

Chlorine Dioxide Solutions

Safety Data Sheet

Section 1 – Chemical Product and Company Identification

Product Identifier:	Chlorine Dioxide 3000 ppm Aqueous Solution
Other Means of Identification:	Chlorine Oxide Solution Chlorine Peroxide Solution Chlorine (IV) Oxide Solution Chloroperoxyl Solution
Recommended Use:	Biocide Aqueous Oxidant
Company:	Anderson Chemical Company 325 East Davis Avenue Litchfield, MN 55355 320-693-2477
Emergency Phone Number:	800-424-9300

Section 2 – Hazards Identification

GHS Classification: Corrosive to Metals Category 1
Skin Irritation: Category 2
Eye Irritation: Category 2B
Acute Toxicity – Inhalation: Category 4

Signal Word: Warning

Pictogram:



Hazard Statements: H290: May be corrosive to metals
H315: Causes skin irritation
Causes eye irritation
H332: Harmful in inhaled

Precautionary Statements:

P234: Keep only in original container.
P280: Wear protective gloves.
P264: Wash exposed areas thoroughly after handling.
P261: Avoid breathing fume/gas/mist/vapors/spray.
P271: Use only outdoors or in a well-ventilated area.
P302 + [NO P CODE]: If on skin: Wash with plenty of water.
P332 + P313: If skin irritation occurs: Get medical attention.
P305 + P351 + P338: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313: If eye irritation persists: Get medical attention.
P304 + P340: If inhaled: Remove person to fresh air and keep comfortable for breathing.
P314: Call a doctor if you feel unwell.
P320: Specific treatment (see First Aid Measures on this SDS).
P362: Take off contaminated clothing and wash it before reuse.
P390: Absorb spillage to prevent material damage.
P406: Store in corrosive resistant/ container with a resistant inner liner.
Dispose of contents/container in accordance with local/regional/national/international regulations.

Unclassified Hazards: None

Ingredients With Unknown Toxicity: None

Section 3 – Composition/Information on Ingredients

Hazardous component(s):

Chemical name	Chlorine Dioxide
CAS #	10049-04-4
Molecular formula	ClO ₂
Concentration	0.3% (3,000 ppm)

Non-hazardous component(s):

Chemical name	Water
CAS #	7732-18-5
Molecular formula	H ₂ O
Concentration	≥ 99.7% (≥ 997,000 ppm)

Section 4 – First Aid Measures

Eyes

If symptoms develop, move patient away from the source of exposure and into fresh air. Flush eyes gently with large amounts of water while holding eyelids apart. If symptoms persist or there is any visual difficulty, seek medical attention.

Skin

Concentrated solutions of the material (> 1000 ppm) may be highly irritating, especially on prolonged contact. Remove contaminated clothing immediately. Immediately flush exposed skin with large amounts of water. Wash thoroughly with mild soap. Consult a physician if irritation or burning persists. Contaminated clothing must be laundered before re-use. Lower concentrations (<1000) ppm may cause some irritation with very-prolonged exposure.

Swallowing

First aid is not normally required when small amounts of the material are ingested. If symptoms develop or if large amounts of material have been ingested, DO NOT induce vomiting. DO NOT give anything by mouth if the patient is unconscious. Drink large quantities of water. Consult a physician immediately. Neutralization and use of activated charcoal are not recommended.

Inhalation

If symptoms develop, immediately move individual away from exposure and into fresh air. Seek immediate medical attention; keep person warm and quiet. If person is not breathing, begin artificial respiration. If breathing is difficult, administer oxygen. Monitor the patient closely for delayed development of pulmonary edema, which may occur up to 72 hours after inhalation.

Most Important Symptoms, Acute and Delayed

Causes skin and eye irritation. Harmful if inhaled.

Immediate Medical Attention Needed

Call poison control center or doctor for treatment advice.

Notes to Physicians

Probable mucosal damage may contraindicate the use of gastric lavage.

Section 5 – Fire-Fighting Measures

NFPA Rating

Health – 1
Flammability – 0
Reactivity – 1

Flash Point

Not applicable

Auto-ignition Temperature

Not applicable

Explosive Limit

Chlorine dioxide solution is not explosive. Chlorine dioxide gas, which may evolve from chlorine dioxide solution, may spontaneously decompose with a mild energy release at concentrations of 10% in air or greater at standard temperature and pressure (i.e., 76 mm Hg partial pressure).

Chlorine dioxide gas may explode with violent force at concentrations of 30% or greater in air at standard temperature and pressure (i.e., 228 mm Hg partial pressure).

Hazardous Products of Combustion

May form chlorine, hydrochloric acid gas, oxygen on combustion or decomposition.

Fire and Explosion Hazards

There are no special fire hazards known to be associated with the material.

Extinguishing Media

Water

Fire Fighting Instructions

Wear a self-contained breathing apparatus (SCBA) with a full-face piece operated in the “positive pressure demand” setting. Use SCBA in conjunction with appropriate chemically resistant personal protective gear. Refer also to the personal protective equipment section of this MSDS.

Section 6 – Accidental Release Measures

Personal Precautions, Protective Equipment, and Emergency Procedures

If run-off occurs, notify proper authorities of any runoff, as required. Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Avoid inhalation of vapors and mist.

Methods and Materials for Containment and Cleaning Up

Large spills: Prevent runoff to sewers, streams, lakes or other bodies of water. Small spills: Absorb liquid on vermiculite, floor absorbent or other absorbent material. Flush area with water. Stop spill at source, dike area around spill to prevent spreading, and pump liquid to salvage tank. Remaining liquid may be taken up on sand, clay, earth, vermiculite, floor absorbent, or other absorbent material and shoveled into containers. Flush with water the area from which the bulk of the spill has been removed.

Section 7 – Handling and Storage

Handling

In order to prevent the evolution of chlorine dioxide gas into the breathing zones of workers, agitation of the material should be minimized, and the material should not be stirred, mixed turbulently, sprayed or splashed.

Storage

The material should be stored indoors, only in the containers in which it is shipped, or in containers authorized by the manufacturer for such storage. Storage temperatures should be maintained above 50°F and below 110°F. The material should not be stored outside or exposed to direct sunlight or freezing temperatures (32°F or below). The material should not be heated to temperatures in excess of 140°F. At temperatures above 140°F, the gas concentration in the headspace of the container may reach high, energetically unstable concentrations.

Section 8 – Exposure Controls / Personal Protection

The OSHA permissible exposure limit (PEL) for ClO₂ gas in air is 0.1 ppm (0.3 mg/m³) as an 8-hour time weighted average. NIOSH recommended exposure limits (REL) and ACGIH threshold limit values (TLV) are also 0.1 ppm.

NIOSH and ACGIH short-term exposure limits (STEL) are 0.3 ppm (0.83 mg/m³) for periods not to exceed 15 minutes. The STEL concentration should not be repeated more than 4 times per day and should be separated by intervals of at least 60 minutes.

Exposure Guidelines (vapor)

OSHA PEL	0.100 ppm – TWA
ACGIH TLV	0.100 ppm – TWA
ACGIH TLV	0.300 ppm - STEL

Eye Protection

Wear splash-proof face and eye protection (PVC is preferred) where chlorine dioxide solution may splash or spray. Safety glasses should be in compliance with OSHA regulations.

Skin Protection

Wear waterproof protective clothing (PVC is preferred) where chlorine dioxide solution may splash or spray. Wear resistant gloves, such as Neoprene, to prevent skin contact, wear impervious clothing and boots. Other protective equipment: eyewash station, emergency shower.

Respiratory Protection

Exposures in the workplace should be monitored to determine if worker exposure exceeds the facility-specified exposure "action level" or the use of the material produces adverse health effects or symptoms of exposure. Provide adequate ventilation to maintain all work areas at concentrations below 0.1 ppm chlorine dioxide concentration. If the generation of vapors or mists is possible, use local ventilation. Where gas concentration may exceed 0.1 ppm, only a NIOSH/MSHA approved half or full-face acid gas respirator should be used. Monitoring results must be used to assess the proper level of respiratory protection necessary. Proper engineering and/or administrative controls should be used to reduce worker exposure. The facility's respiratory protection program must meet the requirements established in 29 CFR 1910.134, which includes a program for medical evaluation. A NIOSH/MSHA approved self-contained breathing apparatus, with full face piece, is required for leaks and emergencies where the concentration may exceed 5 ppm.

Engineering Controls

Provide sufficient mechanical ventilation-- general and/or local exhaust-- to maintain exposure below allowable limits.

Section 9 – Physical and Chemical Properties

Appearance and odor:	Yellow-green liquid, with sharp, pungent odor
Odor threshold of gas:	0.1 ppm
pH:	5.0 or lower (depending on age and temperature)
Freezing Point:	0° C (32° F)
Boiling Point:	100° C (212° F)
Flash Point:	Not applicable
Evaporation Rate:	Not established
Flammability:	Not applicable
Flammability Limits:	Not established
Vapor Pressure:	Not established
Vapor Density:	Not established
Liquid Specific Gravity:	1.0 at 0° C
Solubility:	Complete
Partition Coefficient (n-octanol/water):	Not applicable
Auto-ignition Temperature:	Not applicable
Decomposition Temperature:	No data
Viscosity	0.894 cP (centipoise) at 25 °C

Section 10 – Stability and Reactivity

Reactivity

May be corrosive to metals.

Chemical Stability

The material, as solution, is stable in the dark. On exposure to light, the solution may decompose to an aqueous solution of chloride and chlorate ions. In regard to vapor (gas) that may evolve from the material, see “Hazardous Decomposition Products” below.

Possibility of Hazardous Reactions

Material does not undergo hazardous polymerization.

Conditions to Avoid

Heat. Exposure to UV light or sunlight. Agitation.

Incompatible Materials

Avoid exposure to light. Avoid contact with: metals, reducing agents, strong oxidizing agents, sulfur compounds or sulfur-containing components, carbon monoxide, excessive heat, mercury, organic materials, phosphorus.

Hazardous Decomposition Products

Gas-phase vapors that evolve from the material may decompose on exposure to light, on contact with incompatible materials (see below), or spontaneously at concentrations above 10% in air at standard temperature and pressure (76mm Hg). On decomposition, material may form: Chlorine, hydrochloric acid gas and oxygen.

Section 11 – Toxicological Information

Likely routes of exposure: ingestion, skin and eye contact and inhalation of vapors which may evolve from the material.

Potential acute health effects:

Eye contact: irritation, redness

Inhalation: Irritation, sore throat, wheezing, and difficulty breathing.

Skin contact: redness

Ingestion: Abdominal pain, nausea, vomiting and diarrhea; it is unlikely to cause serious digestive tract injury. Chlorine dioxide given daily in drinking water at 1-100 ppm caused a decrease in blood glutathione, altered the morphology of erythrocytes, and caused osmotic fragility in laboratory animals.

Potential chronic health effects:

Short term exposure: Components in this product may be irritating to the skin, eyes and respiratory tract

Long term exposure: Prolonged inhalation effects may be harmful. In extreme cases, it may cause pulmonary damage and death.

Information on toxicological effects:

Acute Oral Toxicity: LD50 >5000mg/kg -rat

Acute Dermal Toxicity: LD50>5000mg/kg - rat

Acute Inhalation: LC50: 2.13 mg/L - rat

Primary eye irritation: minimally irritating to the eye

Primary skin irritation: moderately irritating to the skin

LLNA mouse – not a dermal sensitizer

Carcinogenicity: This material is not listed as a carcinogen by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), or the Occupational Safety and Health Administration (OSHA) United States Environmental Protection Agency (EPA) or American Conference of Industrial Hygienists (ACGIH).

Reproductive Toxicity: Available information is insufficient to assess risk to the fetus from maternal exposure to this material during pregnancy. Chlorine dioxide did not cause birth defects in laboratory animals even at very high exposure levels.

Specific target organ toxicity (single exposure): None known

Specific target organ toxicity (repeated exposure): None known

Aspiration Hazard: Classification criteria not met. May be harmful if swallowed.

Other Health Effects

No data available on other possible health effects

Section 12 – Ecological Information

Ecotoxicity

No data available.

Persistence and Degradability

No data available.

Bioaccumulation Potential

No data available.

Mobility in Soil

No data available.

Other Adverse Effects

No data available.

Section 13 – Disposal Considerations

Disposal of this material should be in accordance with all applicable Federal, State and local rules, regulations and requirements.

Section 14 – Transport Information

Transport of this material should be in accordance with all applicable Federal, State and local rules, regulations and requirements, including, without limitation, the rules and regulations of the US Department of Transportation, including all applicable packaging and labeling requirements.

DOT Information: Regulated as a hazardous material when shipped by motor vehicle or rail car under UN 1760.

Proper shipping name:	Corrosive Liquid, N.O.S.
Class:	Class 8 – Corrosive. ¹
Packing group:	III (must not ship or store in metal containers)
Hazard label:	CORROSIVE
Technical name:	0.3% Chlorine Dioxide Aqueous Solution

¹
Chlorine Dioxide is a “corrosive material” (Class 8), solely because it is corrosive to steel and aluminum. It is not highly corrosive to skin. It MUST be packaged and shipped in containers that will not react dangerously with or be degraded by the *Chlorine Dioxide* (e.g., plastic).

Section 15 – Regulatory Information

US Federal Regulations

EPA FIFRA Information

This chemical is a pesticide product registered by the Environmental Protection Agency (EPA Registration Number 75757-2) and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

CAUTION

Causes moderate eye irritation. Avoid contact with eyes, skin, or clothing. Harmful if swallowed, absorbed through the skin, or inhaled. Wash thoroughly with soap and water after handling, and before eating, drinking, chewing gum, using tobacco, or using the toilet.

TSCA (Toxic Substances Control Act) Status - United States

The intentional ingredients of this material are listed.

CERCLA RQ- 40 CFR 302.4(a)

None listed

SARA 302 Components - 40 CFR 355 Appendix A

None

SARA 313 Components - 40 CFR 372.65

Section 313 Components	CAS Number	Percent (%)
Chlorine dioxide	10049-04-4	0.3

(Note: the concentration is below the 1.0% de minimis value)

OSHA Process Safety Management 29 CFR 1910

PSM Component(s)	Condition	TQ (lbs)
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CHLORINE DIOXIDE		1000
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EPA Accidental Release Prevention 40 CFR 68

PSM Component(s)	Condition	TQ (lbs)
CHLORINE DIOXIDE Chlorine Oxide (ClO ₂)		1000

International Regulations

Not determined

State and Local Regulations

California Proposition 65:

None on list

Section 16 – Other Information

NSF: Certified to NSF/ANSI Standard 60 (Registration No. 59660) and Non-Food Compounds (Registration No. C 1073954) category codes G-5 and G-7.
Maximum use rate for potable water – 670 mg/liter.
This product ships as NSF certified product from Allentown, PA

Kosher: This product has been evaluated and is Star-K Kosher certified.

OMRI: This product is OMRI certified product number 857 under classes Processing Sanitizers and Cleaners, Crop Management Tools and Production Aids, and Livestock Management Tools and Production Aids

The information set forth herein is believed to be accurate. However, NO WARRANTY IS GIVEN AS TO THE ACCURACY OF ANY OF THE INFORMATION, WHETHER ORIGINATED BY THE COMPANY OR BY OTHERS. Recipients of this SDS are advised to confirm, in advance of any need, that the information is current, applicable, and suitable to their circumstances.

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