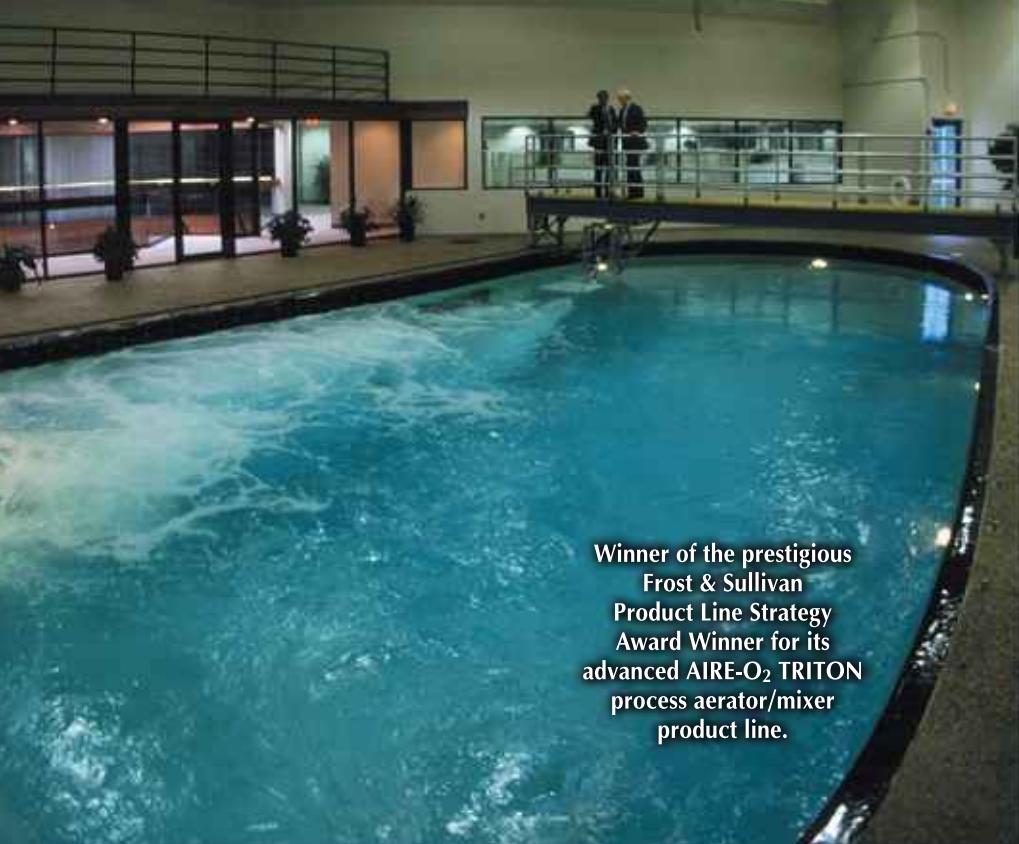




Aeration Industries® International
Because Life Depends On Clean Water

AIRE-O₂ TRITON®
Process Aerator/Mixer





Winner of the prestigious
Frost & Sullivan
Product Line Strategy
Award Winner for its
advanced AIRE-O₂ TRITON®
process aerator/mixer
product line.

The WORLD LEADER in Surface Aeration...

Once again Aeration Industries International, Inc. has raised the bar for aeration systems with its patented AIRE-O₂ TRITON® process aerator/mixer introduced in 1996. Customers have asked for this "award winning" aerator over 1,500 times since then! Together with our AIRE-O₂® aspirator aerators, more than 55,000 units have been delivered throughout the USA and in more than 92 countries worldwide.

A Frost & Sullivan Award winner for its advanced AIRE-O₂ TRITON® aeration product line, the award statement said: "Since its founding in 1974, Aeration Industries has grown to be recognized industry-wide as

a leading high quality technology focused vendor that understands the customer's pulse, and develops products to match these requirements."

You asked and we listened. Our engineers drew upon decades of experience and a commitment to Research and Development to bring you more innovative and effective wastewater treatment solutions. The proprietary AIRE-O₂ TRITON® aerator/mixer technology is the result.

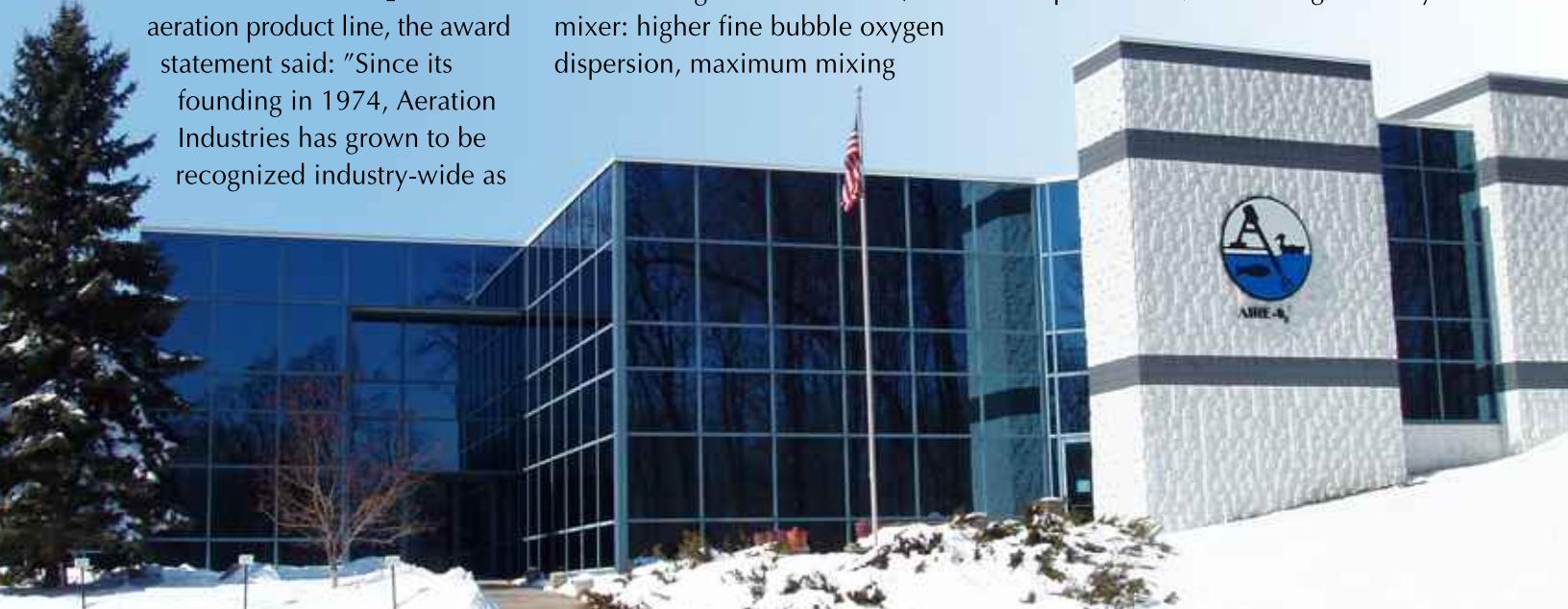
The TRITON is everything you've been looking for in an aerator/mixer: higher fine bubble oxygen dispersion, maximum mixing

capabilities, and its low speed operation ensures extended aerator lifecycle and quiet operation. Plus, biological nutrient removal (BNR) processes are easier to regulate and more cost effective by combining mixing and aeration in a single compact unit with independent aeration control.

The TRITON was developed at the Company's unique research and development (R&D) facility located at the corporate headquarters in a suburban area west of Minneapolis, Minnesota.

The focal point of the R&D center is a 100,000-gallon (378 m³) test pool facility (pictured at left). The pool features windows positioned below the waterline designed for close observation of the AIRE-O₂ TRITON® aerator/mixer. Here, researchers and water quality professionals gain a rare glimpse of fine bubble aeration, mixing and dispersion at its best!

Aeration Industries is the world's largest manufacturer of surface aeration equipment. The Company supplies advanced wastewater treatment systems, aerators and mixers used in municipal and industrial wastewater treatment facilities; the restoration of lakes, rivers and harbors; and the aquaculture (fish farming) industry.



AIRE-O₂ TRITON® Process Aerator/Mixer

In a Class by Itself...the Ideal Aeration System

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 oxygen in a form used by the microorganisms, but also is able to intimately mix and disperse that oxygen throughout the aerated basin.

To achieve these two basic objectives, dozens of different types of aeration devices and systems have been developed and used over the years in various wastewater treatment applications. Taking the best features of these different systems results in the formation

of an ideal aeration system that combines:

1. **Dual-functionality** - precision controlled aeration and mixing allows for biological nutrient removal
2. **Fine bubble aeration** - EPA defined
3. **Horizontal mixing** - whole basin circulation
4. **Minimal maintenance** - few wear parts, no gear box
5. **Total cost of ownership** - up to 5 year warranty, low speed extends aerator life, electrical savings
6. **Small footprint** - deep mixing equals reduced land costs

Aeration Industries' R&D efforts successfully blended these most desirable aeration features. The result is the AIRE-O₂ TRITON® Aerator/Mixer.



How It Works

AIRE-O₂ TRITON® Dual-Function Process Aerator/Mixer

This system optimizes the combination of hydraulic and aeration efficiency necessary to accomplish higher oxygen transfer, superior mixing, and allow unsurpassed control of the activated sludge process environment. Biological nutrient removal (BNR) processes are easier to regulate and more cost effective by combining mixing and aeration in one compact unit with independent aeration control.

Aeration and Mixing Mode

Air is pressurized using a high efficiency regenerative blower. The air is forced down a hollow shaft into the proprietary PowerMix™ propeller/Saturn ring design. The Saturn ring shears the air into fine bubbles and enhances the nitrification process while the PowerMix™ propeller forces the air into a downward direction, dramatically increasing bubble residence time and increasing oxygen transfer.

Mixing Mode

When the blower is turned off, the PowerMix™ propeller maintains velocities without the introduction of air. This allows for power savings when loads decrease, maintaining the dissolved oxygen concentration for optimal process conditions and ensures uniform solids suspension in the basin at all depths.

TRITON Outperforms Conventional Systems In Every Important Area

	Aeration Industries' AIRE-O ₂ TRITON®	High Speed Surface Splashers	Blower Assist Aerators	Diffused Air Systems	Disk/Rotor Systems
Nitrification	Yes	Yes	Yes	Yes	Yes
Denitrification	Yes	No (a)	No (a)	No (a)	No (a)
Dual-Function	Yes	No	No	No	No
BNR	Yes	No	No	No	No
Aerosol Reduction	Yes	No	Yes	Yes	No
Mixing Velocities	1.0 ft/sec (0.305 m/sec)	<0.25 ft/sec (0.076 m/sec)	<0.35 ft/sec (0.107 m/sec)	N/A (b)	1.0 ft/sec
Induced Flow	Yes	No	Minimal	No	No
Warranty Period	3 years, no pro-rating	1 yr. pro-rated	1 yr. pro-rated	1 yr. pro-rated	1 yr. pro-rated
On Site Serviceable	Yes	No	Yes	No	No
Motor Speed	Low	High	High	N/A	Low
Gear Reducer	No	No	No	N/A	Yes
Noise Level	Low	High	Low	High	High

(a) Requires separate mixer.

(b) Due to vertical mixing pattern, full floor coverage required and no data available.

THE KEY is Fine Bubble Oxygen Dispersion

Air is forced down through the shaft, past the propeller, and exits in a high velocity stream of fine bubbles as it is diffused into the water. The average bubble size is 2.0 millimeters and meets the optimum size of 2.2 millimeters established by the U.S. EPA for fine bubble diffused air systems. While others may claim to be fine bubble, Aeration Industries is one of the few firms with the test report to prove it.

Oxygen Dispersion

Oxygen is evenly dispersed throughout the entire basin with the AIRE-O₂ TRITON's unique propeller design and horizontal mixing to maximize oxygen contact with pollutants and exposure to microbes. This optimizes the wastewater treatment process and eliminates dead zones.

Extended Hang-time

The TRITON® injects more air into the water and still breaks the bubbles into "a fine bubble." This increases an equivalent one inch diameter bubble surface area by more than 12 times its original surface area and increases the bubble hang-time to allow for more oxygen transfer/mixed liquor interface time.

Three Systems Put to the Test

- 1 AIRE-O₂ FLOW-LINKAGE:** Multiple aerators create a horizontal flow pattern that maximizes oxygen transfer efficiency, improves oxygen dispersion, and maximizes lagoon volume. The result is a highly oxygenated flow pattern that provides complete mixing, keeps solids in suspension, and maintains optimum temperatures year-round.
- 2 SURFACE AERATORS:** The area of influence for surface aerators is quite limited and has the additional negative effect of cooling a basin through evaporation.
- 3 BLOWER/DIFFUSER SYSTEM:** The diameter of influence for a diffuser system is limited, requiring a large quantity of diffusers to cover the lagoon. Much of the area is snow covered from lack of aeration and mixing. Notice the uneven size of the diffuser openings, indicating the effects of diffuser head scaling and fouling.

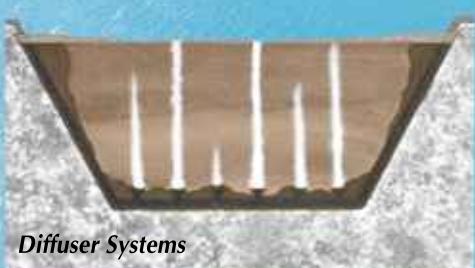
Proof is in the Mixing



A satellite photo captures the TRITON aerators' exceptional mixing capabilities at one of Aeration Industries' installations.

FLOW LINKAGE: The TRITON aerators are strategically placed throughout a basin to achieve the highest average flow velocity attainable with the aggregate Hp applied. This provides the greatest oxygen dispersion and mixing for solids suspension by linking the velocity of one unit to another; mixes high D.O. levels with water having a low D.O. content to improve the oxygen transfer rate above that of a single unit; and total Hp requirements may be reduced, saving energy.

DIFFUSER SYSTEMS: Compressed air is introduced through diffusers from the bottom of the basin. More Hp (higher energy consumption) is required to overcome the water head resistance. Oxygen rises vertically and escapes quickly before effective horizontal dispersion in the water can take place, thus aeration is much less effective, due to lack of mixing.



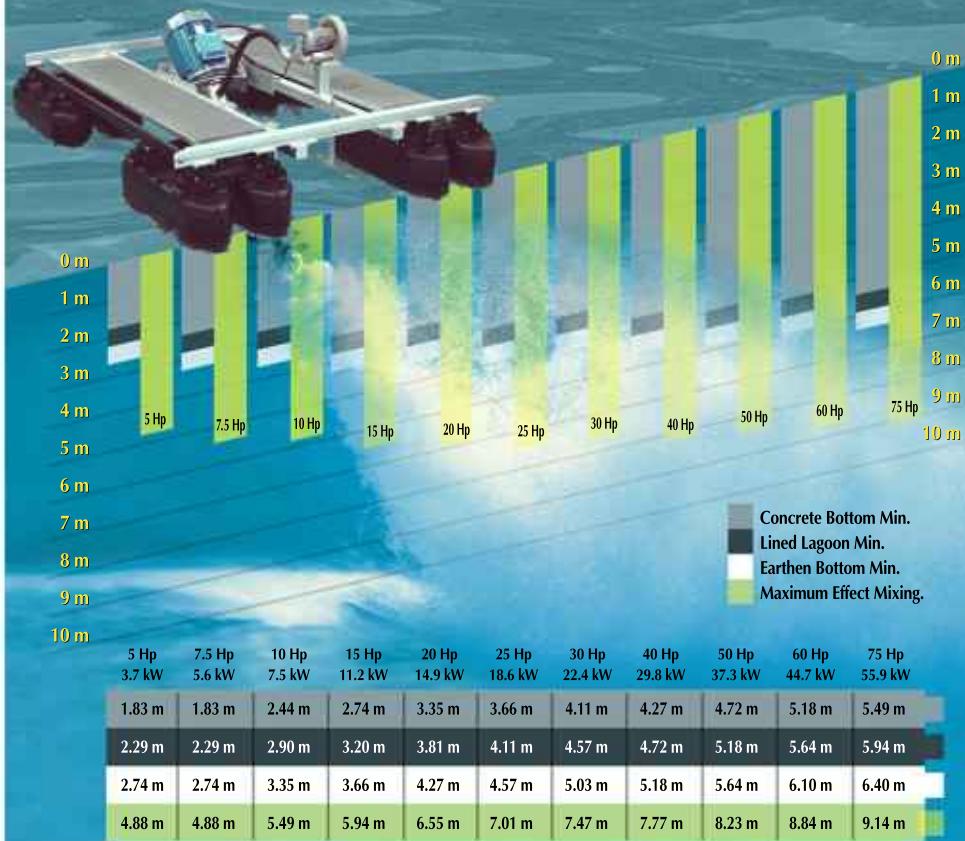
The Ultimate in Horizontal Mixing

The AIRE-O₂ TRITON® process aerator/mixer creates a high velocity, horizontal mixing flow pattern for maximum treatment efficiency.

The TRITON has very high mixing performance efficiencies due to an induced flow rate that is much greater than the prop pumping rates, which can be mathematically calculated. Propeller manufacturers estimate that the induced flow rate may be 10 to 20 times that of the calculated flow rate.

- ⦿ Deep mixing capability to 30 ft (9.14 m).
- ⦿ The integral slow speed mixer operates separately to maintain optimum mixing even when the air is turned off.
- ⦿ Increased oxygen transfer and mixing lead to greater treatment efficiencies that can cut energy consumption by up to 50%.
- ⦿ The TRITON is a sub-surface aerator/mixer. No aerosols, splashing, or released pathogens into the air.
- ⦿ Reduces BOD, TSS, and sludge production plus low maintenance with ease of access.

AIRE-O₂ TRITON® Process Aerator/Mixer Mixing Depth Guidelines

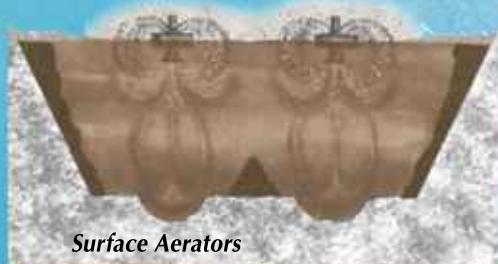


Disclaimer: This chart is only for preliminary design guidance in typical wastewater applications. Please consult Aeration Industries, Int'l for further information on maximum mixing depths for multiple unit installations and/or nonstandard applications. Neither performance warranty nor guaranty is implied.

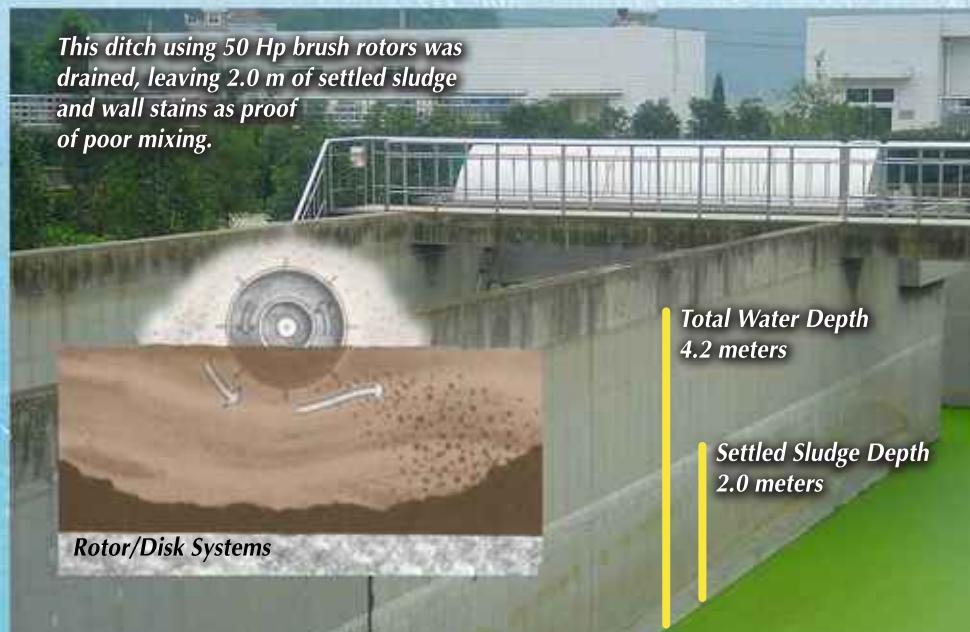
- ⦿ Deep mixing ensures smaller footprint and lower land requirements.
- ⦿ Community friendly – quiet operation and eliminates odors.
- ⦿ Slow speed 900 rpm/60 Hz (750/ 50 Hz) allows for larger Power Mix™ propeller that dramatically improves mixing and maintains solids in suspension.

ROTOR/DISK SYSTEMS: *They are expensive to maintain and are notoriously high in energy consumption and maintenance. Rotor systems propel water into the air, creating an aerosol environment which may release offending odors and/or pathogens into the air. They are inefficient in suspending solids uniformly.*

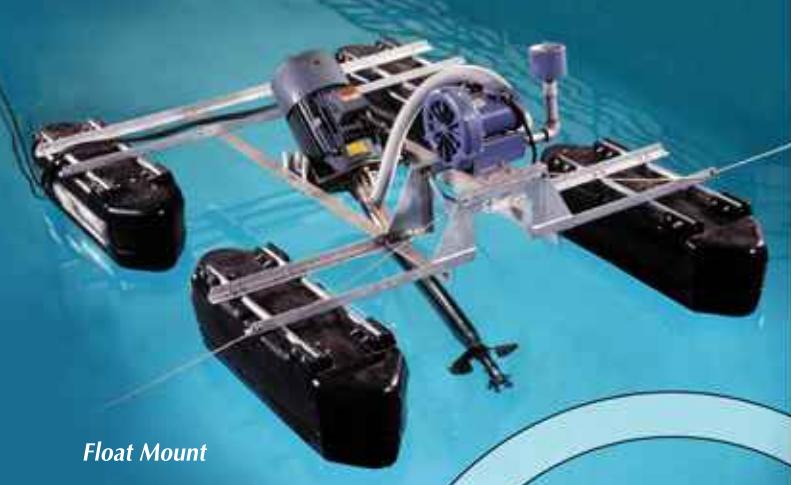
SURFACE AERATORS: *This system pumps water upward and throws it into the air, creating a high aerosol environment. The forces of gravity must be overcome in the system which requires more horsepower (higher energy consumption). The sphere of influence is limited and because of lack of movement, solids quickly accumulate at corners and between units in the basin.*



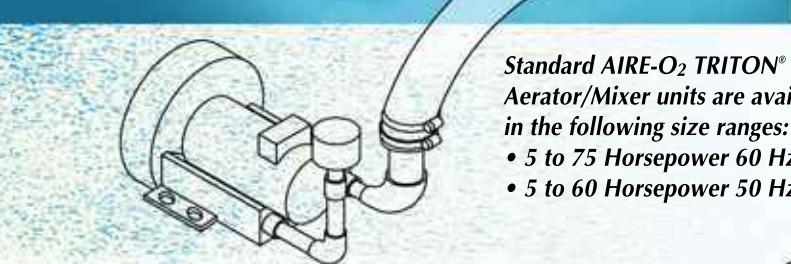
Surface Aerators



Rotor/Disk Systems

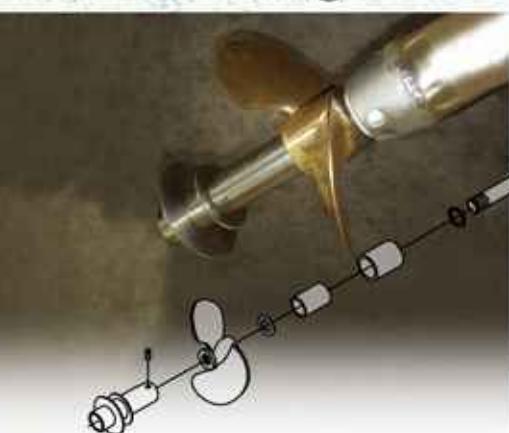


Float Mount



Standard AIRE-O₂ TRITON® Aerator/Mixer units are available in the following size ranges:

- 5 to 75 Horsepower 60 Hz
- 5 to 60 Horsepower 50 Hz



PowerMix™/Saturn Ring Design

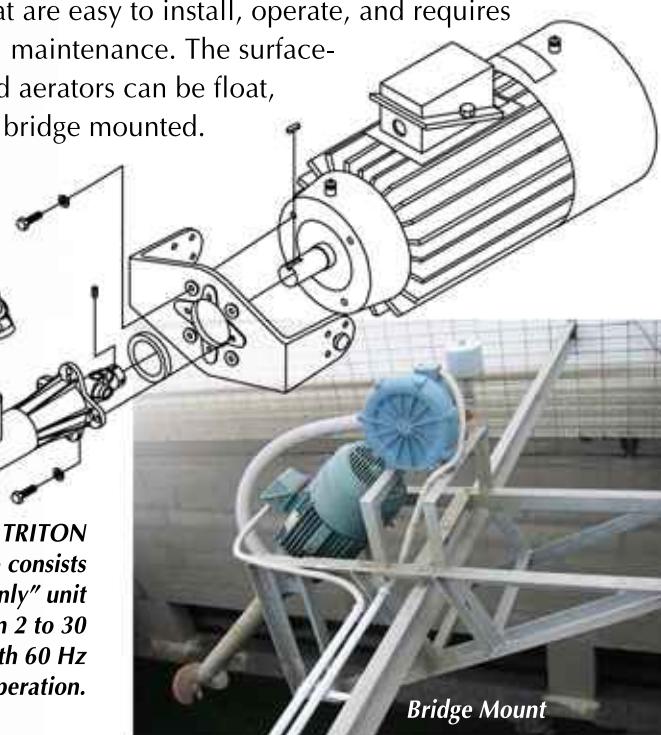
- Complete Separation of Mixing and Oxygenation for Nitrification and Denitrification
- Improves Oxygen Transfer
- Reduces Drag, Improves Reliability, and Longevity

Basic Features:

- Simple mechanical design.
- Few wear components.
- No complicated valves, gear reducers.
- Onboard regenerative blower.
- Turn-down capability for energy savings.
- Unobstructed airflow with no air leakage.
- Heavy-duty low speed industrial motor, stainless steel housing/power drive.
- Routine maintenance requires only two field serviceable replacement parts.
- Exclusive proprietary propeller/ring design and dual mode operation is ideal for biological nutrient removal applications.

Simplicity in Design...

The AIRE-O₂ TRITON® Aerator/Mixer is a statement of simplicity in itself, consisting of only a few moving parts that are easy to install, operate, and requires minimal maintenance. The surface-mounted aerators can be float, wall, or bridge mounted.



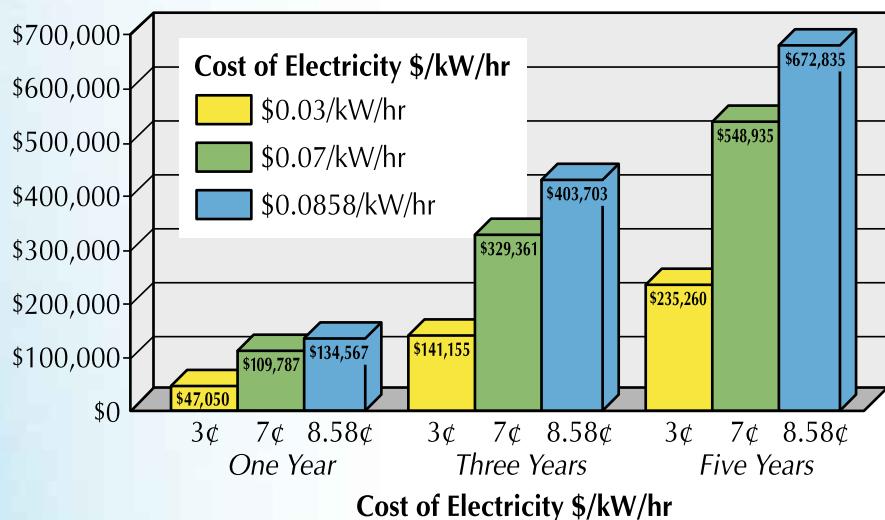
The TRITON line also consists of a "mixer-only" unit that is available in 2 to 30 Horsepower sizes for both 60 Hz and 50 Hz operation.

Bridge Mount

- Low speed (900 rpm/60 Hz - 750 rpm/50 Hz) operation ensures extended aerator life, greatly improves mixing, and quiet operation.
- Portable, easy to install, move and service.
- Process control - capable of turning "On and Off" based on dissolved oxygen (D.O.), timer, or manual operation.
- Subsurface aeration means good winter performance: no aerosols or icing, for a safer environment.
- Up to Five Year Warranty, depending on application.

AIRE-O₂ TRITON® Aerator Energy Savings*

An Oregon WWTP cut energy costs by 55% with the AIRE-O₂ TRITON® Aerators, which equals a \$235,000 savings over five years. With the aerator's superior removal rates and energy efficient motors, fewer units were required to meet permit, resulting in large electrical savings. The city cut its horsepower by 240 Hp. The chart shows the cost savings benefit for a community after one, three, and five years reflecting various costs of electricity. Although the average cost of electricity in Oregon is \$0.07 kW/hr, this WWTP pays only \$0.03 kW/hr. The national average cost of electricity is \$0.0858/kW/hr.



* Data from Water & Wastes Digest, March 2006

Applications

The AIRE-O₂ TRITON® aerator is ideal for most applications that require the introduction of oxygen into a liquid. This includes all of the commonly used biological wastewater treatment processes that use aerated tanks, basins, ponds, and/or structures to implement the process. Typical applications include industrial and municipal wastewater treatment facilities employing aerated lagoons, equalization basins, activated sludge systems, secondary aerobic digestors, and similar processes.

Ideal For Biological Nutrient Removal

Because the TRITON can operate either as an aerator/mixer or as a mixer only, the TRITON is ideally suited for wastewater treatment processes utilizing biological nitrification and denitrification. In the nitrification phase, both aeration and mixing are performed simultaneously. In the denitrification phase, aeration is stopped and the unit operates simply as a highly efficient mixer to facilitate the denitrification process.

The TRITON Aerator/Mixer can easily provide an integrated solution to biological nutrient removal (BNR) by combining aeration with mixing or mixing only, all from a single, entirely self-contained compact piece of equipment. The aerators are a key component of Aeration Industries' Tri-Oval® System, allowing unsurpassed control of the activated sludge process and mixing to 30 ft (9.14 m) deep. This results in a small footprint and huge savings in land costs.

INDUSTRIAL APPLICATIONS

Food & Dairy Industry

Chemical/Petrochemical

Pulp & Paper

Textile Industries

General Industrial

Leachate Treatment

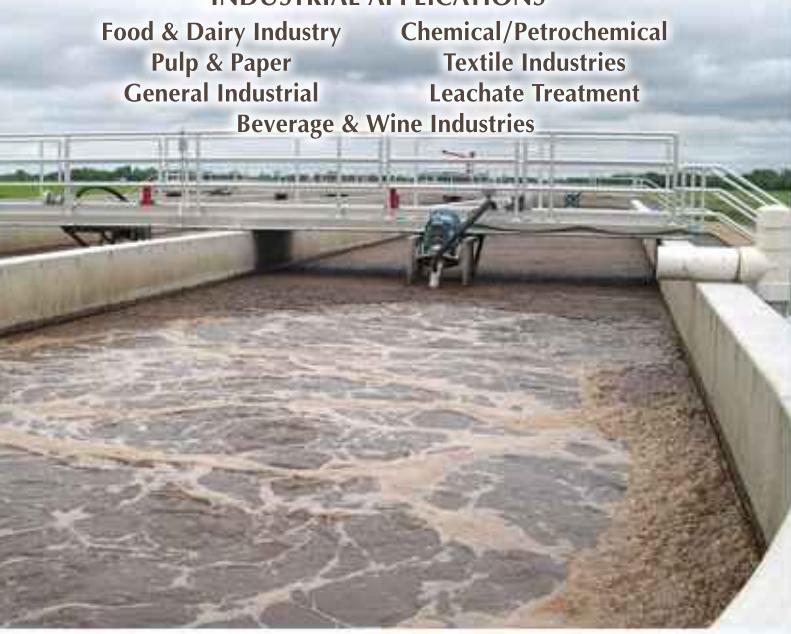
Beverage & Wine Industries



 *Oxygen is evenly dispersed and distributed throughout large basins and lagoons with the float-mounting option that allows for fluctuating liquid levels. This increases bubble hang-time and eliminates short-circuiting.*



 *High oxygen dispersion and strong mixing capabilities make the TRITON aerator the ideal choice for lagoons, complete mix systems, oxidations ditches, basins or tanks.*



 *Bridge mounted units in a Tri-Oval® oxidation ditch installation maintain horizontal velocities up to 30 ft (9.14 m) deep, allowing for a small footprint and reduced land costs.*



MARKET - PROCESSES

Industrial Wastewater

Municipal Wastewater

Oxidations Ovals

Cold Weather Operation

Lake, Rivers, & Harbors

Aquaculture – Cage farming

Sequencing-

Batch Reactor (SBR)

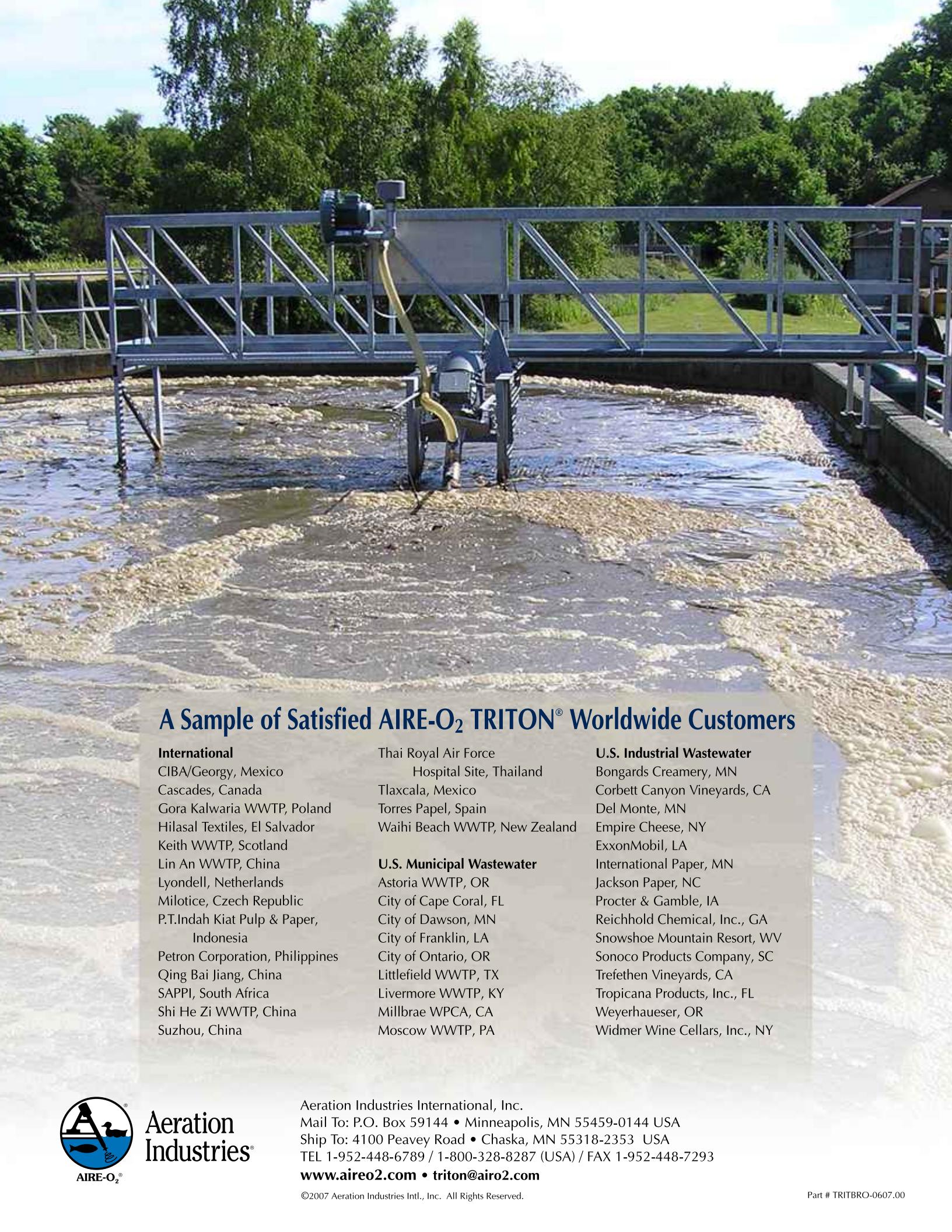
Secondary Aerobic Digestors

Biological Nutrient-

Removal (BNR)

Odor Control

 *In Sequencing Batch Reactor (SBR) applications, TRITON aerator/ mixers maintain D.O. levels, keep solids in suspension, and are capable of anoxic mixing only.*



A Sample of Satisfied AIRE-O₂ TRITON® Worldwide Customers

International

CIBA/Georgy, Mexico
Cascades, Canada
Gora Kalwaria WWTP, Poland
Hilasal Textiles, El Salvador
Keith WWTP, Scotland
Lin An WWTP, China
Lyondell, Netherlands
Milotice, Czech Republic
P.T.Indah Kiat Pulp & Paper, Indonesia
Petron Corporation, Philippines
Qing Bai Jiang, China
SAPPI, South Africa
Shi He Zi WWTP, China
Suzhou, China

Thai Royal Air Force Hospital Site, Thailand
Tlaxcala, Mexico
Torres Papel, Spain
Waihi Beach WWTP, New Zealand

U.S. Municipal Wastewater
Astoria WWTP, OR
City of Cape Coral, FL
City of Dawson, MN
City of Franklin, LA
City of Ontario, OR
Littlefield WWTP, TX
Livermore WWTP, KY
Millbrae WPCA, CA
Moscow WWTP, PA

U.S. Industrial Wastewater

Bongards Creamery, MN
Corbett Canyon Vineyards, CA
Del Monte, MN
Empire Cheese, NY
ExxonMobil, LA
International Paper, MN
Jackson Paper, NC
Procter & Gamble, IA
Reichhold Chemical, Inc., GA
Snowshoe Mountain Resort, WV
Sonoco Products Company, SC
Trefethen Vineyards, CA
Tropicana Products, Inc., FL
Weyerhaeuser, OR
Widmer Wine Cellars, Inc., NY



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