Gaco 183M
CLOSED CELL SPRAY FOAM INSULATION

DESCRIPTION
Gaco 183M is a two component HFC-blown (zero ozone-depleting) liquid spray system that cures to a medium-density rigid cellular polyurethane insulation material. Gaco 183M contains polyols derived from naturally renewable oils, post-consumer recycled plastics, and pre-consumer recycled materials.

This closed cell foam is designed to provide: excellent thermal performance; air impermeable insulation; and, an integral part of an air barrier assembly.

Gaco 183M is a Class A (Class 1) fire rated foam that meets the requirements of ICC-ES AC377 Acceptance Criteria for Foam Plastic Insulation. Gaco 183M meets the requirements of AC377 Appendix X for use in attic and crawl spaces without an additional ignition barrier. See Intertek Research Report IRR-1002 for code compliant application information.

RECOMMENDED USES
Gaco 183M will provide excellent performance in a wide range of residential, commercial, industrial and agricultural applications where in service temperatures are between -40 °F and 200 °F (-40 °C to 93 °C) including:

- Walls
- Ceilings
- Floors
- Attics
- Crawlspace
- Foundations
- Concrete Slabs
- Residential Ducts
- Plenums
- Piping
- Cold Storage
- Freezers
- Storage Tanks
- Other Industrial Applications
- Agricultural Applications including the GacoTough Foam Agricultural System

Gaco 183M is FEMA Class 5, the highest rating for flood-resistant materials.

PHYSICAL PROPERTIES
The following physical property tests were conducted by independent certified laboratories with traceable samples in accordance ICC-ES AC377 and ASTM C1029 for Type II foam and ABAA D-115-010 for Air Barrier Materials and Assemblies.

<table>
<thead>
<tr>
<th>PROPERTY*</th>
<th>ASTM TEST</th>
<th>VALUE</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Density</td>
<td>D1622</td>
<td>2.0 ± 10%</td>
<td>lb/ft³</td>
</tr>
<tr>
<td>Aged R-Value **</td>
<td>C518</td>
<td>R 6.4 at 1” (25.4 mm) ***</td>
<td>h·ft²·°F/Btu</td>
</tr>
<tr>
<td></td>
<td>C518</td>
<td>R 23.3 at 3.5” (88.9 mm) ***</td>
<td>h·ft²·°F/Btu</td>
</tr>
<tr>
<td>Compressive Strength (Parallel to Rise)</td>
<td>D1621</td>
<td>32</td>
<td>psi</td>
</tr>
<tr>
<td>Tensile Strength</td>
<td>D1623</td>
<td>64</td>
<td>psi</td>
</tr>
<tr>
<td>Water Absorption: (96 hours, 2” (50.8 mm) head, 70-74 °F (21-23 °C)</td>
<td>D2842</td>
<td>0.71</td>
<td>% by volume</td>
</tr>
<tr>
<td>Water Vapor Permeance:</td>
<td>E96 – Method A</td>
<td>1.12</td>
<td>perm-in</td>
</tr>
<tr>
<td>Dimensional Stability (7 Days)</td>
<td>D2126</td>
<td>L=6%, W=5%, T=3%</td>
<td>% linear change</td>
</tr>
<tr>
<td>Open Cell Content</td>
<td>D2856</td>
<td>2.6</td>
<td>%</td>
</tr>
<tr>
<td>Air Permeance @ 75Pa (Infiltration/Exfiltration)</td>
<td>E283</td>
<td>0.00 at 1” (25.4 mm)</td>
<td>L/s·m²</td>
</tr>
<tr>
<td></td>
<td>E2178</td>
<td>0.0013</td>
<td>L/s·m²</td>
</tr>
<tr>
<td>Air Barrier Assembly Testing</td>
<td>E2357</td>
<td>0.0027</td>
<td>L/s·m²</td>
</tr>
<tr>
<td>Crack Bridging</td>
<td>C1305</td>
<td>Pass @ -15 °F (-26 °C)</td>
<td>Pass</td>
</tr>
<tr>
<td>Pull Adhesion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concrete Masonry Unity</td>
<td></td>
<td>237</td>
<td>kPa</td>
</tr>
<tr>
<td>Gypsum Sheathing (Dens Glass)</td>
<td></td>
<td>162</td>
<td>kPa</td>
</tr>
<tr>
<td>Oriented Strand Board (OSB)</td>
<td></td>
<td>210</td>
<td>kPa</td>
</tr>
<tr>
<td>Fungi Resistance</td>
<td>C1338</td>
<td>Pass</td>
<td>no growth</td>
</tr>
</tbody>
</table>

* These items are provided for general information.
** Federal Trade Commission regulations published in the Federal Register 16 CFR Part 460 require that R value testing of polyurethane foam insulation must be conducted on aged samples at a 75 °F mean test temperature. Failure to comply can result in substantial fines by the FTC.
*** To determine R values for thickness not listed: Between 1” (25.4 mm) and 3.5” (88.9 mm) can be determined through linear interpolation; greater than 3.5” (88.9 mm) can be calculated based on R 6.67/inch.
SURFACE BURNING CHARACTERISTICS
Meets Class A (Class 1) requirements when tested in accordance with ASTM E84 (UL 723) as defined in NFPA 101 and Section 803 of the International Building Code (2009, 2012).

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>THICKNESS</th>
<th>FLAME SPREAD INDEX</th>
<th>SMOKE DEVELOPED INDEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gaco 183M</td>
<td>4&quot; (101.6 mm)</td>
<td>10</td>
<td>400</td>
</tr>
</tbody>
</table>

LARGE SCALE FIRE TESTING

<table>
<thead>
<tr>
<th>Test</th>
<th>Performance</th>
<th>LOCATION</th>
<th>FOAM THICKNESS / COATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC377, Appendix X</td>
<td>Ignition Barrier</td>
<td>Attic and crawlspace walls</td>
<td>Up to 7.5&quot; (19.05 cm) / no coating required</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Attic and crawlspace ceiling</td>
<td>Up to 9.5&quot; (24.13 cm) / no coating required</td>
</tr>
<tr>
<td>NFPA 286</td>
<td>Thermal Barrier</td>
<td>Vertical surfaces</td>
<td>Up to 5.5&quot; (13.97 cm) / DC315 - 20 mil wet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horizontal or sloped surfaces</td>
<td>Up to 7.5&quot; (19.05 cm) / DC315 - 20 mil wet</td>
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<tr>
<td>NFPA 286</td>
<td>Thermal Barrier</td>
<td>Vertical surfaces</td>
<td>Up to 5.5&quot; (13.97 cm) / DC315 - 6 mil wet primer &amp; 22 mil wet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horizontal or sloped surfaces</td>
<td>Up to 9.5&quot; (24.13 cm) / DC315 - 6 mil wet primer &amp; 22 mil wet</td>
</tr>
</tbody>
</table>

Gaco 183M meets or exceeds the IBC requirements for exterior walls in type I, II, III, IV and V construction. This includes NFPA 285 and NFPA 259 testing with Intertek Listings (GWL/FIP 30-02, GWL/FIP 30-01) and one-hour fire resistance rating per ANSI/UL 263 (UL Design W426) which is equivalent to ASTM E119.

VAPOR RETARDER
Gaco 183M meets the requirement of one perm or less for a Class II vapor retarder per the International Code Council and ASHRAE when installed at 1.12" (28.4 mm) in depth. Water vapor permeability at various thicknesses is provided below:

<table>
<thead>
<tr>
<th>Thickness</th>
<th>WVP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&quot; (25.4 mm)</td>
<td>1.12 perms</td>
</tr>
<tr>
<td>1.12&quot; (28.4 mm)</td>
<td>1.00 perms</td>
</tr>
<tr>
<td>2&quot; (50.8 mm)</td>
<td>0.56 perms</td>
</tr>
<tr>
<td>3&quot; (76.2 mm)</td>
<td>0.37 perms</td>
</tr>
<tr>
<td>4&quot; (101.6 mm)</td>
<td>0.28 perms</td>
</tr>
</tbody>
</table>

AIR BARRIER PERFORMANCE
Gaco 183M is an air impermeable insulation (ASTM E283, ASTM E2178); it has passed air barrier assembly testing (ASTM E2357) and has been evaluated by the Air Barrier Association of America in accordance with ABAA D-115-010.

INDOOR AIR QUALITY
Gaco 183M is a low VOC emitting material and is GREENGUARD Gold Certified (29167-410, 29167-420) (formerly known as GREENGUARD Children & Schools Certification) by UL Environment. This program demands strict certification criteria and considers safety factors to account for sensitive individuals (such as children and the elderly), and ensures that a product is acceptable for use in environments such as schools and healthcare facilities. It is referenced by both the Collaborative for High Performance Schools (CHPS) and the Leadership in Energy and Environmental Design (LEED) Building Rating System.

LEED INFORMATION
Gaco 183M has a minimum of 8.6% recycled content based on weight, including 6.6% pre-consumer material and 2.0% post-consumer material. Gaco 183M raw materials are blended in Waukesha, WI. Actual polyurethane foam end product production is done on-site by the applicator.

TYPICAL LIQUID CHEMICAL PROPERTIES
**PROPERTY** | **TEST TEMPERATURE** | **ASTM TEST** | **VALUE** | **UNIT**
--- | --- | --- | --- | ---
Viscosity – “A” Component: | 77 °F (25 °C) | D2196 | 200 ± 50 | cps
Viscosity – “B” Component: | | | 750 ± 50 | cps
Specific Gravity – “A” Component: | 77 °F (25 °C) | D1638 | 1.24 | S.G.
Specific Gravity – “B” Component: | | | 1.20 | S.G.
Weight/Gallon – “A” Component: | 77 °F (25 °C) | --- | 10.34 | lb/gal
Weight/Gallon – “B” Component: | | | 10.0 | lb/gal
Mixing Ratio – “A” & “B” Component | --- | --- | 1:1 | by volume
Stability When Stored at 50 °F to 70 °F (10 °C to 21 °C) | --- | --- | A Component – 6 | months
| | | B Component – 6 | months

**APPLICATION**
To ensure optimum performance, a minimum pass thickness of ¾” (25.4 mm) is recommended with the maximum not to exceed 2” (50.8 mm) per pass. To obtain optimum results substrate temperature should be within the ranges as stated below. All substrates must be dry at the time of application. Do not apply to wood surfaces with a moisture content of above 18%.

<table>
<thead>
<tr>
<th>Material</th>
<th>Substrate Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gaco 183M</td>
<td>40 °F to 120 °F (4 °C to 49 °C)</td>
</tr>
<tr>
<td>Gaco 183MW</td>
<td>30 °F to 100 °F (-1 °C to 38 °C)</td>
</tr>
</tbody>
</table>

**EQUIPMENT SETTINGS**

| Pre-Heaters - Iso (A) | 105 °F to 135 °F (41 °C to 57 °C) | Cream Time | 1 second |
| Pre-Heaters - Poly (B) | 105 °F to 135 °F (41 °C to 57 °C) | Rise Time | 3 - 6 seconds |
| Hose Heat | 105 °F to 135 °F (41 °C to 57 °C) | Tack Free Time | 4 - 8 seconds |
| Recommended Spray Pressure | 1,000 to 1,200 psi (dynamic) | Cure Time | 4 hours |

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For specific Safety and Health information please refer to Safety Data Sheet.