

Safety Data Sheet

according to OSHA HCS (29CFR 1910.1200)

Revision: June 25, 2019

1 Identification

- **Product identifier**
- **Trade name:** Chlorine Dioxide
- **Other means of identification:** No other identifiers
- **Recommended use and restriction on use**
- **Recommended use:** Pulp Bleaching, Water Treatment, Disinfection
- **Restrictions on use:** No relevant information available.
- **Details of the supplier of the Safety Data Sheet**
- **Manufacturer/Supplier:**
Pureline Treatment Systems, LLC
1241 N. Ellis Street
Bensenville, IL 60106
(847) 963-8465
INFO@PURELINE.COM
- **Emergency telephone number:**
ChemTel Inc.
(800)255-3924 (North America)
+1 (813)248-0585 (International)

2 Hazard(s) identification

- **Classification of the substance or mixture**
Oxid. Gas 1 H270 May cause or intensify fire; oxidizer.
Acute Tox. 3 H331 Toxic if inhaled.
Skin Corr. 1C H314 Causes severe skin burns and eye damage.
Eye Dam. 1 H318 Causes serious eye damage.
STOT SE 1 H370 Causes damage to the respiratory tract. Route of exposure: Inhalation.
- **Additional information:**
This mixture has not been tested. Classification is based on most conservative estimates of physical and health hazards.

- **Label elements**

- **GHS label elements**

The product is classified and labeled according to the Globally Harmonized System (GHS).

- **Hazard pictograms:**



GHS03 GHS05 GHS06 GHS08

- **Signal word:** Danger
- **Hazard statements:**
H270 May cause or intensify fire; oxidizer.
H331 Toxic if inhaled.
H314 Causes severe skin burns and eye damage.
H370 Causes damage to the respiratory tract. Route of exposure: Inhalation.
- **Precautionary statements:**
P220 Keep/Store away from clothing/combustible materials.

(Cont'd. on page 2)

Safety Data Sheet

according to OSHA HCS (29CFR 1910.1200)

Revision: June 25, 2019

Trade name: Chlorine Dioxide

(Cont'd. of page 1)









P244	Keep reduction valves/valves and fittings free from oil and grease.
P260	Do not breathe gas.
P264	Wash thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection.
P301+P330+P331	If swallowed: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353	If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
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.
P310	Immediately call a poison center/doctor.
P307+P311	IF exposed: Call a POISON CENTER or doctor/physician.
P363	Wash contaminated clothing before reuse.
P370+P376	In case of fire: Stop leak if safe to do so.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Other hazards** There are no other hazards not otherwise classified that have been identified.

3 Composition/information on ingredients

· **Chemical characterization: Mixtures**

· **Components:**

7727-37-9	Nitrogen	Simple Asphyxiant	60-80%
7782-44-7	oxygen	 Oxid. Gas 1, H270  Press. Gas, H280	10-20%
10049-04-4	chlorine dioxide	 Oxid. Gas 1, H270  Press. Gas, H280  Acute Tox. 2, H330  STOT SE 1, H370  Skin Corr. 1B, H314	0-5%
124-38-9	Carbon dioxide	 Press. Gas, H280 Simple Asphyxiant	0.1-1%

· **Additional information:**

Nitrogen, Oxygen and Carbon Dioxide are listed as components of ambient air.
For the wording of the listed Hazard Statements, refer to section 16.

4 First-aid measures

· **Description of first aid measures**

· **General information:**

Personal protection for the First Aider.
Remove breathing apparatus only after contaminated clothing have been completely removed.
In case of irregular breathing or respiratory arrest provide artificial respiration.

(Cont'd. on page 3)

Safety Data Sheet

according to OSHA HCS (29CFR 1910.1200)

Revision: June 25, 2019

Trade name: Chlorine Dioxide

(Cont'd. of page 2)

Take affected persons out into the fresh air.

· **After inhalation:**

Supply fresh air.

Do not use mouth to mouth or mouth to nose resuscitation.

Use a respiration bag or breathing device.

Call a doctor immediately.

Provide oxygen treatment if affected person has difficulty breathing.

In case of unconsciousness place patient stably in side position for transportation.

· **After skin contact:**

In cases of frostbite, rinse with plenty of water. Do not remove clothing.

Seek medical treatment if any skin damage has occurred.

· **After eye contact:**

Protect unharmed eye.

Remove contact lenses if worn.

Rinse opened eye for several minutes under running water. Then consult a doctor.

· **After swallowing:**

Rinse out mouth and then drink plenty of water.

Do not induce vomiting; immediately call for medical help.

· **Most important symptoms and effects, both acute and delayed:**

Breathing difficulty

Coughing

Strong irritant with the danger of severe eye injury.

Caustic effect on skin and mucous membranes.

Disorientation

· **Danger:**

Danger of impaired breathing.

Causes serious eye damage.

Toxic if inhaled.

Causes damage to the respiratory tract. Route of exposure: Inhalation.

· **Indication of any immediate medical attention and special treatment needed:**

Medical supervision for at least 48 hours.

If necessary oxygen respiration treatment.

Later observation for pneumonia and pulmonary edema.

If medical advice is needed, have product container or label at hand.

5 Fire-fighting measures

· **Extinguishing media**

· **Suitable extinguishing agents:** Water

· **For safety reasons unsuitable extinguishing agents:** No relevant information available.

· **Special hazards arising from the substance or mixture**

Contains oxidizing agent.

During heating or in case of fire poisonous gases are produced.

· **Advice for firefighters**

· **Protective equipment:**

Wear self-contained respiratory protective device.

Wear fully protective suit.

· **Additional information:** Cool endangered containers with water fog.

(Cont'd. on page 4)

Safety Data Sheet

according to OSHA HCS (29CFR 1910.1200)

Revision: June 25, 2019

Trade name: Chlorine Dioxide

(Cont'd. of page 3)

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**

Isolate area and prevent access.

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation.

Use respiratory protective device against the effects of fumes/dust/aerosol.

- **Environmental precautions**

Do not allow to enter sewers/ surface or ground water.

Inform respective authorities in case of seepage into water course or sewage system.

Inform authorities in case of gas release.

- **Methods and material for containment and cleaning up**

Allow to evaporate.

Dispose of the collected material according to regulations.

- **Reference to other sections**

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

7 Handling and storage

- **Handling**

- **Precautions for safe handling:**

Use only in well ventilated areas.

Open and handle receptacle with care.

Avoid contact with the eyes and skin.

Avoid breathing mist, vapors, or spray.

- **Information about protection against explosions and fires:**

Keep respiratory protective device available.

Contains oxidizing agent.

Keep away from flammable organic substances.

- **Conditions for safe storage, including any incompatibilities**

- **Requirements to be met by storerooms and receptacles:**

Observe official regulations on storing packagings with pressurized containers.

- **Information about storage in one common storage facility:**

Store away from foodstuffs.

Do not store together with acids.

Store away from flammable substances.

Protect from humidity and water.

- **Specific end use(s)** No relevant information available.

8 Exposure controls/personal protection

- **Control parameters**

- **Components with limit values that require monitoring at the workplace:**

7727-37-9 Nitrogen

(Cont'd. on page 5)

Safety Data Sheet

according to OSHA HCS (29CFR 1910.1200)

Revision: June 25, 2019

Trade name: Chlorine Dioxide

(Cont'd. of page 4)

TLV (USA)	withdrawn TLV, see App. F; simple asphyxiant
EL (Canada)	Simple asphyxiant
LMPE (Mexico)	Asfixiante simple
10049-04-4 chlorine dioxide	
PEL (USA)	Long-term value: 0.3 mg/m ³ , 0.1 ppm
REL (USA)	Short-term value: 0.9 mg/m ³ , 0.3 ppm Long-term value: 0.3 mg/m ³ , 0.1 ppm
TLV (USA)	Ceiling limit value: 0.28 mg/m ³ , 0.1 ppm
EL (Canada)	Short-term value: 0.3 ppm Long-term value: 0.1 ppm
EV (Canada)	Short-term value: 0.9 mg/m ³ , 0.3 ppm Long-term value: 0.3 mg/m ³ , 0.1 ppm
LMPE (Mexico)	Short-term value: 0.3 ppm Long-term value: 0.1 ppm
124-38-9 Carbon dioxide	
PEL (USA)	Long-term value: 9000 mg/m ³ , 5000 ppm
REL (USA)	Short-term value: 54,000 mg/m ³ , 30,000 ppm Long-term value: 9000 mg/m ³ , 5000 ppm
TLV (USA)	Short-term value: 54,000 mg/m ³ , 30,000 ppm Long-term value: 9000 mg/m ³ , 5000 ppm
EL (Canada)	Short-term value: 15000 ppm Long-term value: 5000 ppm
EV (Canada)	Short-term value: 54,000 mg/m ³ , 30,000 ppm Long-term value: 9,000 mg/m ³ , 5,000 ppm
LMPE (Mexico)	Short-term value: 30000 ppm Long-term value: 5000 ppm

- **Exposure controls**

- **General protective and hygienic measures:**

The usual precautionary measures for handling chemicals should be followed.

Keep away from foodstuffs, beverages and feed.

Immediately remove all soiled and contaminated clothing.

Wash hands before breaks and at the end of work.

Store protective clothing separately.

Do not inhale gases / fumes / aerosols.

Avoid contact with the eyes and skin.

- **Engineering controls:** Provide adequate ventilation.

- **Breathing equipment:**

Avoid inhalation of the chemical/ the product/ the preparation by organizational measures.

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

- **Protection of hands:**



Protective gloves

- **Eye protection:**

(Cont'd. on page 6)

Safety Data Sheet

according to OSHA HCS (29CFR 1910.1200)

Revision: June 25, 2019

Trade name: Chlorine Dioxide

(Cont'd. of page 5)



Safety glasses

Follow relevant national guidelines concerning the use of protective eyewear.

- **Body protection:** Protective work clothing
- **Limitation and supervision of exposure into the environment**
Avoid release to the environment.
- **Risk management measures** No relevant information available.

9 Physical and chemical properties

· Information on basic physical and chemical properties

· Appearance:

Form: Gaseous
Color: Greenish-Yellow.

· Odor: Chlorine-like
· Odor threshold: Not determined.

· pH-value: Not determined.
· Melting point/Melting range: Not determined.
· Boiling point/Boiling range: Not determined.

· Flash point: The product is not flammable.

· Flammability (solid, gaseous): Not determined.

· Auto-ignition temperature: Not determined.

· Decomposition temperature: Not determined.

· Danger of explosion: Explosive with or without contact with air.

· Explosion limits

Lower: Not determined.
Upper: Not determined.

· Oxidizing properties: Contains oxidizing agent.

· Vapor pressure: Not determined.

· Density:

Relative density: Not determined.
Vapor density: 1.0-2.4
Evaporation rate: Not determined.

· Solubility in / Miscibility with

Water: Soluble.

· Partition coefficient (n-octanol/water): Not determined.

· Viscosity

Dynamic: Not determined.
Kinematic: Not determined.

· Other information: No relevant information available.

(Cont'd. on page 7)

Safety Data Sheet

according to OSHA HCS (29CFR 1910.1200)

Revision: June 25, 2019

Trade name: Chlorine Dioxide

(Cont'd. of page 6)

10 Stability and reactivity

- **Reactivity:** No relevant information available.
- **Chemical stability:** Stable under normal temperatures and pressures.
- **Thermal decomposition / conditions to be avoided:**
No decomposition if used and stored according to specifications.
- **Possibility of hazardous reactions**
Contact with acids releases toxic gases.
Reacts with water and acids.
Reacts with powdered metals.
Acts as an oxidizing agent on organic materials such as wood, paper and fats.
Toxic fumes may be released if heated above the decomposition point.
- **Conditions to avoid** Moisture.
- **Incompatible materials**
Acids.
Organic materials
Metals.
Water
Flammable materials.
- **Hazardous decomposition products**
Oxygen
Chlorine

11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity:** Toxic if inhaled.
- **LD/LC50 values that are relevant for classification:**

Inhalative	LC50/4h	>2000 ppm (rat)
------------	---------	-----------------
- **Primary irritant effect:**
- **On the skin:** Caustic effect on skin and mucous membranes.
- **On the eye:** Strong irritant with the danger of severe eye injury.
- **Sensitization:** Based on available data, the classification criteria are not met.
- **Carcinogenic categories**
- **IARC (International Agency for Research on Cancer):**
None of the ingredients are listed.
- **NTP (National Toxicology Program):**
None of the ingredients are listed.
- **OSHA-Ca (Occupational Safety & Health Administration):**
None of the ingredients are listed.
- **Probable route(s) of exposure:**
Inhalation.
Eye contact.
Skin contact.
- **Germ cell mutagenicity:** Based on available data, the classification criteria are not met.
- **Carcinogenicity:** Based on available data, the classification criteria are not met.

(Cont'd. on page 8)

Safety Data Sheet

according to OSHA HCS (29CFR 1910.1200)

Revision: June 25, 2019

Trade name: Chlorine Dioxide

(Cont'd. of page 7)

- **Reproductive toxicity:** Based on available data, the classification criteria are not met.
- **STOT-single exposure:** Causes damage to the respiratory tract. Route of exposure: Inhalation.
- **STOT-repeated exposure:** Based on available data, the classification criteria are not met.
- **Aspiration hazard:** Based on available data, the classification criteria are not met.

12 Ecological information

- **Toxicity**
- **Aquatic toxicity** Toxic to aquatic life.
- **Persistence and degradability** No relevant information available.
- **Bioaccumulative potential:** No relevant information available.
- **Mobility in soil:** No relevant information available.
- **Other adverse effects** No relevant information available.

13 Disposal considerations

- **Waste treatment methods**
- **Recommendation:**
The user of this material has the responsibility to dispose of unused material, residues and containers in compliance with all relevant local, state and federal laws and regulations regarding treatment, storage and disposal for hazardous and nonhazardous wastes.
- **Uncleaned packagings**
- **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

- | | |
|--|-------------------------|
| · UN-Number | |
| · DOT, ADR/RID/ADN, IMDG, IATA | FORBIDDEN |
| · UN proper shipping name | Transport is forbidden. |
| · Transport hazard class(es) | |
| · DOT, ADR/RID/ADN, IMDG, IATA | |
| · Class | FORBIDDEN |
| · Packing group | None. |
| · Environmental hazards | Not applicable. |
| · Special precautions for user | Not applicable. |
| · Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code | Not applicable. |

15 Regulatory information

(Cont'd. on page 9)

Safety Data Sheet

according to OSHA HCS (29CFR 1910.1200)

Revision: June 25, 2019

Trade name: Chlorine Dioxide

(Cont'd. of page 8)

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **United States (USA)**
- **SARA**

· Section 302 (extremely hazardous substances):
--

None of the ingredients are listed.

· Section 355 (extremely hazardous substances):
--

None of the ingredients are listed.

· Section 313 (Specific toxic chemical listings):
--

10049-04-4 chlorine dioxide

· TSCA (Toxic Substances Control Act)
--

All ingredients are listed or exempt.

· Proposition 65 (California)

· Chemicals known to cause cancer:

None of the ingredients are listed.

· Chemicals known to cause developmental toxicity for females:

None of the ingredients are listed.

· Chemicals known to cause developmental toxicity for males:

None of the ingredients are listed.

· Chemicals known to cause developmental toxicity:

None of the ingredients are listed.

· EPA (Environmental Protection Agency):

10049-04-4 chlorine dioxide

D, CBD

· IARC (International Agency for Research on Cancer):
--

None of the ingredients are listed.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Date of preparation / last revision** June 25, 2019 / -

- **Abbreviations and acronyms:**

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

CAS: Chemical Abstracts Service (division of the American Chemical Society)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

OSHA: Occupational Safety & Health Administration

TLV: Threshold Limit Value

PEL: Permissible Exposure Limit

REL: Recommended Exposure Limit

Oxid. Gas 1: Oxidizing gases – Category 1

Press. Gas: Gases under pressure – Compressed gas

(Cont'd. on page 10)

Safety Data Sheet

according to OSHA HCS (29CFR 1910.1200)

Revision: June 25, 2019

Trade name: Chlorine Dioxide

(Cont'd. of page 9)

Press. Gas: Gases under pressure – Liquefied gas
Acute Tox. 2: Acute toxicity – Category 2
Acute Tox. 3: Acute toxicity – Category 3
Skin Corr. 1B: Skin corrosion/irritation – Category 1B
Skin Corr. 1C: Skin corrosion/irritation – Category 1C
Eye Dam. 1: Serious eye damage/eye irritation – Category 1
STOT SE 1: Specific target organ toxicity (single exposure) – Category 1

Sources

Website, European Chemicals Agency (echa.europa.eu)
Website, US EPA Substance Registry Services (ofmpub.epa.gov/sorinternet/registry/substreg/home/overview/home.do)
Website, Chemical Abstracts Registry, American Chemical Society (www.cas.org)
Patty's Industrial Hygiene, 6th ed., Rose, Vernon, ed. ISBN: 978-0-470-07488-6
Casarett and Doull's Toxicology: The Basic Science of Poisons, 8th Ed., Klaasen, Curtis D., ed., ISBN: 978-0-07-176923-5.
Safety Data Sheets, Individual Manufacturers

SDS Prepared by:
ChemTel Inc.
1305 North Florida Avenue
Tampa, Florida USA 33602-2902
Toll Free North America 1-888-255-3924 Intl. +01 813-248-0573
Website: www.chemtelinc.com