

REPAIR, MAINTENANCE AND UPGRADE SOLUTIONS

LPG, LEG & LNG Cargo containment and Piping

WELL MAINTAINED INSULATION SYSTEMS SAVE COSTS AS WELL AS THE ENVIRONMENT



LNT has, in cooperation with specialized material manufacturers, developed new systems and materials in order to offer the most cost effective and environmentally friendly solutions for repair and upgrade of cargo containment- and pipe insulation.

Our emphasis on engineering, material development and carefully tested application methods, ensures reliability and efficiency of our products ranging from small repairs, to full upgrade and improvement programs.

LNT has long experience with cryogenic insulation systems for most self-supporting cargo containment systems in the marine market, such as IMO Type A tank LPG, Type C tank LPG/LEG/LNG and Type B tank MOSS LNG.

LNT offers its services world-wide and strives to deliver high quality solutions for owners, yards and class societies.

LPG/LEG CARGO TANK INSULATION

Repair and Upgrade with Polyurethane Spray Foam and Polymeric Coating



- Inspection and status reports for repair and maintenance of vessels in operation, including repair procedures and quotations.
- Supply of engineering, supervision, materials and installation for repairs during docking or voyages.
- Repair or upgrade of LPG/LEG cargo tank insulation by using polyurethane spray foam and polymeric coating.
- Partly or full replacement of existing insulation onboard during docking. All materials and systems are approved by classification society.

Pipe insulation and supports

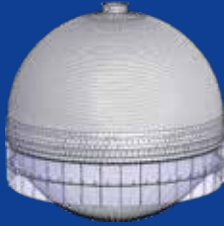
- Repair of pipe insulation by one or two layers of PU insulation section with GRP or glass cloth and mastic coating
 - Pre-insulated pipe systems
 - Replacement of HDPU pipe supports including steel cradles
 - Worldwide material deliveries, installation and Supervision
- A full replacement will provide insulation with the same properties as the original newbuilding specification.
 - An upgrade program by increasing insulation thickness, will improve BOR.
 - Renewal of insulation can be carried out sequentially in order to meet the vessels' operational schedule.
 - Training and instruction of ships' crew for maintenance and repair of insulation.

MOSS LNG TANK INSULATION

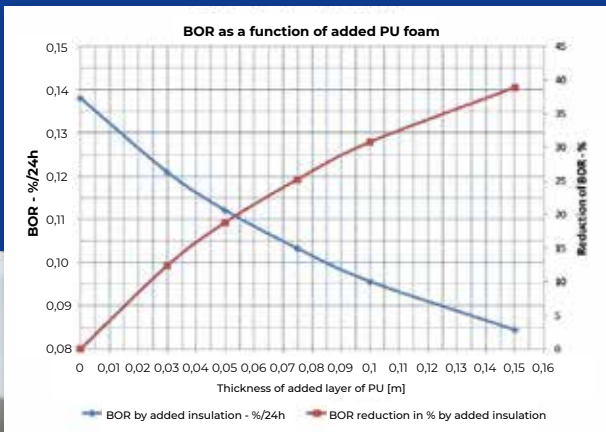
Maintenance and Upgrade Program

LNT has the only class approved refurbishment system for 0-hour upgrade of SG (Spiral Generation) MOSS type LNG insulation.

The system is especially designed for the SG insulation, but can in principle be applied to any type of MOSS LNG tank insulation - for repair as well as for major improvement of thermal performance. The method can be used on complete tanks or partially, according to the owners' requirements.



MOSS LNG insulation is prone to a variety of defects typically showing after time and can be observed as extended de-lamination of vapour barrier and spray shielding, extensive and frequent surface cracking as well as complete through thickness cracking.



SYSTEM DESCRIPTION

The original combined vapor barrier and spray-shield is removed and replaced by a reinforced layer of polyurethane foam and a specially developed cryogenic polymeric coating. This will both seal the original insulation and minimize the risk of cracking, as the structural components of the refurbished system is far more compatible to the insulation than the original vapor barrier.

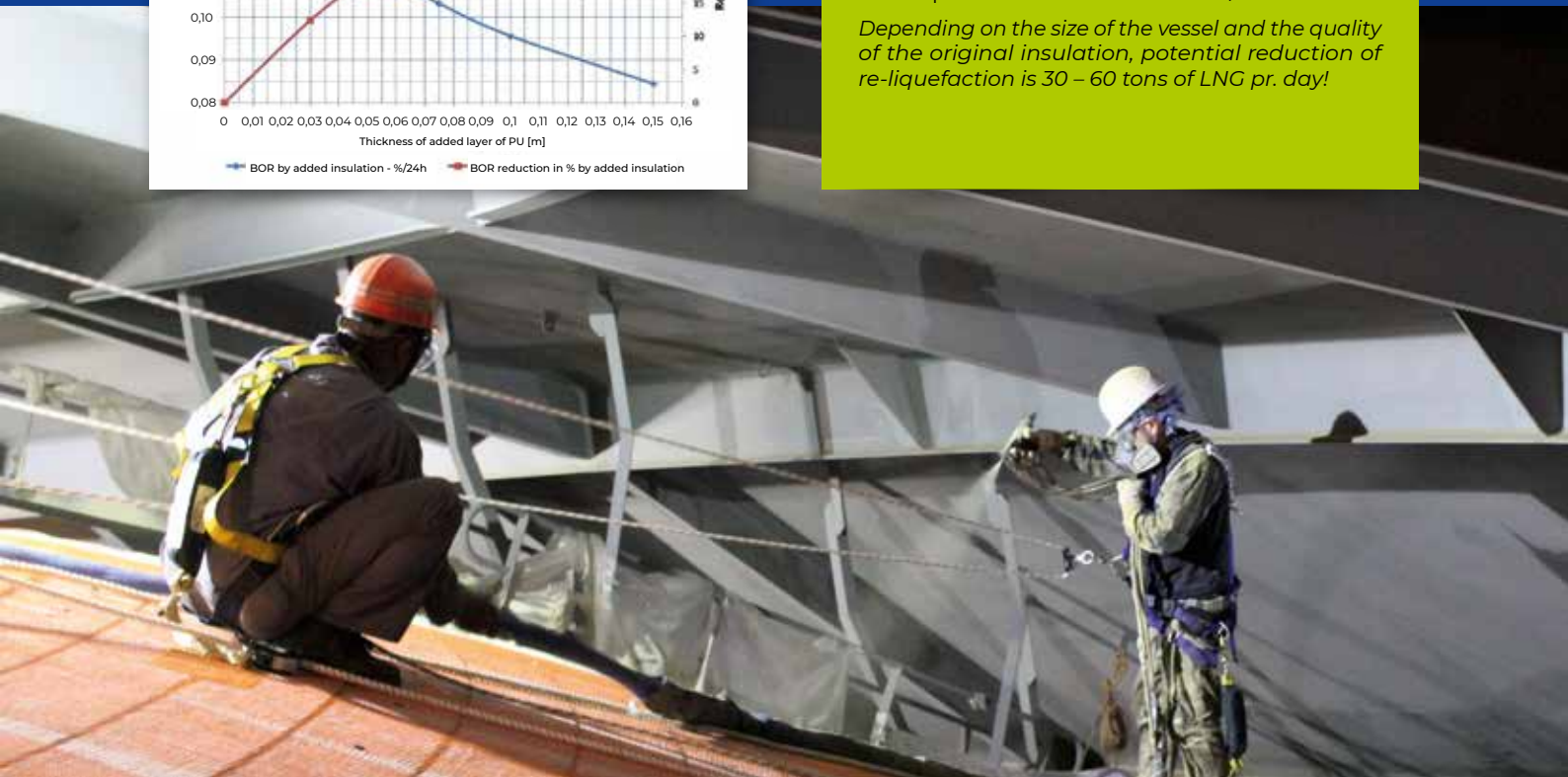
SYSTEM ADVANTAGES

- Continuous application with full visual control of application quality
- Compliance with Class rules
- Reduced need for frequent spot-repairs
- Reduced Nitrogen consumption during operation
- Reduced vapor ingress
- Reduced heat ingress

SYSTEM POTENTIAL

- A typical vessel designed for 0.25 %/24h BOR can be improved to reach 0.15 - 0.18 %/24h
- A typical vessel designed for 0.15 %/24h BOR can be improved to reach 0.08 - 0.10 %/24h

Depending on the size of the vessel and the quality of the original insulation, potential reduction of re-liquefaction is 30 – 60 tons of LNG pr. day!



LNT Marine

Singapore | Drammen | Shanghai | Gdansk

CRYOGENIC INSULATION SERVICES

LNT Marine is an engineering and insulation contracting company offering a variety of insulation services primarily for the marine market, covering new-buildings, repair and retrofit on gas carriers and reefers:

- Complete tailor made insulation solutions
- General engineering services for thermal insulation
- Feasibility studies, economical and technical analyses
- Repair programs and budgets/quotations
- Documentation for class approvals
- Project management
- Supervision and installation
- Training of ships crew for insulation maintenance and repair
- Inspection and status reports for repair and maintenance of vessels in operation
- Turnkey supply comprising all or parts of the above



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