

WASTE NOT, COOL A LOT

Gadlab Engineering, a Finnish collective of ship design engineers, is setting its stall out firmly for the immediate future on a new innovation that has perked up the interest of ship owners.

Normally designing custom-made solutions for vessels and floating structures, the Helsinki-based firm has developed the GadCooler, a new, patented, cooling technology that turns waste heat on ships into air conditioning cooling and refrigeration.

The GadCooler technology is based on absorption: utilising steam, rest heat from the engine cooling water and heat from

boilers, to provide chilled water using a non-toxic absorption fluid as a transfer media. In short, this new equipment negates the need for onboard cooling compressor capacity.

Significant Fuel Reduction

The key benefits include the significant reduction in fuel. For example, cruise ships will use as much as 10MW of power for cooling purposes when operating in tropical conditions.

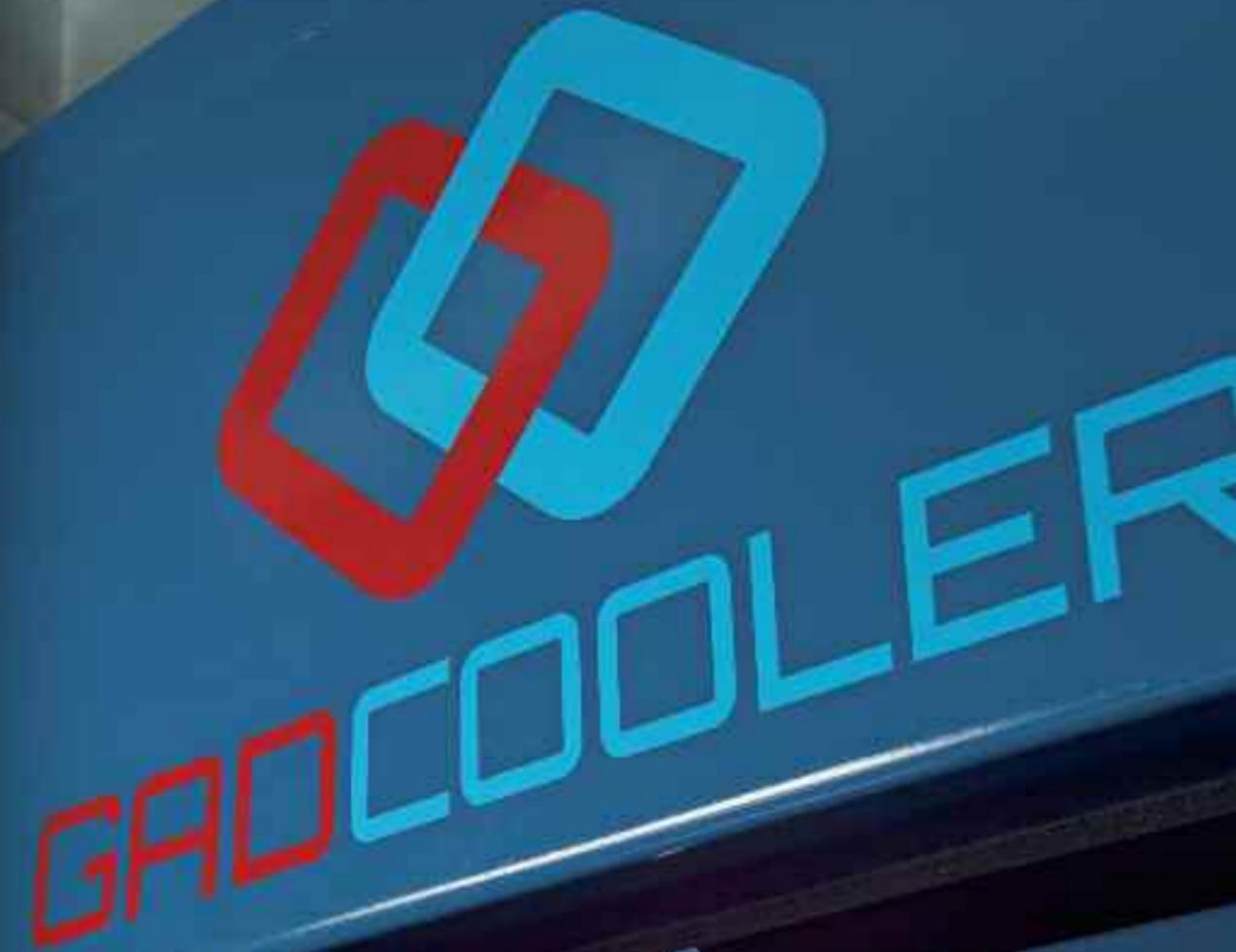
The GadCooler system improves the efficiency of cooling, utilising existing

GadCooler technology is a new energy-saving system that turns waste heat into air conditioning cooling to improve efficiency and reduce ships' fuel consumption. Andy Probert spoke to Gadlab's Managing Director Markus Nuotio about the innovation.

heat sources. Only a small amount of energy is required for the transfer pumps, but significant savings in fuel and emissions reductions.

Using the principles similar to a gas refrigerator, the system relies on existing heat sources to provide chilled water for the cooling system, using a non-toxic absorption fluid - a lithium bromide solution - as the transfer medium.

The system, which has received system approval from DNV GL is practically maintenance-free and can be installed during normal service docking. ▽



It features a smart control system that optimises the cooling efficiency and is available as one or several units, each with a cooling power of up to 5,000 kW to provide maximum flexibility for installation onboard all ship types and sizes.

The innovation has come about as many of the employees at Gadlab Engineering have a shipyard design office background, with essential skills for developing systems for maritime use.

The development project of GadCooler has also received funding from Tekes, the Finnish Funding Agency for Innovation. The GadCooler's patent is pending.

Excellent Results On-Board Finlandia

Markus Nuotio, Gadlab Engineering's Managing Director, said the new system had been installed on Eckero Line's new cruise ferry Finlandia, evidencing significant fuel savings.

The ferry, which operates between Helsinki and Tallin, carrying up to 2,000 passengers and 650 vehicles, will get much of its cooling capacity from GadCooler by using a unit with a capacity of approximately 500 kW.

Mr Nuotio commented: "GadCooler has been developed for the maritime environment in mind. We hope it will revolutionise the cooler sector due to its energy efficiency, cost-saving, quiet performance. For ship owners, the payback is almost immediate.

"Only a small amount of energy is needed for the transfer pumps, resulting in fuel savings and also in less emissions.

"In tropical conditions, as much as 40 per cent of the overall fuel bill can go towards creating cooling so the savings can be significant."

Mr Nuotio said that with a conventional machinery setup, normally only 45 per cent of fuel energy can be used to produce effective power, the other 55 per cent is wasted

through heat loss. The power produced is used to generate electricity and propulsion. Conventionally a ship's AC-cooling runs entirely on electricity.

"The Gadcooler can recover up to 24 per cent of the heat loss from the engines high-temperature water and steam," he said. "The ships AC-cooling is produced from waste heat instead of electricity thus engine power demand is reduced."

Increasing International Awareness

The managing director further added that while Gadlab's clients were 90 per cent local, the advent of the GadCooler would hopefully push that balance to a 50-50 split with international clients.

"The company is normally involved in Arctic class vessels as well as cruise ships, ferries, oil riggers and dredgers," he said.

"But the Gadcooler offers a new edge, a new front to the company and we are really excited about its potential." ■