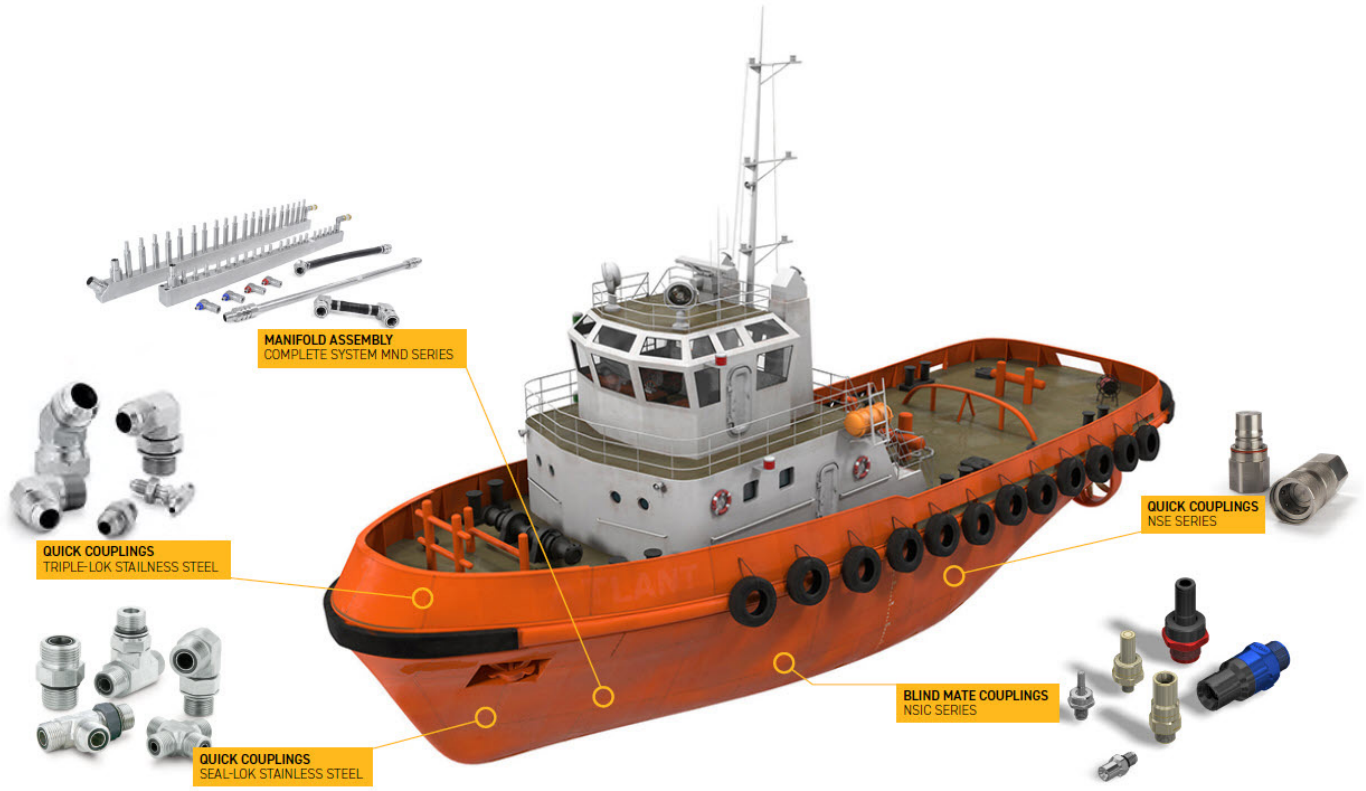
Marine

Transportation

Application Overview

The increased activities linked to environmental care is driving shipping manufacturers to implement new "clean" solutions. More and more manufacturers are implementing hybrid powered systems. The needs of cooling are increased for electrically powered watercraft due to the fast charging requirements. Quick charging considerably increases the temperature in the batteries of these hybrid systems.

Click the images below for additional information.



Innovative Products for Marine

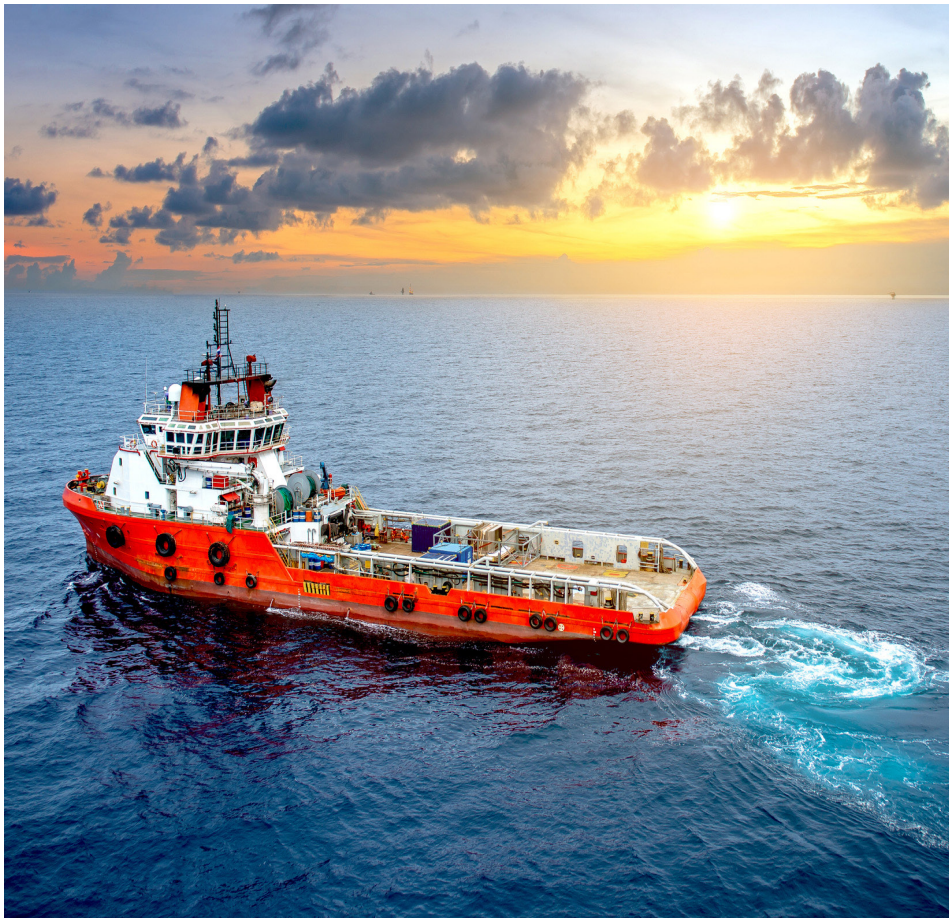
Lithium-ion batteries are electrochemical energy storage devices highly sensitive to temperature. The indirect water-cooling method seems to be the most efficient considering parameters such as costs, complexity, weight, cooling effects, temperature uniformity, and parasitic power.

As integral part of batteries, a power conversion system is an electrical device used to alter the voltage and frequency of incoming alternating current in an electrical system. The same type of indirect water-cooling system is used to maintain the system at the most efficient temperature for working.

Customer Challenges

The use of electrical energy on ships is leading some challenges:

- Energy storage on the ship requires additional space and adds weight
- Energy storage onshore to preserve some electricity for when ships need to charge batteries
- Fast charging batteries reduce the time that the ship or ferry is docked, however that generates high temperatures and reduces the life of the battery which can damage the system



Application Differentiators

- Energy efficiency - minimizes pressure drop and sealing expertise
- Easy maintenance - modular solutions and quick installation
- Reduced complexity - complete cooling systems ready to use

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