The worldwide demand for energy, and specifically cleaner energy sources, led to a sharp spike in Liquefied Natural Gas (LNG). This in turn led to an increased demand in high-performance industrial insulation systems.

The key driver for the need of higher performing insulation systems is that LNG handling facilities are subject to the two biggest enemies of insulation performance: moisture and fire. As a result, engineers globally are realizing the role insulation can play in safety and performance of LNG facilities.
**Moisture Protection**

Many LNG facilities are located in hot, humid climates; so the need for resistance to moisture vapor transmission (MVT) is critical. MVT can be excessive in these design conditions since the pipe or vessel may be operating at a continuous operating temperature of nearly -270°F (-168°C). Add in the fact that ambient temperatures are often around 90°F (32°C), humidity is around 90%, and the opportunity for moisture to be driven into the insulation is therefore at the highest possible level. Because the natural moisture drive is from heat to cold, system designers and specifiers can see how the insulation material and application selections can make or break the system.

**FOAMGLAS® insulation** is 100% glass. It is the only insulation material on the market that is impermeable to moisture in both liquid and vapor forms. Unlike other insulation materials that must rely on protective jacketing to act as a vapor barrier, FOAMGLAS® insulation is itself a vapor barrier when joints are sealed and properly installed.

**Fire Protection**

LNG is a byproduct of hydrocarbon processing, and there is significant fire potential. When selecting an insulation system, protection of the facility from potential catastrophic fire is paramount and needs to be considered as much as moisture resistance.

When considering the insulation system, consider the fire resistance and wicking potential of the most common insulation materials.

Because FOAMGLAS® insulation is an all glass material, it will not wick flammable liquids, but it also cannot burn and will not produce toxic smoke. It provides the best flame and smoke spread characteristics of any insulation on the market.

**A Unique Blend of Characteristics**

In addition to the most critical needs of offering moisture resistance and fire protection, FOAMGLAS® insulation offers a unique blend of physical characteristics and value added services including:

**Dimensional Stability:** Cold or cryogenic service temperatures, combined with high humidity, can promote moisture ingress which results in warping of the insulation, leaving gaps which will promote ice build-up. This can be an expensive problem to repair. FOAMGLAS® insulation has nearly the same coefficient of expansion as steel, therefore warping is not a typical consequence of its use in this service.

**Compressive Strength:** The construction and maintenance of LNG pipe racks required tradesmen to work literally on and around the insulation. Physical damage caused by installation and maintenance traffic on the pipes and tanks is avoided because of the high compressive strength of FOAMGLAS® insulation, which absorbs point loads and traffic.

**Accessories Selection:** Because LNG applications are critical and costly, the selection of insulation system accessories is key, and they must work in concert with the insulation itself. All accessories offered by Pittsburgh Corning have undergone extensive testing and have a proven performance history with FOAMGLAS® insulation contributing to system success.
Insulation Fabrication: Attention to detail in insulation fabrication for cold and cryogenic work should never be understated. FOAMGLAS® insulation fabricators have the capacity for large-volume projects and understand the technical requirements of LNG and other cold/cryogenic insulation systems.

Contractor Selection: Once you have selected the insulation and accessory products for your project, the last but important decision is the insulation contractor. Make certain that your contractor has the staff, financial resources and technical acumen to perform a large, critical project like an LNG installation.

Pool Fire Suppression
When the FOAMGLAS® PFS units are in place within an LNG pit, the polyethylene bag and shrink wrap are consumed during a pool fire. This releases the individual pieces of FOAMGLAS® insulation, which then float to the surface of the flammable liquid, thereby reducing the surface area available to the fire and reducing the flame height and thermal radiation.

Test results have shown the presence of 200 mm of cellular glass on the pool fire surface can achieve up to a 95% reduction in thermal radiation and helps to extinguish the fire using appropriate fire control systems.

Pittsburgh Corning’s Technical Credentials for LNG Insulation Service:
- Flame Spread 0, Smoke Developed 0 (UL 723, ASTM E 84, R2844, also classified by UL of Canada, CR 1957)
- UL 1709
- ISO 9001:2000
- U.S. Coast Guard
- Rosstroy
- SINTEF
- NORSOK
- Det Norske Veritas
- SEE-Berufsgenossenschaft
- Allgemeine Bauaufsichtliche, Zulassung (ABZ, DIBTT)
- DCC
- Russian Maritime
- Allgemeine Bauaufsichtliche, Prufzeugnisse (ABP, MPA)

LNG Pool Fire Suppression (PFS)
Fire safety in the event of an LNG spillage is critical. Relying on its noncombustible physical characteristics, FOAMGLAS® PFS is specified as an LNG pool fire suppression system, keeping flames to a minimum while they are being extinguished. Without this fire precaution, catastrophic damage and loss of life can occur.
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