Basotect®

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Basotect®

New application in LNG tankers

More than a quarter of the global production of natural gas in 2011 was liquefied and shipped throughout the world in ocean-going tankers. In preparation for transport, the gas is cleaned, liquefied at minus 162 degrees Celsius, and then loaded onto tankers that carry liquid cargo. Thus far, these tankers have only been able to travel when either empty or full, because they would otherwise be put at risk by the sloshing of the liquefied gas, which in severe cases might even cause them to capsize.

Working together with BASF, the South Korean company Samsung Heavy Industries has therefore developed a new anti-sloshing solution made of the BASF foam Basotect®. This concept consists of a blanket made of Basotect® cubes. A buoyant entity, or type of buoy, is placed in the center so that the Basotect® cube does not submerge more than 80 percent even after becoming fully soaked with liquefied gas. The individual cubes are stitched into Vectran® textile covers and secured to one another with Vectran® belts. Vectran®, which is made from polyarylate fiber, is produced by the Japanese company Kuraray, and is also suitable for use under cryogenic conditions. In addition, Vectran® is extremely durable and abrasion-resistant.

The principle of using floating blankets to calm the rough surface of a body of liquid is well known, and is used in aviation and aeronautics as well as in transporting liquid cargo in trucks. It has not seen use in LNG (Liquefied Natural Gas) tankers so far because the extremely low temperatures in their tanks place correspondingly extreme demands on the contact materials. Another challenge is posed by apparently contradictory physical requirements: on the one hand an anti-sloshing blanket has to be lightweight in order to float at every level of load, yet it must also be sufficiently heavy to have an anti-sloshing effect. In addition, the material has to be soft in order to withstand repeated severe impact against the walls of the tank while also not damaging the walls.

The newly developed anti-sloshing blanket system made of Basotect® meets these requirements. The melamine resin foam's open-celled structure enables it to absorb a certain amount of LNG, which increases the blanket's overall inertia. Above all, however, Basotect® differs from other foams because it retains its properties even at extremely low temperatures.

The anti-sloshing solution is a kind of carpet consisting of cubes made of the BASF foam Basotect®. Thus far, these tankers have only been able to travel when either empty or full. With the new anti-sloshing concept flexible load levels are possible, which reduces the number of no-load journeys.

In 2012, Samsung received “general approval” for the ABAS concept from two leading classification companies for shipping worldwide, the American Bureau of Shipping in Houston, Texas, USA, and the Bureau Veritas in Paris, France. General approval is a key part of the authorization process for the international shipping industry. It testifies that the application has been subjected to extensive testing for use and found to conform to international standards.

This solution can substantially improve the safety of liquefied gas transports while at the same time offering economic and environmental benefits to shipping companies and their customers – as confirmed by studies from two universities.