



## Reliability on the high seas

Novenco A/S – Naestved, Denmark

Case story

Danish HVAC systems supplier Novenco uses Alfa Laval cooling equipment to keep ships air-conditioned, and their crews comfortable and well fed.

Compact, reliable, environmentally friendly, and with good energy efficiency – these are some of the hallmarks of Alfa Laval condensers. Space is at a premium even on the biggest ships.

When Danish ship owner AP Møller Maersk received delivery of its newest 18,000 dead weight ton multi purpose vessel from the Wuhu Xinlian Shipbuilding in Anhui, China in 2010, it can rest assured that the cooling and air conditioning systems onboard are the best the market can supply. “You can’t live or work on a ship without air conditioning,” says Piergiorgio Barbato, Business Development Manager at Alfa Laval. “Cold storage for food is equally important. In addition, the systems have to be 100 percent reliable.”

Alfa Laval and the Novenco Group are both well-respected brands in the marine sector. Just as importantly, their systems are designed, manufactured and tested according to the requirements of all the classification societies. In close cooperation with Alfa Laval, the Novenco Group’s maritime division supplied four Alfa Laval condensers and their own ancillary equipment like valves, filters, and controls to the new ship.

Two Alfa Laval condensers are used together with compressors from a separate manufacturer for air conditioning purposes, keeping the living quarters of the ship for the 24-crew members at a manageable 27 degrees C inside the cabins. Two other Alfa Laval condensers are used for keeping food



storage lockers for meat and fish and other victuals at -20 degrees C for long voyages at sea.

In systems involving heat transfer, a condenser is a device used to condense a refrigerant from its gaseous to its liquid state, typically by cooling it. In so doing, the heat load is released by the refrigerant and transferred to the condenser coolant (water).

All condenser models can be opened for inspection and maintenance purposes. Alfa Laval shell and tube condensers are manufactured in accordance with ISO 9001. Each unit undergoes an individual pressure and leak test as specified by the relevant authority and in accordance with Alfa Laval internal quality procedures.

Shell and tube condensers are available with five different types of approvals. They include DNV (Det Norske Veritas),

RINA (Registro Italiano Navale), GL (Germanischer Lloyd's), RMRS (Russian Maritime Register of Shipping), and by LRS (Lloyd's Register of Shipping). Upon demand, Alfa Laval can also provide approvals from BV (Bureau Veritas) and from ABS (The American Bureau of Shipping).

Even on a huge ship like AP Møller's new multi purpose vessel, space is a highly valued and limited commodity. So together with Alfa Laval engineers, Novenco modified the standard condensers by adding a second outlet to increase their efficiency, which is a usual procedure for Novenco's maritime clients. And the increased efficiency due to Alfa Laval's designs meant that the condenser's dimensions could be diminished by up to 10 percent compared to those of other suppliers. “This is a powerful sales argument,” says Marwin Wang, Area Sales Manager for Novenco A/S in Shanghai.

The condensers were further modified with special supports for the compressors in order to ease the assembly process, give a more reliable solution and prevent problems caused by vibrations. Even the refrigerant connections were carefully designed in order to prevent issues related to vibrations. Alfa Laval also provided Novenco with tailor-made liquid receivers, which together with the condensers permit the stocking of the liquid refrigerant inside their volume so Novenco can easily maintain the evaporators.

These receivers have the same shape as the condensers in order to create a modular system. The sight-glass installed on both the condensers and receivers permits an easy check on the liquid refrigerant levels. And everything is in accordance to with the chosen marine approvals. "But the biggest added value we can give to the customer – the shipyard and the ship owner – is a reliable and energy efficient system that is also environmentally friendly. That has been the biggest development in the past ten years," says Wang. "Our job is to sell in and educate ship owners about the increased reliability, efficiency and compactness of Alfa Laval condensers. And that is still our challenge at the moment."

### Novenco in brief:

Novenco is a supplier of heating, ventilation, air conditioning and refrigeration systems for land and marine applications.

On the marine side, Novenco's systems have been installed on over 10,000 vessels including merchant cargo ships, cruise ships, ferries, super yachts, navy ships and off-shore oil and gas installations.

Novenco has production facilities in Næstved, Denmark and Wuxi, China. The production covers key HVAC and Refrigeration components including air handling units, axial flow fans, fan coils, centrifugal fans, air heaters, dampers, cooling plants.

For additional equipment, Novenco's marine division has selected partner sub-suppliers like Alfa Laval to complete the product range.

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### Cool facts:

- Two Alfa Laval CDEW260 fresh water condensers for air-conditioning purposes retrofitted with two outlets to increase efficiency and thus diminish size. 35 mm sight-glass is included. The header configuration allows a water design pressure of 10 bar. Design pressure for the refrigerant side is 30 bar, test pressure 45 bar. The condensers are 2.0 meters long and 273 mm in diameter.
- Two Alfa Laval CPS45 fresh water condensers for cold storage retrofitted with two outlets to increase efficiency and diminish size. The condensers were tailor-made for Novenco in order to maximize the water flow. The header configuration allows a water design pressure of 10 bar. Design pressure for the refrigerant side is 30 bar, test pressure is 45 bar. The condensers are 800 mm long and 168 mm in diameter.
- Cooling capacity of the total system: 163 KW.
- Alfa Laval can also supply sea-water condensers for all other installations where it is possible to use the sea as a natural source of cooling water. Marine units are provided with interchangeable anodes made of mild iron in order to prevent galvanic corrosion and to give the condensers a long working life.



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Novenco's air-conditioning and cooling systems are now with Alfa Laval condensers to keep food cool during the long voyage at sea.

### How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at [www.alfalaval.com](http://www.alfalaval.com)