Air Purifiers for the Food Industry

For food storage, transport, food processing, intensive farming, food retailers

electronic control of microbes, odours and ethylene

Leading Edge Technology

**High technology products, designed specifically for the food industry,** for purifying the air which surrounds your food produce and related equipment:

- Controls airborne micro-organisms (bacteria, viruses, protozoa, etc) including common pathogens such as E Coli, Salmonella and Listeria.
- Also controls microbes on surfaces of equipment and foodstuffs (but does not enter the food).
- Significantly increases the shelf/storage life of many foods, by reducing decay and ripening rates.
- Reduces the levels of ethylene, which is generated by ageing fruits and vegetables.
- Eliminates odours (but does not affect the natural fragrances of foods or plants).
- Retards growth of fungi, moulds and algae.
- Removes off-tastes from products such as corks.
- Controls pests such as weevils in grain and flour.

Ozone really is the ideal airborne sanitiser for the food industry. It leaves no chemical residue and is generally harmless to foods. It requires no consumables as it is generated on-site. Used in Europe for 100 years, it is now being rapidly introduced in the USA, Australia and Japan.

Ozone was approved by the USA FDA for use in the food industry in 1997 and for bottled water in 1982. Ozone is approved as a food processing aid in Australia, Japan, the EEC and the USA.

Ozone uses only quality corona discharge technologies. We never use UV methods as they are unsafe and unreliable.

Approximately 30% of all foods are lost by microbial spoilage between harvest and consumption. Join the ozone revolution to protect your food investment.

How Ozone and Ions Work

**Ozone and ions are very effective when generated together.** Unfortunately, cheap products make only one or the other. Recent international research proves that combined ozone and ions can control microbes and odours **up to four times better** than just ozone or just ions.

Ozone is made by passing oxygen through an electric (plasma) field. Ozone eliminates microbes by a process of protein restructuring and removes odours by a process of oxidation. It is also 50% stronger than chlorine and kills bacteria 3,000 times faster. Then it converts back into pure oxygen, leaving no chemical residues whatsoever.

Ions are charged particles generated from air. Ions remove airborne dust by coalescing it together with charged particles and making it fall to the ground. This also restores ion balance (from 100 ions per cm$^3$ found in warehouses, to 3,000 per cm$^3$ found in country areas).

Air Purifiers are currently used in the following areas of the food industry for successful control of microbes, odours, shelf life, colour and taste:

**Food Storage**
- Cold Rooms - fruits
- Cold Rooms - meats
- Warehouses - fruit & veg
- Warehouses - packaged foods
- Warehouses - ultra humidifiers
- Barrel Halls for wineries
- Grain Silos
- Fish Markets
- Ethylene Control

**Food Transport**
- Ship Containers
- Truck Containers

**Food Retailers**
- Butcher Cold Rooms
- Supermarket Service Cabinets
- Food Cooking Areas

**Intensive Farming & Agriculture**
- Chicken Sheds
- Pig Sheds
- Greenhouses
- Hydroponics Odours
- Egg Hatcheries

**Food Processing/Manufacturing**
- Chicken Processing, Boning, etc
- Modified Air Packaging (MAP)
- Flour Processing
- Seafood Processing
- Abattoirs & Meat Processing
- Feed Mills
- Wine Cork TCA Control
- Bottle Disinfection
- Meat Ageing & Tenderising
- Rendering Plants, Tanneries
- Food Waste/Garbage Deodorisation
- Grease Traps
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Model CF1

The CF1 is rich with great features, many of which are truly unique:

• Combination ozone and ion electronics. This yields the four benefits of control of odours, microbes, dust and ion balance.
• Carry handle and two 100mm spigots for hose connection.
• Three-layer laminated case: plastic for electrical insulation, metal for robustness, and a polymer finish.
• Electrical certifications, including EMI approval.
• Patented Plasma Ozone Emitters, featuring ultra-thin polymer laminate - microchip technology. Also the active electrode is removed from the airstream.
• Safety micro-switch.
• Circulation fan with 2-stage inlet filter.
• Variable ozone output, variable airflow output.
• Cyclical timer, allowing operation programming.
• Extra long-life design, with component lives up to 10 times that of cheap alternative products.

Model CC1

The CC1 is simply a smaller version, suitable for smaller jobs such as boning rooms. Or for larger spaces where it is desired to place multiple Air Purifiers around the walls, such as in food storage warehouses.

Model CF2

The CF2 includes a pleated cartridge filter and extra high-flow fan. It is ideal for high output or robust or continuous duty applications. The CF2 is the top-of-the-range. It includes all of the CF1’s features, plus more:

• Inlet filter with 50,000cm² area. Washable hydrophobic media, pleated cartridge design, easily removable.
• High speed fan with high flow rate: 150 litres/second.
• Polymer/plastic coated finish, for corrosion protection, over an earthed metal case.
• Wheel kit comprising four castors and a carry handle.
• Combination ozone and ion electronics (rather than just one or the other). This is essential to yield all four benefits: the control of odours, microbes, dust and ion balance.
• Includes a 200mm spigot as standard. Spigots and hose can be fitted to the inlet and/or outlet.
• Variable ozone output, switch controlled.
• Twin electric circuits with twin switches.
• Protective fuses, indicator lights.
Air Purifiers are currently widely used in food storage, food transport, food processing and intensive farming.

Applications

Air Purifiers are used successfully on many foodstuffs including:

<table>
<thead>
<tr>
<th>Fruits</th>
<th>Vegetables</th>
<th>Other</th>
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</thead>
<tbody>
<tr>
<td>Bananas</td>
<td>Tomatoes</td>
<td>Flour</td>
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<tr>
<td>Citrus fruits</td>
<td>Avocados</td>
<td>Eggs</td>
</tr>
<tr>
<td>Stone fruits</td>
<td>Cauliflower</td>
<td>Cut flowers</td>
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<tr>
<td>Grapes</td>
<td>Potatoes</td>
<td>Cheese</td>
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<tr>
<td>Strawberries</td>
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<td>Dairy products</td>
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<tr>
<td>Raspberries</td>
<td>Chicken</td>
<td>Cereals and grains</td>
</tr>
<tr>
<td>Apples</td>
<td>Pig</td>
<td>Legumes and spices</td>
</tr>
<tr>
<td>Pears</td>
<td>Fish</td>
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</tr>
</tbody>
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Ozone Air Purifiers are used to control many pollutants and substances such as odours, taste, ethylene and microbes. Micro-organisms killed by ozone include:

- Escherichia coli
- Salmonella enteridis
- Listeria monocytogenes
- Campylobacter jejuni
- Bacillus anthracis
- Cladosporium herbarum
- Mucor mucedo
- Brettanomyces
- Penicillium chrysogenum
- Aspergillus
- Achromobacter
- Pseudomonas
- Flavobacterium
- Clostridium
- Staphylococcus aureus

Controllers

The EZ1 is a cost effective way to measure ozone levels. The treated strips give a colour change indication after 10 minutes.

The EZ2 comprises two dishes and growth liquid. Use it to indicate airborne microbe levels before and after ozone treatment.

The EZ3 acts like a thermostat to automatically turn a CF1 or CF2 Purifier on and off to maintain a constant ozone level. Includes an adjustable set point, control station and indicator lights.

The EZ4 is a handheld electronic ozone monitor. It includes LED display and battery charger.

Oztect Service

Ozone "wrote the book" on Food Industry Air Purification. Extensive documentation includes Issue Papers for end-users and Distributor Guides for approved distributors. Ozone Installers are trained to assist with your product selection and installation techniques.

For larger complex jobs the end-user fills in a Fact Finder. Ozone then generates a Sizing Report and, when required, refers to Oztec - a computer database that records our extensive experience and research.
**Food Industry**

1. **Ozone output, maximum (mg/hr)**
   - CF1-1500: 1,500
   - CF1-4000: 4,000
   - CF1-8000: 8,000
   - CC1: 500
   - CF2-8000: 10,000
   - CF2-16000: 16,000

2. **Ion output, maximum (per cm³ at 1m)**
   - CF1-1500: 10,000,000
   - CF1-4000: 10,000,000
   - CF1-8000: 20,000,000
   - CC1: 2,000,000
   - CF2-8000: 10,000,000
   - CF2-16000: 12,000,000

3. **Rated power, nominal (Watts)**
   - CF1-1500: 40
   - CF1-4000: 40
   - CF1-8000: 40
   - CC1: 150
   - CF2-8000: 150
   - CF2-16000: 150

4. **Dimensions, as standard**
   - Width (W mm)
     - CF1-1500: 140
     - CF1-4000: 140
     - CF1-8000: 140
     - CC1: 140
     - CF2-8000: 140
     - CF2-16000: 140
   - Length (L mm)
     - CF1-1500: 550
     - CF1-4000: 550
     - CF1-8000: 330
     - CC1: 570
     - CF2-8000: 570
     - CF2-16000: 570

5. **Height (H mm)**
   - CF1-1500: 170
   - CF1-4000: 340
   - CF1-8000: 340
   - CC1: 340
   - CF2-8000: 340
   - CF2-16000: 340

6. **Weight, nominal (kg)**
   - CF1-1500: 5
   - CF1-4000: 5
   - CF1-8000: 6
   - CC1: 7
   - CF2-8000: 7
   - CF2-16000: 7

7. **Interface, negative/positive ratio, nominal**
   - CF1-1500: 2:1
   - CF1-4000: 2:1
   - CF1-8000: 2:1
   - CC1: 2:1
   - CF2-8000: 2:1
   - CF2-16000: 2:1

8. **Inlet filter area, 2 layers (cm²), filters are washable**
   - CF1-1500: 30
   - CF1-4000: 30
   - CF1-8000: 30
   - CC1: 50
   - CF2-8000: 50
   - CF2-16000: 50

9. **Features - ozone/ion emitters**
   - - plastic body, electrically insulated
   - - earthed plasma source and power cord
   - - certified: no electromagnetic interference
   - - cleanable ozone emitters
   - - switch: variable ozone output
   - - switch: variable fan speed
   - - switch: on/off
   - - safety micro-switch
   - - cyclical timer
   - - spigot(s) included (diameter shown, mm)
     - CF1-1500: 2 x 100
     - CF1-4000: 2 x 100
     - CF1-8000: 2 x 100
   - - carry handle
   - - wheels
   - - rated for continuous duty

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**Innovative Electronics**

1. **Ozone science (for microbes, odour & taste control)**
   - The air contains pure oxygen molecules.
   - Ozone is formed by the Plasma emitters (enriched oxygen).
   - The third oxygen atom attaches to a pollutant to oxidise it to a harmless molecule.
   - Leaving pure oxygen again.

2. **Ion science (for airborne particulates & enhanced growth rates)**
   - The air contains pure oxygen and nitrogen molecules.
   - Ions are formed by the Ion emitter (in a 2:1 ratio). They are charged compounds.
   - Dust and particles are attached to the charge.
   - The heavy particles drop from the air and can lose their charge.

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**The problems with conventional disinfectants, such as chlorine, methyl bromide, sulphur and other chemicals:**

- Weak oxidants (eg chlorine is far weaker than ozone).
- Slow acting (eg chlorine kills cellular microbes 3,000 times slower than ozone).
- Hazardous chemical handling (whereas ozone is generated electrically, on site).
- Leaves chemical residue on food and equipment (whereas ozone reverts to pure oxygen).
- Carcinogenic or mutagenic (whereas ozone is neither).
- Ozone layer depleting (whereas ozone is environmentally friendly).

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**Useful Conversions**

- 1m = 1000mm = 3.38 feet
- 1kg = 1000g = 2.20 pounds
- 1Pa = 0.102mm water = 0.004 inches water
- 1L/s = 3.60m³/hr = 2.12cfm
- 1kW = 1000W = 1.34hp
- Ozone: 1ppm (by volume) = 2mg/m³ = 2000mg/m³
  (at 1 atmosphere and 25°C)

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