ADVANCED FILTERS FOR BALLAST WATER TREATMENT
About Filtersafe®

Our challenge
Filtersafe® is a multinational company specializing in the supply and evolution of intelligent mechanical filtration systems for industry. With over 60 years experience in the automatic filtration industry, and over 10 years experience specifically in ballast water treatment, Filtersafe® brings unrivalled economy, value and performance to seawater filtration.

From improving component technology through to the provision of dedicated pre- and after-sales service, Filtersafe® provides a viable, functionally superior and low-cost alternative to the market.

Our solution
We are one of the very few companies to have specifically responded to the challenge of developing self-cleaning automatic filtration solutions for Ballast water.

Focusing solely on pre-filtration for BWT systems, Filtersafe® is established as the market leader in ballast water filters. Our proven technologies are world renowned for their unparalleled performance and durability.

Our technology
Filtersafe® automatic screen filters utilize unique, patented and leading edge technologies to ensure the high performance criterion the market demands are met.

Our filters harness our own market-proven smartweave® filter screens and nozzler® proximity suction nozzles. The sum of these technologies amounts to EverClear® - our autonomous self-cleaning filtration cycle.


Filtersafe® instills confidence in ship owners and operators

- Reliable, durable and with proven performance - every time.

Filtersafe® advantages for owners & operators

- Lower ballast tank maintenance
- A shorter ballasting process
- Reduced overheads
- Trustworthy technology
- Tailored solutions
- Real energy savings

filtersafe

Our smartweave® screen technology ensures minimal sediment intake to the disinfection process and ballast tanks.

nozzler® self-cleaning cycle for maximum filter efficiency, improved flow rate and shorter ballasting process.

Use of highly durable, noncorrosive components for robust trouble-free operation, requiring minimal maintenance.

Filtersafe® filters are reliable and durable. Our 250+ commissioned filters have consistently performed without delay.

Tailor made design for optimal installation solution in both retro-fit and new-build applications.

Lower operating pressure capability (1.6 bar) means lower ongoing energy costs.
EVERCLEAR™

At the heart of every Filtersafe® filter lies an advanced automated filter cleaning sequence in EVERCLEAR™. Its success largely revolves around a set of uniquely crafted and patented technologies:

- **smartweave™** high performance filtration screens
- **nozzlex™** proximity nozzles

The exclusive combination of these technologies enables EVERCLEAR™ to deliver unparalleled filtration performance under even the most strenuous water conditions.

**1.6 BAR minimum operating pressure**

Only nozzlex™ proximity nozzles have the capability of sustained operations as low as 1.6 Bar (22psi) head pressure.

Even at such extreme pressures, nozzlex confidently cleans 100% of the screen ensuring uninterrupted filter operation without any risk of ‘blindness’.

**EVERCLEAR™ ensures optimum flow rates and filtration performance where others fail.**
Filtersafe® smartweave™ multi-layered sintered screen is a unique and exclusive weave-wire mesh specifically designed for ballast water that enables our BS-Series filters unparalleled zooplankton, phytoplankton and sediment removal rates.

- Trustworthy filtration
- Class-leading performance
- Enhanced strength & durability

Multi-layered sintered structure
smartweave™ is comprised of four stainless steel weave-wire screen layers. The unique composition of weaves are then sintered together to create a strong, durable, reinforced filtering element requiring no additional support.

Available screens
- Mesh size: 15, 20, 25, 40, 50, 68, 100, 138, 200, 300, 500

Premium materiality
smartweave™ sintered screens are offered in two types of stainless steel:
- 316L, for standard applications.
- 904L Duplex SST, for high-corrosion resistance and prolonged filter use.

The original weave-wire screen tailored specifically for challenges of seawater filtration.

Leading Filtration Performance
In conjunction with our research partners and customers, Filtersafe® has tested and perfected the performance of the smartweave™ screen over the course of the last decade.

96% Removal of zooplankton (>50 micron)
50% Removal of phytoplankton (10<50 micron)
98% Removal of total suspended solids (TSS)

<table>
<thead>
<tr>
<th>Screening Process</th>
<th>2500 ppm</th>
<th>2500 ppm</th>
<th>2500 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydroclone</td>
<td>3%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Disc filters</td>
<td>3%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Wedge wire candle filters</td>
<td>3%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>smartweave™</td>
<td>98%</td>
<td>98%</td>
<td>98%</td>
</tr>
</tbody>
</table>

Removal of Zooplankton
Removal of Phytoplankton
Removal of Total Suspended Solids

*Micron rating according to ISO 4782 & SAE/ARP 901 standards
Filtersafe® technology.

**nozzlex**
suction scanning technology

Filtersafe® nozzlex™ efficiently and effectively remove organic matter from the filter screen without having to halt system operation.

- Patented mechanism
- Unparalleled performance
- Absolute cleaning of screen
- Zero wear on filter screen

Patented class-leading technology

nozzlex™ actuates a passive pressure on the filtration screen and will always be in the position to best clean the filtration screen.

The regulated, passive and consistent suction force covers less than 1% of the screen area translating to more water being filtered whilst the EVERCLEARTM automatic cleaning cycle continues to perform.

100%

absolute cleaning of the smartweave™ screen.
Everytime.

Zero screen wear

Where other nozzle-based cleaning technologies utilize often detrimental mechanical force (often pushing TSS against the screen causing punctures).

nozzlex™ equalizes system pressure and ensures an optimal amount of force is activated on the screen.

Force exerted on screen by nozzles

What does this mean?

1. An increase in force means more wear of nozzle head leading to shorter maintenance cycles.
2. The increase in force also pushes sediment into the filtration screen puncturing the fine screen and rendering it significantly less productive.
3. nozzlex™ is designed and proven to have no impact on the performance of the screen due to our consistent but low force applied to the screen.

Substantially better performance from Filtersafe™ when compared to other filtration systems

After just 6 hours of operation, other technologies suffer a substantial loss in performance with virtually no ability to reclaim original flow rates.

Filtersafe® filters will continue to work to specification.

UP TO 1/32nd

of the strenuous force exerted on the screen compared to other suction scanning technologies.

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Flexibility in Design & Installation

Our filters have the flexibility to be configured in a variety of positions and spatial arrangements.

The vertical filter configuration operates in the exact same manner as a horizontally positioned unit and to the same performance standard, whilst substantially reducing its area footprint.

Custom Pressure Vessel Design

Filtersafe® offers explosion proof (EX) and pneumatically operated models. We also have experience in delivering ASME & PED-standard pressure vessels.

Tailored filtration solutions.

Modular Design

The BS-Series’ modular design allows for numerous configuration options and is particularly helpful in retrofit installations.

Ancillary Design Features & Accessories

- Non-return valve
- Back flow protection
- Flow control valve
- Wafer type balancing valve
- Epoxy phenol - dry coating
- Multi-stage zinc-phosphate, electrostatic treatment conforming to international standards including (ASTMB-117)
- PLC controller
- Standard ATEX/EX
- Custom system integration

- Suction sludge pump
- For low operating pressures
- AR1 air release valve
- Non slam double acting valve
- Sigma Shield - Wet Coating
- Multi-stage zinc-phosphate, electrostatic treatment conforming to international standards including (ASTMB-117)
Market leading R&D.

Being a pioneer of the BW filtration, Filtersafe® is in constant pursuit of finding added value & benefit.

Filtersafe® stays ahead of the rest by adopting new, advanced and polished technologies and solutions. Our ever evolving R&D program ensures our filters are best equipped to meet the stringent needs of ship owners and operators.

Research partners

In conjunction with our research, Filtersafe® has tested the performance of its automatic screen filters to meet the rigorous demands of all marine industry standards.

Through scientific development, we have been able to implement some unique technological breakthroughs, including:

• Epoxy phenol corrosion prevention
• High flow rate models
• Refined water-saving mechanisms
• Spacial efficiencies in service zones
• smartweave™ sintered screen technology
• nozzlex™ proximity nozzles

Proven record in ballast water

For over a decade Filtersafe® has been specializing in ballast water filtration applications, bringing an unrivalled economy, value and environmental responsibility to seawater filtration.

Our experience and know-how, backed by our superior technology, has enabled us to forge long-lasting and robust commitments to our customers.

Filtersafe® has supplied more than 270 filters (commissioned) to the emerging BWT market representing over 350,000 m³/hr.

Excellence through experience.

Hundreds of filters now commissioned and serving the worlds oceans without a single operational failure.
Our Certified Filters

Filtersafe®’s BS-Series filters have attained independent class certification (approval status) from leading maritime classification societies around the world including Germanischer Lloyd, Lloyd’s Register & DNV.

Our products are manufactured according to international performance and quality standards (ISO 9001:2008, DNV 2009) giving you the confidence to rely on every filter we supply.

Global Service Network

Filtersafe® supplies to a multitude of ballast water treatment companies worldwide and currently services all major international markets from its offices in Israel, Hong Kong, Singapore, Beijing & Hamburg.

Our highly trained staff, with years of experience in the ballast water market, are on call year round to ensure first-class support is offered anywhere around the globe.

Whilst our operations are headed out of Israel, Filtersafe® has a second world-class manufacturing facility in Shende, China.
Regional Office, Manufacturing & Assembly

ISRAEL
A 4000 sq/m premises comprising our regional sales offices, R&D facilities and manufacturing/assembly hall. The facility is capable of handling very large volumes of production in line with market growth.

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*All flow rates are for 25, 40 & 50 micron, Max 50 PPM dirt load.
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