# Safety Data Sheet

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product identifier:** **CHLORINE, LIQUID**
**Synonyms:** Chlorine, Chlorine – liquefied gas, Chlorine gas, Chlorine (Liquid or Gas)
**Intended use:** Water chlorination, water treatment chemicals, chemical synthesis. This material is a registered pesticide.
**Uses Advised Against:** None identified. This is a pesticide product, do not use in a pesticide application that is not included on the label.

**Company Identification:**
DPC Industries, Inc.
DPC Enterprises, LP
DXI Industries, Inc.
Petra Chemical Company
PO Box 24600
Houston, TX 77229-4600

**Emergency:**
**CHEMTREC (USA)** (800) 424-9300
**24 hour Emergency Telephone No.** (281) 457-4888
www.dxgroup.com

## 2. Hazard identification of the product

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| **Physical hazards** | Gases under pressure<br>Oxidizing gases | Liquefied gas<br>Category 1 |
| **Health hazards** | Acute toxicity, inhalation<br>Skin corrosion/irritation<br>Serious eye damage/eye irritation<br>Specific target organ toxicity, single exposure<br>Specific target organ toxicity, repeated | Category 2<br>Category 1A<br>Category 1<br>Category 3<br>Category 1(Lung) exposure |
| **Environmental hazards** | Very hazardous to the aquatic environment, acute hazard | Category 1 |

**Label elements**
Using the Toxicity Data listed in section 11 and 12 the product is labeled as follows:

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| **Signal Word** | **Danger** |
| **Hazard Statements** | May cause or intensify fire; oxidizer. Contains gas under pressure; may explode if heated. Fatal if inhaled. Causes skin irritation. Causes serious eye irritation. May cause respiratory irritation. Very toxic to aquatic life with long lasting effects. Harmful in contact with skin. Causes severe skin burns and eye damage. Causes serious eye damage. Very toxic to aquatic life. Toxic to aquatic life with long lasting effects. May be corrosive to metals |
| **Precautionary Statements** | |
| **Prevention** | Keep / Store away from combustible materials. Keep reduction valves free from grease and oil. Do not breathe mist / vapors / spray. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear protective gloves / eye protection / face protection. Wear respiratory protection. |
| **Response** | IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing and wash before reuse.<br>IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor / physician if you feel unwell.<br>IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing. Immediately call a POISON CENTER or doctor / physician. If eye irritation persists: Get medical advice / attention.<br>IN CASE OF FIRE: Stop leak if safe to do so. |
| **Storage** | Store in a well-ventilated place. Keep container tightly closed. Store locked up. |
| **Disposal** | Dispose of contents / container in accordance with local / national regulations. |

## 3. Composition/information on ingredients

Synonyms: Chlorine, Chlorine – liquefied gas, Chlorine gas, Chlorine (Liquid or Gas)
Substance classified with a health or environmental hazard. Substance with a workplace exposure limit.

| Ingredient | CAS Number | Percent (%) |
|---|---|---|
| **Chlorine** | **7782-50-5** | **99.5-100** |

## 4. First Aid Measures

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| **General** | Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. |
| **Inhalation** | Move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one- way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult. GET IMMEDIATE MEDICAL ATTENTION |
| **Eyes** | Flush immediately with clean fresh water for at least 10 minutes, holding the eyelids apart. Remove contact lenses, if present, and safe to do so. Continue rinsing. GET IMMEDIATE MEDICAL ATTENTION. |
| **Skin** | In case of contact with substance, immediately flush skin with running water for at least 20 minutes. Exposure to liquid may cause frostbite burns. Remove contaminated clothing, jewelry and shoes. Wash skin with soap and water. Thoroughly clean and dry contaminated clothing and shoes before reuse. GET IMMEDIATE MEDICAL ATTENTION |
| **Ingestion** | If accidentally swallowed obtain IMMEDIATE MEDICAL ATTENTION. Keep at rest. Do NOT induce vomiting. Ingestion not considered a likely route of exposure. |
| **Most important symptoms and effects, both acute and delayed** | |
| **Overview** | Contact with this material will cause burns to the skin, eyes and mucous membranes. Unconsciousness. Cough, shortness of breath, headache, nausea, vomiting. May cause lung damage. |
| **Indication of immediate medical attention and special treatment needed** | For liquid contact, treat the affected person for frostbite if necessary. If the product is ingested, probable mucosal damage may contraindicate the use of gastric lavage. Treat the affected person appropriately. Provide general supportive measures and treat symptomatically. Symptoms may be delayed. |

## 5. Fire-fighting measures

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| **Recommended Extinguishing media** | Use fire-extinguishing media appropriate for surrounding materials. |
| **Unsuitable extinguishing media** | Direct water spray. Direct water spray jet. |
| **Special hazards arising from the substance or mixture** | May cause fire or explosion; strong oxidizer. Contents under pressure. Pressurized container may explode when exposed to heat or flame. Contact with reactive metals e.g., aluminum, zinc and tin may result in the generation of flammable hydrogen gas. Water used for fire extinguishing, which has been in contact with the product, may be corrosive. Water spray on active leak may promote accelerated corrosion of container and accelerate rate of leakage. |
| **Advice for fire-fighters** | Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. Additional protective clothing must be worn to prevent personal contact with this material. Those items include but are not limited to: boots gloves, hard hat, splash-proof goggles, full face shield and impervious clothing, i.e. chemically impermeable suit. Compatible materials for response to this material are neoprene and butyl rubber.<br><br>In case of fire and/or explosion do not breathe fumes. Remove pressurized gas cylinders from the immediate vicinity. Cylinders can burst violently when heated, due to excess pressure build-up. Cool containers / tanks with water spray. Evacuate area and fight fire remotely due to the risk of explosion.<br>**ERG Guide No. 124** |

## 6. Accidental Release Measures

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| **Personal precautions, protective equipment and emergency procedures** | Immediately evacuate personnel to safe areas. Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks). Keep people away from and upwind of spill/leak. Keep out of low areas. Keep unnecessary personnel away. Ventilate closed spaces before entering them. Wear appropriate protective equipment and clothing during clean-up. Local authorities should be advised if significant spillages cannot be contained. For response to Chlorine gas it is recommended to use as a minimum level "B " protection that is compatible to Chlorine. For Liquid spills it is recommended to utilize as a minimum enhanced level "B" (Enhanced Level "B" is the addition of a splash hood). Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Responders can reference Chlorine Institute pamphlet #65 on PPE. |
| **Environmental precautions** | Avoid discharge into drains, water courses or onto the ground. Contact local authorities in case of spillage to drain/aquatic environment. |
| **Methods and material for containment and cleaning up** | Extinguish all flames in the vicinity. Keep combustibles (wood, paper, oil, etc.) away from spilled material. Ventilate well, stop flow of gas or liquid if possible. If possible, turn leaking containers so that gas escapes rather than liquid. Dike far ahead of spill for later disposal. Isolate area until gas has dispersed. Neutralize spilled material with crushed limestone, soda ash or lime. Collect spillage. |

## 7. Handling and storage

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| **Precautions for safe handling** | Avoid heat, sparks, open flames and other ignition sources. Keep away from clothing and other combustible materials. Use only chlorine-compatible lubricants. Do not use greases and oils. Do not breathe gas. Do not get in eyes, on skin, on clothing. Use in a sealed system and/or a well-ventilated area. Wear appropriate personal protective equipment. Observe good industrial hygiene practices. Avoid release to the environment. |
| **Conditions for safe storage, including any incompatibilities** | Contents under pressure. Keep away from heat, sparks and open flame. Secure cylinders in an upright position at all times, close all valves when not in use. Store in a well-ventilated place. Store away from incompatible materials.<br><br>Store at temperatures not exceeding 131 °F ( 55°C) For the above specified temperature the system pressure is 225 psig. |

## 8. Exposure controls and personal protection

**Exposure Control Parameters**

| CAS No. | Material | Source | Type | Value |
|---|---|---|---|---|
| 7782-50-5 | Chlorine | OSHA Table Z-1 Limits | Ceiling | 3 mg/m3 |
| | | US ACGIH Threshold limit values | STEL | 1 ppm |
| | | US ACGIH Threshold limit values | TWA | 0.5 ppm |

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| **Engineering Controls** | Should be handled in closed systems, if possible. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. If these are not sufficient to maintain concentrations of particulates and any vapor below occupational exposure limits suitable respiratory protection must be worn. Observe Occupational Exposure Limits and minimize the risk of inhalation. Eye wash facilities and emergency shower must be available when handling this product. |

**Individual protection measures, such as personal protective equipment**

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| **Respiratory** | Use NIOSH/MSHA approved respirator, following manufacturer's recommendations when concentrations exceed permissible exposure limits. |
| **Eyes** | Wear face shield with safety glasses with side shields and/or safety goggles. |
| **Skin** | Chemical resistant clothing such as coveralls/apron boots should be worn. Chemical Impervious gloves. |
| **Other Work Practices** | Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet. Promptly remove soiled clothing and wash thoroughly before reuse. |

**9. Physical and chemical properties**

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| **Appearance:** | Amber Color Liquid. Greenish-Yellow Gas |
| **Odor:** | Pungent Irritating Odor |
| **Odor threshold:** | .31 ppm air 1.7 |
| **pH:** | Not Applicable |
| **Melting point / freezing point:** | -150 °F (-101 °C) |
| **Initial boiling point and boiling range:** | -29.3 °F (-34 °C) |
| **Flash Point:** | Not Applicable |
| **Evaporation rate (Ether = 1):** | Not Available |
| **Flammability (solid, gas):** | Not Applicable |
| **Upper/lower flammability or explosive limits:** | **Lower Explosive Limit:** Not Applicable |
| | **Upper Explosive Limit:** Not Applicable |
| **Vapor pressure (mmHg):** | 4800 mmHg (@25 °C) |
| **Vapor Density:** | 2.49 |
| **Specific Gravity:** | 1.4 |
| **Solubility in Water:** | Negligible |
| **Partition coefficient n-octanol/water (Log Kow):** | Not Measured |
| **Auto-ignition temperature (°C):** | Not Measured |
| **Decomposition temperature:** | Not Measured |
| **Viscosity (cSt):** | Not Measured |
| **VOC %:** | Not Measured |
| **Other information:** | No other relevant information. |

**10. Stability and reactivity**

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| **Reactivity:** | Oxidizer. |
| **Chemical stability:** | Stable under normal circumstances. |
| **Possibility of hazardous reactions:** | Dry material is highly reactive with titanium and tin. Reacts with most metals at high temperatures or in the presence of moisture. Avoid contact with water. Reacts with water to form corrosive acidic solution (hydrochloric acid) May react explosively with organic matter. |
| **Conditions to avoid:** | No data available |
| **Incompatible materials:** | Avoid contact with reducing agents, organics and alkalis. Keep away from materials such as acetylene, turpentine & other hydrocarbons, ammonia, hydrogen, ether, metals, sulfur, & aluminum. |
| **Hazardous decomposition products:** | Hydrogen chloride and hypochlorous acid. |

**11. Toxicological information**

**Acute toxicity**

| Ingredient | Results | Species | Dose | Exposure |
|---|---|---|---|---|
| Chlorine - (7782-50-5) | LC50 Inhalation Gas. | Rat | 147 ppm | 4 hours |
| | LC50 Inhalation | Rat | 293 ppm | 1 hour |

| Item | Hazard |
|---|---|
| **Acute Toxicity:** | 0.2 - 0.4 ppm odor detection (some tolerance develops)<br>1 - 3 ppm mild mucous membrane irritation (can be tolerated ~ 1 hour)<br>5 - 15 ppm moderate irritation of upper respiratory tract<br>30 ppm immediate chest pain, vomiting, dyspnea, cough<br>40 - 60 ppm toxic pneumonitis and pulmonary edema<br>430 ppm lethal over 30 minutes<br>1000 ppm fatal within a few minutes<br>It's action in the respiratory tract is due to its strong oxidizing capability; it forms both hypochlorous acid and hypochloric acid on contact with moist mucous membranes. Symptoms of pulmonary congestion and edema may develop after a latency period of several hours following severe acute exposure to chlorine. |

**11. Toxicological information**

**Acute toxicity (Cont.)**

**POTENTIAL HEALTH EFFECTS:**

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| **Information on likely routes of exposure** | |
| **Eye contact:** | Causes serious eye damage. Liquid exposure may cause frostbite. |
| **Skin contact:** | Causes skin burns. Liquid exposure may cause frostbite. |
| **Inhalation:** | May cause irritation (possibly severe), chemical burns, and pulmonary edema. Significant exposures may be fatal. |
| **Ingestion:** | Causes digestive tract burns. |
| **Signs and symptoms of exposure:** | Contact with this material will cause burns to the skin, eyes and mucous membranes. Cough, shortness of breath, headache, nausea, vomiting. May cause lung damage. Unconsciousness. |
| **Information on toxicological effects** | |
| **Acute toxicity:** | Fatal if inhaled.<br>Irritation Threshold: approximately 0.5 ppm<br>Immediately Dangerous to Life or Health: 10.0 ppm. |
| **Carcinogenicity:** | Not considered to be a carcinogen by IARC, ACGIH, NTP or OSHA. |
| **Reproductive Toxicity:** | No data available. |
| **Specific target organ systemic toxicity (single exposure):** | Not available. |
| **Specific target organ systemic Toxicity (repeated exposure):** | Causes damage to organs (lungs) through prolonged or repeated exposure. |
| **Aspiration hazard:** | Due to the physical form of the product it is not an aspiration hazard. |

**12. Ecological information**

**Toxicity**

Very toxic to aquatic life. Toxic to aquatic life with long lasting effects.

**Aquatic Ecotoxicity**

| Ingredient | 96 hr LC50 fish, mg/l | 48 hr EC50 crustacea, mg/l | ErC50 algae, mg/l |
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| Chlorine - (7782-50-5) | 14.00, Oncorhynchus mykiss | 0.11, Daphnia pulex | 0.76 (96 hr), Algae |

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| **Persistence and degradability:** | This material is an element and not subject to biodegradation. |
| **Bioaccumulative potential:** | Will not bioaccumulate. |
| **Mobility in soil:** | No data available. |
| **Results of PBT and vPvB assessment:** | This product contains no PBT/vPvB chemicals. |
| **Other adverse effects:** | No other effects are expected. |

**13. Disposal considerations**

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| **Waste treatment methods:** | Do not allow into drains or water courses. Wastes and emptied containers should be disposed of in accordance with regulations made under the Control of Pollution Act and the Environmental Protection Act. Using information provided in this data sheet, advice should be obtained from the Waste Regulation Authority, whether the special waste regulations apply. |
| **Waste from material:** | Use or process if possible. Chlorine may be absorbed into an alkaline solution such as caustic soda, soda ash or hydrated lime. Dispose in accordance with all applicable regulations. |
| **Container Management:** | Return empty chlorine cylinders, tankcars and cargo tanks containing residual gas and/or liquid to supplier in compliance with applicable DOT regulations. See product label for container disposal information. |

**14. Transport information**

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| **UN number:** | UN1017 |
| **UN proper shipping name:** | Chlorine |
| **Transport hazard class(es)** | |
| **DOT (Domestic Surface Transportation)** | |
| **DOT Proper Shipping Name:** | Chlorine |
| **DOT Hazard Class DOT Label:** | 2.3, (5.1, 8)<br>2.3, 5.1, 8 |
| **UN / NA Number:** | UN1017 |
| **DOT Packing Group:** | Not Applicable |
| **CERCLA/DOT RQ:** | 10 lbs. |
| **Environmental hazards:** | IMDG Marine Pollutant: Yes (Chlorine) |
| **Special precautions for user:** | Not Applicable |

**15. Regulatory information**

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| **Regulatory Overview:** | The regulatory data in Section 15 is not intended to be all-inclusive, only selected regulations are represented. All ingredients of this product are listed on the TSCA (Toxic Substance Control Act) Inventory. | | | |
| **WHMIS Classification:** | A - Compressed Gas<br>C - Oxidizing Material<br>D1A - Poisonous and Infectious Material; Materials causing immediate and serious toxic effects - Very toxic material<br>E - Corrosive material | | | |
| **OSHA REGULATORY STATUS:** | This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200) | | | |
| **US EPA Tier II Hazards:** | **Fire:** | No | **Immediate (Acute):** | Yes |
| | **Sudden Release of Pressure:** | Yes | **Delayed (Chronic):** | Yes |
| | **Reactive:** | Yes | | |
| **SARA 302 Extremely Hazardous Substance / RQs (lbs.) :** | Yes (10-lbs) | | | |
| **SARA 311/312 Chemicals and RQs (lbs.) (>0.1%) :** | Yes | | | |
| **SARA 313 (TRI)** | Yes | | | |
| **OSHA PSM (29 cfr 1910.119):** | Yes (2500-lbs) | | | |
| **TSCA:** | Chlorine | | | |

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|---|---|---|---|---|---|---|
| **State Regulations:** | **N.J. RTK Substances (>1%)** | Listed | **Penn RTK Substances (>1%)** | Listed | **California Prop 65** | Not Listed |

**16. Other information**

**EPA Registration Number:** 813-10
**NSF Maximum Use Level (STD 60):** Check BOL for facility Data. (30 mg/L)

**Revision Information:** Changed GHS Hazard Classification: See section 2.

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THE USER IS CAUTIONED TO PERFORM HIS OWN HAZARD EVALUATION AND TO RELY ON HIS OWN DETERMINATIONS.