

Better by design

Enhanced operating efficiency and processing capacity are the key drivers behind the design of a new factory trawler from Denmark-based Knud E. Hansen.

Concerns over the price of marine fuel and managing operating costs are a constant within the fishing industry, and so energy efficiency and improving operational capability are of obvious importance. Knud E. Hansen's latest 50m loa factory trawler offers an energy-efficient design along with maximised catch processing facilities. The vessel also meets DNV-SILENT-F requirements.

Preben Thuren Larsen, technical director and senior naval architect at Knud E. Hansen, tells *Ship & Boat International* that low noise radiation has been proven to have positive effects on catch sizes, particularly in shallow water and when mid-water trawling close to the surface. "The focus in the design of the factory trawler is therefore to have an effective propulsion system together with noise and vibration optimisation of all machinery to minimise noise transfer through the hull," says Larsen. This will lead to increased catch sizes and reduced fuel usage per catch. An additional benefit of the reduced fuel usage per catch is the corresponding reduction in emissions.

The Dutch design and marine consultancy has chosen an optimal overall length of 50m for this latest factory trawler design, allowing for adequate, safe working space and good standard of crew accommodation. This is in line with trends seen in vessel size across fishing fleets worldwide where Knud E. Hansen identified that many fall into the bracket of 55-60m.

According to Larsen, the operational profile for a fishing trawler requires vessels to run under a wide range of



The shape of the trawler's hull form is designed to minimise both slamming and vertical accelerations.

draughts while also running at low speeds for around 80% of the time. The nature of this method of fishing means that trawlers must maintain constant speeds while at work, even during rough weather; the remit for the trawler's

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design therefore included the ability to maintain efficiency in all sea states and at all draughts while trawling. In order to achieve this, the vessel has an optimised hull form and bow. Larsen says that the principle behind the design of the forebody and bulb area of the factory trawler is "to have effective propulsion performance at service speed combined with minimised

vertical accelerations. The shape of the forebody, in the longitudinal direction, is shaped to minimise slamming, with a relative long bulb and minimal flare. In addition, with a relatively large volume of buoyancy below the waterline, this minimises vertical accelerations."

Efficient propeller configuration

A propulsion solution that includes two low-speed, large-diameter nozzled propellers optimised for trawling speeds has been chosen for the factory trawler. Larsen says: "The most efficient propeller configuration is in principal low rotation speed together with high area of the propeller blades. As the draught sets a limit for propeller diameter, the factory trawler is equipped with two propellers, as the width of the vessel allows this. Furthermore, both propellers are equipped with propeller nozzles [which] increase thrust/efficiency at low speeds." The trawler can, however, also be fitted with a single propeller solution if desired.

The trawler features a three deck-high superstructure positioned forward of

TECHNICAL PARTICULARS

50m factory trawler

Length, overall	50.00m
Breadth	11.25m
Depth to first deck	4.50m
Depth to second deck	7.00 m
Draught, max to baseline	4.50m
Accommodation	
Crew.....	6 x single cabins, 8 x double cabins
Hospital	2 x beds
Capacities (customisable)	
Hold	700m ³
Fish processing area	300m ²
Fuel oil	250m ³
Fresh water	50m ³
Grey and black water.....	80m ³
Engine Power	
As single trawler	approx 2000kW
As pair trawler	approx 1500kW
Class designation	
.....	DNV *1A1 Stern Trawler
.....	ICE-C EO SILENT-F, or similar

amidships and has two continuous decks, one partly open boat deck and a forecastle deck. The design offers flexibility, with 300m² of customisable space on the first



deck, the whole of which, apart from engine casings aft, is dedicated to fish processing and quick freezing. The 700m³ capacity fish hold, engine room and bunker tanks are situated below the first deck. The trawl deck is located on the second deck with double trawl lanes that run the length of the vessel. Accommodation for up to 22 crew, in six single-berth cabins and eight double-berth cabins, and trawl-shops are housed forward in casings on each side of the deck. The boat deck at the rear of the superstructure allows space to accommodate winches, cranes and lifesaving equipment.

An effective single-propeller solution can also be installed if required.

There is flexibility to operate the vessel as a single trawler or as a pair trawler. If the option to operate pair trawling only is taken, then it will be possible to configure the vessel with a lower installed power, along with a reduction in the number of winches and trawling equipment; and, as trawl doors are not required when pair trawling, this means that vessels with only moderate horse power are able to tow a relatively large trawl net between them. Knud E. Hansen places the trawler's engine power at around 2000kW if operated as a single trawler and about 1500kW if operated as a pair. **SBI**