Fiberglass Insulation

Quietflex Manufacturing providing solutions for cryogenic resilient and thermal applications

www.quietflex.com
LNG Suspended Deck Blanket

The Quietflex® Brand LNG Suspended Deck Blanket is designed to insulate roof decks for LNG and other cryogenic tank systems. It was developed to reduce blanket settlement, requiring less material to achieve a specific overall depth of fiberglass. This strength is a result of using continuous textile-type glass fibers that have been bonded with a thermal setting phenolic resin. The glass fibers and resin are combined in an air lay system producing a random fiber orientation for exceptional strength and resiliency. Available in amber color.

Advantages
Enhanced Recovery/Resiliency
For reduced settlement and less material usage.
Increased Tensile Strength
For reduced blanket settlement.
High Thermal Efficiency
Reduces heat transfer, lowering energy consumption.
Resistant to Bacterial and Fungal Growth
Promotes healthy work environment.
Compression Packed
Saves freight costs, storage space and protects against damage.

LNG Tank
Insulation Components
- Nozzle Glass
- Tank Bottom Fiberglass
- Die-Cut Parts

Maximum Lambda Range (16 kg/m³)
Thermal Conductivity Values at Select Temperatures (ASTM C518)*

<table>
<thead>
<tr>
<th>Mean Temperature, Degrees C</th>
<th>0.00</th>
<th>0.05</th>
<th>0.10</th>
<th>0.15</th>
<th>0.20</th>
<th>0.25</th>
<th>0.30</th>
<th>0.35</th>
<th>0.40</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>0.25</td>
<td>0.30</td>
<td>0.35</td>
<td>0.40</td>
<td>0.45</td>
<td>0.50</td>
<td>0.55</td>
<td>0.60</td>
<td>0.65</td>
</tr>
<tr>
<td>-155</td>
<td>-135</td>
<td>-115</td>
<td>-95</td>
<td>-75</td>
<td>-55</td>
<td>-35</td>
<td>-15</td>
<td>5</td>
<td>25</td>
</tr>
</tbody>
</table>

*This graph is for general information only. Actual values can vary depending on critical performance specifications.

LNG Resilient Blanket

The Quietflex® Brand LNG Resilient Blanket is designed to offer excellent resiliency and compression ability, as well as increased tensile strength, making it perfect as a wall installation for LNG tank or other cryogenic tank applications. This product can be engineered and customized to meet your specific requirements for each project. Available in amber color.

Advantages
Excellent Resiliency and Compression Characteristics
Increased Tensile Strength
Ideally suited for resilient blanket applications which require the glass to support its own weight.
High Thermal Efficiency
Reduces heat transfer, lowering energy consumption.
Resistant to Bacterial and Fungal Growth
Promotes healthy work environment.
Compression Packed
Saves freight costs, storage space and protects against damage.

Physical Properties:
Deck & Resilient Blanket

<table>
<thead>
<tr>
<th>Property or Method</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM C553 Type 1, 2 and 3</td>
<td>Meets all requirements at varying densities</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>-180°C to 250°C</td>
</tr>
<tr>
<td>ASTM C 1104: Water Vapor Sorption</td>
<td>Less than 0.5% by Weight</td>
</tr>
<tr>
<td>NFPA 259: Limited Combustible</td>
<td>Less than 3,500 BTU/lb</td>
</tr>
<tr>
<td>ASTM E 84: Flame Spread Index</td>
<td>Less than 25</td>
</tr>
<tr>
<td>ASTM E 84: Smoke Developed Index</td>
<td>Less than 50</td>
</tr>
<tr>
<td>Microbial Fungal Growth</td>
<td>Does not support the growth of mold, fungi and bacteria</td>
</tr>
<tr>
<td>Resiliency Factor</td>
<td>Greater than or equal to 0.44 (44%)</td>
</tr>
<tr>
<td>Tensile Strength</td>
<td>≥ 6.6 kPa</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Property or Method</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Density*</td>
<td>Deck: 12 kg/m³</td>
</tr>
<tr>
<td>Density Tolerance</td>
<td>Deck: ±0.5 kg/m³ / ±2.5 kg/m³</td>
</tr>
<tr>
<td>Width Tolerance</td>
<td>±6mm</td>
</tr>
<tr>
<td>Length Tolerance</td>
<td>±5% / ±2%</td>
</tr>
<tr>
<td>Thickness Tolerance</td>
<td>±0.12mm</td>
</tr>
<tr>
<td>Optional Facings Available</td>
<td>Laminated FSK and black mat facing</td>
</tr>
</tbody>
</table>

*This can be modified based on customer need.
**WARNING**

Textile glass fibers are used to manufacture this fiberglass insulation product. Handling, installing, or removing the product may result in some fiberglass contact. Users of this product are therefore advised to wear appropriate personal protective equipment so as not to experience skin, eye, or respiratory irritation. Gloves and eye protection, long sleeved, loose fitting clothing are recommended when installing or otherwise handling the product. Avoid breathing fiberglass dust and avoid contact with skin or eyes. A NIOSH approved (N95 or higher) disposable or reusable dust respirator properly fitted is recommended whenever the product is handled. Respiratory protection is mandatory when the dust levels in the workplace exceed OSHA permissible exposure limits or if worker irritation occurs. Work clothes should be washed separately and the washer rinsed after use.

**FIRST AID MEASURES**

If dust gets into eyes flush eyes with water to remove the fiber dust. If symptoms persist seek medical attention. Fibers can be removed by washing the skin with soap and warm water after handing this product. Further product safety information is available from your employer. The Material Safety Data Sheet is available from your distributor, directly from Quietflex or on the Quietflex website www.quietflex.com.

The physical and chemical properties of Quietflex® Resilient Blanket represent typical, average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. The data is supplied as a technical service and is subject to change without notice. Check with Quietflex Manufacturing Company, L.P. to obtain current information.

---

**Projects Containing Quietflex Fiberglass Insulation**

- **Abu Dhabi**
  - Ruwais Refinery, Abu Dhabi National Oil Co

- **Algeria**
  - Arzew LNG, Sonatrach

- **Australia**
  - Pluto LNG, Woodside
  - PNG LNG, ExxonMobil
  - Gorgon, Chevron Australia
  - AP LNG, Australia Pacific LNG
  - Gladstone LNG, GLNG
  - AG LNG

- **Brunei**
  - Brunei LNG Sdn Bhd
  - Brunei LNG Joint Venture

- **Canada**
  - Mt. Hayes LNG, Terasen Gas
  - Fortis LNG, Fortis Inc.

- **Chile**
  - Chilean LNG (Quinteros), ENAP, BG
  - Chile (Mellinones), Suez
  - Chile (Mellinones) - ammonia

- **China**
  - Fujian, CNOOC
  - Dalian, CNOOC
  - Ningxian Han, Ningxian Han Nat. Gas Co.
  - Ningbo, CNOOC
  - AnSh, CNPC
  - Tianting, Singpu Chemical Industries
  - Shangdong, CNOOC
  - Hainan, CNOOC

- **China Cont.**
  - Jiaxing Propane
  - Tianjin FLNG, CNOOC
  - Shenzhen, CNOOC
  - DaPeng No. 4, CNOOC
  - Yuendong LNG, CNOOC
  - Tianjin LNG, CNOOC
  - CIMC Shanghai, CIMC
  - CIMC Guizhou, CIMC
  - Encro Tianjin, Sinopec

- **India**
  - Mundra LNG, GSPC LNG
  - Dahej, Petronet

- **Indonesia**
  - Donggi LNG, PT Pertamina

- **Peru**
  - Peru LNG (Pisco), Hunt Oil

- **Poland**
  - Polskie LNG, Polskie LNG Co.

- **Portugal**
  - Sines Terminal Expansion, REN Atlantico

- **Qatar**
  - Ras Laffan (nitrogen)
  - Ras Laffan (LPG), Ras Laffan
  - QAPCO, Qatar Petroleum Company

- **Russia**
  - Sakhalin Island
  - Russia, JSC Yamal LNG, Novatek

- **Saudi Arabia**
  - Saudi Kayan, Jabail, KSA (propylene)
  - Saudi Kayan, Jabail, KSA (ethylene)

- **Trinidad and Tobago**
  - Torinid LNG

- **Thailand**
  - PTT Thailand LNG, PTT LNG

- **USA**
  - Sabine Pass, Cheniere
  - Elba Island, Southern LNG
  - Cove Point, Dominion Res.
  - Boron, CA
  - Lake Charles, LA
  - Waterbury, CT, Yankee Gas
  - Gulf LNG - Mississippi, El Paso
  - Golden Pass, ExxonMobil
  - Temple, PA, UGI
  - Marcus Hook, PA, Sunoco
  - Nederland, TX, Sunoco
  - Chorpus Christi, Cheniere Energy
  - Quintana Regas Terminal, Freeport LNG

- **UK**
  - Isle of Grain, National Grid
  - South Hook, South Hook LNG
  - Sabic Plant, Sabic

- **Venezuela**
  - Carabobo
  - El Tablazo

*Please note the owner for each project was not always known. This does not constitute the complete list of projects Quietflex has supplied fiberglass insulation.*