ENVELO-SEAL™ 2.0 IB
Ignition Barrier Spray Foam
Environmentally Friendly Spray-Applied Polyurethane Foam Insulation

PRELIMINARY
Revised 11.07.13NP

DESCRIPTION
ENVELO-SEAL™ 2.0 IB Spray Foam Wall Insulation is a two-component polyurethane foam insulation system. It has a 1.9 - 2.2 PCF spray in place density. ENVELO-SEAL™ 2.0 IB was developed using an EPA approved Zero ODP blowing agent. This product provides superior energy efficiency and air infiltration control. The product can be used in open wall cavities, crawlspaces, perimeter rim joists, cathedral ceilings, and garage ceilings. ENVELO-SEAL™ 2.0 IB meets the USDA criteria for incidental food contact.

RECOMMENDED USES
- Residential Insulation
- Commercial Insulation
- Industrial Insulation
- Exterior Walls
- Vented Attics
- Unvented Attics
- Floors
- Foundations
- Crawl Spaces
- HVAC Ducts
- Fluid Tanks
- Cold Storage Units in conjunction with vapor barrier

GREEN FEATURES
- Contains Rapidly Renewable Resource Components
- Bio-based Contents 5% ("B" side)
- Utilizes Recycled Plastic Materials
- No Dangerous Heavy Metal Catalysts (such as lead or mercury)
- No Ozone Depleting Products (ODP)
- No Bromine or other Halogenated Components
- No Formaldehyde Components
- Mildew, Bacteria, and Fungus Resistant
- Considered Safe for Burial and Landfill Disposal
- Compliant with USDA/FDA Requirements for Incidental Food Contact

SURFACE BURNING CHARACTERISTICS

<table>
<thead>
<tr>
<th>ASTM Method E84 4 inches</th>
<th>Class 1</th>
<th>Note: The flame spread rating is not intended to reflect hazards presented by this or any other material under actual fire conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flame Spread</td>
<td>&lt;25</td>
<td></td>
</tr>
<tr>
<td>Smoke Development</td>
<td>&lt;300</td>
<td></td>
</tr>
</tbody>
</table>

IGNITION BARRIER
ENVELO-SEAL™ 2.0 IB is compliant with ICC-ES AC 377, Appendix X, for use in attics and crawlspaces without a prescriptive ignition, thermal barrier or intumescent coating.

TYPICAL PHYSICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aged R-Value 75°F (24°C)</td>
<td>6.62 at 1 inch</td>
</tr>
<tr>
<td>Density: ASTM D1622</td>
<td>1.7 - 1.8pcf (core)</td>
</tr>
<tr>
<td>Closed Cell Content: ASTM D6226</td>
<td>&gt;92%</td>
</tr>
<tr>
<td>Dimensional Stability: ASTM D2126 (% volume change)</td>
<td></td>
</tr>
<tr>
<td>Performance Permeability: ASTM E96</td>
<td>0.96 perms @ 2&quot;</td>
</tr>
<tr>
<td>Shelf Life: when stored in original unopened containers between 50° - 80°F (10° - 27°C)</td>
<td>&quot;A&quot; side 1 year &quot;B&quot; side 5 months</td>
</tr>
</tbody>
</table>

These items are provided as general information only. They are approximate values and are not part of the product specifications.

PROCESSING PARAMETERS AND PHYSICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-heater/Hose Temperature:</td>
<td>&quot;A&quot; and &quot;B&quot; ± 125°F (52°C) ±5</td>
</tr>
<tr>
<td>Pressures:</td>
<td>1100 – 1400 psi (dynamic, at gun)</td>
</tr>
<tr>
<td>Mix Ratio Parts:</td>
<td>1 to 1 by volume &quot;A&quot; to &quot;B&quot;</td>
</tr>
<tr>
<td>Substrate/Air Temperature</td>
<td>40°F (4°C) min 120°F (32°C) max</td>
</tr>
<tr>
<td>Thickness Per Lift</td>
<td>2&quot; (5 min cure between lifts) 3&quot; (10 min cure between lifts)</td>
</tr>
</tbody>
</table>

These settings will ensure thorough mixing in the spray gun mix chamber in typical applications. Optimum hose pressure and temperature may vary as a function of the type of equipment, ambient, and substrate conditions, and the specific application. It is the responsibility of the applicator to properly interpret equipment technical literature, particularly information that relates acceptable combinations of gun chamber size, proportioner output, and material pressures. The relationship between proper chamber size and the capacity of the proportioner pre-heat is critical.

THERMAL BARRIER
IRC and IBC codes require that SPF be separated from the interior of a building by a thermal barrier, which is applied over SPF to slow thermal rise, and delay its involvement in a fire. A building code definition of an approved thermal barrier is one that is equal in fire resistance to ½ inch gypsum board. Thermal barriers limit the temperature rise of the underlying SPF to not more than 250°F (121°C) after 15 minutes of fire exposure in compliance with ASTM-E119 (Test Methods for Fire Tests of Building Construction Materials). Thermal barriers meeting this criteria are termed a “15 minute thermal barrier” or classified as having an “index of 15”. Specialty Products, Inc. recommends that an approved thermal barrier separate ENVELO-SEAL™ 2.0 IB foam from the building interior unless waived by a local building code official.
PRODUCT APPLICATION

ENVELO-SEAL™ 2.0 IB should be applied in 2” to 3” lifts with suggested cure time between lifts. Note: Re-spraying too soon may result in charring and possible spontaneous ignition of foam. ENVELO-SEAL™ 2.0 IB should only be applied to approved substrates recommended by the manufacturer. The data presented here should only be used as a guide since the actual foam properties are influenced by the efficiency of the spray gun, component temperatures, foam thickness, and ambient conditions. While the above technical information is based on results of actual tests, it should only be used as a guideline for typical chemical and physical properties. The user must test and qualify the product. Final determination of suitability is the responsibility of the user. When removing bungs from containers use caution, contents may be under pressure. Loosen the small bung first and let any built up gas escape before completely removing. The resin “B” component will froth at elevated temperatures.

GENERAL GUIDELINES

ENVELO-SEAL™ 2.0 IB is suitable for application to most construction materials including wood, masonry, concrete, and metal. All surfaces to be sprayed with foam should be clean, dry, and free of dew or frost. All metal to which the foam is to be applied must be free of oil, grease, etc. Multiple layers can be applied to reach the desired thickness and R-value. Substrate temperature at the time of the ENVELO-SEAL™ 2.0 IB application should be between 15°F to 90°F, the warmer the surface, the better the adhesion. When substrates to be sprayed are cooler than 50°F, a half inch lift should be applied to provide a thermal break. Follow with a second lift soon as the original lift is no longer tacky to the touch. For service temperatures above the range of 120°F to 180°F, the articles should be sprayed at 120°F or above at the time of spraying. As with all spray polyurethane foam systems, improper application techniques should be avoided. Examples of improper techniques include, but are not limited to, excessive thickness of spray polyurethane foam, off ratio material and spraying into or under rising foam. Potential results of improperly installed spray polyurethane foam include: dangerously high reaction temperatures that may result in fire and offensive odors that may or may not dissipate. Improperly installed foam must be removed and replaced with properly installed spray polyurethane foam. It is the responsibility of the applicator to thoroughly understand all equipment technical information and safe operating procedures that pertain to a spray polyurethane foam application. When changing the “B” side (resin) to another type of spray polyurethane foam it is very important that the supply hoses and pumps are completely drained. Mixing of dissimilar product types will have an adverse effect on the foam. Spray polyurethane foam insulation is combustible. High intensity heat sources such as welding or cutting torches must not be used in close proximity to any polyurethane foam. Large masses of spray polyurethane foam should be removed to an outside safe area, cut into smaller pieces, and allowed to cool before discarding into a trash receptacle. ENVELO-SEAL™ 2.0 IB is NOT designed for use as an exterior roofing product. Please contact Specialty Products, Inc. for information on our spray polyurethane roofing systems. Cold chemicals can cause poor mixing, pump cavitation, or other process problems due to higher viscosity at lower temperatures. Storage temperatures should be 65°F to 85°F for several days before use, and should not exceed 90°F. Do not store in direct sunlight. Keep drums tightly closed when not in use and under dry air or nitrogen pressure of 2-3 psi after they have been opened. Store in a dry and well-ventilated area.

FIRST AID

Inhalation: Remove to fresh air and seek medical attention. See MSDS for more details.

Eye and Skin Contact: Wearing eye protection is required. Polyurethane foam vapors can enter the body through the lungs, eyes, and skin. It is important to protect lungs, eyes, and skin from overspray and organic vapors emitted by the foam while it is being applied.

Ingestion: If liquid is swallowed seek medical attention immediately.

Applicators should ensure the safety of the jobsite and construction personnel by posting appropriate signs warning that all “hot work” such as welding, soldering, and cutting with torches should not take place until a thermal barrier or approved equivalent is installed over any exposed polyurethane foam. Due to the reactive nature of these components respiratory protection is mandatory. The vapors and liquid aerosols present during application and for a short period thereafter must be considered – and appropriate protective measures taken – to minimize potential risks from exothermic exposure including inhalation, skin, or eye contact. These protective measures include: adequate ventilation, safety training for installers and other workers, use of appropriate personal protective equipment, and a medical surveillance program. It is imperative that the applicator read and become familiar with all available information regarding proper use and handling of spray polyurethane foam. Additional information is available at spraypolyurethane.org, polyurethane.org, sprayfoam.com or by contacting the technical services department of Specialty Products, Inc.

WARRANTY & DISCLAIMER

Specialty Products, Inc. has no role in the manufacture of the finished polymer other than to supply its two components. It is vital that the person applying this product understands the product, and is fully trained and certified in the use of plural-component equipment.

Specialty Products, Inc., an Alaska corporation, warrants only that the two components of this product shall conform to the technical specifications published in the product literature.

The quality and fitness of the product are dependent upon the proper mixture and application of the components by the applicator. There are no warranties that extend beyond the description on the face of this instrument.

Failure to apply the product within the parameters stated on this document shall void the warranty.

SPI - The Single Source Solution Since 1974 Serving the Plural-Component Industry

Product & Equipment Technical Assistance
24 hours – 7 days a week (800) 627-0773