Listing and Technical Evaluation Report™

A Duly Authenticated Report from an Approved Agency

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EnergyShield® Products as an ENERGY STAR® Water-Resistive Barrier and Air Barrier

Trade Secret Report Holder:

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CSI Designations:

DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION Section: 07 25 00 - Water-Resistive Barriers/Weather Barriers

1 Innovative Products Evaluated[1]

1.1 EnergyShield Products:

1.1.1 EnergyShield®

1.1.2 EnergyShield® XR

1.1.3 EnergyShield® Pro

1.1.4 EnergyShield® CGF

1.1.5 EnergyShield® CGF Pro

1.2 EnergyShield Products that meet ENERGY STAR® requirements (See **Appendix A** for additional details):

1.2.1 EnergyShield® XR

2 Product Description and Materials

2.1 EnergyShield Products are proprietary Foam Plastic Insulating Sheathing (FPIS) products.

2.1.1 EnergyShield is a polyisocyanurate (polyiso) insulation board that includes a tri-laminate foil facer material on both sides (ASTM C1289 Type I, Class 1 and Type I, Class 2 sheathing).

2.1.2 EnergyShield XR is a polyiso insulation board that includes tri-laminated foil facer material on both sides (ASTM C1289 Type I, Class 1 and Type I, Class 2 sheathing).

2.1.3 EnergyShield Pro is a polyiso insulation board that includes a white-coated aluminum foil facer material on one side and a reflective aluminum facer on the other side (ASTM C1289 Type I, Class 1 and Type I, Class 2 sheathing).

2.1.4 EnergyShield CGF is a polyiso insulation board that includes a coated glass mat facer on both sides (ASTM C1289 Type II, Class 2 sheathing).

2.1.5 EnergyShield CGF Pro is a polyiso insulation board that includes a light color coated glass mat facer on one side and a dark color coated glass mat facer on the other side (ASTM C1289 Type II, Class 2 sheathing).

2.2 *Material Availability*

2.2.1 *Thickness:*

2.2.1.1 $^1/_2$" (13 mm) through 4$^1/_2$" (114 mm)

2.2.2 *Standard Product Width:*

2.2.2.1 48" (1,219 mm)

2.2.3 Panels can also be supplied in nominal 16" and 24" (406 mm and 610 mm) widths for use in cavity wall applications.

2.2.4 *Standard Lengths:*

2.2.4.1 96" (2,438 mm)

2.2.4.2 108" (2,743 mm)

2.2.5 Panels can be supplied in other lengths upon request.

2.3 As needed, review material properties for design in **Section 6** and the regulatory evaluation in **Section 8**.

3 Definitions[2]

3.1 New Materials[3] are defined as building materials, equipment, appliances, systems, or methods of construction, not provided for by prescriptive and/or legislatively adopted regulations, known as alternative materials.[4] The design strength and permissible stresses shall be established by tests[5] and/or engineering analysis.[6]

3.2 Duly authenticated reports[7] and research reports[8] are test reports and related engineering evaluations that are written by an approved agency[9] and/or an approved source.[10]

3.2.1 This report utilizes intellectual property and/or trade secrets to create public domain material properties for commercial end-use.

3.2.1.1 This report protects confidential Intellectual Property and trade secrets under the regulation, 18.US.Code.90, also known as Defend Trade Secrets Act of 2016 (DTSA).[11]

3.3 An approved agency is *"approved"* when it is ANAB ISO/IEC 17065 accredited. DrJ Engineering, LLC (DrJ) is accredited and listed in the ANAB directory.

3.4 An approved source is *"approved"* when a professional engineer (i.e., Registered Design Professional, hereinafter RDP) is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the state legislature via its professional engineering regulations.[12]

3.5 Testing and/or inspections conducted for this duly authenticated report were performed by an ISO/IEC 17025 accredited testing laboratory, an ISO/IEC 17020 accredited inspection body, and/or a licensed RDP.

3.5.1 The Center for Building Innovation (CBI) is ANAB[13] ISO/IEC 17025 and ISO/IEC 17020 accredited.

3.6 The regulatory authority shall enforce[14] the specific provisions of each legislatively adopted regulation. If there is a non-conformance, the specific regulatory section and language of the non-conformance shall be provided in writing[15] stating the nonconformance and the path to its cure.

3.7 The regulatory authority shall accept duly authenticated reports from an approved agency and/or an approved source with respect to the quality and manner of use of new materials or assemblies as provided for in regulations regarding the use of alternative materials, designs, or methods of construction.[16]

3.8 ANAB is an International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA) signatory. Therefore, recognition of certificates and validation statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA with the appropriate scope shall be approved.[17] Thus, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent,[18] and can be used in any country that is an MLA signatory found at this link: https://iaf.nu/en/recognised-abs/

3.9 Approval equity is a fundamental commercial and legal principle.[19]

4 Applicable Local, State, and Federal Approvals; Standards; Regulations[20]

4.1 *Local, State, and Federal*

4.1.1 Approved in all local jurisdictions pursuant to ISO/IEC 17065 duly authenticated report use, which includes, but is not limited to, the following featured local jurisdictions: Austin, Baltimore, Broward County, Chicago, Clark County, Dade County, Dallas, Detroit, Denver, DuPage County, Fort Worth, Houston, Kansas City, King County, Knoxville, Las Vegas, Los Angeles City, Los Angeles County, Miami, Nashville, New York City, Omaha, Philadelphia, Phoenix, Portland, San Antonio, San Diego, San Jose, San Francisco, Seattle, Sioux Falls, South Holland, St. Louis County, Texas Department of Insurance, and Wichita.[21]

4.1.2 Approved in all state jurisdictions pursuant to ISO/IEC 17065 duly authenticated report use, which includes, but is not limited to, the following featured states: California, Florida, New Jersey, Oregon, New York, Texas, Washington, and Wisconsin.[22]

4.1.3 Approved by the Code of Federal Regulations Manufactured Home Construction: Pursuant to Title 24, Subtitle B, Chapter XX, Part 3282.14[23] and Part 3280[24] pursuant to the use of ISO/IEC 17065 duly authenticated reports.

4.1.4 Approved means complying with the requirements of local, state, or federal legislation.

4.2 *EPA Seal and Insulate with ENERGY STAR® Program:*

4.2.1 *Definitions and Testing Requirements for Residential Insulation Version 1.0, dated 3/28/2013*

4.2.2 *Seal and Insulate with ENERGY STAR® Program for Residential Insulation Manufacturers – Partner Commitments, dated 3/28/2013*

4.3 *Regulations*

4.3.1 *IBC – 18, 21, 24: International Building Code®*

4.3.2 *IRC – 18, 21, 24: International Residential Code®*

4.3.3 *IECC – 18, 21, 24: International Energy Conservation Code®*

4.4 *Standards*

4.4.1 *AAMA 711: Specification for Self-Adhering Flashing Used for Installation of Exterior Wall Fenestration Products*

4.4.2 *AAMA 714: Voluntary Specification for Liquid Applied Flashing Used to Create a Water-Resistive Seal around Exterior Wall Openings in Buildings*

4.4.3 *AATCC TM 127: Test Method for Water Resistance: Hydrostatic Pressure*

4.4.4 *ABTG/FS 100: Standard Requirements for Wind Pressure Resistance of Foam Plastic Insulating Sheathing Used in Exterior Wall Covering Assemblies*

4.4.5 *ABTG/FS 200: Standard for Use of Foam Plastic Insulating Sheathing (FPIS) in Building Envelopes: Above Grade Walls*

4.4.6 *ASTM C203: Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation*

4.4.7 *ASTM C1289: Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board*

4.4.8 *ASTM C1371: Test Method for Determination of Emittance of Materials near Room Temperature Using Portable Emissometers*

4.4.9 *ASTM D903: Standard Test Method for Peel or Stripping Strength of Adhesive Bonds*

4.4.10 *ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials*

4.4.11 *ASTM E330: Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference*

4.4.12 *ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference*

4.4.13 *ASTM E2178: Standard Test Method for Air Permeance of Building Materials*

4.4.14 *ASTM E2357: Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies*

4.4.15 *CAN/ULC-S742: Standard for Air Barrier Assemblies – Specification*

5 Listed[25]

5.1 Equipment, materials, products, or services included in a List published by a nationally recognized testing laboratory (e.g., CBI), an approved agency (e.g., CBI and DrJ), and/or and approved source (e.g., DrJ), or other organization(s) concerned with product evaluation (e.g., DrJ), that maintains periodic inspection (e.g., CBI) of production of listed equipment or materials, and whose listing states either that the equipment or material meets nationally recognized standards or has been tested and found suitable for use in a specified manner.

6 Tabulated Properties Generated from Nationally Recognized Standards

6.1 *Water-Resistive Barrier (WRB)*

6.1.1 EnergyShield Products may be used as a WRB as prescribed in IBC Section 1403.2, IRC Section R703.2, and FS 200, Section 3.2, when installed on exterior walls as described in this section and the manufacturer installation instructions.

6.1.1.1 When installed direct to framing, EnergyShield Products shall be installed with board joints placed directly over vertical exterior framing spaced a maximum of 16" (405 mm) o.c. The fasteners used to attach the board shall be installed in accordance with **Section 9**. Blocking of horizontal joints is not required.

6.1.1.2 EnergyShield Products installed over sheathing are not required to be installed with vertical or horizontal board joints aligned to underlying framing. The fasteners used to attach the boards shall be installed in accordance with **Section 9**.

6.1.2 Flashing must be installed through wall penetrations and shall comply with all applicable code sections. Results of testing using various flashing products, per IBC Section 1402.2, can be found in **Table 1** and **Table 2**.

6.1.3 All joints between boards shall be tightly abutted and sealed with an approved joint sealing product shown in **Table 1** or **Table 2**.

Table 1. List of Approved Liquid Flashing Joint Sealing Products Applied to EnergyShield Insulation Boards

Product	Approved Criteria		
Zip System™ Liquid Flash[1]	Water Resistance[2]	Weathering[3]	Water Penetration[4]
Prosoco R-Guard® FastFlash®			
Sto RapidGuard™			
GCP Perm-A-Barrier® Universal Flashing			
Tremco Dymonic® 100			
Carlisle BarriBond HP			
Siplast® WALLcontrol™ STPE Liquid Flashing			
Atlas EnergyShield® WAVE Liquid Flashing			
Air-Bloc® LF Liquid-Applied Flashing			
Sustant™ SealSkin™ Flash & Seal			

1. A facer from one surface of the insulation board was removed and the liquid flashing was applied directly to board joints, verifying water resistance of the core.
2. Testing conducted using the AATCC-127 Test Method.
3. Testing conducted using AAMA 714-15.
4. Testing conducted using ASTM E331, per IBC Section 1402.2.

Table 2. List of Approved Adhered Joint Sealing Products for use with EnergyShield Insulation Boards

Product	Approved Criteria		
3M™ Venture Tape™ Aluminum Foil Tape 1521CW	Water Resistance[1]	Weathering[2]	Water Penetration[3]
3M™ All Weather Flashing Tape 8067			
DuPont™ Styrofoam™ Brand Tape			
GCP Perm-A-Barrier® Aluminum Flashing			
GCP Perm-A-Barrier® Detail Membrane			
GCP Perm-A-Barrier® Wall Flashing			
Henry® Blueskin® Butyl Flash			
Henry® Blueskin® SA			
ZIP System™ Flashing Tape			
IPG® UL723 Cold Weather Aluminum Foil Tape			
Protecto Wrap® Super Stick Building Tape®			
Protecto Wrap® Protecto Seal 45 Butyl™			
Protecto Wrap® BT20XL Butyl™			
Protecto Wrap® BT25XL™			
Siga Wigluv®			
Siga Wigluv® Black			
Kemper System UT-40 Universal Tape®			

1. Testing conducted using the AATCC-127 Test Method
2. Testing conducted using AAMA 711-2020
3. Testing conducted using ASTM E331, per IBC Section 1402.2.

6.2 *Emittance*

6.2.1 EnergyShield Pro has an emittance value for the reflective side of less than 0.1, as measured by ASTM C1371.

6.3 *Air Barrier Material*

6.3.1 EnergyShield CGF, EnergyShield CGF Pro, EnergyShield Pro, EnergyShield XR, and EnergyShield were evaluated to assess their performance and have met the requirements for use as an air barrier material in accordance with FS 200, Section 3.3.4.1 and IECC Section C402.6.2.3.1[26] (See **Table 3**).

Table 3. Air Barrier Material Permeability of EnergyShield Products

Product	Test Method[1]	Permeance (L/s•m²)
EnergyShield CGF, EnergyShield CGF Pro, EnergyShield XR, EnergyShield Pro, and EnergyShield	ASTM E2178	< 0.02
1. Minimum thickness for EnergyShield Pro and EnergyShield is ¾" and for EnergyShield CGF, EnergyShield CGF Pro is 1.1" tested at 75 Pa.		

6.3.2 EnergyShield Pro, EnergyShield CGF Pro, EnergyShield CGF, EnergyShield XR and EnergyShield shall be installed in accordance with the manufacturer installation instructions and this report, with all seams, including the top and bottom edges, sealed.

6.4 *Air Barrier Assembly*

6.4.1 EnergyShield Pro, EnergyShield CGF Pro, EnergyShield CGF, EnergyShield XR, and EnergyShield were evaluated to assess their performance and have met the requirements for use as an air barrier assembly in accordance with FS 200, Section 3.3.4.2, and IECC Section C402.6.2.3.2[27] (See **Table 4**).

Table 4. Air Barrier Assembly Permeability

Product	Test Method	Permeance [L/(s•m2)][1]
EnergyShield CGF, EnergyShield CGF Pro, EnergyShield XR, EnergyShield Pro and EnergyShield	ASTM E2357	< 0.2
	CAN/ULC-S742	< 0.05
1. Liter per second per square meter		

6.4.2 Any of the products listed in **Table 2** and **Table 5** may be used in the construction of the air barrier assembly.

Table 5. Approved Liquid Flashing Materials for use with EnergyShield Air Barrier Assemblies

Product	Flashing Product
EnergyShield CGF, EnergyShield CGF Pro, EnergyShield XR, EnergyShield Pro, and EnergyShield	Zip System™ Liquid Flash
	Prosoco R-Guard® FastFlash®
	Siplast® WALLcontrol™ STPE Liquid Flashing
	Atlas EnergyShield® WAVE Liquid Flashing
	Air-Bloc® LF Liquid-Applied Flashing
	Sto RapidGuard®
	Tremco Dymonic® 100
	Sustant SealSkin™ Flash & Seal

6.4.3 The following requirements must be met when using EnergyShield CGF, EnergyShield CGF Pro, EnergyShield Pro, EnergyShield XR and EnergyShield as an air barrier assembly:

6.4.3.1 EnergyShield, EnergyShield Pro and EnergyShield XR must be a minimum of $^{3}/_{4}$" in thickness. EnergyShield CGF and EnergyShield CGF Pro must be a minimum of 1.1".

6.4.3.2 Install directly over studs or over a structural sheathing.

6.4.3.3 Vertical joints of all rigid insulation shall be backed by studs or structural sheathing.

6.4.3.4 Joints shall be sealed with any of the approved joint sealing products listed in **Table 2** or **Table 5**, or a solvent acrylic adhesive tape minimum 3" wide, such as 3M™ Venture Tape™ 1520CW or an equivalent.

6.4.3.5 Penetrations, damage, and transitions to other materials shall be flashed with any of the approved joint sealing products listed in **Table 2** or **Table 5**, or a solvent acrylic adhesive tape, minimum 3" wide, butyl flashing tape minimum 4" wide, or sealant, such as Henry® 925 BES Sealant or an equivalent.

6.4.3.6 Seal Block Lok brick ties from Hohmann & Barnard, Inc. with caulk, as needed.

6.4.3.7 No sealant is needed for Pos-I-Tie® brick ties with Rodenhouse Thermal-Grip ci prong washers.

6.4.3.8 No sealant is needed for Grip-Deck screws with Rodenhouse Thermal-Grip ci prong washers.

6.5 *Transverse Wind Loading*

6.5.1 EnergyShield Products are permitted to resist transverse wind load forces as set forth in **Table 6**.

Table 6. Load Capacity (psf) for EnergyShield Products Resisting Transverse Wind Loads[1,2,3]

Product	Minimum Thickness (in)	Maximum Stud Spacing (in)	Fastener Schedule	Fastener Spacing (edge:field) (in)	Allowable Design Value (psf)	Allowable Stress Design Wind Speed V_{asd} (mph)	Basic Wind Speed V_{ult} (mph)
EnergyShield, EnergyShield XR and EnergyShield Pro	1/2	16 o.c.	2 1/2" x 0.113" Ring Shank Nail with 1" Plastic Cap	6:12	19.1	90	115
	3/4	16 o.c.		6:12	27.0	105	140
	1	16 o.c.	3" Galvanized Roofing Nail	12:16	46.1	140	180
	1 1/2	16 o.c.			72.1	155	200
	1 1/2	24 o.c			37.3	125	160
	2	16 o.c.			123.1	155	200
EnergyShield CGF and EnergyShield CGF Pro	1/2	16 o.c.	2 1/2" x 0.113" Ring Shank Nail with 1" Plastic Cap	6:12	45.7	140	180
	3/4	16 o.c.	3" Galvanized Roofing Nail	12:16	78.7	155	200
	1	16 o.c.			120.5	155	200
	1	24 o.c.			48.2	145	185

SI: 1 in = 25.4 mm, 1-psf = 0.0479 kN/m^2

1. Design wind load capacity shall be in accordance with IBC Section 1609.1.1.
2. Wind speeds are based on the methodology detailed in ASCE 7-22 and the following assumptions:
   a. A building height of 30-ft, GC_p= -1.4 for Zone 5 and an Effective Wind Area of 10 ft^2, Exposure B: K_z=0.69, Topographic Factor: K_{zt}=1.0, Ground Elevation Factor: K_e=1.0, Internal Pressure Coefficient, GC_{pi}=+/-0.18 for an enclosed building, K_d = 0.85 for 'Component and Cladding'
   b. V_{ult} is limited to 200 mph.
3. $V_{asd} = V_{ult}\sqrt{0.6}$. V_{asd} is limited to 155 mph ($200\sqrt{0.6}$).

6.6 *Thermal Resistance (R-Value)*

6.6.1 EnergyShield Products meet the continuous insulating sheathing requirements complying with the provisions of IRC Section N1102, IECC Section C402, and IECC Section R402.

6.6.2 EnergyShield Products have the minimum thermal properties shown in **Table 7**.

Table 7. Thermal Properties

Nominal Thickness (in)	Thermal R-Value[1] (°F•ft²•hr/Btu)
0.50	3.0
1.00	6.0
1.50	9.0
2.00	12.0
2.50	15.0
3.00	18.0
3.50	21.0
4.00	24.0
4.50	27.0

SI: 1 in = 25.4 mm; 1 °F•ft²•hr/Btu = 0.1761 K·m²/W

1. Thermal values are determined in accordance with ASTM C1289 at 75° F mean temperature.

6.7 *Surface Burning Characteristics*

6.7.1 EnergyShield Products were evaluated for surface burning characteristics listed in **Table 8** in accordance with IBC Section 2603.5.4.

Table 8. Surface Burning Characteristics

Product[1]	Flame Spread Index	Smoke Developed Index	Classification
EnergyShield	< 75	< 450	Class B
EnergyShield CGF			
EnergyShield Pro	< 25	< 450	Class A
EnergyShield CGF Pro			
EnergyShield Ply Pro			
EnergyShield XR[2]			

1. Foam core tested in accordance with UL 723. Flame spread and smoke developed numbers are shown for comparison purposes only.
2. Foam core tested in accordance with ASTM E84. Flame spread and smoke developed numbers are shown for comparison purposes only.

6.8 Alternative techniques shall be permitted in accordance with accepted engineering practice and experience. These provisions for the use of alternative materials, designs, and methods of construction are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed herein. This includes, but is not limited to, the following areas of engineering: mechanics of materials, structures, building science, and fire science.

7 Certified Performance[28]

7.1 All construction methods shall conform to accepted engineering practices to ensure durable, livable, and safe construction and shall demonstrate acceptable workmanship reflecting journeyman quality of work of the various trades.[29]

7.2 The strength and rigidity of the component parts and/or the integrated structure shall be determined by engineering analysis or by suitable load tests to simulate the actual loads and conditions of application that occur.[30]

8 Regulatory Evaluation and Accepted Engineering Practice

8.1 EnergyShield Products comply with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:

8.1.1 EnergyShield Products were evaluated to determine their performance for use as a Water Resistive Barrier (WRB) in accordance with IBC Section 1403.2 and IRC Section R703.2, when installed with various joint sealing products.

8.1.2 EnergyShield CGF, EnergyShield CGF Pro, EnergyShield Pro and EnergyShield were evaluated for use as an air barrier material in accordance with IECC Section C402.6.2.3.1.[31]

8.1.3 EnergyShield, EnergyShield XR and EnergyShield Pro were evaluated for use as part of an air barrier assembly in accordance with IECC Section C402.6.2.3.2.[32]

8.1.4 EnergyShield Products were evaluated to determine their ability to resist transverse loads for wall assemblies used in light-frame wood construction in accordance with IBC Section 1609.1.1 and IRC Section R301.2.1.

8.2 Any building code, regulation and/or accepted engineering evaluations (e.g., research reports, duly authenticated reports, etc.) that are conducted for this Listing were performed by DrJ, which is an ISO/IEC 17065 accredited certification body and a professional engineering company operated by RDP or approved sources. DrJ is qualified[33] to practice product and regulatory compliance services within its scope of accreditation and engineering expertise,[34] respectively.

8.3 Engineering evaluations are conducted with DrJ's ANAB accredited ICS code scope of expertise, which is also its areas of professional engineering competence.

9 Installation

9.1 Installation shall comply with the approved construction documents, the manufacturer installation instructions, this report, and the applicable building code.

9.2 In the event of a conflict between the manufacturer installation instructions and this report, contact the manufacturer for counsel on the proper installation method.

9.3 For ENERGY STAR® installation instructions see **Appendix A** in this report.

9.4 *Installation Procedure*

9.4.1 All required wall bracing shall be installed prior to insulation board installation.

9.4.2 Insulation boards shall be installed with edges tightly abutted together.

9.4.3 Secure the insulation boards using fasteners capable of penetrating into framing members or structural substrate capable of resisting imposed loads. See manufacturer installation instructions for fastening details per substrate, framing material, cladding type, duration of exposure before cladding, and other relevant fastening factors dependent on imposed loads.

9.4.4 For metal construction, fasteners shall be corrosion resistant and be approved by the fastener manufacturer for the framing material.

9.4.5 Fasteners shall sit flush with the insulation board surface. Do not allow the fastener head to penetrate the insulation board facer. Repair any damage with a joint sealing product.

10 Substantiating Data

10.1 Testing has been performed under the supervision of a professional engineer and/or under the requirements of ISO/IEC 17025 as follows:

10.1.1 Water penetration testing in accordance with ASTM E331 per IBC Section 1402.2

10.1.2 Peel adhesion testing is accordance with ASTM D903

10.1.3 Emittance of materials near room temperature in accordance with ASTM C1371

10.1.4 Air barrier material properties in accordance with ASTM E2178

10.1.5 Air barrier assembly properties in accordance with ASTM E2357 and CAN/ULC-S742

10.1.6 Transverse load testing in accordance with ASTM C203 and ASTM E330

10.2 Information contained herein may include the result of testing and/or data analysis by sources that are approved agencies, approved sources, and/or an RDP. Accuracy of external test data and resulting analysis is relied upon.

10.3 Where applicable, testing and/or engineering analysis are based upon provisions that have been codified into law through state or local adoption of regulations and standards. The developers of these regulations and standards are responsible for the reliability of published content. DrJ's engineering practice may use a regulation-adopted provision as the control. A regulation-endorsed control versus a simulation of the conditions of application to occur establishes a new material as being equivalent to the regulatory provision in terms of quality, strength, effectiveness, fire resistance, durability, and safety.

10.4 The accuracy of the provisions provided herein may be reliant upon the published properties of raw materials, which are defined by the grade mark, grade stamp, mill certificate, or duly authenticated reports from approved agencies and/or approved sources provided by the supplier. These are presumed to be minimum properties and relied upon to be accurate. The reliability of DrJ's engineering practice, as contained in this duly authenticated report, may be dependent upon published design properties by others.

10.5 *Testing and Engineering Analysis*

10.5.1 The strength, rigidity, and/or general performance of component parts and/or the integrated structure are determined by suitable tests that simulate the actual conditions of application that occur and/or by accepted engineering practice and experience.[35]

10.6 Where additional condition of use and/or regulatory compliance information is required, please search for EnergyShield Products on the DrJ Certification website.

11 Findings

11.1 As outlined in **Section 6**, EnergyShield Products have performance characteristics that were tested and/or meet applicable regulations. In addition, they are suitable for use pursuant to its specified purpose.

11.2 When used and installed in accordance with this duly authenticated report and the manufacturer installation instructions, EnergyShield Products shall be approved for the following applications:

11.2.1 Use as a WRB in accordance with IBC Section 1403.2, IRC Section R703.2, and FS 200, Section 3.2.

11.2.2 Use as an air barrier material in accordance with FS 200, Section 3.3.4.1 and IECC Section C402.6.2.3.1[36] (EnergyShield CGF, EnergyShield CGF Pro, EnergyShield Pro, and EnergyShield only.)

11.2.3 Use as part of an air barrier assembly in accordance with FS 200, Section 3.3.4.2 and IECC Section C402.6.2.3.2[37] (EnergyShield, EnergyShield XR, and EnergyShield Pro only.)

11.2.4 Use in resisting transverse loads in accordance with IBC Section 1609.1.1, IRC Section R301.2.1, FS 100, and FS 200, Section 3.1.1.

11.2.5 EnergyShield Products have been evaluated in the context of the codes listed in **Section 4** and are compliant with all known state and local building codes.

11.2.6 Flame spread and smoke developed indices in accordance with the Seal and Insulate with ENERGY STAR® program.

11.2.7 Thermal resistance in accordance with the Seal and Insulate with ENERGY STAR® program.

11.3 Unless exempt by state statute, when EnergyShield Products are to be used as a structural and/or building envelope component in the design of a specific building, the design shall be performed by an RDP.

11.4 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Atlas® Roofing Corporation.

11.5 IBC Section 104.2.3[38] (IRC Section R104.2.2[39] and IFC Section 104.2.3[40] are similar) in pertinent part state:

> **104.2.3 Alternative Materials, Design and Methods of Construction and Equipment.** The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative is not specifically prohibited by this code and has been approved.

11.6 **Approved:**[41] Building regulations require that the building official shall accept duly authenticated reports.[42]

11.6.1 An approved agency is *"approved"* when it is ANAB ISO/IEC 17065 accredited.

11.6.2 An approved source is *"approved"* when an RDP is properly licensed to transact engineering commerce.

11.6.3 Federal law, Title 18 US Code Section 242, requires that, where the alternative product, material, service, design, assembly, and/or method of construction is not approved, the building official shall respond in writing, stating the reasons why the alternative was not approved. Denial without written reason deprives a protected right to free and fair competition in the marketplace.

11.7 DrJ is a licensed engineering company, employs licensed RDPs and is an ANAB Accredited Product Certification Body – Accreditation #1131.

11.8 Through the IAF Multilateral Arrangement (MLA), this duly authenticated report can be used to obtain product approval in any jurisdiction or country because all ANAB ISO/IEC 17065 duly authenticated reports are equivalent.[43]

12 Conditions of Use

12.1 As defined in **Section 6**, where material and/or engineering mechanics properties are created for load resisting design purposes, the resistance to the applied load shall not exceed the ability of the defined properties to resist those loads using the principles of accepted engineering practice.

12.2 As listed herein, EnergyShield Products shall not be used:

12.2.1 As a structural nailing base for claddings.

12.3 In areas where the probability of termite infestation is *"very heavy"*, in accordance with IBC Section 2603.8, the product must not be placed on exterior walls located within 6" (152 mm) of the ground.

12.4 Use of the insulation boards to resist lateral loads is outside the scope of this report.

12.4.1 Walls shall be braced by other materials in accordance with the applicable code, and the exterior wall covering shall be capable of resisting the full design wind pressure.

12.5 When required by adopted legislation and enforced by the building official, also known as the Authority Having Jurisdiction (AHJ) in which the project is to be constructed:

12.5.1 Any calculations incorporated into the construction documents shall conform to accepted engineering practice and, when prepared by an approved source, shall be approved when signed and sealed.

12.5.2 This report and the installation instructions shall be submitted at the time of permit application.

12.5.3 These innovative products have an internal quality control program and a third-party quality assurance program.

12.5.4 At a minimum, these innovative products shall be installed per **Section 9**.

12.5.5 The review of this report by the AHJ shall comply with IBC Section 104.2.3.2 and IBC Section 105.3.1.

12.5.6 These innovative products have an internal quality control program and a third party quality assurance program in accordance with IBC Section 104.7.2, IBC Section 110.4, IBC Section 1703, IRC Section R104.7.2, and IRC Section R109.2.

12.5.7 The application of these innovative products in the context of this report is dependent upon the accuracy of the construction documents, implementation of installation instructions, inspection as required by IBC Section 110.3, IRC Section R109.2, and any other regulatory requirements that may apply.

12.6 The approval of this report by the AHJ shall comply with IBC Section 1707.1, where legislation states in part, *"the building official shall make, or cause to be made, the necessary tests and investigations; or the building official shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in Section 104.2.3"*, all of IBC Section 104, and IBC Section 105.3.

12.7 Design loads shall be determined in accordance with the regulations adopted by the jurisdiction in which the project is to be constructed and/or by the building designer (i.e., owner or RDP).

12.8 The actual design, suitability, and use of this report for any particular building, is the responsibility of the owner or the authorized agent of the owner.

13 Identification

13.1.1 EnergyShield Products (EnergyShield, EnergyShield XR, EnergyShield Pro, EnergyShield CGF, and EnergyShield CGF Pro), as listed in **Section 1.1**, are identified by a label on the board or packaging material bearing the manufacturer name, product name, this report number, and other information to confirm code compliance.

13.2 Additional technical information can be found at www.atlasrwi.com/products/wall/residential-light-commercial.

14 Review Schedule

14.1 This report is subject to periodic review and revision. For the latest version, visit www.drjcertification.org.

14.2 For information on the status of this report, please contact DrJ Certification.

Issue Date: June 1, 2026
Supplement Revision Date: June 1, 2026
Subject to Renewal: January 1, 2027

Appendix A
Seal and Insulate with ENERGY STAR® Program Report

1 Purpose

1.1 The purpose of this appendix is to show, EnergyShield XR recognized in Report Number 2202-01, has also been evaluated for compliance with the program listed below:

1.1.1 Seal and Insulate with ENERGY STAR®

1.2 This appendix also shows that DrJ Engineering has reviewed all relevant test results and has compared them to the criteria provided in the codes and standards listed below and the EPA Definitions and Testing Requirements for Residential Insulation V1.0.

1.3 For the purpose of the ENERGY STAR® program, these products are defined as *"Board Insulation"*.

2 Description

2.1 General installation instructions, warnings, limitations and warranty information for EnergyShield XR of insulation boards are provided below. Consult www.atlasrwi.com/products/wall/residential-light-commercial/energyshield-xr for more information and complete literature including, but not limited to, data sheets, SDS, Sales Policy, etc.

3 Applicable Standards

3.1 *Seal and Insulate with ENERGY STAR*

3.2 *AAMA 714: Voluntary Specification for Liquid Applied Flashing Used to Create a Water-Resistive Seal around Exterior Wall Openings in Buildings*

3.3 *AATCC TM 127: Test Method for Water Resistance: Hydrostatic Pressure*

3.4 *ABTG/FS 100: Standard Requirements for Wind Pressure Resistance of Foam Plastic Insulating Sheathing Used in Exterior Wall Covering Assemblies*

3.5 *ABTG/FS 200: Standard for Use of Foam Plastic Insulating Sheathing (FPIS) in Building Envelopes: Above Grade Walls*

3.6 *ASTM C203: Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation*

3.7 *ASTM C1289: Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board*

3.8 *ASTM C1371: Test Method for Determination of Emittance of Materials near Room Temperature Using Portable Emissometers*

3.9 *ASTM D903: Standard Test Method for Peel or Stripping Strength of Adhesive Bonds*

3.10 *ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials*

3.11 *ASTM E330: Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference*

3.12 *ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference*

3.13 *ASTM E2178: Standard Test Method for Air Permeance of Building Materials*

3.14 *ASTM E2357: Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies*

3.15 *CAN/ULC-S742: Standard for Air Barrier Assemblies – Specification*

4 ENERGY STAR® Definitions

4.1 ***Insulation:*** Any material mainly used to slow down heat flow. It may be mineral or organic, fibrous, cellular, or reflective (aluminum foil). It may be in rigid, semi-rigid, flexible, or loose-fill form.

4.2 ***Facing:*** A thin covering adhered to the surface of insulation prior to field installation. Facings may include, but are not limited to, kraft paper, metal foil, and polymer.

4.3 ***Residential Buildings:*** Single-family homes (attached or unattached), multi-family buildings with four (4) units or fewer, or multi-family buildings (e.g., condominiums and apartments) with three (3) stories or less in height above grade.

4.4 ***Board Insulation:*** Semi-rigid or rigid insulation preformed into rectangular units having a degree of suppleness particularly related to their geometrical dimensions. Typical materials include, but are not limited to, fiberglass, expanded polystyrene (EPS), extruded polystyrene (XPS), polyisocyanurate, and polyurethane. The product may or may not be faced.

4.5 ***Radiant Barrier:*** A reflective material such as a foil that will reduce radiant heat transfer across open air spaces by use of one or more surfaces of high reflectance and low emittance. The reflective material shall have an emissivity of 0.1 or less, and may or may not be factory-applied to a rigid or insulating material.

4.6 ***Insulation with Reflective Facing:*** An assembly consisting of a core insulating material as defined in the Insulation Products Definitions section of this document, and has a reflective facing such as a foil attached to at least one side.

4.7 ***Structural Insulated Panels (SIP):*** A structural sandwich panel, which consists of a foam plastic insulation core bonded directly between two structural facings made of wood structural panels.

4.8 ***R-Value:*** The inverse of the time rate of heat flow through a body from one of its bounding surfaces to the other surface for a unit temperature difference between the two surfaces, under steady state conditions, per unit area. For the purposes of this program, Imperial units will only be accepted [i.e., $(h \cdot ft^2 \cdot °F)/BTU$].

4.9 ***Smoke-Development Index:*** The characteristic of a material to emit smoke when exposed to flame or fire compared to red oak and inorganic cement.

4.10 ***Flame-Spread Index:*** The characteristic of a material to resist the spreading of flames when exposed to flame or fire compared to red oak and inorganic cement.

5 Evaluation

5.1 *R-Value*

5.1.1 EnergyShield XR has minimum thermal resistances (R-Values) as shown in **Table 7** of Report Number 2202-01.

5.2 *Flame Spread and Smoke Developed Index*

5.2.1 EnergyShield XR has the flame spread and smoke developed indexes as shown in **Table 8** of Report Number 2202-01.

5.2.2 DrJ has verified that the test results provided have been generated by a laboratory accredited to perform these tests as required by the Conditions and Criteria for Recognition of Insulation Certification Bodies for the ENERGY STAR® program.

5.2.3 DrJ has verified that the products provided for testing were sampled by the testing agency in accordance with their accredited sampling procedures.

6 General Installation Instructions

6.1 Special training and/or certification is not required. This product is designed for an easy install for both DIYs and professional contractors.

6.2 All boards shall be cut on a level durable surface with a circular saw.

6.3 Before beginning installation, all surfaces shall be clean and free of irregularities that will affect the placement or performance of the insulation including, but not limited to, dirt, debris, miscellaneous fasteners, or warped, defective, or otherwise damaged framing.

6.4 Installation shall be in accordance with **Section 9** of Report Number 2202-01 and the manufacturer installation instructions at the end of this document.

6.4.1 EnergyShield XR is approved for use in:

6.4.1.1 Above grade walls

6.4.1.2 Below grade walls

6.4.2 See specific installation instruction details for EnergyShield XR in the installation support documents found at: www.atlasrwi.com/products/wall/residential-light-commercial/energyshield-xr

6.5 Installations utilizing EnergyShield XR must be separated from the interior side of the building by a suitable thermal barrier or ignition barrier when required. Refer to the Local Building Official for general exceptions and specific governing codes and requirements. Consult with Atlas® Roofing Corporation for special testing and exceptions on thicknesses of 1" or less.

6.5.1 All materials installed over EnergyShield XR (e.g., thermal barrier, ignition barrier, furring strips, interior finishes, veneers, roof systems, etc.), must be mechanically attached through the insulation to the framing/structure according to the building code.

7 Limitations

7.1 EnergyShield XR should not be used as commercial roof insulation directly under membrane systems.

7.2 EnergyShield XR is not a structural panel and must not be used as a nailing base for any other building products. The structure must be properly braced for lateral loads and uplift according to the requirements of the local building codes.

7.3 In *"very heavy"* termite infestation probability areas, except where permitted by code, boards shall not be installed on the exterior face or under interior or exterior foundation walls or slab foundations located below grade, and the clearance between insulation boards installed above grade and exposed earth shall be at least 6" (152 mm). Consult the Local Building Official for specific governing codes and requirements.

8 Warnings

8.1 Polyisocyanurate foam is an organic material, which will burn when exposed to an ignition source of sufficient heat and intensity and may contribute to flames spreading. Boards must not be in direct contact with hot objects requiring a certain amount of clearance. Refer to equipment/fixture rating for guidance.

9 Safety

9.1 Cutting EnergyShield XR produces a nuisance or irritant dust – use of a dust mask may be necessary.

9.2 Safety glasses are always recommended when using power tools.

9.3 Proper ventilation should be provided to minimize airborne dust and fumes if using construction adhesives.

10 Warranty

10.1 See Atlas® Roofing Corporation's website (www.atlasrwi.com) for warranty conditions. Atlas® Roofing Corporation does not assume any responsibility or liability for the performance of any products other than those manufactured by Atlas® Roofing Corporation.

Note: All Atlas® Roofing Corporation products must be tarped, placed on skids, and kept dry before and throughout construction until proper sealing techniques are employed.

EnergyShield® XR Continuous Insulation

INSTALLATION INSTRUCTIONS

Installation Instructions for Below Grade Applications of Energy Shield XR Continuous Insulation

For the purposes of this document, the reference to EnergyShield XR is for below-grade applications. Refer to the Atlas Residential or Commercial Installation Guides for above grade applications that are applicable for EnergyShield XR. Unlike polystyrene foam products, the polyisocyanurate foam core and durable facers will not degrade if exposed to chemical, UV or high heat. Consideration for compressive strength, moisture resistance and vapor control help maximize the effectiveness of long-term thermal performance in below-grade applications.

MATERIALS CHECKLIST

- Proper PPE
- EnergyShield XR continuous insulation
- Fasteners
- Straight edge
- Measuring tape
- Pencil
- Preferred cutting tools: utility or insulation knife, circular or table saw

PREPARATION

- Materials should be delivered to the jobsite undamaged and in original packaging. Inspect EnergyShield XR for damage related to transportation, handling, or weather. Separate and discard any product damaged or beyond repair as it may not be fit for intended use.
- Confirm compatibility with any components adjacent to EnergyShield XR. Follow component manufacturer instructions for specific surface preparation and installation requirements.
- Always refer to local building codes and/or consult with a design professional to ensure compliance with applicable codes and regulations.

PRECAUTIONS AND LIMITATIONS

- Follow local building code requirements.
- Reference IBC Chapter 26, IBC Section 2603.8, and IRC Section R305.4 when installing in areas of *"very heavy"* probability of termite infestation. See DrJ Report Number 2209-01 for approved protection methods.

STORAGE AND PRE-INSTALLATION INSPECTION

- Refer to Technical Bulletin 16 for detailed information on storage recommendations.
- Insulation shall be kept clean and dry, and be protected from damage due to weather and physical abuse at all times.
- Prior to installation, ensure that the insulation and substrate are clean, dry and free of ice, dirt, oils, or any other material that could impede correct installation of the insulation or subsequent material layers.
- Do not install if surface conditions of the insulation or adjacent materials will impede correct installation.

EnergyShield® XR
Continuous Insulation

INSTALLATION INSTRUCTIONS

BELOW-GRADE APPLICATION

EXTERIOR FOUNDATION WALL

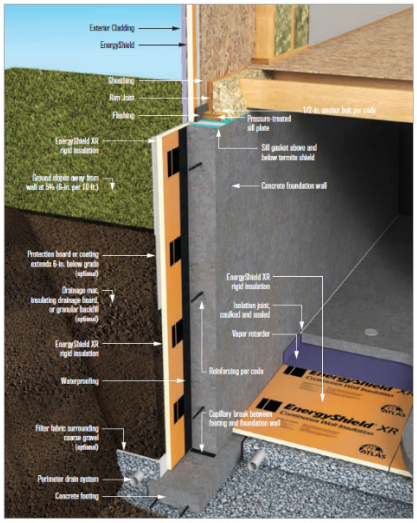
EnergyShield XR is engineered to insulate exterior foundation walls below-grade. Insulating block or concrete walls on the exterior surface helps eliminate effect of thermal bridging providing energy efficiencies for interior spaces.

1. Prepare exterior foundation walls with damp proofing or waterproofing membrane or coating.
2. Install EnergyShield XR extending the full height of the exterior foundation wall from top of footing. Tightly fit board joints together working across the foundation wall.
3. Secure insulation boards to exterior foundation wall with construction adhesive or mechanical fasteners. Alternatively, backfill is often adequate to hold insulation boards in place without the need for fasteners.
4. If desired, install a composite drainage material over insulation to promote adequate drainage in predominately-wet climates.
5. Backfill to secure in place. Avoid damage to the insulation board surface.

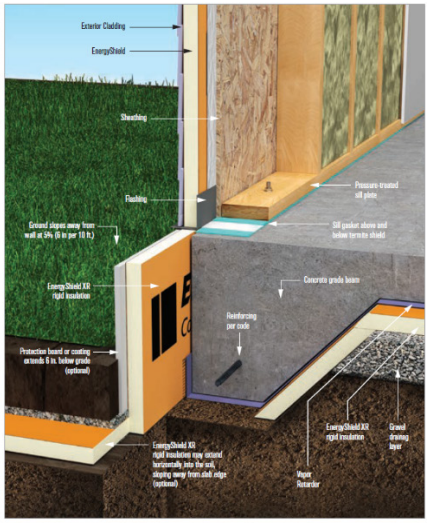
UNDER SLAB

EnergyShield XR can be installed horizontally to insulate under concrete foundation slabs.

1. Prepare level aggregate base or grade for proper drainage.
2. Install EnergyShield XR with joints tightly together and against perimeter walls and/or vertically installed insulation boards. Stagger joints if installing multiple layers.
3. If required, cover entire floor slab area with a vapor barrier, such as a polyethylene protective membrane or equivalent.
4. Set rebar and/or pour concrete as appropriate. Bury or backfill, as required.



STEM WALL



MONOLITHIC SLAB / GRADE BEAM

Appendix B
EnergyShield® Installation Instructions

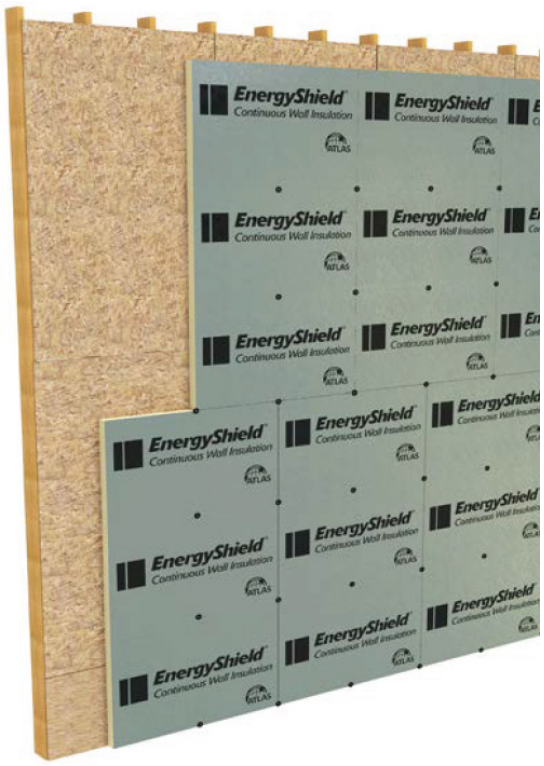
EnergyShield®
Continuous Wall Insulation

INSTALLATION INSTRUCTIONS

For Residential, Multi-Family and Light Commercial Construction
for Exterior Continuous Wall Insulation

CONTENTS

For the purposes of this document, the reference to EnergyShield® is inclusive of EnergyShield, EnergyShield CGF and EnergyShield XR Continuous Insulation products.



Preparation

- Materials should be delivered to the jobsite undamaged and in original packaging. Inspect EnergyShield for damage related to transportation, handling, or weather. Separate and discard any product damaged or beyond repair as it may not be fit for intended use.
- Confirm compatibility with any components adjacent to EnergyShield.
- Follow component manufacturer instructions for specific surface preparation and installation requirements.
- EnergyShield can be ordered precut or scored for project efficiency.
- Plan assembly layout to ensure proper sequencing of material installation and to minimize waste.
- Review applicable manufacturer application instructions, (such as windows, doors, and cladding) to ensure conformance.
- Always refer to local building codes and/or consult with a design professional to ensure compliance with applicable codes & regulations.

Precautions and Limitations

- EnergyShield is not a structural product; follow local building code requirements. Structural requirements can typically be achieved by code accepted shear or corner bracing methods to meet lateral loads. Consult *ABTG Research Report 1601-01* and *IRC Chapter 6* for appropriate solution.
- EnergyShield is not a nailing base for attachment of any kind.
- EnergyShield may be left exposed up to 60 days from date of installation.
- Refer to Technical Bulletin 16 for detailed information on storage recommendations.
- Prior to installation, ensure that the insulation and substrate are clean, dry and free of ice, dirt, oils, or any other material that could impede correct installation of the insulation or subsequent material layers.
- Do not install if surface conditions of the insulation or adjacent materials will impede correct installation.

Materials Checklist

- Proper PPE
- Straight edge
- Measuring tape
- Pencil
- EnergyShield Continuous Wall Insulation
- Fasteners
- Joint sealing and flashing products
- Preferred cutting tools: utility or insulation knife, circular or table saw

General Application

When installing EnergyShield, be sure the substrate is clean, dry, and free from irregularities that could affect the integrity or performance of the insulation board.

- Orient EnergyShield horizontally or vertically using maximum length of boards to minimize joints.
- Align EnergyShield with bottom of the base wall centering vertical board edges over framing.
- Stagger vertical joints by at least one stud cavity. Horizontal joints do not require backing, unless FS 100 needs to be met. Recommend installing drip edge along the bottom edge of a masonry brick ledge, or leave 1/2" from the bottom of first course above insulation to allow for proper drainage.
- Secure EnergyShield to the base wall or framing. For mechanical fastening, use a minimum of 12 fasteners per 4' x 8' insulation board. *See Figure 1 and 2.* Drive correct length fastener flush to surface. Do not countersink. Refer to *Table 1* and *Quick Notes* for additional fastener guidance on next page.
- Continue to work across the wall installing insulation board edges tightly together. Install across the entire wall length before beginning the next course above. At corners, create a butt joint alternating between courses. *See Figure 3*.
- When installing EnergyShield around windows and doors, insulation boards can be precut to fit or installed over openings and cut out later. Reference ***Preparing Rough Openings*** section for further details using picture frame or window buck methods.
- When cutting insulation board for throughwall penetrations, minimize gaps by fitting tight to adjacent materials.

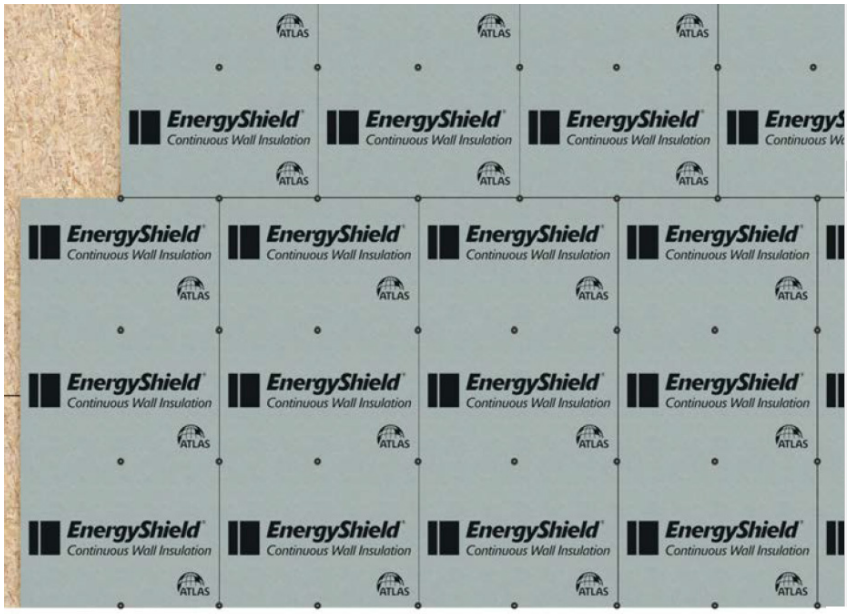


Figure 1: Mechanical Fastening Pattern.

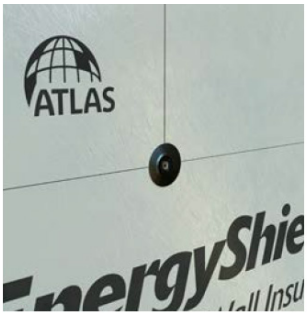


Figure 2: A single washer-style fastener can be used to bridge adjacent insulation boards.

Figure 3: Alternate butt joints at outside corners.

General Application

Quick Notes:

- Additional fasteners may be required in areas experiencing high winds or additional loading, or as dictated by code. Reference DrJ Report Number 2202-01 and ESR-1375 for additional information.
- When exterior cladding or furring strips are installed immediately, EnergyShield can be temporarily secured with a sufficient number of fasteners to meet environmental conditions.
- As an alternative, quality-grade construction adhesive can be used to attach insulation boards to base wall. Supplement with mechanical fasteners at corners.
- Any insulation left exposed must be mechanically secured before leaving jobsite unattended.
- When using multiple layers of EnergyShield, stagger horizontal joints by at least 6" and vertically by at least one stud cavity. First layer may be tacked in place until second layer is installed. Choose length of fasteners based on total thickness to ensure proper penetration into structural framing.

Special Considerations

Repair minor facer damage with compatible spray foam, sealant or flashing component. Any area of installed board and/or facer with major damage should be removed and replaced with a new board piece large enough to be backed by framing for proper attachment.

Table 1: Fastener Selection

Choose length of fastener based on thickness of insulation and sheathing plus minimum penetration required for base wall. Shown are commonly used fastener options and not an exhaustive list. Contact Atlas for further recommendations.

FASTENER	RECOMMENDATION OR EQUIVALENT	REQUIRED PENETRATION*	BASE WALL		
			WOOD STUD	METAL STUD	MASONRY / CONCRETE / CMU
16-ga staples with min 7/16" crown		¾" MIN	▪		
3/8" head galvanized roofing nail		¾" MIN	▪		
6D ring shank nail with min 15/16" diameter plastic washer		¾" MIN	▪		
Corrosion-resistant fastener with min 1" diameter washer	TRUFAST® Plasti-Grip® CBW Washer	¾" MIN	▪	▪	
	TRUFAST® Thermal-Grip® ci Prong Washer	¾" MIN	▪	▪	
	TRUFAST® Thermal-Grip® MVA Brick Tile	¾" MIN	▪	▪	▪
	TRUFAST® Grip-Deck® TubeSeal™	¾" MIN	▪	▪	
	TRUFAST® Plasti-Grip® FMF Anchor	1 ½" MIN			▪
	TRUFAST® Thermal-Grip® IFS Insulation Pin	1" MIN			▪
Corrosion-resistant self-drilling screw with min 1¾" diameter washer	TRUFAST® Grip-Deck® SDS Ceramic Coated Screw	½" MIN		▪	
Corrosion-resistant thread point screw with min 1¾" diameter washer	TRUFAST® Grip-Deck® Hi-Lo Ceramic Coated Screw	¾" MIN	▪		

*Where installed against a nailable substrate, such as minimum 7/16" thick OSB, fasteners are not required to penetrate the framing provided the fastener penetrates the back side of the structural panel by at least 1/4"

Preparing Rough Openings

- Consideration of the window and/or door position relative to the thickness of the continuous insulation is necessary to determine if additional support is needed.
  - If the insulation thickness is 1 1/2" or less, install insulation to the edge of the rough opening and follow standard instruction of the window installation.
  - If the insulation thickness is greater than 1 1/2", jamb extensions may be required when windows are intended to be aligned with exterior cladding. See jamb extension methods below.
- Prepare rough openings prior to EnergyShield installation following window manufacturer installation requirements.
  - In the absence of window manufacturer instructions for installation over foam sheathing, reference *QuickGuide: Window Installation Instructions for Walls with Continuous Insulation* available at www.continuousinsulation.org or *AAMA 500* at www.wdma.com.

Similar installation steps can be used around door openings. Always ensure thresholds are fully supported.

Picture Frame Method: Ideal when aligning window installation to exterior insulation with a thickness of up to 1½".

Using wood studs, furring strips, or equivalent materials that are the same thickness as the insulation boards, install a "picture frame" around the perimeter flush to the rough opening.

Window Buck Method: Common method used when additional support is necessary for window installation with insulation thickness is greater than 1½".

The rough framed opening should accommodate the additional window buck material before window installation.

Using wood studs, or equivalent framing materials, the same width as the rough opening plus the insulation thickness, install a support extension into the rough opening. The extension should be flush to the interior framing and extend outward to support the window.

Rainscreen Method: Used in conjunction with rainscreen furring over insulation prior to exterior cladding installation.

Using the same furring materials to be installed over insulation boards, install a "picture frame" around the perimeter flush to the rough opening.

Exterior Cladding Attachment

Exterior cladding materials must be securely attached through insulation boards to structural framing or base wall. Install all cladding materials according to cladding manufacturer's written instructions. Refer to *2021 IRC Chapter 7*, *2021 IRC Section R703* prescriptive table, *2021 IRC Table 703.3.3*, for installing cladding directly against EnergyShield or using furring strips.

Reference *DrJ Report Number* *2305-04* for more detailed information about exterior cladding attachment at www.atlasrwi.com/products/wall/residential-light-commercial.

Best Practices

SIDING

When furring strips are installed, attach to structural framing or base wall over insulation boards to secure installation of cladding materials before clip or bracket is installed.

STUCCO

When installing behind stucco finishes, EnergyShield may be covered with a bond break layer, such as grade-D felt, before attaching metal lath and stucco system.

MASONRY

When installing masonry veneer anchors before insulation boards, cut EnergyShield horizontally to fit between wall ties to allow for proper attachment of pintle and exterior brick withe.

- EnergyShield can be ordered precut or scored at 16" or 24: o.c. for project efficiency.
- Masonry veneer anchors can be installed after insulation board.

Water Resistive Barrier Application

EnergyShield is an approved code-compliant water resistive barrier (WRB) when proper installation details are followed. If installing a separate WRB, follow manufacturer's written instruction for proper sequence and attachment method. Joint treatment or other sealing of insulation boards is not required when a separate WRB is installed.

Component products used to seal joints may be self-adhered tapes or liquid-applied sealants. See *Atlas Technical Bulletin 15* for a list of approved joint sealing products for installing EnergyShield as a WRB. Reference component manufacturer written instructions for proper installation preparation, techniques, and requirements in addition to these written instructions.

1. Ensure that EnergyShield surface at joints is dry and free of debris to create a bondable surface.
2. Apply joint sealing product where EnergyShield boards meet extending a minimum of 2" across each side of the joint. Cover horizontal joints then vertical joints starting from the bottom to ensure proper shingle-fashion.
3. Apply joint sealing product to all inside and outside corners extending a minimum of 2" onto the face of the insulation boards. Any exposed foam, typically prevalent on outside corners, does not support adhesion. Ensure joint sealing products extend a minimum of 2" beyond any exposed foam and onto the board facer.
4. Cover each fastener head with joint sealing product extending a minimum of 1" from edge of the fastener head onto the face of the board in all directions. When using a washer-style fastener, such as TRUFAST® Grip-Deck® TubeSeal™ or equivalent, with a minimum of 1" diameter cap, sealing each fastener head is not necessary.
   When using flashing tapes, lap ends by a minimum of 1" in proper shingle-fashion starting from the bottom. Apply firm pressure to all flashing tapes using standard J-Roller or equivalent to ensure proper bond. It is recommended to counter-flash the top edge of all horizontal joint sealing product above fenestrations with termination sealant or thin sheathing tape.
5. When using joint sealing tapes, ensure proper bond after installation by applying firm pressure using standard J-Roller or equivalent.

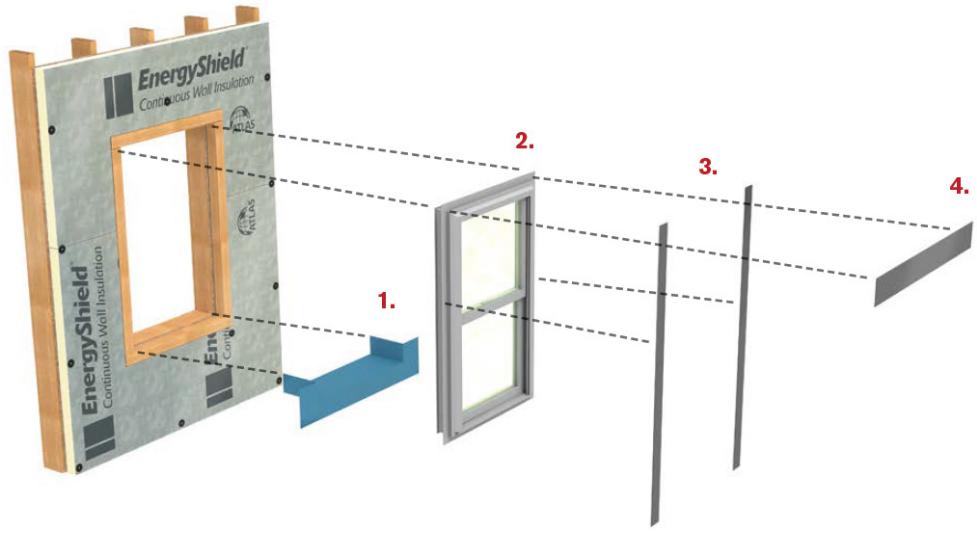
Figure 5: Apply joint sealing product at joints and all inside and outside corners, extending at least 2" on the face of board.

Rough Openings

1. Install sill pan or use flashing across bottom of rough opening extending a minimum of 6" up the jambs and at least 2" onto the face of the insulation boards.
2. Install windows according to manufacturer written installation requirements including, but not limited to, bedding sealants, shims, and fasteners.
3. Install jamb flashing then header flashing (4.) extending onto the foam board at least 2". Do NOT apply flashing over the sill flange to allow for any water to drain properly.

When using flashing tapes, lap ends by a minimum of 1" in proper shingle fashion starting from the bottom. Apply firm pressure to all flashing tapes using standard J-Roller or equivalent to ensure proper bond.

It is recommended to counter-flash the top edge of all horizontal joint sealing product above fenestrations with termination sealant or thin sheathing tape.



Throughwall Penetrations

1. Cut EnergyShield to accommodate a tight fit around penetrations allowing a maximum of 1/8" gap from adjoining materials.
2. Install flashing at least 2" from any penetrations onto the face of the board in proper shingle-fashion.

Below-Grade Application

EnergyShield XR is engineered for below-grade applications. Unlike polystyrene foam products, the polyisocyanurate foam core and durable facers will not degrade if exposed to chemical, UV or high heat. Consideration for compressive strength, moisture resistance and vapor control help minimize the effectiveness of long-term thermal performance in below-grade applications.

Below-Grade Application

EnergyShield XR is engineered to insulate exterior foundation walls below-grade. Insulating block or concrete walls on the exterior surface helps eliminate effect of thermal bridging providing energy efficiencies for interior spaces.

1. Prepare exterior foundation walls with damp proofing or waterproofing membrane or coating.
2. Install EnergyShield XR extending the full height of the exterior foundation wall from top of footing. Tightly fit board joints together working across the foundation wall.
3. Secure insulation boards to exterior foundation wall with construction adhesive or mechanical fasteners. Alternatively, backfill is often adequate to hold insulation boards in place without the need for fasteners.
4. If desired, install a composite drainage material over insulation to promote adequate drainage in predominately wet climates.
5. Backfill to secure in place. Avoid damage to the insulation board surface.

Under Slab

EnergyShield XR can be installed horizontally to insulate under concrete foundation slabs.

1. Prepare level aggregate base or grade for proper drainage.
2. Install EnergyShield XR with joints tightly together and against perimeter walls and/or vertically installed insulation boards. Stagger joints if installing multiple layers.
3. If required, cover entire floor slab area with a vapor barrier, such as a polyethylene protective membrane or equivalent.
4. Set rebar and/or pour concrete as appropriate. Bury or backfill, as required.

Air Barrier Application

EnergyShield is an approved air barrier when proper installation details are followed. This includes sealing all insulation board joints and around all openings and throughwall penetrations on the exterior wall. Additional sealing steps are required on the interior framed wall, such as around fenestration openings, before sheathing or drywall installation.

- Follow steps outlined in *Detailing as Water Resistive Barrier* section on page 8.
- Sealing fasteners is required using compatible sealants unless installing self-sealing fasteners or compatible sealants.
- Install joint sealing products when insulation board transitions to adjacent surfaces, including at foundation and roof-to-wall interface.
- Apply compatible sealant or caulk at all transitions, around openings and throughwall penetrations as needed to meet air exchange requirements per local building code.
- Seal on the interior side for air leakage at all penetrations, especially large penetrations like windows, using expanding foam sealant or caulk. Air being able to easily move through walls at penetrations allows water to make its way into walls. Air-sealing the interior side of these penetrations helps reduce water intrusion by keeping the wall from being under negative pressure.

Alternative Applications

Knee Wall and Vaulted Ceiling Application in Unoccupied Attics

EnergyShield can be installed exposed to the interior space of an attic or crawlspace areas without requiring an ignition barrier, provided the attic or crawlspace is separated from the rest of the building by an approved thermal barrier, such as $^1/_2$" gypsum or equivalent. Reference *DrJ Report Number* 1306-03 for more detailed information at www.atlasrwi.com/products/wall/residential-light-commercial.

1. Install EnergyShield across framing to eliminate thermal bridging. Notch insulation boards to fit over floor and/or ceiling joists with edges tightly fit together.
2. Fasten to framing to secure in place. Choose length of fasteners based on EnergyShield thickness to ensure proper penetration into structural framing. Reference *Table 1 (Page 5)*.
3. Install knee wall before vaulted ceiling.
4. Follow similar steps for crawlspace area installation.

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Notes

1 For more information, visit drjcertification.org or call us at 608-310-6748.

2 Capitalized terms and responsibilities are defined pursuant to the applicable building code, applicable reference standards, the latest edition of TPI 1, the NDS, AISI S202, US professional engineering law, Canadian building code, Canada professional engineering law, Qualtim External Appendix A: Definitions/Commentary, Qualtim External Appendix B: Project/Deliverables, Qualtim External Appendix C: Intellectual Property and Trade Secrets, definitions created within Design Drawings and/or definitions within Reference Sheets. Beyond this, terms not defined shall have ordinarily accepted meanings as the context implies. Words used in the present tense include the future; words stated in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.

3 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1702

4 Alternative Materials, Design and Methods of Construction and Equipment: The provisions of any regulation code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by a regulation. Please review https://www.justice.gov/atr/mission and https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.2.3

5 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1706.2:~:text=the%20design%20strengths%20and%20permissible%20stresses%20shall%20be%20established%20by%20tests

6 The design strengths and permissible stresses of any structural material shall conform to the specifications and methods of design of accepted engineering practice. https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1706.1:~:text=Conformance%20to%20Standards-,The%20design%20strengths%20and%20permissible%20stresses,-of%20any%20structural

7 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1:~:text=the%20building%20official%20shall%20make%2C%20or%20cause%20to%20be%20made%2C%20the%20necessary%20tests%20and%20investigations%3B%20or%20the%20building%20official%20shall%20accept%20duly%20authenticated%20reports%20from%20approved%20agencies%20in%20respect%20to%20the%20quality%20and%20manner%20of%20use%20of%20new%20materials%20or%20assemblies%20as%20provided%20for%20in%20Section%20104.2.3.

8 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1703.4.2

9 https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#approved_agency

10 https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#approved_source

11 https://www.law.cornell.edu/uscode/text/18/1832 (b) Any organization that commits any offense described in subsection (a) shall be fined not more than the greater of $5,000,000 or 3 times the value of the stolen trade secret to the organization, including expenses for research and design and other costs of reproducing the trade secret that the organization has thereby avoided. The federal government and each state have a public records act. To follow DTSA and comply state public records and trade secret legislation requires approval through ANAB ISO/IEC 17065 accredited certification bodies or approved sources. For more information, please review this website: Intellectual Property and Trade Secrets.

12 https://www.nspe.org/resources/issues-and-advocacy/professional-policies-and-position-statements/regulation-professional AND https://apassociation.org/list-of-engineering-boards-in-each-state-archive/

13 https://www.cbitest.com/accreditation/

14 https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.1:~:text=directed%20to%20enforce%20the%20provisions%20of%20this%20code

15 https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.2.3 AND https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#105.3.1

16 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1

17 https://iaf.nu/en/about-iaf-mla/#:~:text=Once%20an%20accreditation%20body%20is%20a%20signatory%20of%20the%20IAF%20MLA%2C%20it%20is%20required%20to%20recognise%20certificates%20and%20validation%20and%20verification%20statements%20issued%20by%20conformity%20assessment%20bodies%20accredited%20by%20all%20other%20signatories%20of%20the%20IAF%20MLA%2C%20with%20the%20appropriate%20scope

18 True for all ANAB accredited product evaluation agencies and all International Trade Agreements.

19 https://www.justice.gov/crt/deprivation-rights-under-color-law AND https://www.justice.gov/atr/mission

20 Unless otherwise noted, the links referenced herein use un-amended versions of the 2024 International Code Council (ICC) 2024 International Code Council (ICC) model codes as foundation references. Mississippi versions of the IBC 2024 and the IRC 2024 are un-amended. This material, product, design, service and/or method of construction also complies with the 2000-2012 versions of the referenced codes and the standards referenced therein. As pertinent to this technical and code compliance evaluation, CBI and/or DrJ staff have reviewed any state or local regulatory amendments to assure this report is in compliance.

21 See Adoptions by Publisher for the latest adoption of a non-amended or amended model code by the local jurisdiction. https://up.codes/codes/general

22 See Adoptions by Publisher for the latest adoption of a non-amended or amended model code by state. https://up.codes/codes/general

23 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3282/subpart-A/section-3282.14

24 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280

25 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#p-3280.2(Listed%20or%20certified); https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#listed AND https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#labeled

26 2021 IECC Section C402.5.1.3

27 2021 IECC Section C402.5.1.4

28 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1703.4

29 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#:~:text=All%20construction%20methods%20shall%20be%20in%20conformance%20with%20accepted%20engineering%20practices%20to%20insure%20durable%2C%20livable%2C%20and%20safe%20housing%20and%20shall%20demonstrate%20acceptable%20workmanship%20reflecting%20journeyman%20quality%20of%20work%20of%20the%20various%20trades

[30] https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#:~:text=The%20strength%20and%20rigidity%20of%20the%20component%20parts%20and/or%20the%20integrated%20structure%20shall%20be%20determined%20by%20engineering%20analysis%20or%20by%20suitable%20load%20tests%20to%20simulate%20the%20actual%20loads%20and%20conditions%20of%20application%20that%20occur

[31] 2021 IECC Section C402.5.1.3

[32] 2021 IECC Section C402.5.1.4

[33] Qualification is performed by a legislatively defined Accreditation Body. ANSI National Accreditation Board (ANAB) is the largest independent accreditation body in North America and provides services in more than 75 countries. DrJ is an ANAB accredited product certification body.

[34] https://anabpd.ansi.org/Accreditation/product-certification/AllDirectoryDetails?prgID=1&orgID=2125&statusID=4#:~:text=Bill%20Payment%20Date-,Accredited%20Scopes,-13%20ENVIRONMENT.%20HEALTH

[35] See Code of Federal Regulations (CFR) Title 24 Subtitle B Chapter XX Part 3280 for definition: https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280

[36] 2021 IECC Section C402.5.1.3

[37] 2021 IECC Section C402.5.1.4

[38] 2021 IBC Section 104.11

[39] 2021 IRC Section R104.11

[40] 2018: https://up.codes/viewer/wyoming/ifc-2018/chapter/1/scope-and-administration#104.9 AND 2021: https://up.codes/viewer/wyoming/ibc-2021/chapter/1/scope-and-administration#104.11

[41] Approved is an adjective that modifies the noun after it. For example, Approved Agency means that the Agency is accepted officially as being suitable in a particular situation. This example conforms to IBC/IRC/IFC Section 201.4 (https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#201.4) where the building code authorizes sentences to have an ordinarily accepted meaning such as the context implies.

[42] https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1

[43] Multilateral approval is true for all ANAB accredited product evaluation agencies and all International Trade Agreements.