1. PRODUCT IDENTIFICATION

Product Name: OZONE

Common Names/Synonyms: Triatomic Oxygen, Trioxygen,

Ozone Generator Manufacturer/Supplier

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Product Use: This SDS is limited to ozone produced in gaseous form on site by an ozone generator, in varying concentrations, in either air or aqueous solution, for the purposes of odor abatement, oxidation of organic compounds, or antimicrobial intervention, in a variety of applications.

2. HAZARD IDENTIFICATION

GHS Classifications:

Physical	Health:	Environmental:
Oxidizing Gas	Skin Irritation – Category 3 Eye Irritation – Category 2B Respiratory System Toxicity – Category 1 (Single & Repeated)	Acute Aquatic Toxicity – Category I

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): **C, D1A, D2A, D2B, F**

Source: CCOHS CHEMINFO Record Number 774

3. COMPOSITION

Chemical name	Ozone
Common names	Triatomic oxygen, trioxygen
Chemical Formula	O_3
CAS Registry Number	10028-15-6

4. 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, heavy chest, shortness of breath	Remove to fresh air, provide oxygen therapy as needed

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

5. FIRE FIGHTING MEASURES

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

6. ACCIDENTAL RELEASE MEASURES

Turn off the ozone generator, and ventilate the area. Evacuate until ozone levels subside to a safe level (<0.1 ppm).

7. HANDLING AND STORAGE

Ozone must be contained within ozone-resistant tubing and pipes from the generation point to the application point.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OSHA Permissible Exposure Limit: 8 hour TWA **0.1 ppm**

ANSI/ASTM: 8 hour TWA **0.1 ppm**, STEL **0.3 ppm**

ACGIH: 8 hour TWA **0.1 ppm**; STEL **0.3 ppm**

NIOSH: ELCV **0.1 ppm** light; **0.08 ppm** moderate; **0.05 ppm**, heavy
Light, moderate, heavy work TWA <= 2 hours: **0.2 ppm**
Immediately Dangerous to Life or Health (IDLH) **5 ppm**

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

Engineering control: Use ozone destruct unit for off gassing of ozone.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	Gas	pH	NA
Molecular Weight	48.0	Decomposition temperature	NA
Appearance	Clear at low concentration, blue at higher concentration	Evaporation rate	NA
Odor	Distinct pungent odor	Flash point	NA
Odor threshold	0.02 to 0.05 ppm; exposure desensitizes	Auto-ignition temperature	NA
Melting point	-193°C/-315°F	Relative density	NA
Boiling point	-112°C/-169°F	Partition coefficient	NA
Vapor pressure	> 1 atm	Flammability	NA
Vapor density	1.6 (air = 1)	Explosive limits	NA
Solubility in water	570 mg/L @20°C & 100% O_3; 0.64 @0°C	Viscosity	NA

10. STABILITY AND REACTIVITY

Ozone is highly unstable and highly reactive. Avoid contact with oxidizable substances. Ozone will readily react and spontaneously decompose under normal ambient temperatures.

11. TOXICOLOGICAL INFORMATION

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

Effects of Acute Exposure: Discomfort, including headache, coughing, dry throat, shortness of breath, pulmonary edema; higher levels of exposure intensify symptoms. Possible irritation of skin and/or eyes.

Effects of Chronic Exposure: Similar to acute exposure effects, with possible development of chronic breathing disorders, including asthma.

LC_{50}: 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, Teratogenicity, Mutagenicity	Not Proven
Toxicologically Synergistic Products	Increased susceptibility to allergens, pathogens, irritants

12. ECOLOGICAL INFORMATION

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

13. DISPOSAL CONSIDERATIONS

Off-gassing of ozone should be through an ozone destruct unit which breaks ozone down to oxygen before release into the atmosphere.

14. TRANSPORT INFORMATION

NOT APPLICABLE, as ozone is unstable and either reacts or decomposes, and must be generated at the location and time of use.

15. REGULATORY INFORMATION

SARA Title III Section 302 EHS TPQ: 100 lbs.

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

SARA Title III Section 313: > 10,000 lbs. used/year.

Source: EPA List of Lists

16. OTHER INFORMATION

Half-life of ozone in water at 20°C = 20 min; in dry still air at 24°C = 25 hr; decreases significantly with increase in humidity, presence of contaminants, air movement, and/or increase in temperature.

Preparer: International Ozone Technologies Group, Inc.

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