High technology products for the permanent removal of odorous emissions or disinfection from stacks, buildings and vessels in industrial environments. Ozone is often the technically superior and most cost effective method of controlling odours and disinfecting when compared to biofilters, wet scrubbers, carbon adsorption or the use of chemicals.

Ozone air treatment provide, numerous advantages:

- The ozone is produced on-site, electrically, and requires no consumables.
- Odour removal efficiencies are high for a wide range of organic and inorganic odours.
- Ozone is an incredibly effective disinfectant - it kills microbes in the airstream.
- The technology is remarkably insensitive to process parameters such as humidity, particulates, temperature, etc.
- Very low running costs - electricity only, low maintenance.

Ozone air treatment systems have been successfully used in the following industries:

- Sewage treatment plants
- Chicken and pig sheds
- Rendering plants
- Fish processing
- Feed mills
- Sewage pump stations
- High rise building stacks
- Foundries
- Dairies
- Starch production odours
- Tanneries
- Paper pulping
- Paper coating
- Rubber manufacturing
- Organic composting
- Coffee roasting
- Breweries and distilleries
- Abattoirs
- Paint and varnish manufacture
- Latex coating of carpets

Industrial deodorisers have been used to oxidise and control many common odours, including:

- Hydrogen sulphide
- Methane
- Amines (all 3 stages)
- Mercaptans (e.g. methyl mercaptan)
- Dimethyl sulphide
- Dimethyl disulphide
- Skatoles
- Olefinic hydrocarbons
- Acrylic ester
- Ammonia (gas phase)
- Phenol
- Toluene
- Ester vapours
- Methanol
- Ethanol
- Iso-propanol
- Aldehydes (eg formaldehyde)
- Indoles
- Methacrylate

Ozone is an extremely strong oxidant which permanently removes odours by a process of oxidation. The clean fresh smell evident after a lightning storm is ozone. Its oxidation strength is 50% greater than that of chlorine. The ozone is made electrically from oxygen. When it has done its job it reverts back to oxygen, leaving no environmental residue. In many instances the final oxidised products are carbon dioxide and water. In other cases the oxidised products are elemental. For example, in the case of Hydrogen Sulphide: \( H_2S + O_3 \rightarrow IS + H_2O + O_2 \). In virtually all cases the resultant products are dramatically less odorous.

Ozone kills micro-organisms by a process of protein restructuring so the result is both deodorised and sanitised.

Leading Edge Technology

How Ozone Works
Industrial Air Treatment Systems

Ozone Air Treatment Systems are complete and integrated plants. We take the "hassle" and complexity out of your project - everything is sized, connected and tested for you. Just connect electricity, air and water. A typical system comprises:

- Ozone Generator
- Residence Chamber
- Distribution Device
- Compressor & Tank
- Refrigerated & PSA Dryer
- Mixing Device
- Water Chiller
- Filter Train
- Integrated Electric
- Integrated Pneumatics
- Integrated Hydraulics
- Integrated Mechanics
- Factory test run
- Detailed Instruction Manual

Ozone air Treatment systems are rich with great features, some of them truly unique, including:

- Plasma Ozone emitter to generate high concentrations (up to 15%).
- Sophisticated touch pad controls with PCB logic. This allows various automatic running modes, feedback signals from Controllers, adjustment of voltages and flow rates, and much more.
- Internal sensors provide signals to monitor performance, with a "self help" diagnostic menu for "on line" maintenance.
- Integrated cooling system, filtered air and water jacket.
- Long life design, low maintenance, energy efficient.

A common installation method is shown, conceptually, above. Ozone is injected into a process pipe which contains the odour, and the ozone/odour then mixes in a residence shed, before the odour-free air is exhausted. However, if a suitable process vessel or space already exists then no shed is required. The Oztec Service (see later) helps you select the best configuration.

Models are available which are either air fed or oxygen fed. Bare ozone generators are available or complete systems:

<table>
<thead>
<tr>
<th>Ozone Generator only</th>
<th>Complete System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Feed Stock</td>
<td>WA8, WA9</td>
</tr>
<tr>
<td>Oxygen Feed Stock</td>
<td>WX8, WX9</td>
</tr>
</tbody>
</table>

General specification as follows:
- Dielectric: ceramic micro gap with individual fuses
- Output: 60 to 1500 g/hr
- Concentration: up to 3% (air feed), 15% (oxygen feed)
- Power Consumption: 16kW.hr/kgO3 (air), 8kW.hr/kgO3 (O2)
- Cooling Water: 2.5T/kg O3.h (air), 1.25T/kg O3.h (O2)
- Output Regulation: 10 to 100%
- Power Supply: 380V, 50Hz
- Operating Environment: -10DegC to 45DegC
- Control Method: Siemens PLC's with DSP motherboard
- Interface: LCD Touch Screen
- Maintenance: On-line fault diagnostics
- Stainless Steel construction, polished

Ozone Emitter Cells

Sophisticated Electronics

Oztec Service

We provide extensive documentation to assist customers (and distributors). Customers can fill out a "Fact Finder" document to help size up the job. We can then generate a Sizing Report by reference to Oztec - a computer database which records our extensive experience and research with large scale air treatment. We can also generate Component Lists and Layout Drawings as required. The products themselves include extensive Instruction Manuals.

Whilst the final choice is always the customer's responsibility, we assist wherever asked - with the System and with Service. We always recommend that customers trial a small unit first, to prove the application, and then "scale up". We can assist by hiring these small trial units also.
Ozone Environmental Technology 2010

Specifications subject to change

BOA-AP-IA-1010

Industrial Air Treatment Systems

Medium Scale
For Deodorisation & Disinfection of Tanks, Buildings, Chimneys

The Limitation of Outdated Technologies

- Bio filters
  - Always risky, as difficult to conduct a small scale test.
  - Low odour removal efficiencies (seldom above 70%).
  - Sensitive to process parameters, e.g. if humidity or particulate levels change, odour levels can actually increase.
  - Often require upstream cyclones, filters, scrubbers, coolers.
  - High running costs due to large fans and regular biomass replacement.
  - Hazardous massive microbe colonies on your site - can leak.

- Wet scrubbers
  - Pollution converters, i.e. turn air pollution into water pollution.
  - Require careful chemical monitoring.
  - Often require an increase in treatment pond capacity.
  - Often require upstream dust collectors.

- Gas filters
  - Large quantities of media required. When media is "full", odours pass straight through. Very expensive replacement costs.
  - Pollution converters, i.e. turns air pollution into landfill pollution.
  - Often require upstream removal of moisture and dust.

- Chemical oxidants
  - Handling, transport and storage of hazardous chemicals.
  - Can increase environmental problems and by-products.
  - Corrosion issues for environment.
  - Inefficient. (Ozone is the strongest oxidant, e.g. 50% more powerful than chlorine).

Ozone Generator Module

High Ozone concentrations combined with stable output.
- Plasma Ozone emitter to generate high concentrations (up to 15%).
- Sophisticated touch pad controls with PCB logic.
- Internal sensors provide signals to monitor performance, with a "self help" diagnostic menu.

Our Oxygenators utilise the PSA (pressure swing adsorption) method. They feature two molecular sieves in pressure vessels, and a third oxygen accumulator tank. It is controlled by a PLC.

Controllers

The EZ4 and EZ5 Electronic Monitors are hand-held devices which measure ozone levels in ppm. Both models include a battery charger and detailed instructions. The EZ4 measures up to 0.14 ppm with an LED display, and the EZ5 up to 20 ppm with a digital display.

The EZ3 and EZ7 Controllers act like thermostats by measuring ozone levels and sending a signal to automatically adjust the output from the deodoriser plant. The Controllers include indicator light and adjustable set point. The EZ3 controls up to 0.14 ppm, and the EZ7 up to 20 ppm with a digital monitor display.

Compressor Sets

Ozone can supply compressor sets which deliver the correct quantity of clean, dry air. The sets comprise:
- Refrigerated dryer
- Compressor
- Air receiver tank
- Integrated electrics

Destructor Accessories

These Accessories can remove ozone from air when it vents from a residence tank. They feature catalyst media with a heater regenerative circuit.

Water Chiller Accessories

A water chiller is used to create a "closed loop" cooling system for the water jacket in your ozone generator.

---

<table>
<thead>
<tr>
<th>Phase</th>
<th>Code</th>
<th>Type</th>
<th>Description</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Ozone in Air&quot;</td>
<td>EZ1</td>
<td>Ambient Tester</td>
<td>Manual kit, treated strips in tube, ambient Ozone</td>
<td>0 to 0.14 ppm</td>
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<tr>
<td>Controllers</td>
<td>EZ2</td>
<td>Ambient Controller</td>
<td>Fixed instrument, on/off signal, ambient Ozone</td>
<td>0 to 0.1 ppm</td>
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<td></td>
<td>EZ4</td>
<td>Ambient Monitor</td>
<td>Handheld instrument, analogue display, ambient Ozone</td>
<td>0 to 0.14 ppm</td>
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<tr>
<td></td>
<td>EZ8</td>
<td>Process Controller</td>
<td>Fixed instrument, up/down signal, process Ozone</td>
<td>0 to 16 ppm</td>
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### Data Table

#### Ozone Generator Module - air feedstock

<table>
<thead>
<tr>
<th>Size (mm)</th>
<th>ZX8-60</th>
<th>ZX8-80</th>
<th>ZX8-100</th>
<th>ZX8-150</th>
<th>ZX8-200</th>
<th>ZX8-400</th>
<th>ZX8-600</th>
<th>ZX8-1000</th>
<th>ZX8-1500</th>
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<tr>
<td>Width (W)</td>
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<td>CS300</td>
<td>CS400</td>
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<td>CS1200</td>
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<td>Height (H)</td>
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<td>CS300</td>
<td>CS400</td>
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<td>CS1200</td>
</tr>
<tr>
<td>Length (L)</td>
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<td>CS150</td>
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<td>CS300</td>
<td>CS400</td>
<td>CS600</td>
<td>CS900</td>
<td>CS1200</td>
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#### Air Treatment System - air feedstock

<table>
<thead>
<tr>
<th>Size (mm)</th>
<th>WX8-60</th>
<th>WX8-100</th>
<th>WX8-150</th>
<th>WX8-200</th>
<th>WX8-400</th>
<th>WX8-800</th>
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<td>WX8-150</td>
<td>WX8-200</td>
<td>WX8-400</td>
<td>WX8-800</td>
<td>WX1000</td>
<td>WX1500</td>
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<td>Height (H)</td>
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<td>CS200</td>
<td>CS300</td>
<td>CS400</td>
<td>CS600</td>
<td>CS900</td>
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#### Ozone Generator Module - oxygen feedstock

<table>
<thead>
<tr>
<th>Size (mm)</th>
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<th>ZX8-100</th>
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<td>Height (H)</td>
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#### Oxygenator Module

<table>
<thead>
<tr>
<th>Size (mm)</th>
<th>AX20</th>
<th>AX25</th>
<th>AX30</th>
<th>AX35</th>
<th>AX70</th>
<th>AX100</th>
<th>AX140</th>
<th>AX170</th>
<th>AX250</th>
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<tbody>
<tr>
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<td>CS200</td>
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<td>CS400</td>
<td>CS600</td>
<td>CS900</td>
<td>CS1200</td>
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</tbody>
</table>

#### Compressor Set Module

<table>
<thead>
<tr>
<th>Size (mm)</th>
<th>CS50</th>
<th>CS100</th>
<th>CS150</th>
<th>CS200</th>
<th>CS300</th>
<th>CS400</th>
<th>CS600</th>
<th>CS900</th>
<th>CS1200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure (bar)</td>
<td>0.55</td>
<td>1.1</td>
<td>1.5</td>
<td>2.2</td>
<td>3.0</td>
<td>4.0</td>
<td>5.5</td>
<td>7.5</td>
<td>11.0</td>
</tr>
</tbody>
</table>

#### Water Chiller - Accessory

Available on Request

#### Ozone Destructor - Accessory

Available on Request

### Ozone science

1. **Ozone Science**
   - The oxygenator supplies diatomic oxygen from air.
   - Ozone is formed by the Plasma emitters.

2. The third oxygen atom seeks out electrophilic reactive molecules such as odours and microbes. It oxidises the pollutant to a less odorous state.

3. **Application notes**
   - The safe threshold for ozone levels in an occupied space is 0.5 ppm. All Ozone Deodorizers are designed to be used in conjunction with Controllers (e.g. IZ3, EZ4, EZ5 and EZ7) to measure and adjust ozone levels.
   - Feedstock air to all Air Treatment Systems should be dry, clean and cool.
   - For applications which are new on your site, test and prove the Ozone Air Treatment Systems on a small scale, before upgrading.
   - Our services (such as Ozone) help you choose the products for your application. They are free because we are equipment suppliers, not consultants. We rely on our customers and their agents to safely select products and design connected systems, to suit their application. We warrant our products, not your results. Conditions of Quotation and Sale apply.
   - Read Instruction Manual before use.

### Useful Conversions

<table>
<thead>
<tr>
<th>1m = 1000 mm</th>
<th>3.38 feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1kg = 1000 g</td>
<td>2.20 pounds</td>
</tr>
<tr>
<td>1 Pa = 0.102 mm Hg = 0.004 inches water</td>
<td></td>
</tr>
<tr>
<td>1 l/s = 3.60 m³/h</td>
<td>2.12 cfm</td>
</tr>
<tr>
<td>1 kW = 1000 W</td>
<td>1.34 hp</td>
</tr>
</tbody>
</table>

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