

## Safety Data Sheet - Ozone

[Last Reviewed 4<sup>th</sup> Feb 2014]

1 – PRODUCT IDENTIFICATION	
Product Name	Ozone
Common Names Synonyms	Triatomic Oxygen, Trioxygen, O <sub>3</sub>
Ozone Generator Manufacturer / Supplier	Ozone Technologies PTY LTD. Suite 4a, 32-34 Peter Brock Drive Eastern Creek NSW 2766. Telephone: 1300 766 961 Website: <a href="http://www.ozonetechnologies.com.au">www.ozonetechnologies.com.au</a> Email: <a href="mailto:admin@ozonetechnologies.com.au">admin@ozonetechnologies.com.au</a>
2 – HAZARD IDENTIFICATION	
Emergency Overview	Ozone is a powerful oxidising agent and oxidation with ozone is generally active at lower temperatures than oxidising with oxygen. Ozone is an unstable gas, which at normal temperatures, decomposes to diatomic oxygen.
Potential Health Effects	<b>Inhalation</b> – Causes dryness of the mouth, coughing and irritates the nose, throat and chest. May cause difficulty in breathing, headaches and fatigue. The characteristic sharp, irritating odour is readily detectable at low concentrations (0.01 to 0.05ppm).
	<b>Skin Contact</b> – Absorption through skin contact is not expected.
	<b>Eye Contact</b> – Ozone is an irritant to the eyes causing pain, lacrimation and general inflammation.
	<b>Ingestion</b> – Not an expected route of exposure.
	<b>Aggravation of Pre-existing conditions</b> – Ozone may increase Sensitivity to bronchoconstrictors and bronchial asthma.
3 – COMPOSITION / INFORMATION ON INGREDIENTS	
Chemical Name	Ozone
Common Names	Triatomic oxygen, Trioxygen
Chemical Formula	O <sub>3</sub>
Ingredient Ozone Gas	CAS Number – 10028-15-6. Percent 1-15%. Hazardous - Yes
Molecular Weight	48.0
4 – FIRST AID MEASURES	
Inhalation	Remove to fresh air, if breathing is difficult a trained person should administer oxygen.
Ingestion	Not an expected route of exposure.
Skin Contact	Wash skin thoroughly with soap and water.
Eye Contact	Immediately flush eyes with large amounts of water for at least 15 minutes, while holding eyelids open to ensure flushing of the entire eye surface. If irritation, pain, or any other symptoms persist seek medical attention.
Acute	May cause irritation of skin, eyes and mucous membranes of the respiratory tract. Drowsiness, dizziness, headaches and fatigue have been associated with exposure.
Chronic	Long term health effects are not expected. A partial tolerance appears to develop with repeated exposures.

## Safety Data Sheet - Ozone

<b>5 – FIRE FIGHTING MEASURES</b>	
<b>Flash Point</b>	N/A
<b>Auto Ignition Temperature</b>	N/A
<b>Extinguishing / Flammability</b>	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.
<b>Unusual Fire and Explosion Hazard</b>	None expected. Since ozone is highly unstable and decomposes under all conditions and is not expected except at very small levels in the immediate vicinity where formed.
<b>6 – ACCIDENTAL RELEASE MEASURES</b>	
Switch off ozone generator, ventilate the area and evacuate the area until ozone levels subside.	
<b>7 – HANDLING AND STORAGE</b>	
Ozone must be contained within ozone resistant tubing or pipes from the generation point to the application point. Any leaks are to be repaired before further use. Ozone is only generated at point of demand and is not stored under any circumstances and is to be only used as stated by supplier/manufacture's recommendations.	
<b>8 – EXPOSURE CONTROLS / PERSONAL PROTECTION</b>	
<b>Safe Work Australia</b>	<p>8 Hour time-weighted average exposure standards are the average airborne concentration of a particular substance that is permitted over an eight hour working day and a 5 day working week. In the case of ozone the 8 hour TWA is 0.1ppm.</p> <p>During periods of continuous daily exposure to an airborne contaminant, the 8 hour TWA exposure standard permits short term excursions above the exposure standard provided they are compensated for by extended periods below the standard during the working day.</p> <p>In practice, the actual concentration of an airborne contaminant arising from a particular process may fluctuate significantly with time. Even where the TWA exposure standard is not exceeded, excursions over the 8 hour TWA exposure standard should be controlled. A process is not considered to be under reasonable control if short term exposures exceed three times the TWA (0.3ppm) exposure standard for more than a total of 30 minutes per eight hour working day, or if a single short term value exceeds five times the 8 hour TWA (0.5ppm) exposure standard.</p>
<b>OSHA Permissible Exposure Limits for ozone</b>	8 Hour Time Weighted Average or TWA is 0.1ppm.
<b>Specific Personal Protective Equipment</b>	<p><b>Eye</b> – Not Necessary.</p> <p><b>Gloves</b> – Not Necessary.</p> <p><b>Other Clothing &amp; Equipment</b> – Not Necessary.</p>

## Safety Data Sheet - Ozone

<b>9 - PHYSICAL AND CHEMICAL PROPERTIES</b>	
Specific Gravity	(H <sub>2</sub> O=1): 2.144g/L
Molecular Weight	48.0
Boiling Point	-111.9°C
Melting Point	-192.7°C
Vapour Pressure	N/A
Evaporation Rate	(BuAc=1): N/A
Vapour Density	(Air=1): 1.7
Solubility in H <sub>2</sub> O % By Weight	0.49
Appearance and Odour	Colourless to bluish gas with a characteristic pungent odour similar to the smell after strong lightning storms.
<b>10 - STABILITY AND REACTIVITY</b>	
Ozone is highly unstable and highly reactive. Avoid contact with oxidisable 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.	
<b>11 – TOXICOLOGICAL INFORMATION</b>	
Likely Routes of Exposure	Inhalation, Eyes and Skin Exposure
Effects of Acute Exposure	Discomfort including headache, coughing, dry throat, shortness of breath, heavy feeling in the chest. Higher levels of exposure intensify symptoms. Irritation of eyes and skin is also possible
Effects of Chronic Exposure	Similar to acute exposure effects with possible development of chronic breathing disorders including asthma.
<b>12 – ECOLOGICAL INFORMATION</b>	
Environmental Effects	No Information Found
Environmental Toxicity	No Information Found
<b>13 – DISPOSAL CONSIDERATIONS</b>	
Large levels of 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.	
<b>14 – TRANSPORT INFORMATION</b>	
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.	

## Safety Data Sheet – Ozone

<b>15 – REGULATORY INFORMATION</b>	
<b>SAFE WORK AUSTRALIA</b>	Guidance on the interpretation of workplace exposure standards for airborne contaminants. <a href="http://www.safeworkaustralia.gov.au/AboutSafeWorkAustralia/WhatWeDo/Publications/Pages/Exposure-Standards-Airborne-Contaminants.aspx">www.safeworkaustralia.gov.au/AboutSafeWorkAustralia/WhatWeDo/Publications/Pages/Exposure-Standards-Airborne-Contaminants.aspx</a>
<b>OSHA</b>	Hazard Communication Standard (29 CFR 1910.1200)
<b>16 – OTHER INFORMATION</b>	
<p>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. 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 the 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.</p> <p>Also using the OTEK method of producing ozone with the UV light setup which produces lower concentrations of ozone and by injecting into the washer wheel this almost eliminates off gassing into the air around the laundry environment keeping levels within standards.</p> <p>Air monitoring can also be provided to the laundry to monitor levels stay within standards.</p>	

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