

Tideflex[®] Technologies

Your Partner in and Manufactu





Our patented air diffuser products are revolutionizing aeration system design through innovative new features and proven Tideflex[®] Check Valve technology. Tideflex[®] Air Diffusers are being successfully applied in municipal and industrial aeration applications.

Air diffusers were developed to overcome the limitations of traditional coarse and fine bubble designs. By incorporating patented Tideflex® Check Valve technology into the design of each air diffuser model, Tideflex® Technologies has created a line of products that offers excellent mixing and oxygen transfer characteristics, while preventing the backflow and clogging that is the cause of most maintenance in an aeration system. Tideflex® Technologies air diffusers can significantly reduce operating costs. While most conventional air diffusers will quickly clog with accumulated sludge when airflow is interrupted due to a blower shutdown or power failure, our air diffusers prevent the backflow of sludge to keep the manifold clear. The integral check valve also allows the air supply to be shut down at will, resulting in dramatic cost savings from reduced energy consumption. Blowers no longer have to be run around the clock to keep air diffusers clear.

Engineering, Design re of Aeration Systems



TF-A Tideflex[®] Coarse Bubble Diffuser Valve

Tideflex[®] Air Diffusers:

- Integral Tideflex[®] Check Valve prevents backflow and clogging.
- All-rubber construction and maintenance-free design give long service life.

Standard schedule pipe and fittings ease installation and lower capital costs.

Complete engineering support for system design or retrofit.

All Tideflex[®] air diffusers are designed for ease of installation and require no special or proprietary manifold piping or connections. The simple installation of Tideflex[®] air diffusers makes them ideal for retrofit applications as well. Existing systems can quickly be improved or replaced with new diffuser units from Tideflex[®] Technologies.

Tideflex[®] Technologies not only supplies diffusers, but also can design complete air diffuser system packages for new or retrofitted systems. These packages include drop legs, manifold layout, headers, supports, and all equipment within the tank. The correct sizing of manifolds and proper configuration of diffusers are important in order to ensure the successful installation and operation of the system. Tideflex® Technologies combines years of experience with superior products to provide the most cost-effective and efficient systems for industrial and municipal applications.



Maintenance-Free Coarse Bubble Diffusers

Problem



Solution



Clogged stainless steel diffusers are a common site at wastewater treatment plants. Many users keep two sets in constant rotation, one in service and one being cleaned. Tideflex® Technologies' Coarse Bubble Air Diffusers solve this problem by preventing sludge and raw sewage from backing up into the diffuser or manifold piping. Tideflex[®] Technologies' Coarse Bubble Air Diffusers are used primarily for their excellent mixing characteristics. The unique shape of the TFA Air Diffuser allows it to be mounted in any orientation to ensure optimum dispersion and mixing of the tank. The TFA eliminates stratification and settling, while providing oxygen transfer comparable to other coarse bubble designs.



The principle of operation of the TFA is simple: positive differential air pressure opens the Tideflex® Diffuser Valve, allowing airflow. When airflow is interrupted or shut down, reverse pressure on the outside of the diffuser seals the bill, preventing backflow. The maintenance-free Coarse Bubble Air Diffuser is available in a variety of synthetic elastomers to match almost any installation requirement.



Engineered Tideflex[®] duckbill has memory; forward pressure opens the valve; reverse pressure seals the valve and prevents backflow into the header pipe.



Tideflex[®] Coarse Bubble Diffusers:

- Optimize oxygen transfer and mixing characteristics.
- Provide proven long-term, maintenancefree service life.
- Provide backflow prevention.
- Prevent clogging and fouling—no jet wash or acid baths required.
- Offer durable, heavyduty construction.

Proven Performance In:

- Aeration basins.
- Sludge holding tanks.
- **Equalization basins.**
- Aerated grit chambers.
- Pre/post-aeration.
- **b** Channels.
- Aerobic digesters.
- Flocculation.
- Storage tanks.
- Landfill odor control.
- Industrial mixing.

New and Innovative Fine Bubble Diffusers



Tideflex[®] Technologies Fine Bubble Air Diffusers overcome many of the shortcomings of traditional tube-and-disk air diffusers by combining proven Tideflex[®] Check Valve technology with advanced design and innova tive mounting systems.

At the heart of each Fine Bubble Diffuser is an integral Tideflex[®] Check Valve that prevents the backflow of sludge and debris into the air diffuser and manifold piping. The Tideflex[®] virtually eliminates clogging and ensures maximum efficiency at all times, even after a shutdown.

The Tubeflex® features a hollow core with an open end that reduces buoyancy. The rugged elastomer membrane is replaceable and features preset tension clamps to ensure an adequate seal when replaced by operators in the field.

Tubeflex[®] Diffusers Feature:

- Integral Tideflex[®] Check Valve to prevent backflow.
- Hollow core for reduced buoyancy.
- Replaceable elastomer membrane.
- Flexible mounting bushings that minimizes damage
- Installation with standard schedule pipe and fittings.



Coarse Bubble and Fine Bubble Diffusers Combined for an Optimal Aeration System



Historically, there have been two options in air diffuser systems. Fine bubble diffusers could provide the biological system requirements at a low airflow rate, but generally the airflow had to be increased to provide sufficient mixing. Coarse bubble diffusers provided high mixing power, but needed twice the airflow to meet oxygen requirements. (Figure 1)

Fine Bubble Systems

- High 0₂ transfer efficiency
- Low mixing energy
- High maintenance cost
- High capital cost
- Low operating cost

Coarse Bubble Systems

- Low 02 transfer efficiency
- High mixing energy
- Low maintenance cost
- Low capital cost
- High operating cost

Tideflex[®] Technologies has developed a unique approach to aeration-system design by combining the aeration benefits of our fine bubble product line with the mixing benefits of our coarse bubble product line. A combined system can meet the biological system requirements for oxygen and still provide sufficient mixing at a lower total airflow.



Section View—Mixing Patterns

Coarse bubble diffusers provide power to high mixing rate from large bubbles and high mass volume.

Diffusers located near bottom enhance scouring of the tank bottom through eduction of the wastewater following the path of the rising bubbles.

Fine bubble diffusers provide oxygen supplement; transfer efficiency increases due to entrainment in higher velocity loops created by coarse bubble diffusers.

Combined System Benefits:

- Enhanced O₂ transfer efficiency.
- Excellent mixing energy.
- Reduced maintenance cost.
- Reduced capital cost.



Custom Engineered Design for Aeration Systems

At Tideflex® Technologies, we know that providing reliable air diffuser products is only one step in a much larger process. Factors such as the physical shape and size of the aeration basin, number and power of blowers, types of mounting systems, lengths of pipe and makeup of the material to be aerated must be taken into consideration in order to provide the right products.

We use a complete-system approach to aeration by providing engineering support on every aeration product we sell. Our staff of civil, mechanical and environmental engineers provides assistance and recommendations for applying diffused aeration in biological and chemical treatment facilities. By combining our expertise with innovative aeration products, Tideflex® Technologies can ensure that your aeration system will provide the reliability you want and the level of performance you need.

Aeration Sizing Program –

Our Aeration Sizing Program uses plant waste loading rates and facility dimensions to determine oxygen volume required, number of diffusers and airflow required. Sufficient mixing evaluations, power requirements and overall system treatment capacities are based on geometric volumes and F/M ratios.

Aeration System Retrofitting –

Tideflex[®] Technologies is often called upon to solve the problems of plugging and poor mixing that are common with most types of air diffusers. Staff engineers can evaluate existing piping configurations and recommend modifications to enhance system performance in conjunction with applying Tideflex[®] diffusers.

Construction and Installation Plans – We provide full detailed plans in AutoCAD format for consulting engineers during the design phase and for contractors during installation. This cuts the development time of new systems and eases retrofitting of existing systems.



Tubeflex®–Fine Bubble

	Diameter	Length	Connection	Flow Range
TFX - 40 S	3″	42″	3″ NPT	0-40 SCFM
TFX - 26 S	2″	26″	2″ NPT	0-8 SCFM
TFX - 26 I	2″	26″	3/4″ NPT	0-8 SCFM
TFX - 26 II *	2″	26″	3/4″ NPT	0-8 SCFM

* Equipped with a Deflection Mechanism



Tideflex[®]-Coarse Bubble



TFA-3.0



Download the Design Data form from: **www.tideflex.com** and have our engineering staff design your aeration system using our environmental systems, modeling program.



Tideflex[®] Technologies has developed an environmental design model for evaluation of biological treatment systems and the associated designs for diffused aeration systems. Our experienced engineering staff can input your organic loading values and process requirements into the design model to provide a complete evaluation of your biological process along with its oxygen demand and mixing requirements.



TF-A Tideflex® Coarse Bubble Diffuser Valve

Some of the features included within the model:

- US and SI unit conversion for all variables
- Recommended oxygen to BOD reduction ratios based on the type of biological process and equipment utilized
- Food to biomass comparison for tank sizing evaluation
- Sizing evaluation based on mixing criteria
- Actual operating horsepower required as adjusted for site barometric pressure and temperature
- Oxygen demand based on BOD, NH3 and COD organic loading

- Adjustable AOR proportioning across multiple aeration zones
- VSS reduction through Aerobic Digesters
- Channel and Aerated Grit Chamber aeration design
- Heat exchanger equations for temperature reduction through drop piping
- Post aeration and re-aeration design

Model output is converted to Adobe format (.pdf) and emailed for use within engineering reports and design documents.



The products contained in this brochure are covered under one of the following patent numbers: U.S. patent no. 6016839, 6193220, 6372140, 6702263, 6367783, 53931197, Canada patent no. 2329453, 3266252, 2385902



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