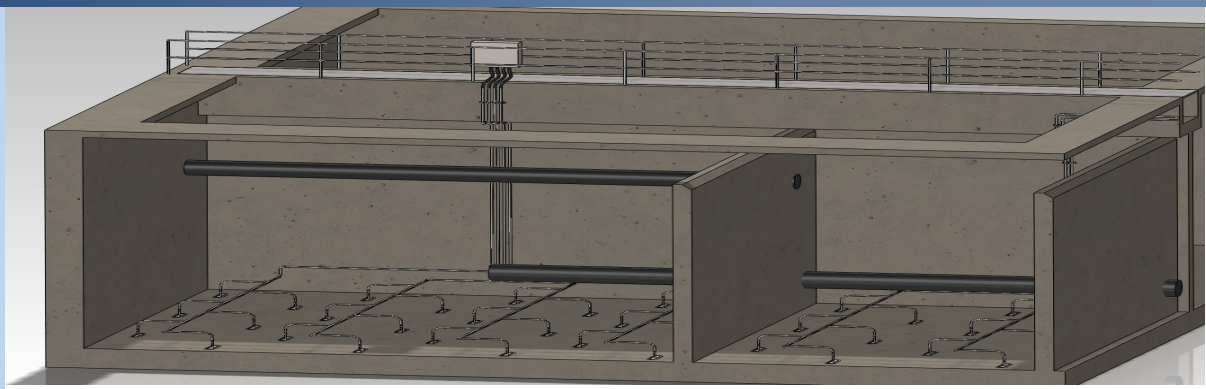
ENVIROMIX
Sustainable Solutions for a Cleaner Environment

INTELLIGENT MIXING SYSTEMS FOR THE WASTEWATER INDUSTRY

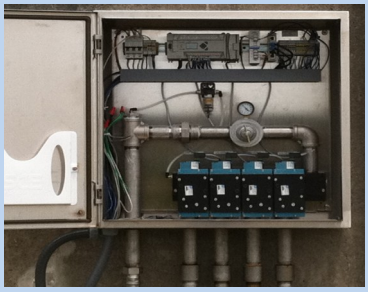
BioMix™ Compressed Gas Mixing

Energy-Saving, Maintenance-Reducing Technology



Key Benefits

- BioMix™ system provides *60%+ power savings* versus leading submersible mixer
- Insignificant oxygen transfer enables anaerobic, anoxic and aerobic application
- Bottom-up mixing in basins of any geometry
- Zero maintenance of non-clogging, self-cleaning in-tank components
- Minimal maintenance of components (compressor, air control valves) in controlled environments
- PLC controlled with customizable operating parameters to meet varying mixing requirements
- One BioMix compressor may be used to mix over 20 tanks, whereas mechanical mixers must be installed in each tank.



BioMix Control Panel

Applications

- Biological process tanks
- Aerobic digesters
- Channels
- Equalization tanks
- Chlorine contact tanks
- Pump stations

BioMix™ provides mixing of liquids by firing programmed short bursts of compressed air through patented engineered nozzles affixed to the floor of the tank. Multiple studies have identified a 60%+ reduction in power usage versus the leading submersible mechanical mixer in comparably-sized applications. BioMix electrical requirements are limited to the power to operate the compressed air source and the programmable logic controllers in the BioMix valve control panels.

BioMix utilizes four parameters (pressure, sequence, duration, frequency) to control the firing of the air injection valves in order to mix a specific fluid and tank geometry. Compressed air is intermittently and sequentially fired in fractional second durations to mix a tank both vertically and horizontally. For example, firing parameters of 0.5 second duration at 4.0 to 5.0 second intervals have provided proven, effective mixing. These mixing parameters may be changed to optimize mixing and power utilization, either manually or through automated variable process feedback.

Insignificant Oxygen Transfer

BioMix may be used to mix anoxic and anaerobic biological process tanks due to the insignificant oxygen transfer into the liquid. The relatively small amount of expanded air produces amorphous gas volumes, similar to an array of softball-sized bubbles. Since oxygen transfer is inversely proportional to the surface area interface between the air and liquid, the larger the bubble, the less oxygen transfer. As examples, one ft^3 of diffused air produces 51,600 coarse (± 0.4" Ø) spherical bubbles with 180 ft^2 of surface area, or 51,566,200 fine (± 0.04" Ø) bubbles with 1800 ft^2 of surface area. By comparison, the same volume yields just 60 softball-sized (3.8" Ø) bubbles with 18.9 ft^2 of surface area—a reduction of 90% (coarse bubble) or 99% (fine bubble).

BioMix Configuration Example

Demonstrated Results

BioMix system provide significant power savings as compared to mechanical mixer installations. Mechanical mixers, which are typically sized by volume (HP/1000 ft^3), require at least one unit per basin, with the total installed power commonly increased to accommodate standard motor sizes. However, BioMix system power utilization is efficiently applied across multiple tank systems, by using a single, optimally-sized and easily-maintained compressor.