

LNG-Applications

Technical Benefits of the Arma-Chek system within Low Temperature environments such as LNG

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- Products

The performance of Armaflex particularly on low temperature applications brings many benefits over other insulation types. In the first instance Armaflex is a very efficient thermal insulation if one takes a typical Oil industry product such as LNG *(Liquefied Natural Gas), this has a boiling point of $-165\text{ }^{\circ}\text{C}$ at atmospheric pressure. Loss of LNG by boil-off as a result of heat leakage through insulated pipes and vessels must be kept to a target minimum of 1% of the total volume. If one takes a design ambient of $+35\text{ }^{\circ}\text{C}$ and the $-165\text{ }^{\circ}\text{C}$ LNG temperature the resultant lambda value of NH Armaflex at the mean temperature of these conditions is $0.033\text{ W}/(\text{m. K})$. Using Armaflex therefore is a very good solution against excessive boil-off rates, which deplete the mass of LNG and result in a financial loss. Bulk carriers attempt to recoup some of the resultant loss by using some excess boil-off LNG to augment the carrier's propulsion fuel.

The thermal performance of Armaflex is augmented by some other important factors. Armaflex, being closed cell insulation, has an integral vapour barrier so it does not need additional vapour barriers until $-186\text{ }^{\circ}\text{C}$. In fact, Armaflex can be used on applications as low as $-200\text{ }^{\circ}\text{C}$ in consultation with our technical departments. The chance to eliminate the need for a heavy external metal barrier, which some insulation types need, is a major benefit especially for the LNG Industry. Carrier ships will use less fuel due to an improved power to weight ratio as well as reduced drag factor.

Galvanic corrosion events can occur with the use of two dissimilar metals. Cold work and the added presence of water and condensation, which will act as an electrolyte, provide an additional risk of galvanic corrosion with the combination of metal pipework and metal cladding.

This means that because the integral vapour barrier of Armaflex eliminates the use of metal external vapour barriers, eliminating the chance of galvanic corrosion. Because Armaflex remains flexible down to $-40\text{ }^{\circ}\text{C}$, the layer at the boundary between the ambient and the insulated surface is always flexible. Unlike brittle and inflexible insulation, Armaflex does not require a metal barrier to prevent damage to its surface. Insulation which is brittle even at the surface can become easily damaged and leave annular spaces. This type of brittle insulation requires a metal jacket to protect against impact damage, but the use of metal jacketing can contribute to the formation of condensate under the metal jacket by radiant heat loss especially at night. The condensate can then build up in the annular spaces already formed by impact damage to the brittle substrate immediately under the metal jacket leading to corrosion events on the outer metal jacket.

Date of Release:

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