

IGNITE[™] Integrated Nitrification Process

Lagoon Based BOD Removal with Enhanced Nitrification

- Ideal for lagoon upgrades to improve effluent quality
- Provides efficient aeration and mixing of lagoon cells
- Enhanced ammonia removal with attached growth technology
- Simple to design and install
- Easy to operate lagoon-based process

Enhanced Lagoon Treatment

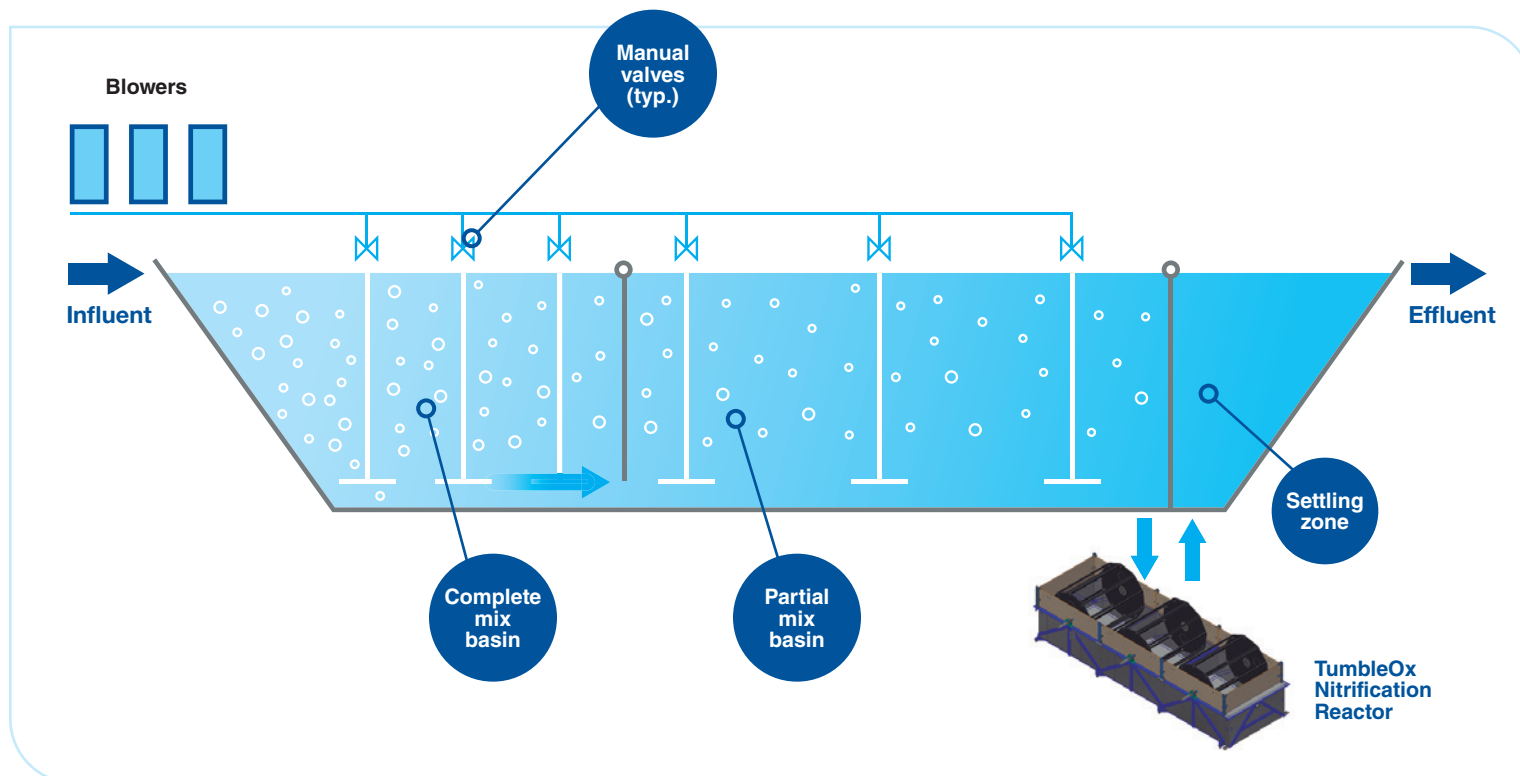
The IGNITE™ Integrated Nitrification process is a non-activated sludge solution for upgrading lagoon based treatment plants to achieve improved BOD and ammonia removal. The process utilizes a combination of Parkson's Biofuser® lagoon aeration system and the TumbleOx™ Nitrification Reactor process.

The IGNITE™ process flow includes:

- A completely mixed primary aeration cell which provides significant influent BOD reduction using a relatively small cell volume – typically 4-8 day hydraulic retention time (HRT).
- A partially mixed secondary aeration cell with sufficient volume to remove remaining BOD from the wastewater and convert some ammonia to nitrate.
- The Parkson TumbleOx™ Nitrification Reactor removes the remaining ammonia in the secondary cell effluent using an attached growth biological process. Excellent aeration and biofilm control provide reliable ammonia removal with discharge concentrations typically <1.0 mg/L. The attached growth process has a low biosolids production with effluent TSS typically <30 mg/L so effluent can be disinfected and discharged or sent to a settling zone for further solids removal, depending on permit requirements.

Advantages of the IGNITE™ process include:

- Coordinated process design and performance guarantee. Equipment for all treatment steps is provided by Parkson.
- Ability to achieve tighter BOD, TSS and ammonia permit limits with minimal upgrades. Existing lagoons are typically utilized.
- Simple operation by treating with a non-activated sludge process. No clarifiers or sludge recycle required.
- Initial capital cost and long term operational costs are lower than activated sludge or other treatment options.
- Upgrades can occur while the existing plant remains in service.



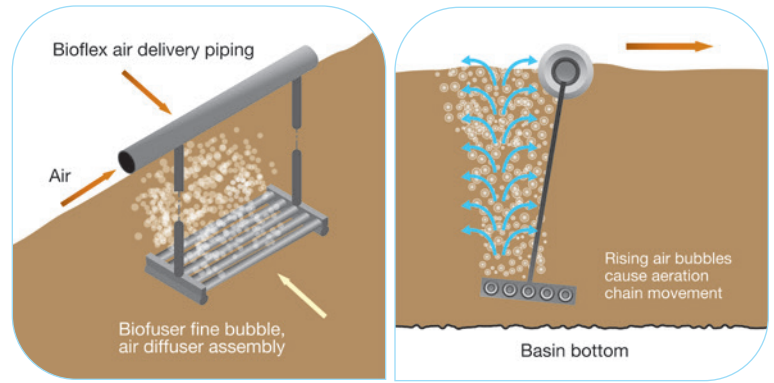
Biofuser® Aeration Design

The Biofuser aeration system for lagoons consists of floating aeration chains that suspend fine bubble diffusers near the basin bottom. Low pressure blowers provide the air to all aeration chains with each chain isolated with a manual valve to allow for easy service and maintenance.

Moving Aeration Chain System

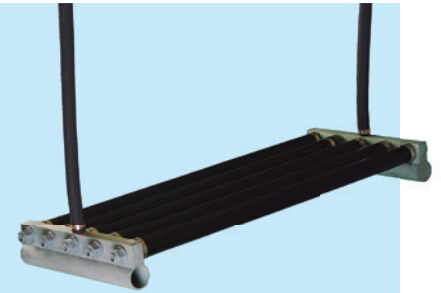
The aeration system is designed to be completely suspended above the basin bottom with no supports or points of attachment to the basin bottom. This arrangement allows for ease of access for service and maintenance without dewatering the basin or having a complete aeration system shut down.

The ability to mix large basin volumes using minimal energy is a critical function of the moving aeration chains with the attached Biofuser fine bubble diffuser assemblies. The aeration chains are designed to move back and forth systematically in the wastewater to provide high mixing efficiency. Stationary fine bubble aeration systems require 8-10 scfm of air per 1,000 cubic feet of volume to achieve complete mix. The movement of the Biofuser aeration chains allows complete mix to be achieved while applying only 4 scfm of air per 1,000 cubic feet of basin volume. This can result in significant energy savings when aerating and mixing the complete mix zone of the process.



Biofuser® Features and Benefits

- All equipment is accessible for service and maintenance without basin dewatering.
- Robust polypropylene frame design with diffusers supported on both ends.
- Polyurethane fine bubble membranes provide excellent oxygen transfer efficiency.
- Moving aeration chain concept achieves complete mixing with lower air flows versus fixed diffuser systems.



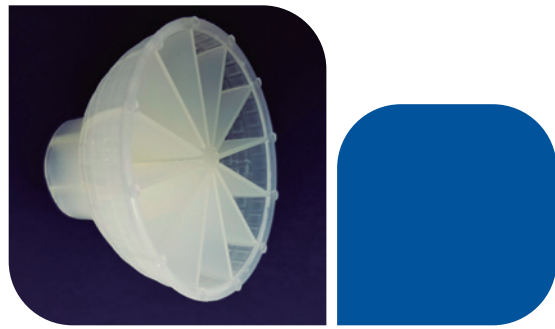
TumbleOx™ Nitrification Reactor

The Parkson TumbleOx Nitrification Reactor consists of a treatment tank(s) containing a series of slowly rotating drums. Each drum is partially filled with loose media which freely tumbles inside the five-foot diameter drum as it rotates. A thin biofilm grows on the media and provides biological treatment. The unique media design maximizes surface area for biological growth and also aerates the wastewater as the drum turns, providing dissolved oxygen for the micro-organisms. The system components include the rotating drum, plastic media, and the bearings and simple drive mechanism to slowly rotate the drum. No supplemental aeration system is required.



TumbleOx™ Features and Benefits:

- Vigorous movement of the media within a rotating drum completely wets all media surface while providing excellent mixing and contact of wastewater with the biofilm.
- Exceptional biofilm thickness control eliminates any possibility of plugging or fouling of the media bed while maximizing treatment efficiency.
- The media shape continually lifts and discharges the liquid through the media bed, providing consistent transfer of atmospheric oxygen to the wastewater. This results in high residual dissolved oxygen levels throughout the reactor without supplemental aeration. No separate aeration system is required – NO blowers, NO diffusers, NO aeration piping, NO aeration controls, NO blower energy.
- High residual dissolved oxygen maximizes treatment efficiency, resulting in high quality effluent with excellent nitrification capability. Dissolved oxygen levels typically maintained above 3.0 mg/L.
- More active biomass per ft³ of reactor volume than a suspended growth process, resulting in more treatment per unit volume.
- Less sludge produced versus conventional suspended growth processes.
- Low operation and maintenance costs. Each drum powered by a 1.0 HP drive unit. Maintenance requirements are limited to scheduled bearing lubrications.



- Available as single drum units installed in owner supplied tanks or as factory-built packages. Packaged designs are shipped with media drums factory installed in coated carbon steel tanks. Packaged designs are simple to install with one influent flow connection, one effluent connection and one field electrical connection.
- Tank covers and splash guards available as add-ons.



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