INTRODUCING...

THE ICYNENE X-WALL SYSTEM™

ALL-IN-ONE SPRAY FOAM

• INSULATION • AIR BARRIER • VAPOR RETARDER • WATER RESISTANT BARRIER

NOW FEATURING
LOW GWP Blowing Agent!

15 YEAR THERMAL WARRANTY

ICYNENE X-WALL SYSTEM™

ICYNENE®
The Evolution of Insulation
BUILDING IT RIGHT WITH ICYNENE

Architects and specifiers today are faced with a multitude of challenges in designing a strong, reliable building envelope that will:

1. Deliver excellent value at a reasonable installed cost
2. Meet the new Continuous Insulation (CI) building codes
3. Provide long term energy efficiency savings
4. Protect the structure from nature’s elements.

The ICYNENE X-WALL SYSTEM provides everything needed to insure a solid and tightly sealed building envelope with the highest quality products & accessories, custom design assistance and engineering support, and certified installer network. One complete system designed to enhance the exterior building envelope of your project with high performance thermal insulation, a tightly sealed air barrier, a class II vapor retarder, and a Water Resistant Barrier (WRB).

ALL-IN-ONE SPRAY FOAM

- Thermal Insulation
- Air Barrier
- Class II Vapor Retarder
- Water Resistant Barrier (WRB)
- 15 Year Thermal Warranty

ENVIRONMENTALLY FRIENDLY TECHNOLOGY

The Icynene X-Wall System now includes ProSeal HFO as our most technologically advanced and environmentally friendly closed cell spray foam product. Serving as a combination insulation, air barrier, vapor retarder, and water resistant barrier (WRB), Icynene’s new ProSeal HFO features an ultra-low Global Warming Potential (GWP) rating of 1, which is 99.9% lower than conventional HFC blowing agents commonly used within many closed cell spray foam insulation products. The inclusion of this latest HFO technology makes the Icynene X-Wall System an ideal choice for forward thinking building owners seeking outstanding energy efficiency with an environmentally friendly product system.
A Better, Lower Cost Alternative to Rigid XPS Foam Insulation Board

All-In-One: Insulation • Air Barrier • Vapor Retarder • Water Resistant Barrier

MASONRY WALLS WITH CLOSED CELL SPRAY FOAM CONTINUOUS INSULATION MAJOR COMPONENTS:

CMU 2” BRICK
- 8” CMU Backup Wall $10.00
- 2” Closed-Cell ProSeal Spray Foam Insulation (R14) $1.89
- Brick Veneer $16.57

TOTAL PER SQUARE FOOT $28.46

CMU 3” BRICK WATERPROOFING
- 8” CMU Backup Wall $10.00
- 3” Extruded Polystyrene (XPS) Insulation (R15) $2.58
- Brick Veneer $16.57
- Bituminous asphalt spray 2 coat waterproofing $1.65

TOTAL PER SQUARE FOOT $30.80

INSTALLED COST SOURCE: R.S. MEANS 2017 BUILDING CONSTRUCTION COST DATA

The information detailed above is intended to provide a general cost comparison of commercial air barrier assemblies designed with foam plastic insulation materials of similar R-value. Figures do not include scaffolding costs, which can vary widely. R-Value performance will vary by product. Consult with manufacturers for specific details.
A Better, Lower Cost Alternative to Rigid XPS Foam Insulation Board

All-In-One: Insulation • Air Barrier • Vapor Retarder • Water Resistant Barrier

CLOSED CELL SPRAY FOAM STEEL FRAMING (LGMF) WALLS
MAJOR COMPONENTS:

- 1/2" Gypsum Wallboard, Taped and Finished
- 18 ga. 6" studs @ 24" O.C.
- 1/2" glass mat exterior gypsum sheathing
- 2" Closed-Cell ProSeal Spray Foam Insulation (R14)
- Brick Veneer

TOTAL PER SQUARE FOOT $24.19

RIGID XPS FOAM BOARD STEEL FRAMING (LGMF) WALLS
MAJOR COMPONENTS:

- 1/2" Gypsum Wallboard, Taped and Finished
- 18 ga. 6" studs @ 24" O.C.
- 1/2" glass mat exterior gypsum sheathing
- Polyethylene self-adhering composite membrane waterproofing (60 mil)
- Joint Tape (optional)
- 3" Extruded Polystyrene (XPS) Insulation (R15)
- Brick Veneer

TOTAL PER SQUARE FOOT $27.96

INSTALLED COST SOURCE: R.S. MEANS 2017 BUILDING CONSTRUCTION COST DATA

The information detailed above is intended to provide a general cost comparison of commercial air barrier assemblies designed with foam plastic insulation materials of similar R-value. Figures do not include scaffolding costs, which can vary widely. R-Value performance will vary by product. Consult with manufacturers for specific details.
ENGINEERING, TECHNICAL AND DETAIL DESIGN ASSISTANCE

As the market leader in spray foam insulation technology, Icynene has the dedicated engineering resources to work with architects and specifiers on your individual project needs. Not sure how to properly detail around an unusually shaped window or door opening? Icynene will provide hands-on support and technical guidance where needed to insure a completely secure and reliable detailing specification. In addition to custom design assistance, Icynene also offers a complete library of commercial detail drawings as pictured in the examples below for CMU, Light Gage Metal Framing (LGMF), and Precast Walls.

Call 1-800-758-7325 today for a prompt and reliable assistance on your project.

Complete details for various wall systems can be found at icynene.com/architect in the Architectural Resource Online Binder.
MULTIPLE CLADDING OPTIONS

Build your own NFPA 285 compliant wall assemblies for your next construction project.

Quickly design & specify a wall assembly with interior or exterior insulation, or both. Choose from common wall, cladding & insulation options, featuring award-winning Icynene spray foam.

Icynene has comprehensively tested our insulation products in order to provide over 750 NFPA compliant wall assemblies to choose from.

With this tool, you can build your own wall assembly in 5 steps or less, and download a free PDF with product specs once finished.

Let's get started
Which wall layers should your assembly include?

- Interior only
- Interior + Exterior
- Exterior only

The Icynene Wall Assembly Builder tool helps you design wall assemblies with various interior/exterior insulation combinations, but there are more options available to meet NFPA 285. Call our Engineering team at 1-800-759-5737 for assistance if your preferred assembly configuration is not available above.


X-WALL SYSTEM LIQUID FLASHING FOR WINDOWS/DOORS ASSURES MEMBRANE COMPATIBILITY

Note - Flashing coverage will vary by substrate. Contact Icynene for additional information.
ICYNENE-X-WALL SYSTEM THIRD PARTY PERFORMANCE TESTED IN 2018 AT INTERTEK LABORATORIES

**ASTM E331 per ICC-ES AC71**
Acceptance criteria for foam plastic used as water-resistive barriers based on the standard test method for water penetration of exterior windows, skylights, doors, and curtain walls by uniform static air pressure difference.

**ASTM E2357**
Standard test method for determining air leakage rate of air barrier assemblies.

Prior to the spray foam being applied, test assemblies were constructed for ASTM E2357 (Air Barrier) and ASTM E331 (Water Resistant Barrier) around windows and other wall areas with openings such as windows or where penetrations occurred for piping, etc.

Icynene’s environmentally friendly low VOC and low GWP ProSeal HFO spray foam applied at 1” thickness for water and air barrier testing.

Water jets attempting to penetrate the Icynene X-Wall System as part of the water resistant barrier (WRB) testing.
Icynene ProSeal™ HFO
Technical Product Data

THERMAL INSULATION AND AIR BARRIER
CCRR-1108

Specification Section: 07 21 19 Foamed-in-Place Insulation, 07 27 00 Air Barriers

PRODUCT DESCRIPTION
Icynene ProSeal™ HFO is a closed cell spray applied foam, which was developed using an EPA approved 4th generation blowing agent and when installed following application guidelines adheres tenaciously to framing members and substrates. It is a thermal insulation and air barrier material suitable in buildings in accordance with the IRC and the IBC including Type I, II, III, IV and V construction. It is a low VOC product allowing for 1 hour job site re-entry and 2 hour job site re-occupancy at applicable ventilation rates. ProSeal™ HFO Closed-Cell spray foam closed cell spray foam can be applied with an initial pass thickness of 5.5 inches. It provides exceptional performance in minimizing heat transfer, moisture gain, air leakage, and improving racking strength.

Recommended Product Applications:
- Wall Cavities
- Exterior Walls as Continuous Insulation
- Unvented Attics and Vented Attics
- Ceilings
- Floors
- Piping
- Unvented Crawl Spaces
- Vented Crawl Spaces
- Foundations
- Concrete Slabs
- Ducts
- Cold Storage Areas

PROPERTIES OF CURED FOAM

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Test Method</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Density</td>
<td>ASTM D 1622</td>
<td>2.0 lbs./ft³</td>
</tr>
<tr>
<td>Color</td>
<td></td>
<td>Cream</td>
</tr>
<tr>
<td>Aged Thermal Resistance: at 1&quot;</td>
<td>ASTM C 518</td>
<td>R-6.2</td>
</tr>
<tr>
<td>at 2&quot; (Calculated)</td>
<td></td>
<td>R-13</td>
</tr>
<tr>
<td>at 3½&quot; (Calculated)</td>
<td></td>
<td>R-20.4</td>
</tr>
<tr>
<td>Air Permeance at 1&quot;</td>
<td>ASTM E 2178</td>
<td>&lt; 0.02 L/s.m²</td>
</tr>
<tr>
<td>Water Vapor Permeance @ 74°F</td>
<td>ASTM E 96</td>
<td>1.4 perms @ 1&quot;</td>
</tr>
<tr>
<td>Water Resistive Barrier</td>
<td>ICC-ES AC71</td>
<td>1&quot;</td>
</tr>
<tr>
<td>Water Absorption</td>
<td>ASTM D 2842</td>
<td>2.36%</td>
</tr>
<tr>
<td>Dimensional Stability 28 days at 160°F, 100%RH</td>
<td>ASTM D 2126</td>
<td>≤4%</td>
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<tr>
<td>Compressive Strength</td>
<td>ASTM D 1621</td>
<td>28.1 psi</td>
</tr>
<tr>
<td>Closed Cell Content (% Volume)</td>
<td>ASTM D 6226</td>
<td>&gt; 90%</td>
</tr>
</tbody>
</table>

BURN CHARACTERISTICS

<table>
<thead>
<tr>
<th>Surface Burning at 4 Inches:</th>
<th>Flame Spread Index</th>
<th>Smoke Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM E 84</td>
<td>15</td>
<td>350</td>
</tr>
</tbody>
</table>

Commercial Fire Resistance
- ASTM E 119: 1 & 2 Hour Ratings*
- NFPA 285: Assembly Passed*
- DC 315, No-Burn Plus ThB Thermal Barrier: NFPA 286 > 15 minutes
- Wall & Ceiling Application Maximum Thickness: ACC377
- Attic & Crawl Space Walls & Roof Uncoated Thickness: ACC377 Appendix X

Air Barrier/ Mechanical Ventilation
- Icynene ProSeal™ HFO fills any shaped cavity, and adheres to most construction materials, creating assemblies with very low air permeance.
- Additional interior or exterior air infiltration protection is subject to applicable codes.
- All buildings insulated and air sealed with Icynene ProSeal™ HFO must be designed to include adequate mechanical ventilation/outdoor air supply for optimum IAQ (Indoor Air Quality).
- For mechanical ventilation see ASHRAE Standard 62 – Ventilation for Acceptable Indoor Air Quality or any other acceptable good engineering practice.

*consult Icynene-Lapolla Engineering Department for details.
WATER VAPOR PERMEANCE & ABSORPTION

- Icynene ProSeal™ HFO is a Class II vapor retarder, at 1.4” thickness, which reduces the amount of moisture that can diffuse through the insulation.
- Icynene ProSeal™ HFO meets FEMA criteria for resisting water absorption.
- It is resistant to moisture allowing it to be used below the base flooding elevation in flood prone areas.

ENVIRONMENTAL AND HEALTH

- Icynene ProSeal™ uses an environmentally friendly HFO blowing agent and therefore has zero ozone-depletion potential.
- Icynene ProSeal™ HFO has the lowest Global Warming Potential (GWP of 1) value for foam insulation products.
- Icynene ProSeal™ HFO is PBDE-free.
- 1 hour re-entry and 2 hour re-occupancy possible provided rate of air exchange (ventilation) during spraying and for noted time period thereafter equals or exceeds 18 air changes per hour.
- UL Greenguard Gold certified

INSTALLATION

- Icynene ProSeal™ HFO is installed by a network of Licensed Dealers, trained in its installation.
- Maximum thickness per pass is 5.5 inches for the first pass. Wait 30 minutes for the first layer to cool before applying a second layer/lift of 5.5 inches over the initial layer/lift.
- THIS FOAM MUST NOT BE APPLIED IN EXCESS OF 5.5 INCHES PER PASS AS NOTED. THE FOAM SHOULD BE ALLOWED TO COOL FOR 30 MINUTES OR UNTIL THE SURFACE TEMPERATURE HAS RETURNED TO AMBIENT BEFORE ADDITIONAL APPLICATIONS OF FOAM ARE ATTEMPTED. FOAM APPLIED IN EXCESS OF 5.5 INCHES OR WITHOUT ALLOWING FOR COOLING MAY RESULT IN, BUT IS NOT LIMITED TO EXCESS HEAT BUILD-UP AND RESULT IN FIRE OR THE GENERATION OF OFFENSIVE ODORS THAT MAY NOT DISSIPATE WITH TIME.
- LIMITATIONS: Wood, concrete and gypsum board sheathing substrates may receive 5.5 inches per application. Substrate thinner than 22 gauge and gypsum board attic floor substrates should be applied at 1 inch for the first pass. Low voltage wiring should not be encased in a single 5.5 inch pass.
- This product should not be installed within 3” of heat emitting devices, (or as specified by Code) where the temperature is in excess of 180°F, in accordance with applicable codes.
- It can be installed at ambient temperatures between 14°F and 35°F (winter blend), 35°F and 70°F (regular blend) and 65°F and 120°F (summer blend).
- Heat settings, hose and preheaters
  - Summer 105°F-120°F (115°F average starting point)
  - Regular 105°F-125°F (118°F average starting point)
  - Winter 65°F-85°F (115°F average starting point)
- Pressures
  - 4242 mix chamber 1000-1250 psi (recommended)
  - 5252 mix chamber 1000-1150 psi (recommended)
- When spraying passes at or over 2.5” it is optimal to spray it like open cell (side to side) to obtain the highest possible yields so adjust the pressures accordingly.
- Surface preparation is generally not necessary.
- Within seconds, the foaming process is complete.

HANDLING AND SAFETY


AVAILABILITY

Contact Icynene Inc. at 800-758-7325 or visit our website at www.icynene.com.

WARRANTY

WHEN INSTALLED PROPERLY IN ACCORDANCE WITH INSTRUCTIONS, THE COMPANY WARRANTS THAT THE PROPERTIES OF THE PRODUCT MEET PRODUCT SPECIFICATIONS AS OUTLINED IN THIS TECHNICAL DATA SHEET. SAVE AND EXCEPT ANY EXCLUSIONS REFERENCED IN THE WARRANTY.

TECHNICAL

Icynene Licensed Dealers and Icynene Inc. provide support on both technical and regulatory issues. Architectural specifications in CSI 3-Part format and design details are available at our website at www.icynene.com.

REGULATORY

- Icynene ProSeal™ HFO has been tested as per the requirements of the International Code Council Evaluation Service’s AC377 Acceptance Criteria (April 2016).
- Meets ASTM C1029 Type II classification.
- For regulatory issues concerning Icynene ProSeal™ HFO contact Icynene at 800-758-7325.

RELATED REFERENCES

All physical properties were determined through testing by accredited third party agencies. Icynene Inc. reserves the right to change specifications in its effort of continuous improvement. Please confirm that technical data literature is current.

PACKAGING AND STORAGE

- Packaging - 55 US gallon, closed top steel drums
- Component ‘A’ – 520 lb. per drum. Base Seal® MDI
- Component ‘B’ – 480 lb. per drum. Icynene ProSeal™ HFO – Resin
- Icynene ProSeal™ HFO (Component A and Component B) ideally should be stored between 65°F (18°C) and 85°F (30°C).
- Component A should be protected from freezing.
- Shelf life is 6 months.
MasterFormat: 07 27 26

DESCRIPTION
X-Wall Liquid Flashing is a high-quality, gun grade, low-odor, elastomeric, polyether, liquid applied flashing and detailing membrane. It bonds to most construction materials, such as aluminum, brick, concrete, wood, vinyl, and exterior gypsum board.

USES
This general purpose, wet flashing membrane is used to seal rough openings and detail joints between exterior gypsum board. X-Wall Liquid Flashing is designed for window and door flashing applications installed along with Icynene ProSeal HFO spray foam insulation.

FEATURES/BENEFITS
- Can be applied in damp conditions.
- Does not peel back when left exposed.
- Does not create buildup in rough openings.
- Non-sag.
- 100% solvent free.
- Non-shrinking.
- Bonds to most construction materials.
- Paintable in 24 hours.
- Guns and tools easily.
- Compatible with Icynene ProSeal HFO spray foam insulation.

PACKAGING
- 20 Oz. (600 mL) Sausages (12/Carton)

COVERAGE
- 20 Oz. (600 mL) Sausage
  12 – 15 Mils 15 – 19 ft.² (1.4 – 1.8 m²)

Coverage rates will vary depending on the surface the material is applied on.

SHELF LIFE
When stored indoors and in original, unopened containers at temperatures between 40 - 90°F (4 - 32°C), shelf life is one year from date of manufacture.

SPECIFICATIONS
Complies with all current federal, state, and local maximum allowable VOC requirements, including U.S. EPA, LADCO, SCAQMD, and OTC.

TECHNICAL DATA

<table>
<thead>
<tr>
<th>Chemistry</th>
<th>Silyl-Terminated Polyether – Moisture Cure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>12.2 +/- 0.2 lb./Gal. (12.2 +/- 1.46 kg/L)</td>
</tr>
<tr>
<td>Viscosity at time of manufacture</td>
<td>900,000 +/- 200,000 cps</td>
</tr>
<tr>
<td>Tack-Free Time</td>
<td>30 min +/- 15 min</td>
</tr>
<tr>
<td>Shear Strength</td>
<td>210 psi +/- 25 psi</td>
</tr>
<tr>
<td>Tensile Strength</td>
<td>230 psi +/- 25 psi</td>
</tr>
<tr>
<td>Elongation at Break</td>
<td>215% +/- 25%</td>
</tr>
<tr>
<td>Low Temperature Flex</td>
<td>Pass @ -10°F (-23°C)</td>
</tr>
<tr>
<td>Shore A Hardness</td>
<td>38 +/- 5</td>
</tr>
<tr>
<td>Installation Temperature</td>
<td>&gt;32°F (0°C)</td>
</tr>
<tr>
<td>Service Temperature</td>
<td>-20°F to 200°F (-29°C to 93°C)</td>
</tr>
<tr>
<td>Shrinkage</td>
<td>No Visible Shrinkage After 14 Days</td>
</tr>
<tr>
<td>Exposure Time</td>
<td>12 Months</td>
</tr>
<tr>
<td>VOC Content</td>
<td>19 g/L</td>
</tr>
<tr>
<td>Color</td>
<td>Green</td>
</tr>
</tbody>
</table>

APPLICATION
Surface Preparation: All surfaces to receive X-Wall Liquid Flashing should be clean, smooth, and free from all bond-breaking contaminants. Product can be applied to damp surfaces if it is clean. Remove any damaged structural wall components. Any raw edges of exterior gypsum board may require adhesive. For detailed instructions, view our X-Wall Liquid Flashing Installation Guidelines document on our website.

APPLICATION METHOD
Rough Opening: Inspect rough opening. The rough or cut edge of gypsum board should be applied with adhesive. Prefill any gaps larger than ¼” (6.35 mm) with X-Wall Liquid Flashing and allow to skin over.

Apply bead of X-Wall Liquid Flashing in opening to be sealed. Spread the material using putty knife across rough opening surface. Next, apply a thick bead of material to the structural wall surface around rough opening. Again, spread the material evenly using a putty knife. Make sure material is spread in an even, monolithic manner. Make sure to spread the material 12 – 15 mils [4” - 6” (100 - 152 mm)] on to structural wall. Make sure material contains no pinholes and is void-free. Again, make sure material is even, monolithic, and undamaged.

CONTINUED OVER PAGE >
Make sure X-Wall Liquid Flashing covers the entire opening and seamlessly joins the specific X-Wall membrane being installed. Allow surface to dry before installing windows, doors, wall assembly, and specific X-Wall membrane being applied.

**Drying Time:** At 70° F (21° C) and 50% relative humidity, product skins within 30 minutes. X-Wall Liquid Flashing is moisture curing. Low temperatures and low relative humidity slow dry time. High temperatures and high relative humidity accelerates dry time.

**PRECAUTIONS**
Not for use as a structural sealant. Not for use in place of AIR-SHIELD THRU-WALL FLASHING from W. R. MEADOWS. Not for use below-grade or in locations designed to be continuously immersed in water. When painting, use latex paints only.

**LEED INFORMATION**
May help contribute to LEED credits:
- EA Credit 1: Optimize Energy Performance
- IEQ Credit 3.1: Construction Indoor Air Quality Management Plan: During Construction
- IEQ Credit 4.2: Low-Emitting Materials - Paints and Coatings
- IEQ Credit 7.1: Thermal Comfort - Design
- MR Credit 2: Construction Waste Management
- MR Credit 5: Regional Materials

For most recent data sheet, further LEED information, and SDS, visit www.icynene.com.
X-Wall Liquid Flashing is high-quality, gun-grade, low-odor, elastomeric, polyether liquid applied flashing and detailing membrane that is installed with Icynene ProSeal HFO spray foam insulation. This general-purpose, wet flashing membrane is used to seal rough openings and detail joints and bonds to most construction materials, such as aluminum, brick, concrete, wood, and vinyl and exterior gypsum board.

This document has been created as an addendum to the X-Wall Liquid Flashing technical data sheet to provide information regarding the application of X-Wall Liquid Flashing for rough openings, such as windows and doors. Following are the typical installation instructions recommended by Icynene. It is important to review each application as there may be situations that may require this procedure to be modified based on the project requirements. If this situation arises, please contact Icynene Technical Services.

**Installation Instructions**

1. Inspect rough openings and ensure that all areas to receive X-Wall Liquid Flashing are clean, dry, smooth, and free from all bond-breaking contaminants.

2. Remove and replace any damaged structural wall components.

3. Apply a coat of MEL-PRIME™ on the raw edges of exterior gypsum board.

4. Prefill any joints or cracks that are larger than ¼" (6.35 mm) and less than ½" (12.7 mm) with X-Wall Liquid Flashing. Apply a generous bead of material over the joint, press, and spread into the joint. Allow material to skin over prior to full application of X-Wall Liquid Flashing.

5. Prefill any joints or cracks larger than ½" (12.7 mm) with X-Wall Liquid Flashing. Install KOOL-ROD™ into the joint to control sealant depth and apply X-Wall Liquid Flashing. Smooth out using a putty knife and allow to cure prior to full application of X-Wall Liquid Flashing.
Installation Instructions (cont’d)

6. Starting at the top of the rough opening, apply a bead of X-Wall Liquid Flashing in the rough opening to be sealed and spread the material using a putty knife across the rough opening surface at an even consistency. Test the thickness of the material and ensure that it has a thickness of 12-15 mils using a wet mil gauge.

7. Apply a generous bead of X-Wall Liquid Flashing to the vertical surface around the rough opening and spread this material with a putty knife in an even, monolithic manner 4” – 6” (100 – 152 mm) onto the vertical surface around the rough opening. Make sure material contains no pinholes and is void-free. Again, make sure material is even, monolithic, and undamaged. Test the thickness to ensure the material has a thickness of 12-15 mils.

8. Allow X-Wall Liquid Flashing to dry before installing windows, doors, wall assembly, and the specific X-Wall membrane being applied.
Hereby warrants that for a period of fifteen years, commencing with the date of manufacture, that the Insulation’s actual thermal resistance for the x-wall system will not vary by more than ten percent from its published LTTR-value. If the insulation is determined by sampling and tests (conducted as provided below) to not meet warranty value, Icynene will either deliver to the owner of the building on which the insulation was initially installed a quantity of equivalent Icynene product to replace the non-performing Insulation or, at Icynene’s sole discretion, refund to the Owner the original purchase price of the non-performing Insulation. Total Icynene expense for the life of this warranty will be limited to the original purchase price of the insulation.

THE WARRANTY IS IN LIEU OF ALL OTHER GUARANTEES AND WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING THE WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND SHALL NOT BE EXTENDED OR ALTERED EXCEPT BY WRITTEN INSTRUMENT SIGNED BY ICYNENE AND THE OWNER. THERE ARE NO WARRANTIES OR GUARANTEES WHICH EXPAND BEYOND THE DESCRIPTION SET FORTH IN THIS WARRANTY.

THERMAL WARRANTY CONDITIONS

Icynene’s obligations under this warranty will only take effect if installed in strict accordance with all applicable Icynene specifications, recommendations and guidelines which were in effect at the time of such installation. This warranty shall be void in Icynene’s judgment, the Insulation’s performance has been impaired by either damage or alterations (lacking prior Icynene written approval) to the insulation.

EXCLUSIONS

Icynene does not assume any liability for any incidental, consequential, exemplary, special or punitive damages, including (but not limited to) incremental heating, cooling or similar costs and any other harm to persons or property.

INSULATION TESTING

All Sampling shall be conducted in accordance with sampling procedures prescribed by Icynene and samples of the Insulation shall only taken in the presence of an authorized Icynene representative. Testing of Insulation samples shall be in accordance with ASTM test Method C518 or CAN / ULC S770 (LTRR Method), or the then closest Icynene approved effective equivalent thereof. Insulation samples shall be conditioned to equilibrium prior to testing. All sampling and testing costs (including but not limited to costs of Insulation covering removal and replacement) shall be at the Owner’s sole expense.

WARRANTY INCLUDES

Icynene Proseal HFO installed within the X-Wall system design
This specification utilizes the Construction Specifications Institute’s (CSI) 3-Part formatting. The specification is a manufacturer-specific product specification to be used by design professionals as a guide specification. Editing notes are indicated in red italics and precede specification text. Delete editing notes in final specification. Metric conversion, where used, is soft metric conversion.

This specification specifies medium density blown spray foam insulation by Icynene, Inc. Revise section number and title below to suit project requirements.

The specified product may contribute to the following credits/points for the respective rating system:

LEED for Building Design and Construction (BD+C)

LEED for Homes

National Green Building Standard (NGBS, ICC-700)
1.3 SYSTEM DESCRIPTION

A. Furnish and install an exterior continuous installation that becomes the building enclosure thermal, air and water barriers while seamlessly transitioning to adjacent materials and meeting fire code compliance per NFPA 285. The system shall include the following:
   1. Closed cell spray foam insulation adhered to the exterior sheathing or cementitious surface
   2. Liquid flashing transition material for openings and dissimilar materials

B. Performance Characteristics:
   1. Thermal performance: Exterior wall insulation tested per: ASTM C518, shall have a minimum aged R-Value of R6.8 per inch thickness at 3 inches thick with a minimum 90 day exposure capability to outdoor elements and a 15 year thermal warranty.
   2. Air barrier performance: When tested in accordance with ASTM E 2357; less than 0.001 L/s*m² @75 Pa (1.57 psf) and less than 0.047 L/s*m² @300 Pa (6.27 psf)

C. Fire Resistance:
   1. System materials shall be a part of an exterior wall assembly that meets NFPA 285

1.4 REFERENCES

A. American Society for Testing and Materials International (ASTM)
   2. ASTM C 1338: Standard Test method for Determining Fungi Resistance of Insulation Materials and Facings
8. ASTM E 2357: Standard test Method for Determining Air Leakage of Air Barrier Assemblies

1.5 SUBMITTALS
A. Product Data for type of insulation product specified.
B. Product test reports performed by a qualified third-party testing agency evidencing compliance of insulation products with specified requirements including those for thermal resistance, fire-test-response characteristics, water-vapor transmission, and other properties, based on comprehensive testing of current products.
D. Manufacturer’s certificate certifying insulation provided meets or exceeds specified requirements.
E. Installer’s certificate showing the Icynene installation certification.

LEED BD+C Submittals:

Edit the following for actual credits being achieved:

1. MR Credit 4, Recycled Content: Product data showing normalized pre-and post-consumer recycled content.

F. LEED for Homes Submittals:

Edit the following for actual credits being achieved:

1. EA Credit 2, Basic Insulation: Product data showing R-value for sprayed insulation.
2. MR Credit 2.2, Environmentally Preferable Products: Product Data substantiating sprayed insulation complies with CA practice for testing of VOC’s from building materials using small chambers.

G. National Green Building Standard (NGBS, ANSI ICC-700-08) Submittals:

Edit the following for actual credits being achieved:

1. Credit 703 Prescriptive Path: Product Data confirming the sprayed insulation is Grade 1.
2. Credit 901.11: Insulation – Emissions: Product Data confirming sprayed insulation contains formaldehyde emission levels that comply with the requirements of CA/DHS 01350.

H. Low Chemical Emissions Certification Submittals:

*Edit the following for actual credits being achieved:*

1. Credit EQ 2.2, Low Emitting Materials: Product Data confirming sprayed insulation is certified to GREENGUARD Gold (UL Environment).

I. Sample warranty

1.6 QUALITY ASSURANCE

A. Manufacturer’s Qualifications: Product produced in an ISO 9001 registered factory.

B. Single Source Responsibility: Single source insulation product from one manufacturer.

C. Installer Qualifications: Engage an Icynene Licensed Contractor (installer) who has been trained and certified by Icynene.

D. Fire-Test-Response Characteristics: Provide materials specified as determined by testing identical products per test method indicated below by a testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

1. Surface-Burning Characteristics: ASTM E 84
2. Rated Wall Assembly Testing: ASTM E119 and NFPA 285

E. Toxicity/Hazardous Materials

1. Provide products that are “Low-emitting”.
2. Provide products that contain no PBDE’s.
3. Provide products that contain no urea-formaldehyde.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Comply with manufacturers written instructions for handling and protection prior to and during installation.

B. Store both insulation components in a temperature controlled area between 60 and 85 degrees F, out of direct sunlight and avoid cold temperatures less than 60 F.

C. Use only those insulation components that are supplied by the Manufacturer.

1.8 PROJECT CONDITIONS

A. Do not expose insulation to sunlight, except to extent necessary for period of installation and concealment.

1.9 WARRANTY

A. Submit the following warranties:

1. 15 year thermal warranty
HOW TO SPECIFY

2. Liquid flashing: Limited Warranty

B. Refer to www.Icynene.com for full warranty terms.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. X-Wall System components: Icynene ProSeal HFO™ and X-Wall Liquid Flashing by Icynene Inc.

B. Intumescent paint:
   1. DC-315 by International Fireproof Technology Inc.
   2. Fireshell F10E by TPR² Corp.

2.2 MATERIALS

A. Exterior Wall Insulation: Medium-density, closed-cell, polyurethane spray foam conforming to the following material performance:
   1. Material Properties and Performance:
      a. Aged Thermal Resistance: (for 1 inch of material) (R-Value/inch @75 deg F): ASTM C 518; R6.2
      b. Aged Thermal Resistance: (for 3 inch of material) (R-Value/inch @75 deg F): ASTM C 518; R20.4
      c. Compressive Strength: ASTM D1621; minimum 28.1 psi
      d. Thickness per Pass: Up to 5.5 inches in one pass
      e. Minimum Substrate Temperature: 14 °F
      f. Air Permeance (for 1 inch of material): ASTM E 2178; less than 0.02 L/s*m² @75 Pa
      g. Air Barrier System (for 1 inch of material): ASTM E 2357; less than 0.001 L/s*m² @75 Pa (1.57 psf) and less than 0.047 L/s*m² @300 Pa (6.27 psf)
      h. Water Vapor Transmission (for 1.4 inches of material): ASTM E 96; 0.95 perm
      i. Water-Resistive Barrier (for 1 inch of material): ASTM E331 evaluated per ICC-ES AC71; Pass
      j. Resistance to Fungal Growth: ASTM C 1338: no growth
      k. Flame Spread and Smoke Developed Rating: ASTM E 84, Flame Spread 15 and Smoke Developed 350
      l. Fire Assembly: NFPA 285; passed per exact wall design
      m. GREENGUARD Gold Certified
      n. 4th generation blowing agent to provide Global Warming Potential (GWP) of ≤1

2. Required Products: Icynene ProSeal HFO

B. Transition Material: gun grade, polyether, liquid applied flashing:
   1. Material Properties and Performance:
      a. Density: ASTM D 1475; 12.2 +/- 0.2 lb/Gal
      b. Shear Strength: ASTM D 412; 210 psi +/- 25 psi
      c. Tensile Strength: ASTM D 412; 230 psi +/- 25 psi
HOW TO SPECIFY

Icynene X-Wall™ System

2. Required Products: Icynene X-Wall Liquid Flashing

2.3 SOURCE QUALITY CONTROL
A. Insulation product components produced in an ISO 9001 registered factory.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Examine substrates and conditions, under which work is to be performed. Do not proceed until unsatisfactory conditions have been corrected.
   1. Review placement area to determine final location will not be within 3 inches of any heat source where the temperature will exceed 180 deg F per ASTM C 411 or in accordance with authorities having jurisdiction.

3.2 PREPARATION
A. Clean substrates and cavities of loose materials capable of interfering with insulation placement.

3.3 APPLICATION
A. Site mix liquid components supplied by Icynene and installed by Independent Icynene Licensed Dealer.
B. Apply insulation to substrates in compliance with manufacturer's written installation instructions. Apply to maximum of 5 inch pass, in either a full 5 inch lift, or a combination of a 3 inch lift, followed immediately by a 2 inch lift. Consult manufacturer's installation instructions for thicknesses greater than 5 inches.
C. Apply insulation to produce thickness required for indicated R Value.
D. Extend insulation in thickness indicated to envelop entire area to be insulated.
E. Water-Piping Coordination: If water piping is located within insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.
F. If required, install intumescent paint to required wet or dry mil thickness or coverage rate as confirmed by assembly tests, in accordance with manufacturer's instructions, by brush, roller, conventional or airless spray.

3.4 REPAIRS
A. Any repairs must be effected by an Icynene Licensed Contractor.

3.5 PROTECTION
A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation is subject to abuse.

END OF DEVISION 07 - SECTION 2100