



MATERIAL SAFETY DATA SHEET

PureCide[®] 25 Solution

This MSDS is supplied by PureLine Treatment Systems as a service to clients.

SECTION 1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PureLine Treatment Systems

25612 Commercentre Drive
Lake Forest CA 92630
Phone: (949) 716-4615
Fax: (949) 716-4645

PureCide[®] 25 Solution, 25 wt% Active

Product Name: PureCide[®] 25 Solution

Major Update: 1/05/01

CAS#: 7758-19-2

MSDS Code: PureLine PureCide[®] 25

Synonyms: Sodium chlorite, sodium chlorite solution

Product Use: Generation of chlorine dioxide for use as a disinfectant or for use as an oxidant. Bleaching of textiles, wood pulp bleaching, water treatment as biocide for control of microorganisms and algae, oxidation of sulfides in wastewater, bleaching and deodorising of fats and oils, and odor control. PureCide[®] 25 solution is also used in PureLine's proprietary electrochemical ClO₂ generation systems.

Emergency Contact:

(949) 724-4615
after 6:00 PM PST (949) 855-7340

SECTION 2 – COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	% Range	CAS NO.	OSHA PEL
Sodium Chlorite	25%	7758-19-2	None established
Sodium Chloride	1 - 5%	7647-14-5	None established
Sodium Chlorate	0 - 3%	7775-09-9	None established
Sodium Sulfate	0 - 2%	7757-82-6	None established
Water	66 - 76%	7732-18-5	None established

SECTION 3 – HAZARD IDENTIFICATION

Emergency Overview: Pale green, clear, non-volatile liquid. CORROSIVE! Can cause severe irritation to eyes and skin. OXIDIZING AGENT! Highly reactive to strong acids, reducing substances producing toxic and potentially explosive amounts of chlorine dioxide gas. Combustible materials saturated with dried solution are heat to ignite nearby combustible materials. Toxic to aquatic organisms. Read the entire MSDS for a more thorough evaluation of the hazards.

Potential Health Effects:

Inhalation: Does not readily form a vapor and inhalation exposure is likely to occur as an aerosol. Due to its corrosive nature, aerosols could cause pulmonary edema (severe, life-threatening lung injury). The development of pulmonary edema may be delayed up to 48 hours after exposure. The early symptoms of pulmonary edema include shortness of breath and tightness in the chest.

Skin Contact: Corrosive! Capable of causing severe irritation and/or burns with symptoms of redness, itching, swelling, and possible destruction of tissue. The severity of injury depends on the concentration (solutions) and the duration of exposure.

Eye Contact: Corrosive! The severity of injury increases with the concentration, the duration of exposure, and the speed of penetration into the eye. Damage can range from severe irritation and mild scarring to blistering, disintegration, ulceration, severe scarring and clouding.

Ingestion: May cause gastroenteritis with any or all of the following symptoms: nausea, pain, burning of the mouth, throat and esophagus; vomiting; diarrhea; collapse, bleeding or ulceration. Acute ingestion of large quantities may also cause anemia due to the oxidizing effects of the chemical.

Chronic Effects: Repeated or prolonged skin contact would be expected to cause drying, cracking, and inflammation of the skin (dermatitis).

Existing Medical Conditions Possibly Aggravated By Exposure : Asthma, bronchitis, emphysema and other lung diseases and chronic nose, sinus or throat conditions. Skin irritation may be aggravated in individuals with existing skin disorders.

Carcinogenicity: Not classified as a carcinogen by ACGIH (American Conference of Governmental Industrial Hygienists) or IARC (International Agency for Research on Cancer), not regulated as a carcinogen by OSHA (Occupational Safety and Health Administration), and not listed as a carcinogen by NTP (National Toxicology Program).

SECTION 4 – FIRST AID MEASURES

General: If you feel unwell seek medical advice (show the label where possible).

Inhalation: Move victim to fresh air. If breathing is difficult, oxygen may be beneficial if administered by trained personnel, preferably on a doctor's advice. Give artificial respiration ONLY if breathing has stopped. 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. Give Cardiopulmonary Resuscitation (CPR) only if there is no pulse AND no breathing. Obtain medical attention IMMEDIATELY. Symptoms of pulmonary edema can be delayed up to 48 hours after exposure.

Skin Contact: Immediately flush skin with running water for at least 20 minutes and upward to 60 minutes is recommended. Under running water remove contaminated clothing, jewelry, and shoes. If irritation persists, repeat flushing. For burns, obtain medical attention. Discard contaminated clothing and shoes in a manner, which limits further exposure.

Eye Contact: Immediately flush eyes with running water for a **minimum** of 20 minutes and upward to 60 minutes is recommended. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY. Do not transport victim until the recommended flushing period is completed unless flushing can be continued during transport.

Ingestion: DO NOT INDUCE VOMITING. If victim is alert and not convulsing, rinse mouth and give as much water as possible to dilute material (8 to 10 oz.). If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. IMMEDIATELY transport victim to an emergency facility.

SECTION 5 – FIRE FIGHTING MEASURES	
Flash Point	Not applicable. Not combustible
Flammable Limits (Lower)	Not applicable
Flammable Limits (Upper)	Not applicable
Auto Ignition Temperature	Not applicable
Combustion and Thermal Decomposition Products	Oxygen, sodium chloride and sodium chlorate salts
Rate of Burning	Not applicable
Explosive Power	Not applicable
Sensitivity to Mechanical Impact	Not applicable

Fire and Explosion Hazards: Does not burn, but combustibles wetted with this solution and subsequently allowed to dry are easily ignited and will burn vigorously

Extinguishing Media: Water is the only effective extinguisher in the event of a fire with combustibles.

Special Information: Evacuate area and fight fire from a safe distance or a protected location, especially in the event that the solution is in contact with acids, which can generate toxic amounts of chlorine dioxide gas. Approach fire from upwind. If possible, isolate materials not involved in the fire and protect personnel. Move containers from fire area if it can be done without risk. Water should be used to extinguish the fire.

Fire Fighting Protective Equipment: Firefighter's normal protective clothing (Bunker Gear) will not provide adequate protection. Chemical resistant clothing (e.g. chemical splash suit) and positive pressure self-contained breathing apparatus (MSHA/NIOSH approved or equivalent) may be necessary.

NOTE: Also see "Section 10 - Stability and Reactivity"

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Spills, Leaks, or Releases:

- Restrict access to area until completion of clean up. Ensure that trained personnel conduct the clean up. Ventilate area.
- Wear adequate personal protective equipment (See Section 8). Do not touch spilled material.
- Prevent entry into sewers or waterways.
- Land spills of solution should be contained by diking with an inert material, such as sand or earth, and not with any combustible materials such as sawdust. The material should be made alkaline with the addition of sodium carbonate (soda ash) to prevent any generation of chlorine dioxide. The material should then be collected into clean metal or high density polyethylene containers.
- Water spill: Make alkaline with soda ash.
- Comply with Federal, Provincial/State and local regulations on reporting releases.

Deactivating Chemicals: Dilute solution or material with water, add soda ash to make solution alkaline followed by the addition of dilute aqueous sodium sulfite.

Waste Disposal Methods: Dispose of waste material at an approved waste treatment/disposal facility, in accordance with applicable regulations. Do not dispose of waste with normal garbage or to sewer systems because it is an oxidizer.

SECTION 7 – HANDLING AND STORAGE

Precautions: Have emergency equipment (for fires, spills, leaks, etc.) readily available. Ensure all containers are labeled. Wear appropriate Personal Protection Equipment. Product is NOT compatible with acids and combustibles such as cloth, leather, and paper. People working with this chemical should be properly trained regarding its hazards and its safe use.

Handling Procedures and Equipment: Use smallest possible amounts in designated areas with adequate ventilation. Keep containers closed when not in use. Empty containers may contain hazardous residues and should be properly rinsed or washed to remove residues. Avoid generating mists. Transfer solutions using equipment, which are corrosion-resistant. Cautiously, transfer into sturdy containers made of compatible materials. Never return contaminated material to its original container.

Storage Requirements: Store in a cool, dry, fireproof, well-ventilated area. Keep containers tightly closed when not in use and when empty. Protect from damage. Store away from incompatible materials such as strong acids, reducing agents, and combustibles. See Section 10 for Incompatibles. Use corrosion-resistant structural materials and lighting and ventilation systems in the storage area. Containers made of plastics or plastic-lined steel, or FRP tanks of derakane vinyl ester resin may be suitable. Container contents may develop pressure after prolonged storage. Drums may need to be vented. Trained personnel should only perform venting.

Storage Temperature: Avoid freezing. Do not expose sealed containers to temperatures above 50 °C (122 °F).

SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

PREVENTIVE MEASURES

Recommendations listed in this section indicate the type of equipment, which will provide protection against over exposure to this product. Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace.

Engineering Controls: Use separate, corrosion resistant local exhaust ventilation wherever there is an incidence of point source emissions or dispersion of regulated contaminants in the work area. Ventilation control of the contaminant as close to its point of generation is both the most economical and safest method to minimize personnel exposure to airborne contaminants. Do not use wood or other combustibles to construct the system. Prevent entry of solution into motor bearings or gear boxes, which could cause an explosion by reaction with petroleum lubricants.

PERSONAL PROTECTIVE EQUIPMENT

Maintain eye wash fountain and quick-drench facilities in work area. Detailed requirements for personal protective equipment should be established on a site-specific basis.

Eye Protection: Wear full face-shield and chemical safety goggles when there is potential for contact.

Skin Protection: Wear appropriate personal protective clothing to prevent skin contact. Wear butyl rubber or neoprene gloves for hand protection.

Respiratory Protection:

Up To 10 mg/m³: Supplied Air Respirator (SAR) operated in a continuous-flow mode, eye protection needed; or full-facepiece respirator with high-efficiency particulate filter(s); or powered air- purifying respirator with dust and mist filter(s), eye protection needed; or full-facepiece Self-Contained Breathing Apparatus (SCBA); or full-facepiece SAR.

Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions: Positive pressure, full-facepiece SAR; or positive pressure, full-facepiece SAR with an auxiliary positive pressure SAR.

ESCAPE: Full-face respirator with high-efficiency particulate filter(s); or escape-type SCBA.

EXPOSURE GUIDELINES

PRODUCT:	PureCide® 25
ACGIH Ceiling Exposure Limit (TLV-C)	Not established or available
OSHA PEL	Not established or available
NIOSH IDLH	Not established or available

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES	
Alternate Name(s)	Sodium chlorite solution
Chemical Name	Sodium chlorite solution
Chemical Family	Alkali chlorite
Molecular Formula	NaClO ₂
Molecular Weight	90.45
Appearance	Clear liquid
Odor	Slight chlorine or bleach-like odor
State	Liquid
Color	Pale green, clear
pH	12.5 - 13.0
Vapor Pressure	Not available

Vapor Density (Air = 1)	Not applicable
Boiling Point	104 - 106 °C
Freezing Point	-7°C
Solubility (Water)	Miscible
Specific Gravity	1.21 (at 20 °C)
Evaporation Rate	Not available
Viscosity (cp):	1.2 (at 20 °C)

SECTION 10 – STABILITY AND REACTIVITY

Chemical Stability: Stable at room temperature, does not burn by itself. Reactive to other substances as described below.

Hazardous Decomposition Products: Thermal decomposition of sodium chlorite solid residues will give off oxygen and form chloride containing salt residues.

Conditions to Avoid: Acid and acidic materials. Keep away from combustible materials such as leather, paper. Clean up all liquid spills.

Incompatibility with other Substances: Sodium chlorite reacts vigorously with acids to produce toxic chlorine dioxide and chlorine gas. Mixtures with combustibles, if allowed to dry out, are easily ignited by heat or friction and burn vigorously or may explode.

Hazardous Polymerization: Will not occur.

SECTION 11 – TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA:

Toxicological Data:

Toxicity data: LD_{Lo} oral rat 165 mg /kg ;

Irritation data: 500 mg/24 hour(s)

Dermal LD₅₀: >2g/kg (rabbit)

Mutagenicity: Evidence of mutagenicity has been demonstrated in bacteria and in mammalian cell cultures, but not in experiments involving whole animals.

Skin Contact: Irritating to the skin if not washed off promptly. Dermatitis is likely to occur from repeated or prolonged contact.

Carcinogenicity: Does not appear on reference lists.

Reproductive Effects: Shown to be toxic to mammalian fetuses only at doses toxic to the mother.

Teratogenicity and Fetotoxicity: No information is available.

Sensitization: Not reported as a human sensitizer.

Synergistic Materials: None known

SECTION 12 – ECOLOGICAL INFORMATION

Ecotoxicological Information: Acute TL₅₀ for Rainbow Trout 50.6 mg/l; Acute LC₅₀ (96 hrs.) for Rainbow Trout 290 mg/l; Acute TL₅₀ for Bluegill 208 mg/l; Acute LC₅₀ (96 hrs.) for Bluegill 265-310 mg/l; Acute LC₅₀ (96 hrs.) for Daphnia Magna 0.29 mg/l

Persistence and Degradation: Degrades readily by reacting with natural carbon dioxide in the air. Does not bioaccumulate.

SECTION 13 – DISPOSAL CONSIDERATIONS

Review federal, state and local government requirements prior to disposal. Do not dispose of waste with normal garbage, or to sewer systems.

Whatever cannot be saved for recovery or recycling, including containers should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options.

RCRA: Test waste material for corrosivity, D002, prior to disposal.

SECTION 14 –TRANSPORT INFORMATION

	DOT
Shipping Name	Sodium chlorite solution
Hazard Class/Division	8: Corrosive
Identification No.	UN1908
Packing Group:	II

IATA/ICAO Class: 8

SECTION 15 – REGULATORY INFORMATION

OSHA Classification: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200)

SARA Regulations sections 313 and 40 CFR 372: N

SARA Hazard Categories, SARA SECTIONS 311/312 (40CFR370.21):

ACUTE: Y

CHRONIC: N

FIRE: N

REACTIVE: Y

SUDDEN RELEASE: N

OSHA PROCESS SAFETY (29CFR1910.119): N

CERCLA SECTION 103 (40CFR302.4): N

Reportable Quantity (RQ) under CERCLA: Not Applicable

TSCA Inventory Status: N

Other Regulations/Legislation which apply to this product: N

Right-to-Know/Disclosure Lists: Illinois, Massachusetts, New Jersey, Pennsylvania,

California Proposition 65: N

This product does not contain nor is it manufactured with ozone depleting substances.

Canadian Classification

This product has been classified in accordance with the hazard criteria of the CPR (Controlled Products Regulations) and this MSDS (Material Safety Data Sheet) contains all the information required by the CPR.

Controlled Products Regulations (WHMIS) Classification: E: Corrosive

CEPA / Canadian Domestic Substances List (DSL): Y

WHMIS Ingredient Disclosure List: Meets criteria for disclosure at 1% or greater.

EINECS Number: 215-185-5

SECTION 16 – OTHER INFORMATION

The information contained herein is offered only as a guide to the handling of

this specific material and has been prepared in good faith by technically knowledgeable personnel. It is not intended to be all-inclusive and the manner and conditions of use and handling may involve other and additional considerations. No warranty of any kind is given or implied and PureLine Treatment Systems will not be liable for any damages, losses, injuries or consequential damages that may result from the use of or reliance on any information contained herein. This Material Safety Data Sheet is valid for three years.

National Fire Protection Association (NFPA) Rating

Hazardous Materials Identification System (HMIS) Rating

	NFPA	HMIS
HEALTH	3	3
FIRE	0	0
REACTIVITY	1	1

4 = Extreme/Severe
3 = High/Serious
2 = Moderate
1 = Slight
0 = Minimum
W = Water Reactive

REFERENCES:

1. Chemlist, STN Database, Chemical Abstract Service, 1999
2. "CHEMINFO", through "CCINFODisc", Canadian Centre for Occupational Health and Safety, Hamilton, Ontario, Canada, (Aug 1999).
3. DOSE, Royal Society of Chemistry, Aug 27, 1999.
4. HSDB- Hazardous Substances Data Bank, CCOHS, May 1999
5. RTECS-Registry of Toxic Effects of Chemical Substances, On-line search, Canadian Centre for Occupational Health and Safety RTECS database, Doris V. Sweet, Ed., National Institute for Occupational Safety and Health, U.S. Dept. of Health and Human Services, Cincinnati, Entry Update/May 1999.
6. "1999 Threshold Limit Values and Biological Exposure Indices", American Conference of Government Industrial Hygienists, 1999.
7. Merck, 11th Edition, 1989

PREPARATION INFORMATION:

For further information contact:

Jerry Kaczur
PureLine Treatment Systems
(949) 724-4615, ext 21

SIGNATURE: Glenn W. Holden

DATED: January 5, 2001

PureLine Treatment Systems assumes no responsibility for injury to or death of the recipient of this material or third persons, or for any loss or damage, howsoever caused and the user, owner, bailee and their respective employees and agents assume all such risks if reasonable safety procedures are not adhered to.

In addition, **PureLine Treatment Systems** assumes no responsibility for injury to or death of the recipient of this material or third persons, or for any loss or damage to any property, or for any consequential damage resulting from any abnormal use or theft of the material and the user, owner, bailee and their respective employees and agents assume all such risks even when caused by negligence, omission, default or error in judgment of **PureLine Treatment Systems** or its agents or servants.

Each recipient should carefully review the information, data and recommendations in the specific context of the intended use.

LEGEND:

- ACGIH - American Conference of Governmental Industrial Hygienists
- ANSI - American National Standards Institute
- CAS # - Chemical Abstracts Service Registry Number
- CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act
- CFR - Code of Federal Regulations
- DOT - Department of Transportation
- IDLH - Immediately Dangerous to Life and Health
- LC50 - The concentration of material in air expected to kill 50% of a group of test animals
- LD50 - Lethal Dose expected to kill 50% of a group of test animals
- NIOSH - National Institute for Occupational Safety and Health
- OSHA - Occupational Safety and Health Association
- PEL - Permissible Exposure Limit
- RCRA - Resource Conservation and Recovery Act
- RQ - Reportable Quantity
- STEL - Short Term Exposure Limit
- TDG - Transportation of Dangerous Goods Act/Regulations
- TLm - Threshold Limit
- TSCA - Toxic Substances Control Act
- TWA - Time-Weighted Average
- WHMIS - Workplace Hazardous Material Information System