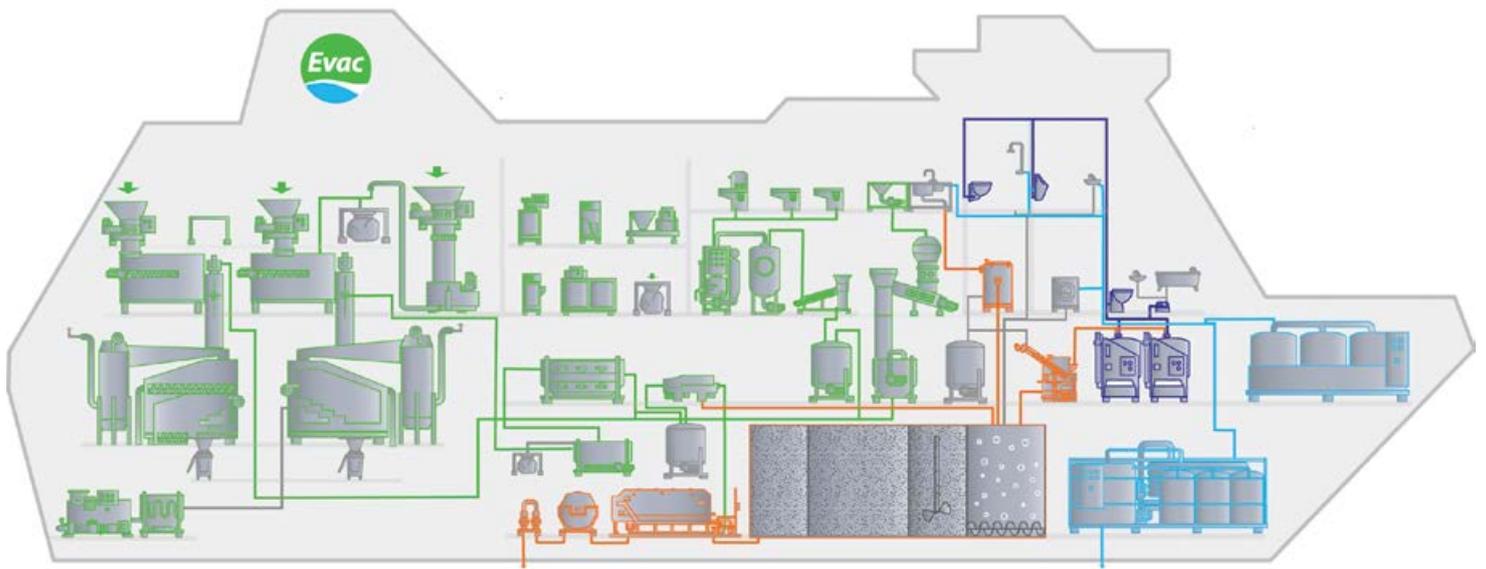


innovations

Focusing on innovation in the global cruise industry

Cruise ship boom benefits Evac



Vacuum collection



Wastewater treatment



Dry and wet waste treatment



Fresh water generation



Systems automation

Special Report
International Cruise Ship Industry

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How to control diverse waste on board cruise ships

Thanks to a moving bed biofilm reactor (MBBR) technology, shipowners increasingly choose Evac to outfit their ships.

MBBR isn't the most often used acronym in the cruise business, but may be someday soon, the company claimed.

They are on board wastewater treatment plants that enable ships to purify wastewater by oxidation and entrapment of organics. In the simplest terms, MBBR technology allows ships to meet land-based standards for wastewater treatment.

"MBBR allows a ship to operate without limitations," said Evac's Senior Process Specialist, Jari Jokela. "With Evac MBBRs, ships may operate in many Environmentally Sensitive Sea Areas (ESSAs) and Special Areas (SAs) defined nationally or internationally, where special discharge restrictions apply."

'Complete' means 'savings'

The company has launched a five-system package - Evac Complete Cleantech Solution - which is a total waste and wastewater management initiative. It includes dry and wet waste treatment systems, an incinerator, a recycling equipment covering glass, plastic, paper, cardboard and aluminium waste, plus food waste vacuum systems, a bio-sludge treatment unit, plus vacuum collecting systems, which include vacuum units and vacuum toilets.

"By 'complete' it also means you get the benefits from the integrated and cost-effective operation of

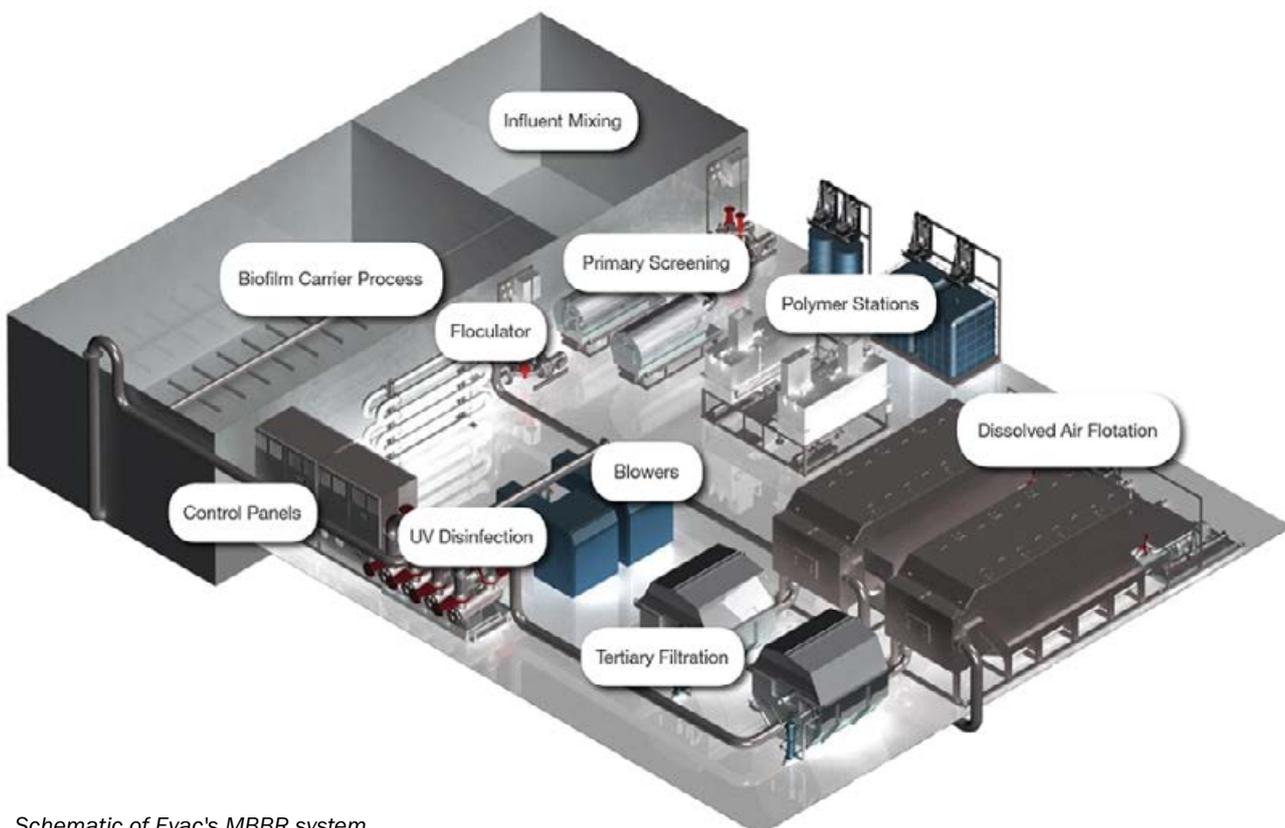


Evac's CEO Tomi Gardemeister is benefiting from more orders from the cruise ship sector.

the systems," explained Jokela. "Our total system is simpler than competitive systems. It uses fewer process units and it's easier to operate."

For example, competitive systems require three different chemicals for precipitation. Evac's system requires only one. "We also offer one control system to take care of it all," added Jokela, "which frees the ship operator from the headache of having to manage three to four interfaces between earlier systems."

"Evac also eliminates the issue of compatibility of systems between multiple suppliers," claimed Jokela. "Our Evac Complete Cleantech Solution means service is available from one point of contact."



Schematic of Evac's MBBR system.

A big part of ship operation responsibilities are handed over to Evac.”

Jokela also pointed out that savings come from two sources: “On the waste side there are cost savings. But from the wastewater system you also save significantly on operational costs.”

Who’s benefiting?

Evac Complete Cleantech Solution is claimed to be the choice of navies, coast guards, offshore operators, and cruise lines. For example, during the first quarter of this year, Evac’s backlog value grew 60% versus the previous year.

In April 2016, Evac announced a contract valued at over €10 mill for three large-scale cruise vessels with an option for another. The business was won specifically due to Evac Complete Cleantech Solution covering integrated waste and wastewater management, the company said.

“There are shipowners out there for whom energy consumption is so important that they require their new ships to be a certain percentage more efficient than previous ships,” said Jokela. “Evac’s long-term approach to product development has enabled us to minimise overall energy consumption by, for exam-

ple, adding sensors and frequency converters to the process control. We’re very good when it comes to energy efficiency, and that’s one reason we’re winning these jobs.”

Evac’s success has come because of the company’s different way of working, according to Mika Karjalainen, Evac’s Chief Operating Officer. “We constantly invest in product development with energy efficiency and environmental protection in mind.”

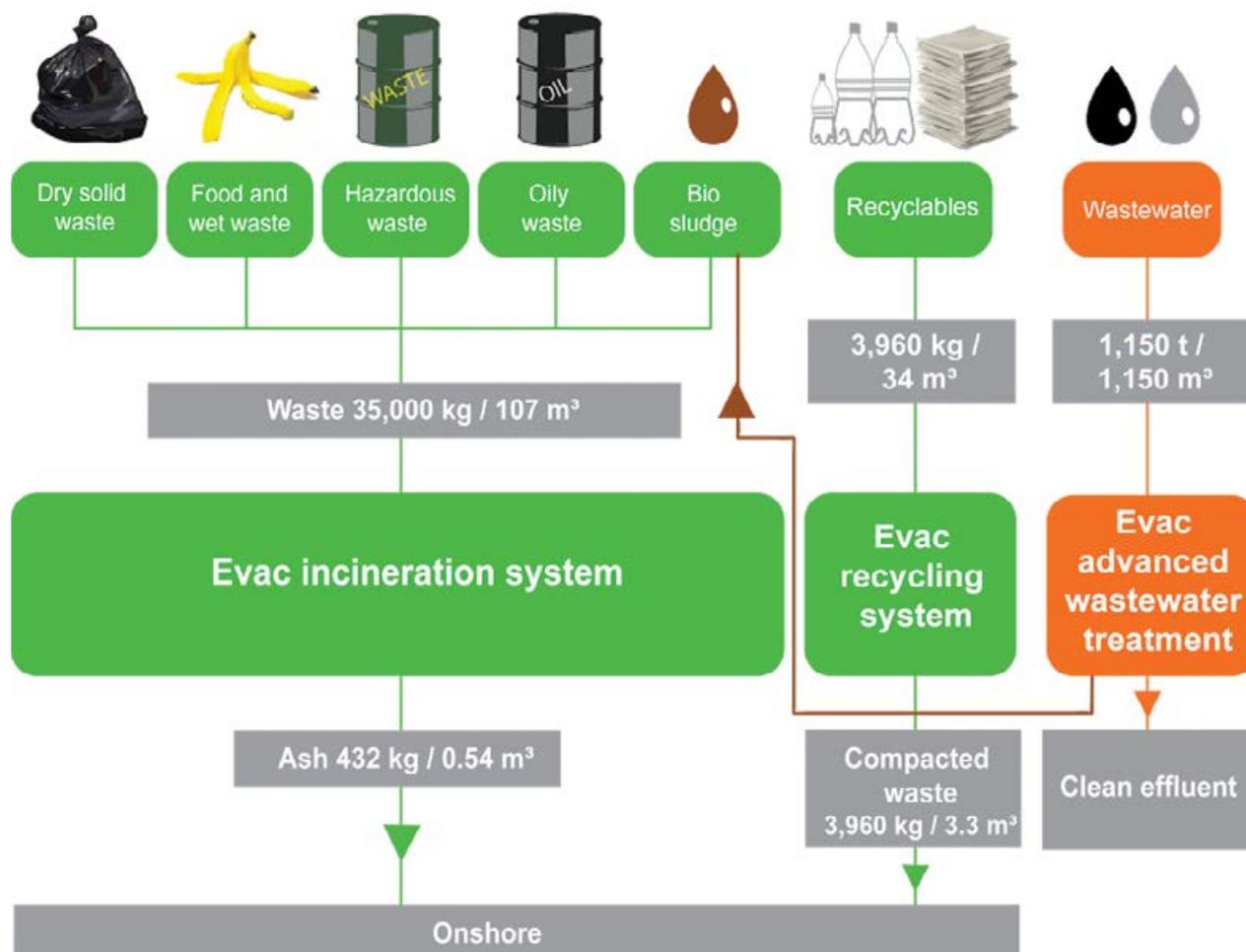
Karjalainen said the waste treatment system is the latest state of the art technology, and it’s one which has benefited from continual investment in research and development.

“If we have a secret weapon,” he said, “it’s that we don’t fear going outside. Evac always uses the best expertise available in the world through networking with the best specialists in the industry. And our customers see the benefit.”

Ferry installation

Earlier, the company announced that the Evac Complete Cleantech Solution is to be installed on board ‘Megastar’, the new generation LNG-powered shuttle ferry under construction for the Tallink Grupp.

The ferry is being built at the Meyer Turku Yard shipyard and is due for delivery at the beginning of



The amount of waste from a cruise ship can clearly be seen from this diagram.

2017. She will operate on the Helsinki and Tallinn route and will be able to carry a maximum of 2,800 passengers.

Green values, reduction of all emissions, minimising the amount of waste and increasing recycling use, were very carefully taken into account in the design of the ferry, Evac said. The ship will use LNG as fuel and as a result, she will comply with the new and stricter emission regulations for the ECA areas, including the Baltic Sea.

The company said that it had benefited from the booming cruise industry directly with 40% annual growth. Nearly 23 mill passengers are expected to take a cruise in 2016 and cruise lines are currently ordering new vessels for deliveries during the 2018 to 2026 period.

In 2015, Evac's turnover grew 40% to €98 mill, thanks primarily to large cruise, navy, coast guard, and offshore contracts.

In the first quarter of 2016, Evac won two cruise projects, including Evac Complete Cleantech Solution covering the integrated waste and wastewater management systems for a total of seven cruise vessels. The total value of these projects was about €40 mill.

"The cruise industry continues to grow," says Tomi Gardemeister, Evac CEO, "and its growth means great things for the state of the art cleantech marine products that Evac provides."

Evac systems purify wastewater to 99% clean effluent and 1% sludge that can be burned in Evac incinerators. Evac vacuum toilets consume only 1.2 litres of water per flush versus 3 - 10 litres consumed by traditional gravity toilets. With an average cruise passenger flushing a toilet 10 times per day, Evac systems save a typical vessel a minimum of 59,000 litres of water per day.

"Evac's competitive edge is our ability to offer in-house product development, product testing, constant product development, plus the largest product offering on the market. Unlike our competitors, Evac answers all our customers' waste, wastewater and water management systems needs, significantly simplifying project management and systems integration," said Karjalainen.

Thus far, the company has undertaken more than 20,000 marine and 2,000 building projects worldwide. Evac has employees in Brazil, China, Finland, France, Germany, South Korea, Norway and the US, and also has representatives in more than 40 other countries.

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