

Section 01: Chemical Product Identification

 Domestic Trade Name: **OZONE**

Export Trade Name: Ozone

Product Use: Water distribution system disinfection

Manufacturer/Supplier: AmeriWater, LLC

General Information: 937-461-8833

 Synonyms: Triatomic Oxygen, Trioxygen, O₃

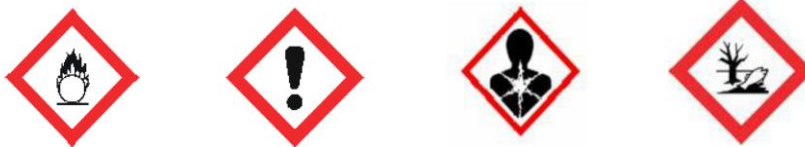
CAS Number: 10028-15-6

Address: 3345 Stop 8 Rd, Dayton Ohio, 45414, USA

Transportation Emergency Number: **CHEMTREC: 800-424-9300 (Domestic North America)**
703-527-3887 (International, collect calls accepted)

Section 02: Hazards Identification:

Symbols:



GHS Classification:

Physical Hazards	Health Hazards	Environmental Hazards
Oxidizing Gas	Skin Irritation – Category 3	Acute Aquatic Toxicity – Category 1
	Eye Irritation – Category 2B	
	Respiratory Systemic Toxicity – Category 1 (Acute & Repeated Exposures)	

NOTE: Severe respiratory toxicity will develop before skin or eye irritation go beyond listed categories. Anyone with chronic pulmonary problems, especially asthma, should avoid exposure to ozone.

WHMIS Classifications (Workplace Hazardous Materials Information System, Canada)

D1A	Acute lethality – Very toxic, immediately	C	Oxidizing
D2A	Chronic Toxicity – Very Toxic	F	Dangerously Reactive
D2B	Mutagenicity – Toxic		

Section 03: Composition / Information on Ingredients

Chemical name: Ozone
 Common names: Triatomic oxygen, trioxygen
 Chemical Formula: O₃
 CAS Registry Number: 10028-15-6

Section 04: First Aid Measures

Route of Entry		Symptoms	First Aid
Skin Contact	YES	Irritation	Rinse with water
Skin Absorption	NO	NA	NA
Eye Contact	YES	Irritation	Rinse with water, remove contacts
Ingestion	NO	NA	NA
Inhalation	YES	Headache, cough, dry throat, heavy chest, shortness of breath	Remove to fresh air, provide oxygen therapy as needed

For severe cases, or when symptoms don't improve, seek medical help.

Section 05: Fire Fighting Measures

While ozone itself is not flammable, it is a strong oxidant and may accelerate, even initiate, combustion, or cause explosions. Use whatever extinguishing agents are indicated for burning materials.

Section 06: Accidental Release Measures

Turn off ozone generator, and ventilate the area. Evacuate the area until ozone levels subside.

Section 07: Handling and Storage

Ozone must be contained within ozone-resistant tubing and pipes from the generation point to the application point. Any leaks must be repaired before further use.

Section 08: Exposure Control/Personal Protection

OSHA Permissible Exposure Limit: 8 hour Time Weighted Average 0.1 ppm

ANSI/ASTM: 8 hour TWA 0.1 ppm, Short Term Exposure Limit 0.3 ppm

ACGIH: 8 hour TWA 0.1 ppm; STEL 0.3 ppm

NIOSH: Exposure Limit Ceiling Value 0.1 ppm light; 0.08 ppm moderate; 0.05 ppm, heavy;

Light, moderate, heavy work TWA <= 2 hours, .2 ppm

Immediately Dangerous to Life or Health 5 ppm

Respiratory Protection: Use full face self-contained breathing apparatus for entering areas with high concentration of ozone.

Engineering controls: use ozone destruct units (thermal and/or catalytic) for off gassing ozone.

Section 09: Physical and Chemical Properties

Physical state :	Gas	pH:	NA
Molecular Weight:	48.0	Flash point:	NA
Appearance :	Clear (blue at higher concentrations)	Evaporation rate:	NA
Odor :	Distinctive pungent odor	Flammability:	NA
Odor threshold:	0.02 to 0.05 ppm; exposure desensitizes	Explosive limits:	NA
Melting point :	-193oC/-315oF	Relative density:	NA
Boiling point :	-112oC/-169oF	Partition coefficient:	NA
Vapor pressure:	> 1 atm	Auto-ignition temperature:	NA
Vapor density :	1.6 (air = 1)	Decomposition temperature:	NA
Solubility in water:	570 mg/L @20oC, 100% O3; 0.64 @0oC (vol/vol)	Viscosity:	NA

Section 10: Stability and Reactivity

Ozone is highly unstable and highly reactive. Avoid contact with oxidizable substances, including alkenes, benzene and other aromatic compounds, rubber, dicyanogen, bromine diethyl ether, dinitrogen tetroxide, nitrogen trichloride, hydrogen bromide, and tetrafluorohydrazine. Ozone will readily react and spontaneously decompose under normal ambient temperatures.

Section 11: Toxicological Information

Likely routes of exposure: inhalation, eyes, skin exposure.

Effects of Acute Exposure: Discomfort, including headache, coughing, dry throat, shortness of breath, heavy feeling in chest (including possible pulmonary edema/fluid in the lungs); higher levels of exposure intensify symptoms. Irritation of skin and/or eyes is also possible.

Effects of Chronic Exposure: Similar to acute exposure effects, with possible development of chronic breathing disorders, including asthma. Inhalation LC50: mice, 12.6 ppm for 3 hours; hamsters, 35.5 ppm for 3 hours

Irritancy of Ozone	YES
Sensitization to Ozone	NO
Carcinogenicity (NTP, IARC, OSHA)	NO
Reproductive Toxicity	Not Proven
Teratogenicity	Not Proven
Mutagenicity	Not Proven
Toxicologically Synergistic Products	Increase susceptibility to allergens, pathogens, irritants

Section 12: Ecological Information

The immediate surrounding area may be adversely affected by an ozone release, particularly plant life. Discharge of ozone in water solution would also be harmful to any aquatic life. Due to natural decomposition, bioaccumulation will not occur, and the area affected would be limited.

Section 13: Disposal Considerations

Off-gassing of ozone should be through an ozone destruct unit which uses heat and/or a catalyst to accomplish the breakdown of ozone to oxygen before release into the atmosphere.

Section 14: Transport Information

NOT APPLICABLE, as ozone is unstable and either reacts with other substances in the environment or decomposes, and therefore must be generated at the location and time of use.

Section 15: Regulatory Information

SARA = Superfund Amendments and Renewal Act

SARA Title III Section 302 Extremely Hazardous Substance TPQ: 100 lbs.

SARA Title III Section 304, EHS RQ: 100 lbs.

SARA Title III Section 313: Ozone is reportable if more than 10,000 lbs. are used/year.

TPQ (Threshold Planning Quantity) requires emergency planning activities if this amount is on site at any time during year

RQ (Reportable Quantity) requires any release of this amount into the environment to be reported to the National Response Center

Source: EPA List of Lists.

Section 16: Other Information

The half-life of ozone is much shorter in water than in air. Increased temperature in either solvent decreases the half-life. Published research indicates a half-life of 20 minutes for ozone dissolved in water at 20°C, and a half-life of approximately 25 hours for ozone in dry air at 24°C (McClurkin & Maier, 2010). The practical half-life time is actually less, especially in air, due to air circulation, humidity, the presence of contaminants or walls with which to react, etc. In many situations, with air movement, warmer temperatures, and normal relative humidity, the half-life of ozone in air could be 1 hour or less. Further, ventilation of a closed space to other areas will also disperse the ozone, so that concentration levels can rapidly decrease after generation ceases.

Source websites:

Canadian Centre for Occupational Health and Safety: Chemical Profiles: Ozone
http://www.ccohs.ca/oshanswers/chemicals/chem_profiles/ozone/

Haz-Map: Occupational Exposure to Hazardous Agents: Ozone
http://hazmap.nlm.nih.gov/cgi-bin/hazmap_generic?tbl=TblAgents&id=68

International Chemical Safety Cards #0068: Ozone
<http://www.cdc.gov/niosh/ipcsneng/neng0068.html>

NIOSH Pocket Guide to Chemical Hazards: Ozone
<http://www.cdc.gov/niosh/npg/npgd0476.html>

United States National Library of Medicine ChemIDplus Lite: Ozone 10028-15-6

<http://chem.sis.nlm.nih.gov/chemidplus/ProxyServlet?objectHandle=DBMaint&actionHandle=default&nextPage=jsp/chemidlite/ResultScreen.jsp&TXTSUPERLISTID=0010028156>