DEL ozone™
advanced sanitation solutions

3580 Sueldo Street, San Luis Obispo, California 93401
Phone 800.676.1335 | Fax 805.541.8459

DEL Ozone is the Premier Choice for Water Parks and Commercial Aquarium Life Support Systems

DEL has offered environmentally sustainable ozone systems for more than thirty-five years; we have produced and sold over 5,000,000 ozone systems worldwide. We offer a complete ozone product line ranging from 50 milligrams per hour to 1200 grams per hour (in a single system), as well as accessories and components necessary for complete installation and integration to any size project. Our expertise in ozone applications spans over several markets; residential pools & spas, commercial pools & spas, water parks, commercial aquariums, agrifood & food safety, and industrial applications.

You can be confident in every DEL Ozone system's ability to successfully deliver consistent dissolved ozone doses reliably, safely and efficiently, as well as extremely cost-effectively. DEL offers expert on-site engineering ozone system consultation, evaluation and feasibility assessment, on-site start-up and commissioning and contracted annual field service, either factory-direct or in conjunction with our systems integrator partners and service centers. DEL provides an exceptional warranty on all supplied ozone systems and components. Our customer service department is at your service for any installation or warranty consultation as well as in-field service globally. Our Owner's Manuals provide Standard Installation Procedures (SIP's), as well as general ozone operational and safety information.

DEL ozone systems are UL listed (larger systems are built to UL standards) and listed under NSF/ANSI Standard 50, with an EPA Establishment number, and have been third-party validated (under NSF/ANSI Standard 50) for 3 log reduction (99.9%) of *Cryptosporidium parvum* and a 6 log reduction (99.9999%) of all harmful microorganisms (in a side-stream applied single pass) commonly found in commercial swimming venues.

A properly sized and managed ozone system is documented to be an effective antimicrobial oxidizer against microorganisms commonly found in swimming pools (including *Cryptosporidium*, *Pseudomonas*, *e. coli*, *Giardia, MRSA, Enterococcus faecium,* etc.); while significantly reducing chloramines and their harmful off-gas, oxidizing organic bather waste, improving the efficacy of the pool's filtration system, and significantly reducing the amount of chlorine necessary to achieve a constant residual of Free Available Chlorine in the pool water. Ozonated pool water is optimum for swimmer comfort and safety, as well as decreasing pool owner's liability risk. Estimated chlorine consumption reduction in commercial pools is 50%.

DEL's Commercial Ozone Systems are in compliance with the latest U. S. legislation for Secondary Disinfection as promulgated by the Centers for Disease Control and Prevention (CDC) Model Aquatic Health Code (MAHC). This is in addition to chloramine reduction, improved water quality, biofilm removal and cost reduction.

DEL Offers

- Ozone sizing consultation
- Design consultation
- Water quality consultation
- Regulatory consultation
- In-field pre-commissioning support/consultation

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- In-field commissioning and annual service
- Multiple system model sizes
- 2 year warranty

DEL Systems

Our turnkey complete ozone packages include:

- Ozone generators (with oxygen concentrator and compressor)
- Injector Manifold Assemblies
- Reaction Tanks
- Degas Valves
- Thermal/Catalytic Ozone Destruct Systems
- ORP Monitor-Controllers
- Ambient Ozone Monitor-Controllers

DEL Advantages

Complete Turn-Key System Packages with Minimum Footprint for Any Size Swimming Venue

- DEL Ozone systems are listed under ANSI/NSF Standard 50 for antimicrobial efficacy and safety
- Third-party, validated NSF studies report DEL Ozone provides greater than 6 log (99.9999%) kill of *Pseudomonas auruginosa* and *Enterococcus faecium* as well as greater than 3 log (99.9%) kill of *Cryptosporidium parvum* in a side-stream applied single-pass
- DEL's exclusive vacuum design with on-board O_2 concentration is proven safe, efficient and cost effective
- Monitored and controlled self-diagnostic design and automated operation for safety and efficacy
- Ozone cells require no replacement, only routine cleaning

Safe & Effective Sanitation

- Ozone oxidizes organic and inorganic contaminants that create chloramines, reducing their formation to less than 0.2 ppm without affecting free available chlorine (FAC) levels
- Provides micro-flocculation to aid filtration and noticeably improve water clarity
- Reduces chlorine consumption by 50%
- Can eliminate shock-oxidizing; Leaves behind no harmful byproducts
- Improves air and water quality
- Low operational cost

Chlorine Is No Longer Enough

Sanitizer resistant pathogens require secondary disinfection systems (SDS) as recommended by the Centers for Disease Control and Prevention (CDC).

All DEL Ozone systems are built for many years of flawless performance and robust reliability, in addition to simple operation and maintenance. They continuously check themselves for proper operational parameters and will let the operator know if anything is out of proper range, including automatic shut-down in the event of ancillary equipment failure. DEL's 35 years of factory testing, field experience and validation, coupled with third-party testing and validation for safety and efficacy has

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led to the development of the entire line of exceptional ozone generation systems. Please refer to DEL's Written Specifications for more details on all models.

For Commercial Aquariums, reliable equipment means a healthy habitat. We understand that, and that's why DEL Ozone has been setting the standard for ozone integration into aquatic life support facilities for nearly 20 years. Trusted by Life Support Designers, Facility Operators and Animal Husbandry professionals our innovative systems are designed to operate under vacuum, utilizing on-board oxygen concentrators and fully-automated PLC Controllers. A properly sized and installed DEL Ozone system will provide safe, reliable sanitation with minimum maintenance.

Our Approach

All DEL systems utilize on-board (or adjacent on larger systems) oxygen concentrators to provide high performance in a smaller package, while enabling significantly improved ozone mass-transfer. All systems produce ozone under vacuum not only for safety, but to assist in the optimum performance of the injection system. After all, ozone that doesn't dissolve in the water is wasted. This approach out-performs that of a pressurized, air-fed ozone system and is far more safe and effective. We've got the science to prove it.

Oxygen-Fed Ozone System Benefits

- Oxygen-fed systems provide at least double the amount of ozone in grams/hour
- Oxygen-fed systems will provide at least double the amount of concentration of ozone gas (in % by weight)
- When the concentration is doubled, the mass-transfer of ozone is doubled
- When the mass-transfer is doubled the ozone off-gas is cut in half
- Injectors used with oxygen-produced ozone are half the size
- Oxygen-produced ozone will have only trace amounts of dissolved nitrogen in the water and more dissolved oxygen, which makes the water healthier for aquatic animals
- Far less ozone system maintenance is required when using an oxygen concentrator vs. an air dryer

The use of oxygen-fed ozone systems offers more controlled mass-transfer, more manageable operation of the entire system, a smaller footprint for injector assemblies, smaller de-gas systems, and easier maintenance of the ozone system.

Product Features

DEL's exclusive system designs incorporate many standard features such as multiple safety interlocks, backflow prevention devices, external control interfaces, 4-20 mA capability, 0-100% adjustability, complete isolation during shutdown, PLC controllers (on most models), oxygen monitors with low level protection and integrated ORP Controller/Monitors. These features provide the end-user with a system that protects and corrects itself in any situation.

Models up to 45 grams per hour utilize DEL's exclusive Genesis Advanced Cell Technology ™ for many years of consistent performance with no replacement or cleaning required. Larger models utilize self-fusing cold-cathode, gas filled glass electrodes for long-lasting, impeccable performance with minimal annual cleaning.

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Cost Savings for all Aquatic Venues (Water Park, Commercial Pools, Commercial Aquariums)

The use of a properly sized ozone system as a *Secondary Disinfection System* will reduce the annual chlorine maintenance dose by 50% or greater, in addition to eliminating the need for routine chlorine "shock" treatments (necessitated by swimmer and environmental contaminants causing chloramines). In addition, ozone will provide protection from *Cryptosporidium* contamination in the water along with all other waterborne pathogens with its strong antimicrobial oxidation. All this provides a healthy swimming environment as well as offering the greenest technology by today's stricter environmental standards.

Typical Return on Investment (including annual operating costs) is 2-3 years.