

Environmental Dynamics Inc.

Aeration Technology



FOCUS ON AERATION

Aeration - Cornerstone of Biological Wastewater Treatment

Aeration is more than the supply of oxygen and mixing. Aeration is the cornerstone of biological wastewater treatment. It controls the treatment performance and operational economics of the entire wastewater treatment facility. Analysis of wastewater treatment plant costs repeatedly

shows that aeration accounts for 50% to 80% of the overall plant-operating budget. Only by selecting the right aeration technology and a properly designed aeration system, can treatment performance and plant operating cost objectives be attained.



*"Aeration is more than a capital purchase, it's an investment in total ownership cost" - C. E. Tharp, P.E.,
President EDI*



Leadership in Innovation

Since its inception in 1975, Environmental Dynamics Inc. (EDI) has focused on diffused air technologies. EDI's innovation in design, materials, testing and manufacturing has lead to several major advances in aeration technology and design practice including:

- Improved operating efficiency by applying high efficiency membrane aeration technology in lagoons.
- Superior mechanical service life with the use of the patented diffuser saddle mount.

EDI's innovation in design, materials, testing and manufacturing has lead to several major advances in aeration technology and design

- Enhanced system economics achieved with the large capacity FlexAir™ Magnum diffuser.
- Maximum oxygen transfer efficiency with the use of FlexAir MiniPanel technology.
- Low maintenance aerobic digester aeration and mixing from applying high capacity FlexAir diffusers.

EDI's leadership position is the successful outcome of the company's focus on meeting application

needs, which vary with each wastewater treatment plant and client. Through a continuous investment in R&D, and its flexible engineering and manufacturing capabilities, EDI has developed a wide range of aeration technologies and system components to meet the most demanding project objectives. Whether the objective is low life cycle cost requiring a high level of operational efficiency, or low capital cost, EDI can deliver.

Aeration Design Philosophy

The design of an aeration system is a complex process, which extends beyond the simple selection and sizing of system components. True wastewater treatment plant optimization first requires a full evaluation of project objectives and an aeration system design focused to meet project objectives. Optimization also requires a properly operated and maintained aeration system. EDI's organization is structured to support both the initial installation and long-term service needs associated with procuring and operating an aeration system.

EDI's staff of application specialists is available to assist clients in defining objectives for their wastewater treatment plant and aeration system. Once project objectives are defined, EDI application specialists present the appropriate aeration technologies, then design individual system components to meet project objectives. Each system component is evaluated on a



net present-value project cost basis, this ensures the project objectives of capital cost, operating cost, maintenance, service life and mechanical reliability are met.

EDI supports a self-service program for system designers and end users, offering a vast array of resource information. A visit to the EDI website at www.wastewater.com gives access to product literature, technical information and a multitude of interactive system design tools. Design tools featured on the website include biological process models for both activated sludge

and lagoon processes, aeration system sizing tools, and economic evaluation models.

EDI's Diffuser *Express*[®] group supports the self-service and long-term needs of aeration systems. With a wide array of inventoried standard diffuser products and replacement components for most manufacturers, *Diffuser Express* is the industry resource to keep diffused aeration systems running at peak efficiency. Products and parts are available for rapid delivery at www.diffuserexpress.com.



Aeration System Technologies

EDI offers multiple diffuser platforms and system configurations for a wide range of aeration and mixing applications. Diffuser platforms and system configurations are independently selected to best match the objectives of each project.

EDI Coarse Bubble Diffuser Platforms

Coarse bubble diffusers have been available for many years and offer moderate oxygen transfer efficiency and low maintenance. *EDI's* full spectrum of coarse bubble dif-

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fuser platforms offers advances in mechanical reliability, application flexibility, plus ease of installation and maintenance.

MaxAir™ stainless steel "broad band" diffuser – an industry standard. Units are provided with 3/4-inch NPT connections to mount directly into the air distribution piping.

MaxAir non-metallic "broad band" diffuser – provides maximum corrosion resistance. It uses the *EDI* patented diffuser saddle mount system for unparalleled mechanical reliability.

PermaCap™ membrane diffuser – ideal for small system applications. The large five-inch diameter with 3/4-inch NPT connection is used for high capacity.



FlexAir™ high capacity tube and disc diffusers – well suited for the most rigorous coarse bubble applications requiring the utmost in system reliability. Diffusers incorporate integral check valve capabilities and are available with threaded 3/4-inch NPT connection or saddle mount.

EDI Fine Bubble Diffuser Platforms

Fine bubble diffusers are key components to optimize operational economics of a wastewater treatment plant. The innovative advanced technology fine bubble diffuser platforms from EDI offer maximum choices for performance and application flexibility.

FlexAir membrane disc diffuser platform – delivers high efficiency with traditional disc diffuser units. Diffusers are available with threaded 3/4-inch NPT connection or saddle mount.

Ceramic disc diffuser platform – for special applications. EDI Ceramic diffuser units are convertible to flexible membrane for maximum performance flexibility.

FlexAir Magnum tube diffuser platform – provides maximum application flexibility and low initial system cost.

FlexAir MiniPanel™ diffuser platform – best for maximum efficiency applications and low total ownership cost.

EDI Diffuser System Configurations

Each diffuser platform is engineered with an appropriate system configuration for optimized system functionality. Multiple system options are available for improved system reliability, ease of installation, ease of maintenance, and service life.

Floor Mounted Systems – ideal for multiple tank applications. Standard grid for high oxygen transfer efficiency and mixing performance, also suitable for roll configurations when special mixing requirements exist.



Full Floor Configuration (FFC)

– used when maximum oxygen transfer is desired to minimize energy consumption. The FFC grid configuration supports diffuser densities in excess of 50%.

ModuleAir™ Systems – offer retrievable modules for high rate aeration applications where the reactor cannot be drained for system maintenance.

Retractable Systems – tip-up grid systems give unrestricted access to the reactor floor for tank maintenance.

System options are available for improved system reliability, ease of installation, ease of maintenance, and service life.

Floating Lateral Configurations – chosen for economical applications in lagoons and medium to low-rate activated sludge systems. This configuration allows easy installation and access for new or upgrade of basins or lagoons.

Submerged Lateral Configurations – selected for easy access and maintenance of diffuser components in low-rate aerated lagoon applications. This system is particularly suitable for severe climates where significant icing can occur.



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