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MATERIAL SAFETY DATA SHEET FOR OZONE GAS

Product Information	
Product Name	Ozone
Synonyms	Triatomic Oxygen, O ₃
Chemical Formula	O ₃
Description	Gaseous oxidant
Molecular Weight	48.0
Other Designations	None
Hazardous Components	
Components	Ozone Gas
Concentration	0-15% by weight
CAS#	10028-15-6
ICSC#	0068
Physical Data	
Boiling Point (760mm Hg)	-111.9° C
Melting Point	-192.7° C
Gas Density (0° C and 1 atm.)	2.14 g/l
Vapor Density (air=1)	1.6
Water Solubility (20° C, 4% ozone in oxygen)	19 mg/l
Specific Gravity	1.614
Odor	Pungent
Appearance and Odor:	Colorless gas with pungent odor generally detectable at 0.01 to 0.04ppm and a sharp disagreeable odor at 1.00ppm.
Fire and Explosion Hazard Data	
Flash Point	Not Applicable
Auto-Ignition Temperature	Not Applicable
Flammability	Non-Flammable but enhances combustion of other substances. Some reactions may cause fire or explosion.
Extinguishing Media	Use extinguishing media appropriate for the fuel source.
Special Fire Fighting Procedures	Use self-contained breathing apparatus. Ozone is an oxidizer.
Unusual Fire and Explosion Hazards	Ozone can react explosively with readily oxidizable substances and reducing agents.

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Reactivity Data	
Stability	Unstable. Decomposes to form oxygen under ordinary conditions thus is not encountered except in the immediate area where it is formed.
Reactivity	Reacts with any materials that can oxidize. Reactions with some materials such as alkenes, ether and other compounds are highly unstable and explosive.
Hazardous Decomposition	None. Ozone decomposes rapidly to oxygen (O ₂).
Conditions to Avoid	Do not concentrate to high levels (>17%/wt.). The decomposition of ozone at high concentrations can become explosive.
Incompatibility	Avoid contact with materials that can oxidize.

Health Hazard Data	
Threshold Limit Value	The American Conference of Governmental Industrial Hygienists has set a threshold limit value for occupational exposure to ozone of 0.1 ppm as a time-weighted average over an 8-hour day. The short-term exposure limit is currently 0.3 ppm.
Primary Route of Entry	Pulmonary system
Effects of Single Overexposure	May cause irritation of the respiratory tract experienced as nasal discomfort, dryness, irritation of the throat, pain or congestion of the chest, difficult breathing or coughing. Irritation of the eyes, headache, nausea and drowsiness may also occur. Concentrations above 9 ppm have been found to result in pneumonia. Exposure to high concentrations could be fatal.

Emergency First Aid		
Exposure	Symptom/Prevention	First Aid
Emergency Overview	Ensure adequate ventilation in the area where ozone is present	Remove from the presence of air containing ozone.
Inhalation	Irritating to respiratory system. Cough, headache, shortness of breath. Ventilation.	Remove from the presence of air containing ozone. Administer oxygen if necessary. If breathing is difficult or discomfort persists, obtain medical attention.
Skin	Not an expected route of entry.	
Eyes	Irritating to eyes. Ventilation. Face shield or eye protection with breathing protection.	Remove from the presence of air containing ozone. Rinse with water for several minutes and seek medical attention if necessary.
Ingestion	Not an expected route of entry	

Exposure Control / Personal Protection	
Engineering Controls	Ozone equipment should be operated with an ozone off-gas destruct process.
Ventilation	Ozone off gas should be collected and destroyed prior to release.
Eyes/Face	Not applicable
Skin	Not applicable
Respiratory	Respirator or self-contained breathing apparatus for concentrations greater than 0.1ppm.
Handling	Not applicable
Storage	Ozone gas cannot be stored. Ambient ozone gas monitors should be used for detection.

Disposal Information	
Waste Disposal	Ozone rapidly decomposes to form oxygen (O ₂). Use an ozone destruct system to convert any unused ozone or off gas into oxygen prior to discharge.