

THE COMBINATION AERATION SYSTEM

“Combining Fine Bubble Diffusers & Coarse Bubble Diffusers to Optimize Oxygen Transfer and Process Mixing”

When considering a diffused aeration system to provide dissolved oxygen supply and complete mixing for a specific application traditionally there have been two alternatives; Fine Bubble Systems and Coarse Bubble Systems. Each of these options comes with positive benefits but each also has associated limitations, therefore neither is the perfect solution for all applications and the requirements of the application must be evaluated to determine the appropriate system. The positive and limiting aspects of each system consist of the following;

Fine Bubble Systems

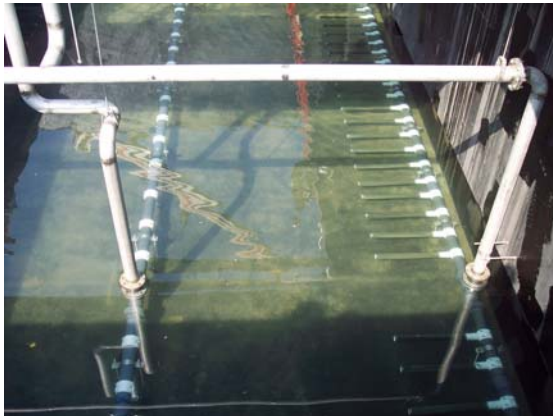
- + High O2 Transfer Efficiency
- + Low Operating Power Cost
- Low Mixing Energy Applied
- High Capital Equipment Cost
- High Maintenance Cost

Coarse Bubble Systems

- + High Mixing Energy Applied
- + Low Maintenance Cost
- + Low Capital Cost
- Low O2 Transfer Efficiency
- High Operating Power Cost

Combining these two types of diffusers within the same system can achieve optimization by utilizing the benefits of each type of diffuser. The coarse bubble diffuser's primary function is to provide complete mixing of the system and maintain biomass suspension. The fine bubble diffuser's primary function is to provide the remaining oxygen required for the biological process.

This combination produces a system with high rate mixing and high oxygen transfer capacity.



Orientation and arrangement of the two diffusers types within the Tideflex Combination System is the key in achieving oxygen transfer optimization. The coarse bubble manifolds generate high rate mixing loops, the fine bubble manifolds are located in the down-draft hydraulic return mixing loops. The fine bubbles emitted from the diffusers have lower upward momentum and when flowing against the hydraulic down surge become entrained within the mixing loops; this increases their residence time resulting in higher mass transfer of the available oxygen within the more efficient fine bubbles.

Process Applications

- Aeration Tanks
- On / Off Aeration Processes
- SBR Processes
- Aerobic Digester Optimization

Unique Performance Features

- Reduced Quantity of Fine Bubble Units
- Reduced Maintenance
- Increased Mixing Power
- Blower Cycling to save energy

Tideflex Technologies / Red Valve Company holds the patent for elastomer duckbill diffusers and their incorporation into a multipoint diffuser piping system. Any suppliers of systems incorporating duckbill diffusers would need authorization from Tideflex Technologies / Red Valve Company. Soliciting of systems incorporating Tideflex diffusers by others without the consent of Tideflex Technologies constitutes intent to violate the patent protection of this product and is subject to the penalties defined within the Patent Protection Laws of the United States.

US Patent No. 6,016,839 / 6,193,220 / 6,372,140 / 6,702,263
Canada Patent No. 2,366,252 / 2,385,902; United Kingdom Patent No. 2,326,603