BIO-MICROBICS®
INCORPORATED
Better Water. Better World.®

GO green OTL MECHANICAL

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FAST® wastewater treatment systems with SFR®

Wastewater Treatment for a Changing World

The world's population is growing and the increased demand on water resources has forced lifestyle changes and an emphasis on water conservation. Although water conservation helps to preserve our precious water resources, conservation also makes concentrations of pollutants stronger in wastewater. Additionally, new chemicals introduced into the waste stream everyday from agricultural, industrial and pharmaceutical industries make it more challenging to treat water than ever before.

FAST® wastewater treatment systems are proven, innovative treatment products that provide robust, high-performance treatment to meet the challenges of our changing world. Suited for use in countless applications, a versatile FAST system is ready to serve your needs. FAST® is designed to be efficient, dependable, easy to install and very user-friendly. FAST is tremendously beneficial alone or in combination with other processes to meet the rigorous demands of the most challenging and complex projects. Retrofitting of existing activated sludge plants with FAST technology is an affordable, dependable way to significantly upgrade performance with minimal impact in time and operation.

LagoonFAST Wastewater Treatment Systems

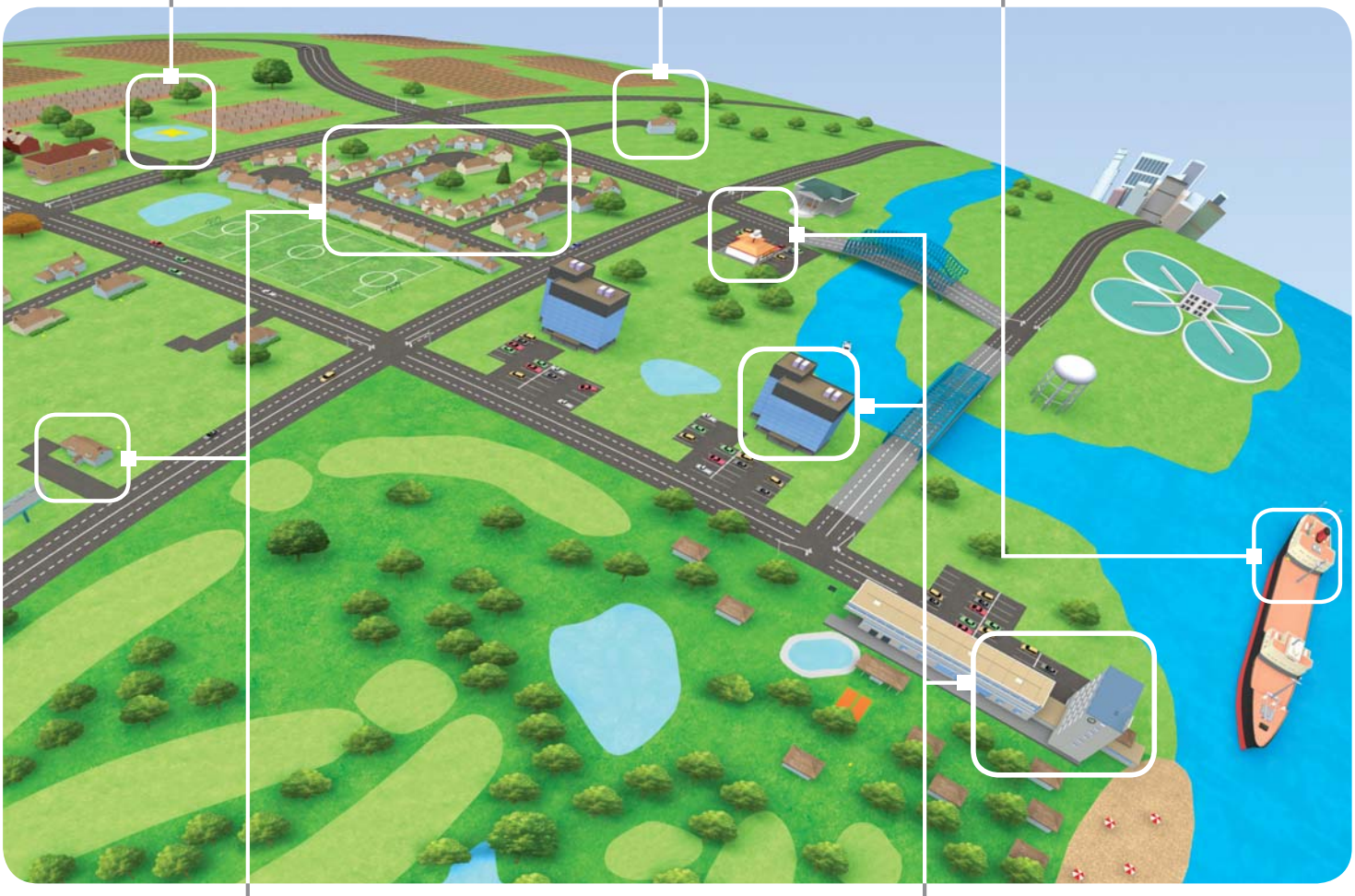
Clever upgrade packages for high-performance treatment and enhanced nitrification of aeration ponds and lagoons.

RetroFAST wastewater treatment systems

Simple retrofit for conventional septic systems. Renovates failing systems, upgrades new systems.

MarineFAST's complete line of proven marine sanitation devices, packaged for large and small marine vessels, such as: yachts, work boats, offshore rigs and more.

SCIENCO/FAST



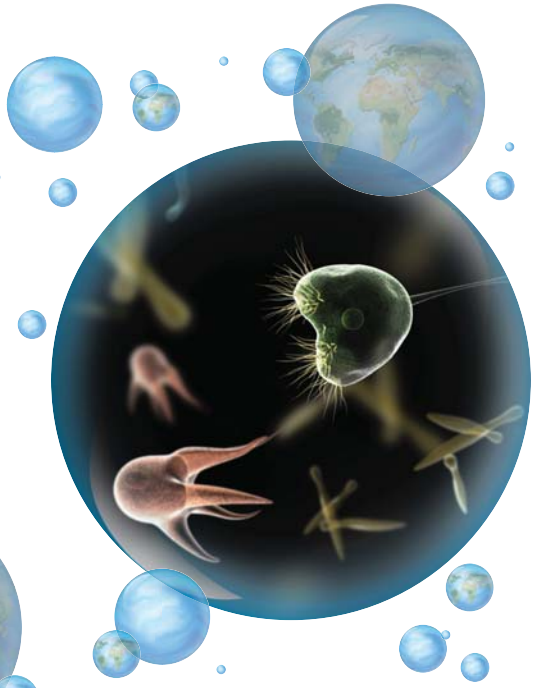
MicroFAST wastewater treatment systems

Advanced wastewater treatment systems for individual homes, clustered subdivisions, small communities and other sanitary-strength flow applications. Simple installation, proven performance.

HighStrengthFAST wastewater treatment systems

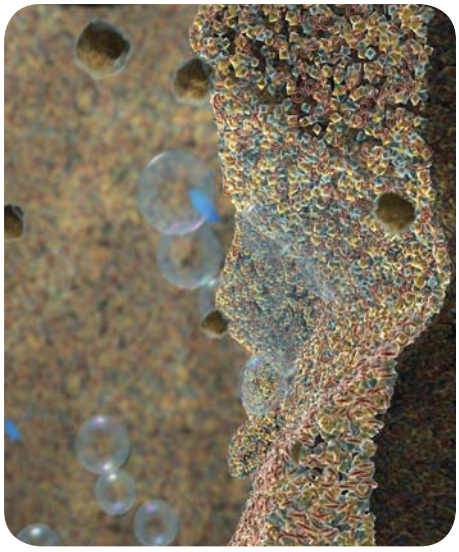
Meeting the unique challenges of high-strength commercial applications with robust, low-maintenance treatment modules.

The Real Beauty of this System is How Well it Works.



FAST® is simply great technology, based on environmentally sound and simple scientific principles. The FAST (Fixed Activated Sludge Treatment) process employs a unique hybrid combination of attached and suspended growth in an aerobic, packed bed bioreactor. This proven IFAS (Integrated Fixed-Film Activated Sludge) combination includes the stability of fully-submerged, fixed-film media and the effectiveness of activated sludge treatment, making the innovative, patented FAST system technologically advanced and extraordinarily reliable. The FAST process provides the ideal environment for rapid bacterial growth by ensuring plenty of oxygen and food are equally distributed to the bacteria layered upon the surfaces of the media.

FAST's fixed film media provides a high surface-to-volume ratio to maintain exceptional microbial growth during low, average and peak usage. Bacteria become "fixed" or attached to the stationary media where the abundant, diverse and self-regulating population of microbes is consistently maintained in the aeration zone to metabolize the waste. FAST maintains stable performance because the abundant bacterial population is attached to the media and does not wash out of the aeration zone. During times of low usage, the large volumes of thriving organisms delay a dying-off of the system, making FAST well suited to intermittent use applications. Unlike conventional activated-sludge (suspended-growth systems), bacteria grow on the media and feed on incoming waste, leaving the circulated liquid essentially clear and free of solids.



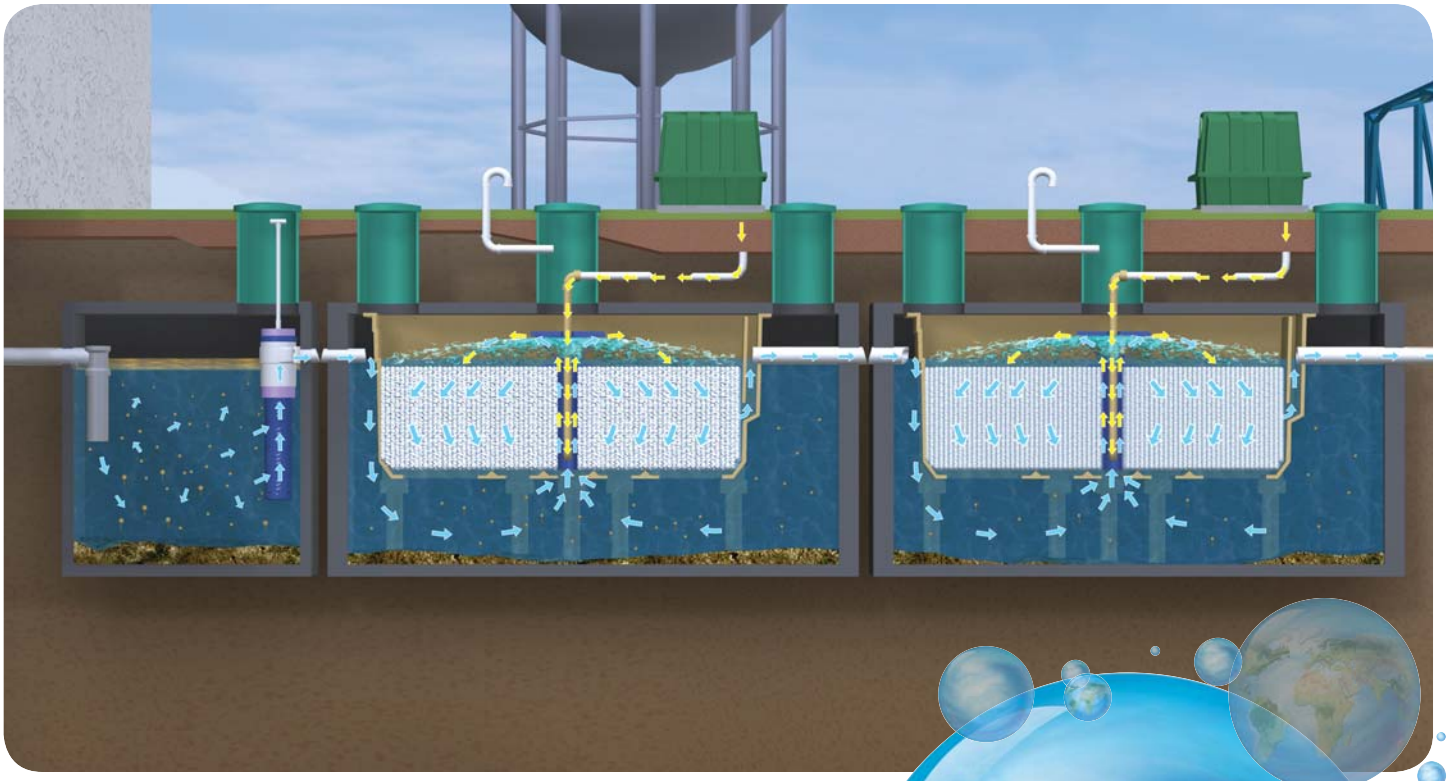
The "fixed" bacteria feed off incoming waste, leaving the circulated liquid essentially clear and free of solids.

A remote-mounted, above-ground blower, the systems only moving part, introduces air (oxygen) into the system to facilitate a robust circulation of wastewater through the media's channeled flow path. Eventually, the robust circulation of air and liquid through the system creates a sloughing effect on the thick biomass growth, which creates a self-cleaning action, eliminating the need for any media maintenance. Sloughed solids then settle to the bottom of the tank for later removal.

The robust circulation creates a sloughing effect on the thick biomass growth...eliminating the need for any media maintenance.

High levels of bacteria and other useful microbes (including stalked ciliates and rotifers) in the bioreactor aeration zone provide stable operation, break down biodegradable constituents in the wastewater, prevent bulking conditions and settling problems, and yield a significantly longer sludge age than conventional plants. A long sludge age achieves nitrification and denitrification much easier, operates more effectively in cold climates, and produces less sludge.

A FAST® system provides an ideal home for large volumes of friendly organisms in the inner, aerated, self-cleaning bioreactor chamber to digest the wastewater and turn it into a clear, odorless, high-quality effluent.



HighStrengthFAST Shown

Nitrogen Reduction

Nitrification and denitrification projects are much easier with FAST technology. Multiple biological, bio-chemical, chemical and physical processes occur simultaneously within the FAST wastewater treatment system. Individual mechanisms may vary depending on the particular FAST product used and the specific needs of the project.

FAST® wastewater treatment systems have proven themselves to consistently reduce nitrogen levels – including nitrates and all other nitrogen species - at exceptionally high percentage rates.

The very high surface area to volume ratio of the media provides the needed space for nitrifying bacteria to attach themselves within the naturally protective environment of the fixed film micro sites. Large volumes of biomass, combined with longer sludge age, lessen the impact of low temperature effects, further enabling a more complete nitrification of influent ammonia levels.

FAST wastewater treatment systems have proven themselves to consistently reduce nitrogen levels – including nitrates and all other nitrogen species - at exceptionally high percentage rates. Larger or more complex applications can also utilize various configurations of FAST in combination with other processes to meet the rigorous demands of the most challenging projects.

Decades of experience with water and wastewater projects worldwide has taught us that when we provide pre-engineered, modularized products to project decision makers, projects are completed more quickly, more affordably and with repeatable, consistent and successful results.

FAST® is designed to be efficient, dependable, easy to install and very user-friendly. FAST is tremendously beneficial alone or in combination with other processes to meet the rigorous demands of the most challenging and complex projects.

- Retrofitting of existing activated sludge plants with FAST technology is an affordable, dependable way to significantly upgrade performance with minimal impact in time and operation.
- The advanced treatment of FAST allows for innovative reuse and recycling of precious water resources.
- Aerated ponds and lagoons can also be considerably enhanced with the addition of specially configured FAST systems designed for installation directly into the lagoon without missing a day of operation.
- The flexibility and consistent performance of the compact, modular FAST wastewater treatment systems make them ideal for use in countless applications and projects around the world.
- Since the first FAST prototype installation aboard the river towboat M/V Missouri in 1969, FAST® products can now be seen operating quietly in residential, commercial, municipal, industrial and marine applications around the globe.

A Process Born from Unique Challenges

Since the early 1900s, wastewater engineers have attempted to use some form of medium in an aerobic environment to facilitate biomass growth and reduction of solids and BOD in domestic and industrial wastewater. In the 1960s, Smith & Loveless, Inc. succeeded in developing a version of this hybrid process and engineered a new technology called fixed activated sludge treatment (FAST®) for the marine industry. This innovative system allowed wastewater to be treated and reused aboard marine vessels for toilet flushing.

This unique marine application presented many challenges not seen in municipal or industrial wastewater applications. With a marine vessel's constant movement, small space requirements, variable ship personnel, flow surges and operator skill level, a traditional primary, secondary and even tertiary treatment process would not work. The first prototype was installed aboard the river towboat M/V Missouri in 1969. The success of the unit sparked full production of what is now known as MarineFAST® (availble through Scienco/FAST, Inc) in 1973. The success of the FAST process sparked engineering efforts for development of land-based FAST treatment plants that would provide the very same benefits: a robust, stable treatment process, small footprint and very little need for operator attention.

From this interesting beginning, the FAST technology has been engineered into many product lines; all designed around the same fixed activated sludge treatment process. FAST products can now be seen operating quietly in residential, commercial, municipal, industrial and marine applications around the globe.

Technical Specifications

Materials of construction: Made with 100% corrosion resistant materials and contains post-consumer recycled materials.

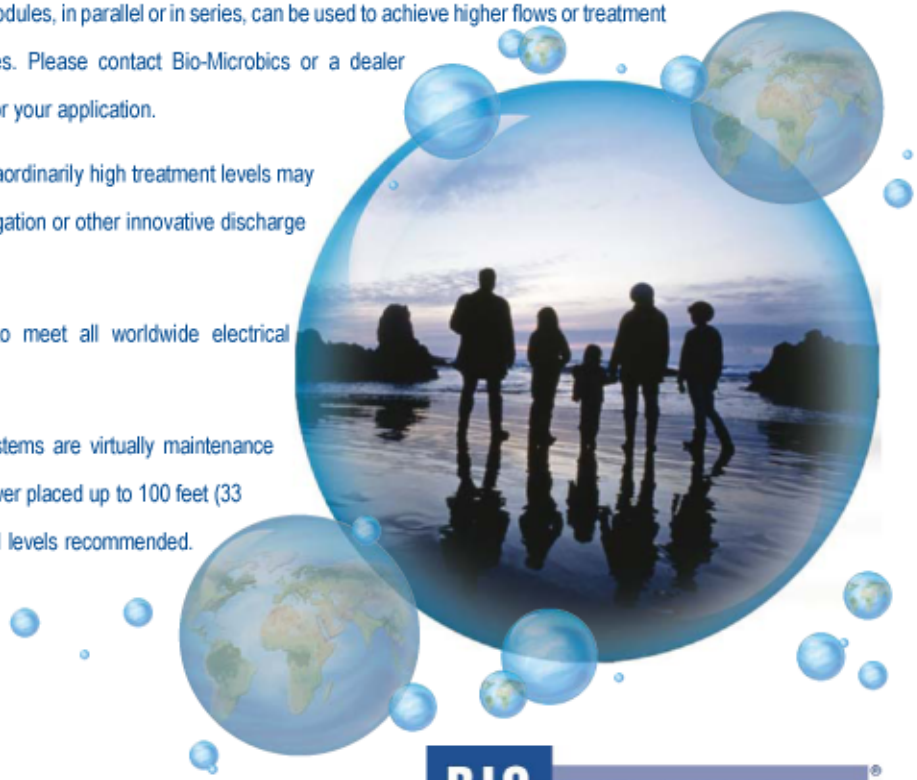
FAST® Installation: FAST systems are mounted inside tanks in above ground or below ground applications. Tanks can be made from concrete, fiberglass, steel or plastic materials. Please consult product specifications for specific tank recommendations. Always check local regulations before installing or altering a wastewater system. Contact Bio-Microbics or a dealer near you for more information on the availability of proper tankage in your area.

Capacity: FAST systems are available in several convenient, affordable sizes and configurations. Multiple FAST modules, in parallel or in series, can be used to achieve higher flows or treatment capacities. Please contact Bio-Microbics or a dealer near you for more information on the FAST system that's right for your application.

Dispersal Options: Check your local regulations. The extraordinarily high treatment levels may allow reductions in drain field areas, use of treated water for irrigation or other innovative discharge methods.

Power required: Electrical components are available to meet all worldwide electrical specifications (volt/phase/frequency).

Maintenance Requirements: Once installed, FAST systems are virtually maintenance free. The only moving part in the system is an above ground blower placed up to 100 feet (33 m) away. Periodic review of electronic components and residual levels recommended. Residuals will need to be removed when appropriate.



Typical Applications:

- Single-family homes
- Clustered subdivisions
- Municipalities
- Restaurants
- Schools
- RV & Mobile-home parks
- Office parks
- Resorts and hotels
- Golf courses
- Shopping centers
- Grocery stores
- Food & Beverage
- Wineries
- Petrochemical/Chemical
- Aerobic polishing
- Pharmaceutical
- Luxury Yachts
- Tug & Work boats
- Offshore vessels
- Tankers
- Aircraft carriers
- Cruise ships
- Military facilities
- Mobile Worker Camps

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FAST® Certifications Include:

- US Electrical System • Underwriters Laboratories (UL) • US Coast Guard • International Maritime Organization (IMO)
- Canadian Standards Association (CSA) • Canadian Great Lakes (CGL) • UK Department of Trade • European Union (CE)
- European Electrical Systems (& Tropical Certification) • Royal Australian Navy • Australian Department of Transportation
- Saudi Arabian Standards Organization (SASSO) • NSF/ANSI Standard 40 & 245 for MicroFAST 0.5, 0.75, 0.9, and 1.5
- US Environmental Protection Agency (EPA) Environmental Technology Verification (ETV) for RetroFAST .250 and .375