

Cryogel[®] Z

Proven in Cryogenic Service

Project Profiles



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www.aerogel.com



Location Everett, Massachusetts, USA

Owner Suez Energy

Contractor Zampell

In Service October 2010

LNG Tank Risers



The LNG tank risers at Distrigas in Boston are located so close to the tank stiffener rings that there is only 3 inches (75 mm) of room for the insulation. This severe space constraint, combined with wind- and temperature-induced movements of the lines, created the need for a thin and mechanically durable insulation design. Seven 10 mm layers of Cryogel® were applied to the risers and held in place with stainless steel bands. At the pipes' closest approach to the stiffener rings, pre-fabricated stainless steel clamp bands were applied. These bands now provide mechanical protection where the pipe rubs against the guides and stiffener rings, and serves to support the jacketing above.



TOP: Vapor stop applied above the clamp band
 CLOCKWISE FROM LEFT:
 Clamp band applied over the Cryogel®; Failed urethane insulation; Insulators working on different levels; Cryogel® insulation being applied

Cryogel[®] Z

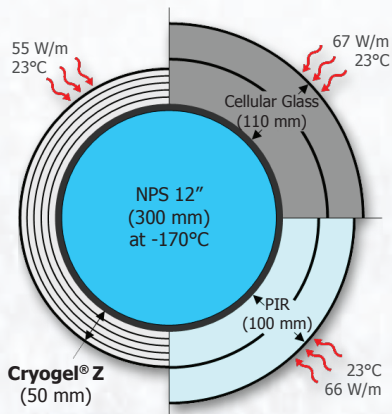
Flexible Industrial Insulation With Integral Vapor Barrier for Sub-Ambient and Cryogenic Applications

Cryogel[®] Z has the lowest *k*-value of any cryogenic insulation material in the world, reducing thicknesses by 50%-75%. Cryogel[®] Z's flexible blanket form, with a factory-applied vapor barrier, is both faster to install and more durable once in service, resulting in lower-cost, higher-performing designs.

Applications for Cryogel[®] Z include sub-ambient piping and equipment, cryogenic storage and transport, industrial gases, and LNG import/export pipelines and process areas.

Cryogel[®] Z Insulation System Advantages

- Thinness creates more space in and around pipe racks and equipment.
- Thinness can decrease the overall size of a production facility, resulting in major material reductions and cost savings.
- Thinness results in volume and freight savings, decreased accessory materials, minimal site storage, and simplified logistics.
- Unique flexible form and wrap application makes installation faster, easier, and less costly. Rigid insulation systems require numerous segments that must be effectively sealed.
- Will not break during shipment or once in service.
- Competitive with other insulation systems on an installed basis due to decreased material requirements, logistics improvements, reduced installation time, and shorter construction schedules.



All three designs meet the same condensation control criteria.

Service Temperature Range -460°F (-270°C) to 195°F (90°C)

Thermal Performance Cryogel[®] Z has the lowest thermal conductivity of any material used for cryogenic service. It is therefore much thinner compared to other cold insulation materials. In most cases, condensation control thickness is sufficient to meet the desired heat gain limitations. Cryogel[®] Z's minimal thickness results in a smaller surface area and reduced heat gain compared

to other insulation materials. This heat gain "safety factor" maximizes system performance by improving process control, reducing boiloff and saving energy. Also, Cryogel[®] Z does not have blowing agents that diffuse out over time, so its thermal performance remains constant.

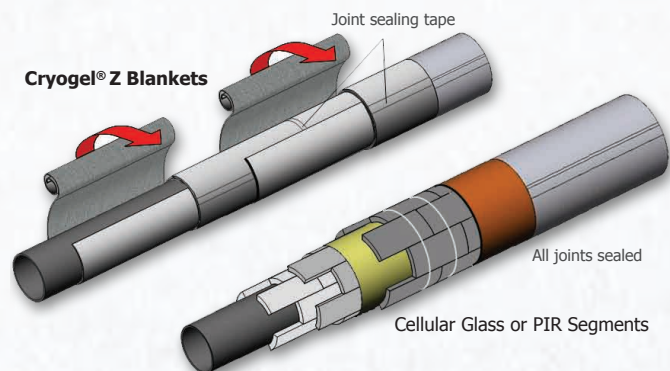
Moisture and Vapor Resistance Permeability to water and water vapor are critical to any insulation system operating at cryogenic temperatures. Cryogel[®] Z uses a factory-applied mylar vapor barrier to achieve a zero-perm system.

Structural Integrity

Cryogel[®] Z is well-suited for sub-ambient and cryogenic applications. Under these severe conditions, its structure experiences no thermal shock and remains totally flexible. This is unlike rigid, cellular insulation materials, which experience contraction, thermal shock, extreme stresses, damaged structure, freeze-thaw crack propagation, and degraded insulation performance under the same conditions.

Dimensional Stability

Cryogel[®] Z insulation has a coefficient of thermal expansion similar to that of stainless steel, so there is minimal movement of the insulation system. Its low contraction rate and flexible wrap application eliminate the need for costly and labor-intensive expansion and contraction joints required by traditional rigid insulation systems.



In addition to reducing labor, Cryogel[®] Z blankets minimize sensitivity to workmanship.