

Fish farming revolution



In conjunction with Nordlaks, NSK Ship Design has designed an aquaculture ship that could be the beginning of a sustainable revolution in the fish farming industry.

There is an air of excitement at NSK Ship Design, because they have been quietly working away since June 2015 on a special project for Nordlaks - a project that can be classified as no less than sensational for the fish farming industry.

The world's largest ship

On the drawing board is a ship known as Havfarm ("Ocean Farm"), 430 metres in length and 54 metres wide, it will lay at anchor, fixed to the seafloor using the offshore industry's technological solutions. Norway is a world leader in this field, and the Norwegian industry is comfortable creating solutions that can withstand very tough conditions at sea.

The aquaculture industry is basically being taken from the fjords to the ocean.

If the project is completed as it has been designed, it will be the longest ship in the world.

For reference, the world's largest cruise ship is 360 metres long. The longest hangar ship in the world, the American *USS Enterprise*, is 342 metres long.

One Havfarm will be able to contain 10,000 tons of salmon – over 2 million fish. For comparison, the Nordlaks salmon slaughterhouse at Børøya produces 70,000 tons a year. The facilities will be able to withstand a significant wave height of ten metres, and can be raised by four metres during inclement weather. The ocean farm itself will extend ten metres below sea level. The farm will be constructed as a steel frame for six "cages" measuring 50 by 50 metres on the surface, with aquaculture nets going to a depth of 60 metres.

- At the time Inge Berg from Nordlaks contacted us, we had previously been flirting with the idea of producing a larger construction from scratch. Berg came up with a

very thorough idea of how to move from aquaculture pens to aquaculture ships in the open ocean, says sales manager Thomas Myhre.

Because steel louse skirts at a depth of ten metres will make sea lice history. When the Havfarm lays at anchor, the spreading area for waste products will be 27 times larger than it would be for ordinary pens, a massive 472,000 square metres. To the extent lice may appear on the salmon, the farm can facilitate the manual removal of sea lice. This also provides a totally chemical-free production. The use of chemicals to remove lice has been a much-debated environmental issue, and has been a major expense for the industry as well. This will change the direction of the aquaculture industry, which has been struggling due to such issues.

A leader in their field

Nordlaks selected NSK Ship Design because they are a leading design firm that already has a strong presence in the aquaculture market. They design everything from sea pens to LNG-powered fish feed carriers and wellboats, and have managed major redesigns of existing ships as well. Among other things, the company has reconstructed a trawler into a seismic vessel, and have turned a container vessel into a krill trawler as well. Projects like these were a major factor in this partnership.

- Our staff at Harstad is a team with great expertise in the area of project management, and with both them and our engineering team at Arkhangelsk, we had the specialist expertise required to bring the idea to life. This was a unique chance to take a project from scratch to construction in conjunction with Nordlaks, says Myhre.

From concept to application

Minister of Fisheries Elisabeth Aspaker and the Norwegian government announced free concessions for aquaculture businesses willing to make larger investments into new technology in order to overcome the industry's challenges with regard to environmental and space issues. Shortly after, the owner notified that Nordlaks had great plans in response to the government's efforts, namely the Havfarm ships. Now Nordlaks is well underway in the process, and they have applied to build three ships, each of which will cost between 600 – 700 million NOK.

- We're hoping we can begin using the technology in 2017, if we are provided with development concessions to do this, tells Inge Berg at Nordlaks.

NSK Ship Design finds it exciting that there are businesses willing to change the pace of the industry.

- Nordlaks is focused on creating sustainable solutions for its own production. For them it isn't just about increase volume, getting control of the louse problem, but also the well-being of the salmon, and sustainable solutions. The Havfarm project raises the bar for what is possible in aquaculture, and we absolutely want to be a part of that, says sales manager Thomas Myhre.