hybrid sewage treatment plant

VST series

VOYAGÆR auxiliary equipment

introduction



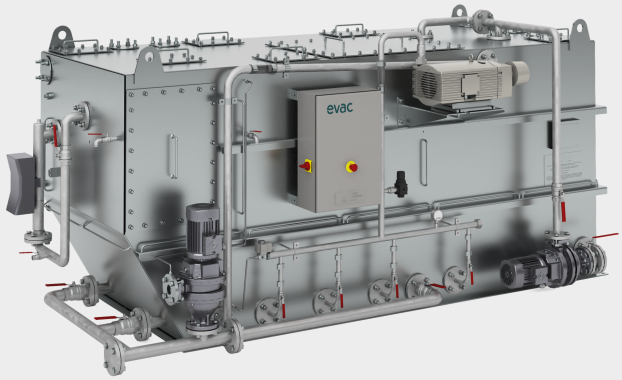
advanced sewage management
future proof your fleet

As global environmental regulations tighten across international waters, maritime operations require wastewater treatment systems that are uncompromising in performance, reliability, and efficiency. The VST sewage treatment plant is engineered to meet these exacting demands, delivering unsurpassed ecological protection for commercial vessels and offshore platforms through a proprietary hybrid treatment architecture.

a superior solution
pioneering hybrid treatment technology

The VST series is the premier domestic marine sewage treatment system to seamlessly integrate advanced biochemical processing with state-of-the-art electrolysis.

This hybrid approach ensures maximum breakdown of organic pollutants while maintaining an ultra-compact footprint that outperforms conventional biological systems in its class.



key engineering innovations

Patented Double A/O Cycle:
Our highly efficient biochemical architecture maximises the engagement of both aerobic and anaerobic bacteria. This dual-cycle configuration aggressively eradicates complex organic matter and harmful substances without requiring excessive tank volume.

Graphene-Enhanced Flat-Film MBR:
Utilising an industry-first graphene material formulation, our membrane bioreactor (MBR) modules feature superior anti-bacterial and anti-fouling properties, ensuring uninterrupted flow and exceptional effluent clarity.

Advanced Silicon-Anode Electro-Catalysis:
Moving beyond traditional chemical treatments, the VST series employs a groundbreaking silicon anode design. This allows the system to execute complete electrochemical reactions natively, entirely eliminating the need for supplementary electrolytes.

scan here for our digital contact card

VST series

VOYAGÆR auxiliary equipment

hybrid sewage treatment plant

Managing an auxiliary system shouldn't add to your crew's workload. Voyagaer sewage treatment plants features a PLC paired with a smart touch-screen telemetry dashboard, putting total control at your fingertips.

operational advantages:

The VST series is engineered to minimise total cost of ownership while maximising onboard reliability.

By addressing the most common pain points of marine wastewater management, the system delivers tangible benefits to both the balance sheet and the engine room crew.



driving efficiency at sea

Low OPEX operation
Traditional treatment plants require the continuous procurement, storage, and manual handling of hazardous chemical consumables. By leveraging our pioneering silicon-anode electro-catalysis technology, our sewage treatment plants achieve complete electrochemical reactions natively. This eliminates the need to dose supplementary electrolytes, drastically reducing ongoing operational expenses (OPEX) and removing chemical storage liabilities from the vessel.

Exceptional black water load resilience
Marine sewage systems frequently struggle with fluctuating hydraulic and organic loads. The patented double A/O (Anaerobic/Oxic) cycle provides a highly robust biological buffer. This ensures the system maintains peak breakdown efficiency even during sudden spikes in high-concentration black water loading, preventing system crashes and ensuring continuous, stable effluent quality.

Significantly reduced crew intervention
Engine room hours are a premium resource. The integration of an advanced MBR booster actively manages membrane integrity and prevents sludge buildup. By extending the operational lifespan between flat-film cleaning cycles by up to 300%, the VST system transforms wastewater management from a labor-intensive chore into a largely autonomous background process.

Optimised engine room footprint
Space and weight constraints are critical in maritime engineering. By maximising the reaction efficiency of both the biological and electrolytic stages within a single, integrated architecture, the VST plant achieves an industry-leading volume-to-capacity ratio. This ultra-compact footprint allows for seamless retrofitting in tight machinery spaces and frees up valuable tonnage for new vessel builds.

Future-proof regulatory compliance
Effluent non-compliance can result in severe fines and vessel detention. The VST series is rigorously engineered and type-approved to comfortably exceed the stringent parameters of IMO MEPC.227(64). The highly stable graphene-MBR filtration guarantees exceptional effluent clarity, providing absolute peace of mind for operators and owners alike.

scan here for our digital contact card

VST series

VOYAGER auxiliary equipment

sewage treatment plant capacities

Voyager's VST series is engineered across a spectrum of scalable capacities to accommodate the specific hydraulic and organic loading requirements of diverse maritime operations. Whether outfitting a compact offshore support unit or calculating the black water processing requirements for a commercial vessel, selecting the correct model ensures optimal biological efficiency, regulatory compliance, and spatial economy.

VST Series	HYDRAULIC LOAD	ORGANIC LOAD	PERSON ON BOARD
	litres/day	kgBOD5/day	black and grey water *estimates
1.5K	1500	0.75	5
2.1K	2100	1.05	10
4.5K	4500	2.25	20
7K	7000	3.5	30
10K	10000	5	45
15K	15000	7.5	70
20K	20000	10	95
25K	25000	12.5	120
35K	35000	17.5	160
40K	40000	20	190
50K	50000	25	235
60K	60000	30	280
70K	70000	35	330

* plant / person on board estimates are based on 210 litres per person per day, BOD_5 are calculated using an estimated mean value of 0.06 kg per person per day.

vacuum ready: system and accessories



A marine vacuum collection system is an advanced wastewater conveyance network that utilises negative atmospheric pressure to transport black and grey water from vessel sanitary fittings to a centralised treatment plant. Unlike traditional gravity-fed plumbing, which relies on downward slopes and high fluid volumes, vacuum systems provide unparalleled engineering flexibility and operational efficiency for modern commercial vessels and offshore platforms.

Water conservation: Vacuum toilets require significantly less flush water—typically around 1.2 liters compared to 8+ liters in gravity systems. This directly reduces the total hydraulic load placed on the vessel's freshwater generators; and the required holding tank volumes.

Architectural flexibility: Because wastewater transport is driven by differential pressure rather than gravity, the network utilises smaller-diameter piping that can be routed upwards, around bulkheads, and across varying deck levels. This saves critical weight and simplifies installation during new vessel builds or retrofits.



Enhanced hygiene and odor control: The continuous negative pressure within the piping ensures that in the event of a mechanical breach, air is drawn into the system rather than wastewater leaking out. This absolutely contains noxious odors and prevents hazardous bio-spills.