


# the environmentally-friendly Process Aerator

Triton Aerator/Mixer  
Saves Energy & Operational Costs  
& Reduces Carbon Footprint

by Cheri Cohen  
Vice President Marketing/PR  
Aeration Industries International, Inc.



**m**unicipal and industrial users tackle many wastewater treatment challenges at their facilities including meeting more stringent permit limits with limited or declining resources. The ideal solution for today's professional is finding an innovative technology that offers a cost-effective, sustainable treatment solution that exemplifies environmental stewardship in the community.

Many facilities have found their ideal aeration choice with the award-winning Aire-O<sub>2</sub> Triton® process aerator/mixer that offers operational and energy savings, capital investment savings, unsurpassed process control and Biological Nutrient Removal (BNR), a smaller carbon footprint, and minimal maintenance. The process aerator is manufactured by Aeration Industries International, Inc. of Chaska, MN.

Aerobic wastewater treatment processes are dependent upon effective and efficient aeration systems that provide the necessary oxygen to microorganisms, making the process work. Optimal efficiency and treatment effectiveness are achieved when the aeration system not only provides dissolved oxygen in a form used by the microorganisms, but also to ultimately mix and disperse that oxygen throughout the aerated basin. The Triton process aerator offers fine bubble oxygen dispersion and maximum horizontal mixing capabilities to depths of 33 feet.

## **Operating & Energy Savings**

The Aire-O<sub>2</sub> Triton® process aerator is a unique piece of process equipment that has the capability to mix and aerate in one single unit and to do so independently of one another. The aerator is driven by a 900 rpm (60 Hz) motor that drives a large power mix propeller, producing a high degree of mixing to ensure that tank contents are completely mixed from top to bottom.



The dual mode functionality of the Triton units allow for unsurpassed process control for BNR treatment for nitrification, denitrification and phosphorous removal by separating the aeration/mixing from mixing only, allowing for energy conservation during the required anoxic treatment mode, resulting in a high effluent quality.

All of the air produced by the aerator is provided by a very quiet on-board regenerative blower which pushes the air down the dynamically balanced hollow shaft of the mixer and injects the air into the water column producing a large volume of fine bubble diffused air. The aerators are not self-aspirating. The air is driven deep into the tank by the powerful mixing propeller providing for efficient contact of the air with the wastewater and long bubble hang times thereby maximizing oxygen transfer efficiency.

The St. Augustine, FL wastewater treatment facility has Triton process aerators and utilizes the “turn-down capability” of multiple units to match influent loads or flows by shutting down units to realize more energy savings. The plant manager, George Lomax, reports saving almost half the horsepower by replacing aging disk aerators with the Triton process aerators.

Aeration Industries was honored to receive the 2008 Frost & Sullivan Award for the Aire-O<sub>2</sub> Triton<sup>®</sup> process aerator’s capability to reduce operating costs and energy consumption.

### **Environmentally Friendly: Minimal Aerosols or Noise**

Since the surface-mounted process aerator drives air deep into a tank or oval by its power mix propeller, this minimizes aerosols or splashing of potentially harmful environmental concerns such as pathogens in the air and volatile organic compounds (VOC). The subsurface aeration also reduces noise making the aerators an environmentally and community-friendly choice.

“The Tritons don’t splash or throw any wastewater into the air”, reports Steve Mier of St. Augustine WWTP. “The water stays in the tank even on windy days.” He adds, “Working around the disks on windy days can get kind of nasty with the wastewater splashing.”

*In this photo, a traditional mechanical aerator is shrouded in a mist due to aerosols.*



A wastewater treatment plant in Perry Township, PA uses the Triton aerator/mixers in its sequencing batch reactor (SBR) plant that is located immediately adjacent to a Rails-to-Trails bike path that runs between Pittsburgh and Washington D.C. Terry Soster, President of KLH Engineers, noted that, “There are many bikers that pass by the plant and the noise levels are imperceptible.” Noise levels within 10 m of the plant are easily < 70 dbA without the need for any special covers or enclosures for any of the equipment. The average human voice speaking normally is approximately 60 dbA.



### **Small Carbon Footprint**

Aire-O<sub>2</sub> Triton<sup>®</sup> process aerator drives fine bubble aeration and mixing to 33 feet deep, which allows for deeper ditch designs with smaller carbon footprints. Aeration Industries’ Tri-Oval<sup>®</sup> System integrates Triton aerator/mixers into the Oxidation Oval format, providing subsurface horizontal mixing at sufficient velocities to prevent solids from settling. This permits longer entrainment of the unit’s fine bubble diffused air and allows for deeper ditch designs. The mounting of the Triton units in the ditch is clean and simple eliminating the need for complex concrete structures and making access for inspection and maintenance very easy.

Aeration Industries' Tri-Oval® System garnered the 2008 Environmental Business Journal Technical Merit Achievement Award for the system's design and operating flexibility, energy conservation, and low installation costs.

### Capital Equipment Savings/Flexibility

The Aire-O<sub>2</sub> Triton® process aerator's unique design and compact size eliminate the need for huge capital equipment expenditures and upfront installation costs. Since the Triton aerator provides both the mixing and aeration in one unit and is installed directly in a tank, there is a substantial savings in both equipment supply and installation perspectives versus conventional designs utilizing diffused air. The cost of diffuser heads, piping networks and supports, centrifugal or positive displacement blowers, and blower buildings or enclosures is eliminated and replaced by the Triton process aerator/mixer at a much lower capital cost. The result is a much more compact plant that is quicker to install and easier to operate and maintain. The use of the aerator devices allows municipalities to free up valuable building space that would have been used for blowers and to use that space for much needed storage that they did not have with the original plant design.

*A bridge assembly makes installation and maintenance easy.*



The aeration system is ideal for incorporation into either complex or simple wastewater treatment systems. It also allows for a multitude of industry applications such as aerated lagoons, conventional activated sludge systems, aerobic digesters, oxidation ditches, and sequencing batch reactors.

The flexibility of the process aerator equipment also makes it suitable for a wide variety of process applications, including conventional biological oxygen demand (BOD), chemical oxygen demand (COD), ammonia reduction, as well as full biological nutrient removal (BNR) for the treatment of phosphorus and total nitrogen.

Redundancy is a non-issue compared to other traditional aeration systems. A spare aerator is essentially a minor expense and compliments the overall lower cost of ownership and sustainability features.

### Maintenance

As an ongoing expense, maintenance requirements including downtime, manpower requirements, spare parts inventories and whether or not the equipment can be serviced in the field are major factors that directly impact the owner's overall cost of ownership for as long as the wastewater treatment system is in operation.

The Triton process aerator is a statement of simplicity itself, offering dependable service and quick and easy maintenance. The units can be serviced in the field. The process aerator is driven by a 900 rpm (60 Hz) motor which significantly extends the life of the equipment. There are few wear components. There are no complicated valves and no gear reducers.



*Three men easily perform routine maintenance on the aerator in the field.*

## Conclusion

In typical wastewater treatment plants today, aeration is the largest consumer of electricity accounting for approximately 60 percent of the facility's electrical usage. When choosing an aeration system for your wastewater treatment facility, a proven Green Technology that adds savings to your bottom line and is environmentally friendly is a winning formula to achieve your long-term sustainability goals.

### About Aeration Industries:

Founded in 1974, Aeration Industries designs and manufactures process aerators/mixers and advanced wastewater treatment systems that conserve energy and reduce operating costs to produce a high quality effluent solution for municipal and industrial customers. Advanced systems include the Argos™ Sequencing Batch Reactor (SBR), Tri-Oval® Oxidation Ditch System, Aire-O2 Bio-film Fixed Film Media System and Microfloat DAF System. Aeration Industries is the world's leading manufacturer of surface aerators with over 62,000 aerators delivered in the U.S. and over 92 countries worldwide. Please visit us at [www.aireo2.com](http://www.aireo2.com) to learn more.



AIRE-O<sub>2</sub>®

### Aeration Industries® International, Inc.

4100 Peavey Road • Chaska, MN 55318-2353 USA  
Tel: +1-952-448-6789 • USA (Toll-Free) +1-800-328-8287 • Email: [aiii@aireo2.com](mailto:aiii@aireo2.com)