

### Small details count on the high seas



Wärtsilä is the leading global supplier of total marine power and propulsion systems and related services for all types of commercial vessels, naval craft and offshore applications. In total, Wärtsilä employs over 8000 people worldwide.

Designing and constructing marine engines is one of the biggest challenges a manufacturer can face. As well as meeting tough demands for accessibility and output, the engines must be able to withstand huge stresses, depending on the load and climatic conditions. And space is a critical variable — the more compact the engine, the more space there is for cargo, and the simpler it is to carry out maintenance.

Efficient oil cooling in a compact format

Wärtsilä redesigned its W20 engine with the overall aim of creating an even more compact marine diesel, with increased performance and versatility. The engine would be equipped with flexible turbo locations and automatic cartridgeless filters, and the oil cooling function would be improved. Efficient oil cooling improves lubrication properties and

extends the engine's service life. "We were looking for increased oil cooler capacity, and more flexible arrangements for oil and cooling water," says Matti Vaarasto, Manager Ancillary Systems at Wärtsilä. "We also wanted better modularity, and standardization across different cylinder configurations."

Previously, Wärtsilä had used shell-and-tube oil cooling, but the new specification required higher cooling

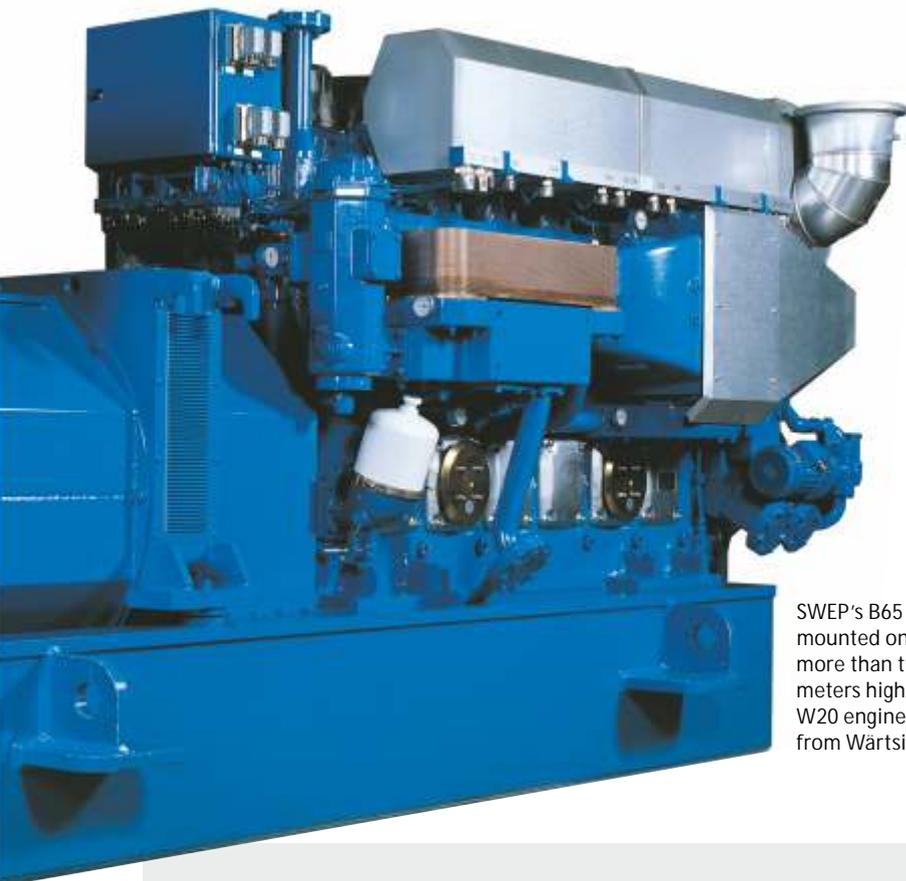
capacity. This would have implied an even larger shell-and-tube exchanger. However, an extremely compact solution was achieved by integrating a space-saving SWEP BPHE with the engine.

Close cooperation between Wärtsilä and SWEP

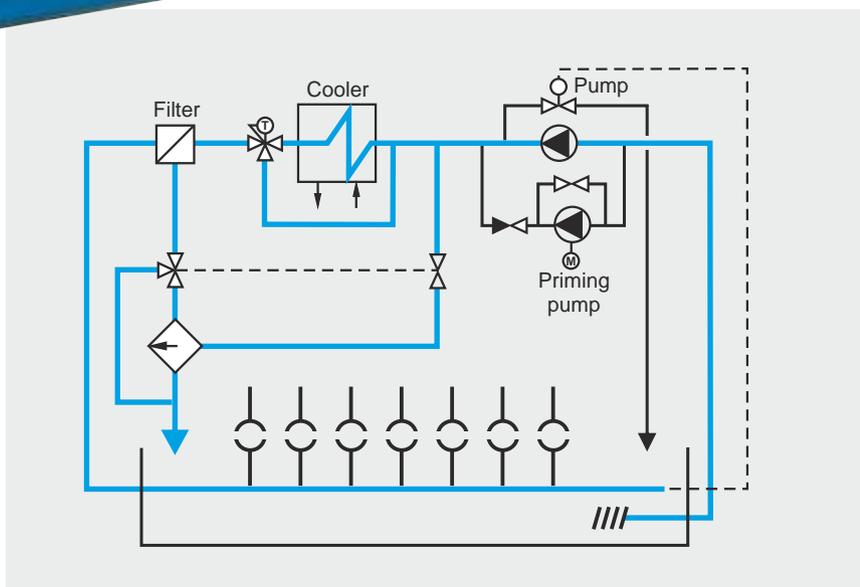
"We started working closely with SWEP in 1998," says Lasse Rintala, Component Manager, Procurement, Wärtsilä. "Early tests showed that we needed higher resistance to engine vibrations. So we cooperated closely on the development of tailor-made, vibration-resistant connections for the BPHE. The cooler base module was also modified to suit. Following successful tests on the engine, and some fine-tuning, the BPHE was released for serial production in 2000."

Wärtsilä's Matti Vaarasto says that SWEP's BPHE solution makes possible a stiff, compact cooler module: "The cast cooler base module includes integrated channels and thermostatic valves for oil and water. The same cooler base module can be used for all cylinder configurations, and we don't need a separate cooler shell. Overall, we save about 25% on the space required for the oil module, and there's more room for maintenance."

Possible further BPHE applications for Wärtsilä  
Wärtsilä's positive experiences with the W20 mean they may use SWEP BPHEs on other engines. "The new concept is helping to increase interest in our W20 engine in the demanding marine market," says Matti Vaarasto. "We believe the flexibility of SWEP's BPHE solution makes it suitable for new applications."



SWEP's B65 is mounted on the more than two meters high W20 engine from Wärtsilä.



All W20 engines are equipped with a complete lube oil system, i.e. an engine-driven main pump, electrically driven prelubricating pump, cooler, full flow filter and centrifugal filter.



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