

**SCIENCO/FAST**<sup>®</sup>  
a subsidiary of BioMicrobics, Inc.



**BioBarrier**<sup>®</sup>  
**Marine MBR**<sup>®</sup>  
MEMBRANE BIOREACTOR

Long service life with minimal maintenance



Certified to ABS, EPA, USCG, & IMO Standards for vessel compliance



Remove 99.9% of contaminants from wastewater with no chemicals

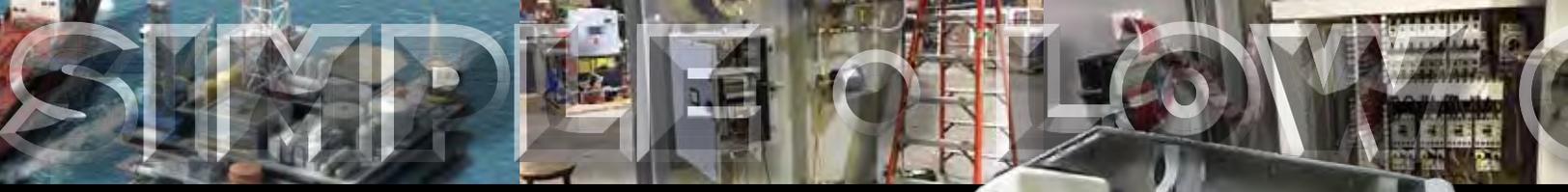


**AWARD-WINNING  
INTEGRATED WATER  
TECHNOLOGY**

**ADVANCED MARINE WASTEWATER TREATMENT  
WORKBOATS • CRUISE/FERRIES • SHIPS • OFFSHORE**

**BETTER WATER. BETTER WORLD.®**

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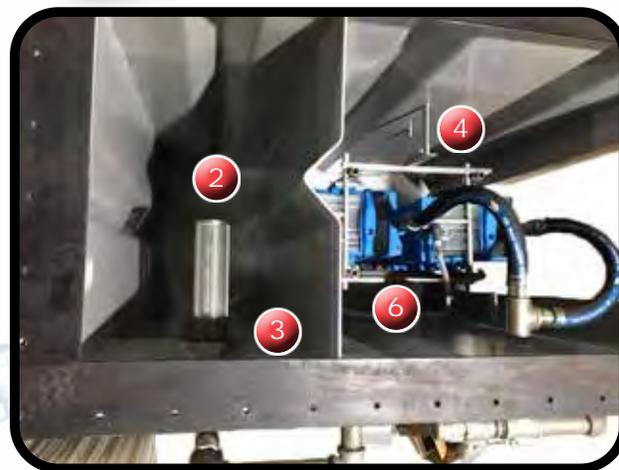
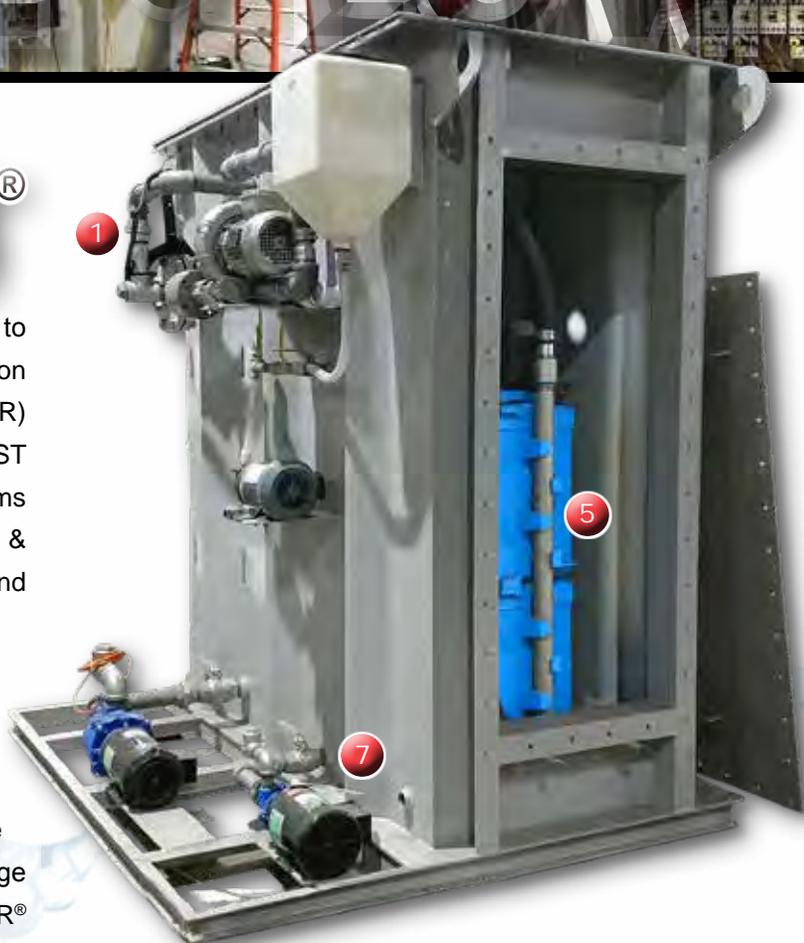
# BioBarrier<sup>®</sup> Marine MBR<sup>®</sup> MEMBRANE BIOREACTOR

Certified by the USCG 33CFR159 Standards and to International Maritime Organization (IMO) resolution MEPC.227(64), the BioBarrier<sup>®</sup> Marine MBR<sup>®</sup> (MMBR) joins the MarineFAST<sup>®</sup> product line of Scienco/FAST to provide effective wastewater treatment systems for Naval architects & Engineers, maritime owners & operators, chief engineers, and shipyard operation and maintenance crews.

With its long performance history of providing the affordable, adaptable, and proven FAST<sup>®</sup> Systems, Scienco/FAST offers a higher treatment option with MBR (Membrane BioReactor) technology to remove 99.9% of the pollutants and contaminants found in sewage sources on the vessel. The BioBarrier<sup>®</sup> Marine MBR<sup>®</sup> uses an advanced process that acts as an impenetrable physical barrier for nearly every common pollutant found in wastewater.

## HOW IT WORKS!

- 1 Each factory-built unit contains its own flow-equalization so that raw unscreened sewage can flow directly into the unit as it is produced.
- 2 One or more 316SS wedgewire screens protect the membranes from accumulations of destructive filamentous materials.
- 3 A large screenings tank and associated screenings pump collect, store and remove the accumulated screenings.
- 4 The screened sewage is subjected to aerobic activated sludge treatment. Specially designed aeration grids clean the membranes as they introduce oxygen into the tank contents.
- 5 The membranes remove all solids and bacteria so that the discharge of the filtrate pumps is suitable for overboard discharge without any need for disinfecting chemicals, UV sterilizers or other gadgets.



Top down view of BioBarrier<sup>®</sup> Marine MBR<sup>®</sup> system showing inside the tank

- 6 The filtrate pumps are submerged and simple, reliable to vacuum-draw the water through the 0.3 micron pores of the Membranes.
- 7 Excess activated sludge is automatically removed from the membrane tank for external storage and disposal. One very effective way to do this is to return this sludge to a primary sewage collection tank. This also reduces the organic loading on the membranes resulting in extended service intervals.



## Advantages of the BioBarrier® MarineMBR®

*Ideal for total blackwater/  
greywater sources and water  
reuse onboard boats, ships,  
yachts, ferries, and more!*

The BioBarrier® MarineMBR® (MMBR) is the result of over 15 years of on-site testing, monitoring and development.

The system is incredibly flexible, with standard factory-built modules that can be combined with each other and with ship's tanks to adapt to the requirements of any vessel or offshore structure:

1. Certified Type II marine sewage systems assembled, wired and tested at the factory before shipment.
2. Can be paralleled to provide greater flow capacities.
3. Units can work with the primary collection tank to reduce organic loading, extend service intervals and store residual sludge.
4. Filtrate (effluent) pump on each unit can easily be isolated and operates continuously without inconvenience or delay.
5. Can be installed in ship's tanks without the factory-built tanks.
6. Ultrafiltration occurs to filter out bacteria and viruses.
7. Autonomous operation with PLC.

8. All pumps are "dry-pit" and can be reached and serviced outside the tank.
9. Factory-built tanks are built to ABS deep tank standards with superior coating systems and protection against corrosion both inside and out – built like a battleship.
10. Consider the Service Intervals on TABLE 1.

**TABLE 1: Service Intervals**

OPERATION	UP TO
Blower inlet filter	3 months
<b>Membranes</b>	
Clean in place (CIP)	14 months
Forward soak	5 years
Replace	12 years
Pump out screening tank	6 months
Clean wedgewire screen	2 years
Check membrane tank MLSS	6 months



AMERICAN  
BUREAU OF  
SHIPPING



CERTIFICATION OF  
COMPLIANCE WITH  
33 CFR 159 – Type II MSDs



IN ACCORDANCE  
WITH IMO RESOLUTION  
MEPC.227(64)

### BioBarrier® MarineMBR® Rated Capacities – ENGLISH UNITS (US gal, lb)

MMBR MODEL	1.0	2.0	3.0	4.0	5.0	6.0	7.0
Number of tanks	1	1	1	1	2	3	4
Hydraulic limit gpd*	700	1400	2800	4200	8400	12600	16800
Organic limit BOD5 lb/day	2.2	4.3	11.5	17.2	34.4	51.5	68.7

#### RATED CAPACITIES LIVE-ON PERSONS

Vacuum blackwater only @ 3 gpcd	43	87	229	344	687	1031	1375
Conventional blackwater only @ 11 gpcd	43	87	229	344	687	1031	1375
Vacuum blackwater plus personal washwater @ 16 gpcd	33	66	174	260	521	781	1041
Vacuum toilets plus all greywater @ 36 gpcd	17	35	78	117	233	350	467
All domestic sewage with vacuum toilets @ 44 gpcd	12	24	64	95	191	286	382

### BioBarrier® MarineMBR® Rated Capacities – METRIC UNITS (m<sup>3</sup>, kg, liters)

MMBR MODEL	1.0	2.0	3.0	4.0	5.0	6.0	7.0
Number of tanks	1	1	1	1	2	3	4
Hydraulic limit m <sup>3</sup> /d*	2,7	5,3	10,6	15,9	31,8	47,7	63,6
Organic limit BOD5 kg/day	1,0	2,0	5,2	7,8	15,6	23,4	31,2

#### RATED CAPACITIES LIVE-ON PERSONS

Vacuum blackwater only @ 11 lpcd	43	87	229	344	687	1031	1375
Conventional blackwater only @ 42 lpcd	43	87	229	344	687	1031	1375
Vacuum blackwater plus personal washwater @ 61 lpcd	33	66	174	260	521	781	1041
Vacuum toilets plus all greywater @ 136 lpcd	17	35	78	117	233	350	467
All domestic sewage with vacuum toilets @ 167 lpcd	12	24	64	95	191	286	382

\*For higher flows, please consider our MarineFAST® USCG & IMO certified Type II Marine Sanitation Devices (MSDs).



With decades of history unlike any other, the origins of SCIENTO® & FAST® can be traced back to the 1940's in St. Louis, MO for water and salt management systems. In 1981, Scienco/FAST combined to produce internationally recognizable top-quality water, wastewater,

and maintenance products focused on marine, commercial food and beverage, and agricultural market treatments with top-notch field services. SCIENTO®'s current commercial product lines combine proven performance with long-term reliability and many low-cost options.







### Certified, Advanced Marine Wastewater Treatment

After the first system installed in 1969, today's MarineFAST® (LX-, M- & MX-, & DV-Series) Type II Sewage Treatment Systems have developed into the most reliable system on the market.

Since the 1970's, almost all have remained in continuous operation and compliance with minimal maintenance. The MarineFAST® provides long-term performance for the life of the vessel!