SCIENCO/FAST
a division of Bio-Microbics, Inc.

Scienco/FAST specializes in:

- *Marine Sanitation Devices*

- *Water Treatment Systems*

- *Specialty Tablets and environmentally-friendly Cleaners*

MarineFAST®
SEWAGE TREATMENT SYSTEMS

Marine wastewater treatment solutions built to handle extreme environments for small to large flows to the world's marine certifications.

"Let us help bring your system into compliance and keep it there at the lowest total cost for treatment."

www.sciencofast.com

Welcome to Scienco/FAST

The best marine sanitation devices on the oceans and waterways!

Located near St. Louis, MO, Scienco/FAST is internationally recognized for quality products and top-notch field services. As a manufacturer of innovative, proven solutions for the marine and other industries, Scienco/FAST focuses on three distinct markets to provide *adaptable...affordable...and FAST*® solutions:

- MarineFAST® Marine Sewage Treatment systems built to handle extreme environments and fully certified under U.S. and IMO regulations.
- Scienco® Commercial Equipment technologies for bulk salt storage, liquid injection, onsite hypochlorite generation, etc...
- Mighty Mike™ Environmentally-friendly cleaners & biological tablets: Grease-eating (FOG); Bacterial additive (U&F); Decalcification (CPT), etc...

AdaptABLE...AffordABLE...FAST®

Providing a full line of marine and off-shore sewage treatment systems that are built to handle the extreme marine environment. Over the years, Scienco/FAST has developed marine sanitation systems to meet the requirements of small to large vessels and offshore platforms that can handle any combination of blackwater, graywater, ground food waste, freshwater, seawater, vacuum toilets and conventional toilets.

All MarineFAST® sewage treatment systems meet and exceed most international effluent standards and fully certified under U.S. and IMO regulations. Versatile to fit in any configuration and size of vessel or offshore platform, the MarineFAST® helps to lessen the environmental impact of contaminants.

MarineFAST® LX-Series - Originally developed for small harbor tugs, these lightweight systems use DOT certified salvage drums and overpacks. The HDPE and XLPE tanks are so strong that they lower the cost with no compromise in performance, strength or reliability. Easy installation, this Series have now grown to include six models with capacities ranging from crew sizes of 4 to 39 people.

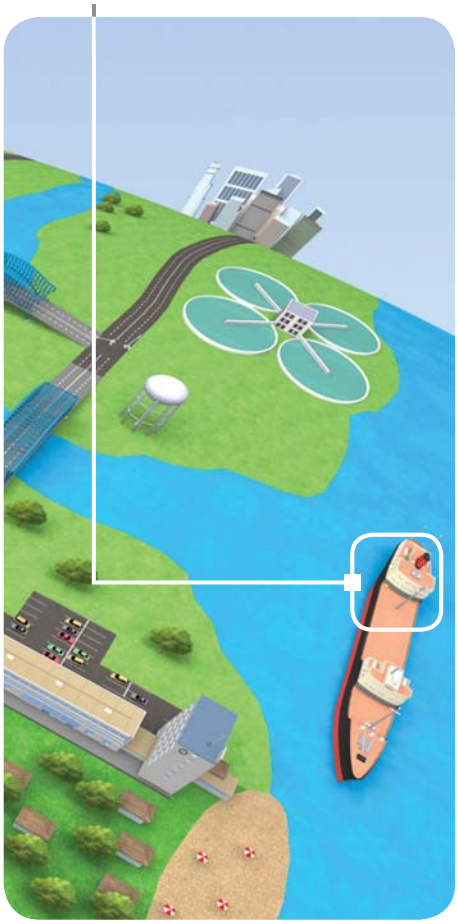
MarineFAST® M- & MX-Series - Originally developed to fit into the rope lockers and shaft alleys of small towboats, these are modular units can be installed wherever space is available. Each unit will fit through a 28" X 60" watertight door with 6" radius corners and will do so without disassembly. There are five models with epoxy coated steel tanks and with capacities ranging from 11 to 80 people. The MX-Series are assembled versions of the M-Series.

MarineFAST® DV-Series - Originally developed for vessels with larger populations, the DV-Series are rectangular tanks employing "vee-crimp" technology. Bulkhead plates are press-formed with deep vees running from top to bottom. This structure meets applicable requirements for ABS deep tanks without the need for welded stiffeners and capacities range from 33 to over 900 people:

1. A clean, strong and rigid structure
2. A substantial reduction in fabrication cost
3. Tanks that can be shipped in ISO standard and high-cube containers

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



WHY USE FAST® TECHNOLOGY?

Great Process

FAST® is simply great technology. It meets the strictest effluent regulations without filters, membranes, microprocessors, adjustments, gimmicks or trained operators. FAST actually works on ships and platforms in the real world and not just in land certification tests. There are no adjustments and performance does not depend upon the skill of the operator. The FAST process can handle any combination of blackwater, graywater, ground food waste, freshwater, seawater, vacuum toilets and conventional toilets.

Reliable

We see inquiries for sewage treatment systems from time to time where a spare sewage treatment unit is specified. FAST units can be fitted with dual blowers or duplex discharge pumps if desired. But, there is no need for a spare FAST unit.

Strong Tanks

Steel tanks are designed to ABS Deep Tank Standards. In a manner of speaking they are as strong as the ship and will probably last just as long. Polyethylene tanks are so strong that they are certified by DOT for transport of hazardous waste on common carriers. These tanks are also immune to marine corrosion and vibration.

Superior Protection against Corrosion

As a standard, FAST units are designed to handle seawater sewage. Steel tanks employ large access hatches for efficient blasting and painting. All tank seams and penetrations are full welded both sides (some standards only require this for fuel tanks and allow water tanks to be welded on one side only). Surfaces are grit blasted to white metal with the right profile and then given two good coats of epoxy resin. All weld seams are brush coated. Threaded penetrations and all fasteners and assembly hardware inside and outside are 316SS.

Long Service Life

In 2011, one of the first FAST units ever sold was retired after 38 years of continuous commercial marine service. The operator replaced it with another FAST unit. When vessels are scrapped, it is not unusual for operators to remove the FAST units and transfer them to newly purchased vessels.

Older Units Can be Updated & Upgraded

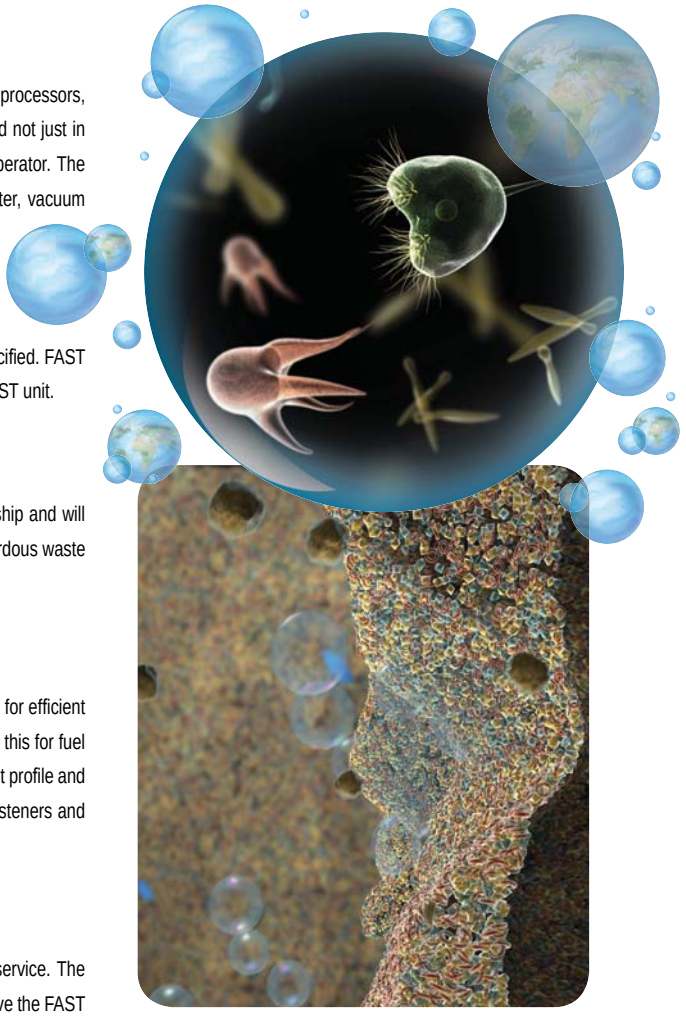
Although FAST process technology is state of the art, the components are simple and economical. The internals of any existing FAST unit can be brought up to the latest configuration and upgraded as required to meet the newest regulations.

Worldwide Technical Support

We provide long term technical support to our customers. When on-site service is required, it is available worldwide. It seems that most of the firms that obtained marine sewage treatment certifications in the 1970's are no longer active or even present. We are truly in the sewage treatment business, we have been building marine sewage treatment systems for over 40 years and we will continue to support our customers in the foreseeable future.

Certified

Certified under MARPOL 73, has successfully passed all testing for MARPOL 2010. All standard FAST units are certified for installation on USCG inspected vessels and meets applicable requirements of MEPC.159(55) as specified in USCG Navigation and Vessel Inspection Circular NVIC 1 09 Voluntary Compliance with International Sewage Regulations in Annex IV to MARPOL 73/78. As of this date, all certification testing has been successfully completed and this section will be updated when the certificates are issued. This not only insures safe and high quality equipment, it also recognizes that as regulations change previously uninspected vessels are increasingly becoming USCG inspected vessels.



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

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

THE FAST® FIXED INTEGRATED TREATMENT TECHNOLOGY [FITT™] UTILIZES A COMPLETELY SUBMERGED FIXED FILM PROCESS ALONG WITH A PASSIVE RECYCLE SYSTEM TO PROVIDE AN AERATED, SELF-CLEANING BIOREACTOR CHAMBER TO DIGEST THE WASTEWATER AND TURN IT INTO A CLEAR, ODORLESS, HIGH-QUALITY EFFLUENT.

FULLY CERTIFIED

Scienco/FAST manufactures all products and systems at their location in Sunset Hills, MO

FAST® TECHNOLOGY 40+ YEARS OF HISTORY & EXPERIENCE

1969 After the prototype for the marine FAST® sewage treatment system was installed aboard the towboat M/V Missouri while the vessel was underway. It was an immediate success.

1973 After years of successful operation aboard three towboats, FAST unit sales and production began. Even though there were no Federal rules, towboats operating on the Great Rivers had to meet regulations of the individual States.

1975 The US Coast Guard issued sewage treatment regulations 33 CFR Part 159. Official testing was done aboard the towboat M/V United States while underway, the FAST unit passed all tests and FAST obtained USCG certification.

1978 Canada issued their Pollution Prevention Regulations for the Canadian waters of the Great Lakes. A production FAST Model 40D passed all tests with results that were so outstanding that the testing laboratory personnel were amazed. Additional tests were run for US Coast Guard and the results were similarly outstanding.

2011 A production FAST Model L-3X passed all tests for MARPOL 2010 / MEPC.159(55) with results every bit as outstanding as those achieved in 1978.

Today OVER 2,000 MARINE & OFFSHORE INSTALLATIONS are Installed aboard towboats, tugs, offshore supply vessels, diving support vessels, semi-submersibles, offshore platforms, drill ships, crane barges, fireboats, pilot boats, shop and office barges, container ships, tankers, bulk carriers, research vessels, icebreakers, survey ships, school ships, river towboats, harbor tugs, cruise ships, float homes, etc.

Also serving land-based applications for residential, commercial, and small communities, all claims for the FAST® process and treatment systems are supported by 42,000+ installations worldwide and over 40 years of research, development and real world operating history, proven results, and experience. Test reports are available upon request.

Decades of experience has taught us, the most successful projects involve pre-engineered systems to achieve critical customer satisfaction. Key project decision makers have agreed, these projects get managed with more accuracy; within budget; and with repeatable, consistent, and successful results.

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 for a significant upgrade performance with minimal impact in time and operation.
- The advanced treatment of a FAST system allows for innovative reuse and recycling of precious water resources.
- Aerated ponds and lagoons can be enhanced with the addition of a specially configured FAST system 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.
- For over 40 years since the first FAST installation aboard the river towboat M/V Missouri, tens of thousands of FAST® systems are 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, what is now, Scienco/FAST 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® (available 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 and engineered into many product lines, the FAST technology is 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.

DID YOU KNOW?

FAST® processes raw, unscreened sewage as it is produced - FAST units are capable of handling any combination of blackwater, graywater, ground food waste, freshwater, seawater, vacuum toilets and conventional toilets. No macerators, grinders, pretreatment or flow equalization tanks are required. The process is very turbulent and the airlifts used for oxygen transfer throw foreign objects to the sides of the tank where they will not interfere with the process.

Clogging in everyday operation is virtually impossible - There are no moving parts in contact with sewage, no filters, membranes or fine pore aerators to blind or plug.

FAST effluent meets any known marine standard worldwide - FAST units provide outstanding effluent quality without any filters or membranes. Consider official testing under three separate regulations over a 33 year span and with standard production units:

Parameter units	BOD5 mg/l	TSS mg/l
Canadian Great Lakes		
Official Test Results	5.3	2.76
Effluent Requirement	50	50
US Coast Guard 33CFR159		
Official Test Results	3.2	4.2
Effluent Requirement	n/a	150
MEPC.159(55)		
Official Test Results	4.1	5.8
Effluent Requirement	25	35
Definitions		
BOD5 - 5 day biochemical oxygen demand		
TSS - total suspended solids		

FAST is not adversely affected by light loading - Many biological processes are upset by light loading. The only effect on FAST is that the effluent quality is even better.

FAST starts up in half the time - FAST starts up much faster than conventional suspended growth processes. Also, FAST is self-starting without powdered bacteria or activated sludge from another sewage treatment plant. In the real world, all biological processes are upset from time to time. FAST handles these quickly and automatically and no operator intervention is required.

FAST produces the minimum amount of sludge possible - All processes capable of removing pollutants to meet MEPC.159(55), US EPA and other secondary effluent standards produce a residual sludge that requires separate disposal - that is, all processes that do not employ dilution to meet standards.

FAST process supports a more complex microbial culture than conventional suspended growth systems. Higher ordered microorganisms predate upon simpler microorganisms and reduce the mass rate of sludge accumulation by one-third or more. At the same time, FAST sludge is up to three times more concentrated than that from suspended growth systems of all types (including MBR's). In volumetric terms, the net result is a rate of sludge accumulation of about 2/3 X 1/3 = 22% that of other processes.

FAST units set up for MEPC.159(55) or secondary treatment incorporate two to three month's internal sludge storage. The accumulated sludge can eventually be pumped out at sea, incinerated or transferred to a separate tank for efficient disposal.

FAST units are more compact - FAST® is truly a state of the art process. Operating weight is less than half that of comparable biological units.

FAST handles the entire range of shipboard applications - The smallest FAST units are sized to handle harbor tugs and individual homes. The biggest systems so far handle 195,000 gpd from 1,750 persons aboard a cruise ship and 1,500,000 gpd from a municipal system at Tokoroa, New Zealand.

FAST units are built to last - Steel tanks are designed to meet ABS Deep Tank standards. This provides a strong foundation for a superior coating system.

Many FAST units remain in everyday marine and offshore service after 30 years of continuous operation. When requirements change, these units can be and are updated at minimal cost.

FAST units can be upgraded - With such long service lives, older FAST units can be and are upgraded to meet the latest regulations when so required. Although the process technology is state of the art, the components are simple and economical.

FAST units can be integrated with vacuum collection machinery, standard tank dimensions can be modified to fit a particular space and the FAST process can be built into ship's tanks when no space is available for factory-built units.

Special and custom designs are fully certified by USCG. The largest single marine system to date handles 195,000 gpd from 1,750 people.

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866-652-4539 • www.sciencofast.com

Scienco/FAST and Bio-Microbics Product 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 (SASO) • NSF/ANSI Standard 40 & 245 for MicroFAST 0.5, 0.75, 0.9, and 1.5