full-facepiece SCBA; or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA. Respirators should be selected based on the form and concentration of contaminants in air, and in accordance with OSHA (29 CFR 1910.134). Advice should be sought from respiratory protection specialists.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Do not breathe gas. Avoid contact with eyes, skin and clothing. Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke when using the product. Wash hands before breaks and immediately after handling the product. Remove soiled clothing and wash it thoroughly before reuse. Inform laundry personnel of contaminant's hazards.

9. Physical and chemical properties

Appearance	
Physical state	Gas (or liquid under pressure).
Form	Compressed liquefied gas.
Color	Amber color; vaporizes to greenish, yellow gas.
Odor	Pungent suffocating odor
Odor threshold	0.02 - 3.4 ppm (detection)
pH	Not applicable (reacts with water to form an acidic solution)
Melting point/freezing point	-149.8 °F (-101 °C)
Initial boiling point and boiling range	-30.28 °F (-34.6 °C)
Flash point	Not Applicable
Evaporation rate	Not Applicable.Gas at normal temperatures.
Flammability (solid, gas)	The product is not flammable.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not Applicable
Flammability limit - upper (%)	Not Applicable
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	638.4 kPa @ 20°C (68°F) 4788 mm Hg @ 20°C (68°F)
Vapor density	2.49 @ 0°C (32°F) (Air = 1)
Relative density	3.21 kg/m³ @ 0°C (32°F)

Solubility(ies)

Solubility (water)	6.3 mg/l (Slightly soluble)
Solubility (other)	Soluble in dimethylformamide, disulfur dichloride, benzene, chloroform, carbon tetrachloride, hexachlorobutadiene, tetrachloroethane, pentachloroethane, chlorobenzene, nitrobenzene, glacial acetic acid (99.84%) and other chlorides
Partition coefficient (n-octanol/water)	Not applicable (gas)
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Viscosity temperature	Not Applicable (Gas)

Other information

Critical temperature	290.75 °F (143.75 °C)
Explosive properties	Not explosive.
Molecular weight	70.91
Oxidizing properties	Strong oxidizing agent because of its electron-transfer capabilities. Supporter of combustion and can intensify a fire. Note, that Chlorine does not yield oxygen or any other oxidizing substance.
Specific gravity	0.003 @ 0°C (32°F)

10. Stability and reactivity

Reactivity	Combines with water to produce hydrochloric and hypochlorous acid. These acids can decompose to hydrochloric acid and oxygen. Contact with combustible material may cause fire.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.Chlorine is extremely corrosive to most metals in the presence of moisture (> 150 ppm water and/or -40 degrees F dew point) or at high temperatures. Will support or initiate combustion or explosion of organic matter and other oxidizable material. Note, that Chlorine does not yield oxygen or any other oxidizing substance. Liquid or gaseous chlorine can react violently with many combustible materials, and other chemicals, including water. Metal halides, carbon, finely divided metals and sulfides can accelerate the rate of chlorine reactions. Chlorine reacts with carbon monoxide to produce toxic phosgene, and sulfur dioxide to produce sulfuryl chloride. Intense local heat (above 200 deg C) on the steel walls of chlorine cylinders can cause an iron/chlorine fire resulting in rupture of the container.
Conditions to avoid	Keep away from combustible materials. Avoid contact with incompatible materials. Keep away from heat. Do not use in areas without adequate ventilation.
Incompatible materials	Tin; Metals; Sulfides; Titanium. Reacts with most metals at high temperatures. Reacts with water to produce hydrochloric aids, which are corrosive to most metals. Ammonia, elemental metals, certain metal hydroxides, carbides, nitrides, oxides, phosphides and sulfides, easily oxidized materials, organic materials, reducing agents, alkalis and unstable and reactive compounds.
Hazardous decomposition products	Hydrogen chloride gas. Hydrochloric acid. Hypochlorous acid.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Very toxic by inhalation. Fatal if inhaled. May cause severe irritation to the nose, throat, and respiratory tract.
Skin contact	Causes skin burns. Contact with liquefied gas might cause frostbites, in some cases with tissue damage. Not expected to be absorbed through the skin.
Eye contact	Causes severe eye burns. If product is sprayed directly into the eyes, could cause freezing of the eye.
Ingestion	Not an expected route of entry under normal conditions of use.

Most important symptoms/effects, acute and delayed

Fatal if inhaled. Immediately dangerous to life or health (IDLH) at 10 ppm. May cause severe irritation to the nose, throat, and respiratory tract. Symptoms may include coughing, choking and wheezing. Could also cause tightness in the chest, a blue discolouration of the skin (cyanosis), severe headache, nausea, vomiting and fainting. Inhalation could result in pulmonary edema (fluid accumulation). Symptoms of pulmonary edema (chest pain, shortness of breath) may be delayed. May result in unconsciousness and possibly death. Severe, short-term exposures may cause long-lasting respiratory effects, e.g. Reactive Airways Dysfunction (RADS), due to the material's severe irritating properties. With this condition, asthma-like symptoms and increased reactivity of the airways is experienced.
Direct skin contact may cause corrosive skin burns, deep ulcerations and possibly permanent scarring. If product is sprayed directly on skin, symptoms of frostbite may be experienced including numbness, prickling and itching.
Corrosive to the eyes and may cause severe damage including blindness. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. If product is sprayed directly into the eyes, could cause freezing of the eye.

Information on toxicological effects

Acute toxicity

Hazardous by OSHA criteria. Classification:
Acute Toxicity (inhalation - gas) - Category 2. Fatal if inhaled.
See below for individual ingredient acute toxicity data.

Product	Species	Test Results
Chlorine (CAS 7782-50-5)		
Acute		
Dermal		
LD50	Rabbit	No data in literature.
Inhalation		
LC50	Rat	147 ppm, 4 Hours
Oral		
LD50	Rat	No data in literature.

Skin corrosion/irritation

Hazardous by OSHA criteria. Classification:
Skin corrosion/irritation - Category 1. Causes severe skin burns.

Serious eye damage/eye irritation

Hazardous by OSHA criteria. Classification:
Serious eye damage/eye irritation - Category 1. Causes serious eye damage.

Respiratory or skin sensitization

Respiratory sensitization

This product is not expected to cause respiratory sensitization.

Skin sensitizer

This product is not expected to cause skin sensitization.

Germ cell mutagenicity

Not expected to be mutagenic.

Carcinogenicity

This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA. See below for ingredients present on regulatory lists.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

Reproductive toxicity

This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure

Hazardous by OSHA criteria. Classification:
Specific Target Organ Toxicity (STOT), Single Exposure. Category 3. May cause respiratory irritation.

Specific target organ toxicity - repeated exposure

Not expected to be hazardous by OSHA criteria.

Aspiration toxicity

Not likely, due to the form of the product. Not expected to be an aspiration hazard.

Chronic effects

Prolonged or repeated exposure to low concentrations may cause drying and cracking of the skin, respiratory effects, gum disorders and painless destruction of teeth
Limited occupational studies with long-term exposure to low concentrations, have not shown significant respiratory effects.
Long-term animal studies confirm that chlorine is a severe irritant to the upper and lower respiratory tract.

12. Ecological information

Ecotoxicity

Very toxic to aquatic life. See below for individual ingredient ecotoxicity data.

Product		Species	Test Results
Chlorine (CAS 7782-50-5)			
Aquatic			
Acute			
Crustacea	EC50	Water flea (Daphnia magna)	0.005 mg/l, 48 hours (mg Free Available Chlorine/L)
Fish	LC50	Rainbow trout,donaldson trout (Oncorhynchus mykiss)	0.014 mg/l, 96 hours

Persistence and degradability Free chlorine is consumed upon contact with living tissues making measurement of biodegradation impossible and unnecessary.

Bioaccumulative potential Not expected to be bio accumulative.

Mobility in soil The product itself has not been tested.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

UN number UN1017
UN proper shipping name Chlorine (CHLORINE)
Transport hazard class(es)
Class 2.3
Subsidiary risk 5.1, 8
Label(s) 2.3, 5.1, 8
Packing group Not applicable.
Environmental hazards
Marine pollutant Yes
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.
US CERCLA Reportable Quantity (RQ): 10 lbs / 4.54 kg
Special provisions 2, B9, B14, N86, T50, TP19
Packaging exceptions None
Packaging non bulk 304
Packaging bulk 314, 315

IATA

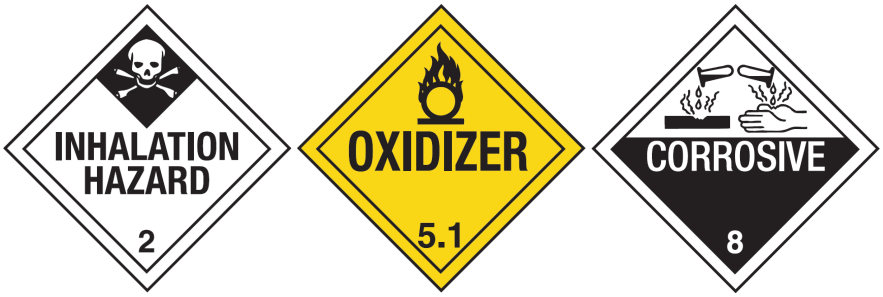
UN number UN1017
UN proper shipping name Chlorine
Transport hazard class(es)
Class 2.3
Subsidiary risk 5.1, 8
Packing group Not applicable.
Environmental hazards Yes
ERG Code 2CP
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.
Refer to Special Provision A2 for shipping information.
Other information
Passenger and cargo aircraft Forbidden

Cargo aircraft only	Forbidden

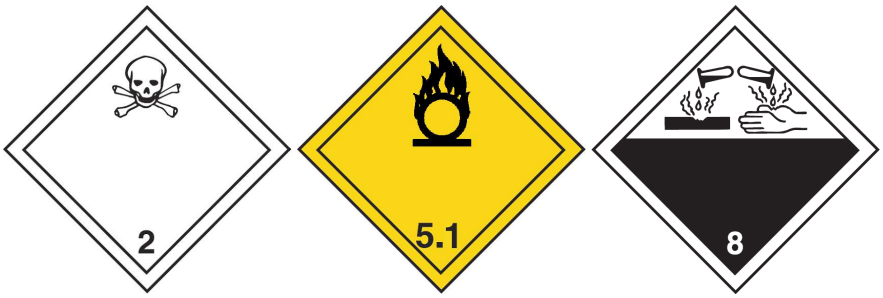
IMDG

UN number	UN1017
UN proper shipping name	CHLORINE
Transport hazard class(es)	
Class	2.3
Subsidiary risk	5.1, 8
Packing group	Not applicable.
Environmental hazards	
Marine pollutant	Yes
EmS	F-C, S-U
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not available.

DOT



IATA; IMDG



Marine pollutant

General information	This product meets the criteria for an environmentally hazardous mixture, according to the IMDG Code.

15. Regulatory information

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Chlorine (CAS 7782-50-5) Listed.

SARA 304 Emergency release notification

Chlorine (CAS 7782-50-5) 10 LBS

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Oxidizing Gases, Gas under pressure
Acute Toxicity
Skin Damage
Eye Damage
Specific Target Organ Toxicity, single exposure

SARA 302 Extremely hazardous substance

Chemical name	CAS number	Reportable quantity	Threshold planning quantity	Threshold planning quantity, lower value	Threshold planning quantity, upper value
Chlorine	7782-50-5	10	100 lbs		

SARA 311/312 Hazardous chemical Yes

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Chlorine	7782-50-5	99.5

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Chlorine (CAS 7782-50-5)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Chlorine (CAS 7782-50-5)

Clean Water Act (CWA) Hazardous substance

Safe Drinking Water Act (SDWA) 4 mg/l
4.0 mg/l

US state regulations

US. California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)

Not listed.

US. Massachusetts RTK - Substance List

Chlorine (CAS 7782-50-5)

US. New Jersey Worker and Community Right-to-Know Act

Chlorine (CAS 7782-50-5)

US. Pennsylvania Worker and Community Right-to-Know Law

Chlorine (CAS 7782-50-5)

US. Rhode Island RTK

Chlorine (CAS 7782-50-5)

US. California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes

Country(s) or region	Inventory name	On inventory (yes/no)*
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date 01-07-2015 **Revision date** 12-17-2018

Version # 02

HMIS H: 4 F: 0 R: 1

NFPA H: 4 F: 0 R: 0 Other: OX

Certified to NSF/ANSI 60

Maximum use level for Chlorine in potable water is 30 mg/L.

List of abbreviations

ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstract Services
CERCLA: Comprehensive Environmental Response, Compensation and Liability Act of 1980
CFR: Code of Federal Regulations
DOT: Department of Transportation
EPA: Environmental Protection Agency
EPCRA: Emergency Planning and Community Right-to-Know Act
ERG: Emergency Response Guidebook
HSDB® - Hazardous Substances Data Bank
IARC: International Agency for Research on Cancer
IATA: International Air Transport Association
IBC: Intermediate Bulk Container
IDLH: immediately dangerous to life or health
IMDG: International Maritime Dangerous Goods
LC: Lethal Concentration
LD: Lethal Dose
NIOSH: National Institute of Occupational Safety and Health
NOEC: No observable effect concentration
NTP: National Toxicology Program
OECD: Organization for Economic Cooperation and Development
OEL: National occupational exposure limits
OSHA: Occupational Safety and Health Administration
PEL: Permissible exposure limit
RCRA: Resource Conservation and Recovery Act
RQ: Reportable Quantity
RTECS: Registry of Toxic Effects of Chemical Substances
SAR: supplied-air respirator
SCBA: self-contained breathing apparatus
SDS: Safety Data Sheet
STEL: Short Term Exposure Limit
TWA: Time Weighted Average
UN: United Nations

Disclaimer

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