

Nr. 1 Low Pressure LNG Tank and Bunker Storage Solutions

Background:

Liquefied natural gas (LNG) is seen as a future-oriented fuel for ships. One main component of the fuel system is the tank filled with LNG. Natural gas becomes liquid at -163°C , so the tank needs high-quality insulation to minimize the heat impact of the environment. Such cryogenic tanks are already available but in addition to the high costs, the installation of the cylindrical tanks is usually at the expense of the cargo capacity.

Content:

Within the project legal, technical and economic framework conditions have been examined and an innovative new tank concept (Low Pressure LNG Tank) were developed. The tank system consists of two box shaped tanks (inner and outer tank). The inner tank as the medium-carrying tank is installed in an outer tank. The space between the inner and outer tank is fitted with a stable insulation material. The evacuation of the intermediate space creates the strength of the tank structure. The principle of pressure-resistant, vacuum-insulated thin sheet metal parts used as tank walls results in an enormous reduction in weight. The tank concept is based



on low-pressure storage of the LNG. This makes it possible to design the shape of the tank almost freely, depending on the production limits. An adaptation to the ship or pontoon hull and the use of free spaces becomes possible, whereby loss of cargo capacity due to the tank installation can be avoided.

Leadpartner:



Co-partner:



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Results:

A prototype (Low Pressure LNG Tank) was built with the following specifications*:

- Size outer tank: 3,3 m x 1,8 m x 1,8 m
- Size inner tank: 3 m x 1,5 m x 1,5 m
- Volume: 7 m³
- Weight: 1560 kg
- Operating pressure: up to 1 bar
- Density: 450 kg/m³
- Insulation strength: 140 mm
- Insulation material: Fumed silica
- Cost reduction: 50% (compared to cylindrical type C LNG tanks)

*all details with reservation



Advantages:

- More efficient ✓
- Less expensive ✓
- Lighter ✓
- Customizable for every ship ✓

This makes the use of LNG as fuel more attractive and efficient.

Partners:



Ahlers & Vogel



DE BOER & DE GROOT
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