

**EnergyShield® Pro, EnergyShield® Pro2,
EnergyShield® CGF Pro & EnergyShield® Ply Pro
Fire Performance in Buildings of Type I-V Construction**

TER No. 1306-03

Issue Date: July 23, 2013

Updated: August 14, 2017

Subject to Renewal: July 1, 2018

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DIVISION: 07 00 00 – THERMAL AND MOISTURE PROTECTION

Section: 07 21 00 – Thermal Insulation

1. Products Evaluated:

- 1.1. EnergyShield® Pro
- 1.2. EnergyShield® Pro2
- 1.3. EnergyShield® CGF Pro (formerly known as Rboard® Pro)
- 1.4. EnergyShield® Ply Pro
- 1.5. For the most recent version of this Technical Evaluation Report (TER), visit drjengineering.org. For more detailed state professional engineering and code compliance legal requirements and references, visit drjengineering.org/statelaw. DrJ is fully compliant with all state professional engineering and code compliance laws.
- 1.6. Requiring an evaluation report from a specific organization (ICC-ES, IAPAMO, CCMC, DrJ, etc.) is a violation of international, federal, state, provincial and local anti-trust and free trade regulations and constitutes restraint of trade. Building code regulations require that evaluation reports are provided by an approved agency meeting specific requirements. Any agency accredited in accordance with ANSI ISO/IEC 17065 meets this requirement within ANSI's scope of accreditation. For a list of accredited agencies, visit ANSI's [website](http://www.ansi.org). For more information, see drjcertification.org

DrJ is a Professional Engineering Approved Source

 **Learn more about DrJ's Accreditation**

- DrJ is an ISO/IEC 17065 accredited product certification body through ANSI Accreditation Services.
- DrJ provides certified evaluations that are signed and sealed by a P.E.
- DrJ's work is backed up by professional liability insurance.
- DrJ is fully compliant with IBC Section 1703.

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- 1.7. This TER can be used to obtain product approval in any country that is an IAF MLA Signatory (all countries found [here](#)) and covered by an [IAF MLA Evaluation](#) per the [Purpose of the MLA](#) (as an example, see [letter to ANSI](#) from the Standards Council of Canada). Manufacturers can go to jurisdictions in the U.S., Canada and other [IAF MLA Signatory Countries](#) and have their products readily approved by authorities having jurisdiction using [DrJ's ANSI accreditation](#).

2. Applicable Codes and Standards:¹

- 2.1. 2009, 2012 and 2015 International Building Code (IBC)
- 2.2. 2009, 2012 and 2015 International Residential Code (IRC)
- 2.3. 2010 and 2014 Florida Building Code – Building (FBC)²
- 2.4. ASTM C1289 – Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
- 2.5. ASTM C1371 – Test Method for Determination of Emittance of Materials near Room Temperature Using Portable Emitters
- 2.6. ASTM D1929 – Standard Test Method for Determining Ignition Temperature of Plastics
- 2.7. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials
- 2.8. ASTM E119 – Standard Test Method for Fire Tests of Building Construction and Materials
- 2.9. ASTM E136 – Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C
- 2.10. ASTM E1354 – Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter
- 2.11. ASTM E2178 – Standard Test Method for Determining Air Permeance of Building Materials
- 2.12. ASTM E2357 – Standard Test Method for Determining Air Leakage of Air Barrier Assemblies
- 2.13. CAN/ULC S-742 – Standard for Air Barrier Assemblies – Specification
- 2.14. NFPA 259 – Standard Test Method for Potential Heat of Building Materials
- 2.15. NFPA 285 – Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components
- 2.16. NFPA 286 – Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth
- 2.17. UL 263 – Fire Tests of Building Construction and Materials
- 2.18. UL 723 – Test for Surface Burning Characteristics of Building Materials and Flammability Ratings

3. Performance Evaluation:

- 3.1. EnergyShield® Pro, EnergyShield® Pro2, EnergyShield® CGF Pro and EnergyShield® Ply Pro were evaluated to determine:
 - 3.1.1. Performance for use in buildings of Type V construction in accordance with [IBC Section 2603](#) and [IRC Section R316](#).
 - 3.1.2. Performance for use in buildings of Type I-IV construction in accordance with [IBC Section 2603.5](#).
 - 3.1.2.1. Performance in accordance with [UL 723](#) for flame spread and smoke development ratings in accordance with [IBC Section 2603.3](#) and [2603.5.4](#).
 - 3.1.2.2. Performance for use as an air barrier material in accordance with [IECC Section C402.5.2.1](#).
 - 3.1.2.3. Performance for use as part of an air barrier assembly in [ASTM E2357](#).

¹ Unless otherwise noted, all references in this code compliant technical evaluation report (TER) are from the 2015 version of the codes and the standards referenced therein, including, but not limited to, [ASCE 7](#), [SDPWS](#) and [WFCM](#). This product also complies with the 2009 - 2012 versions of the [IBC](#) and [IRC](#) and the standards referenced therein. As required by law, where this TER is not approved, the building official shall respond in writing, stating the reasons this TER was not approved. For variations in state and local codes, if any see [Section 8](#).

² Unless otherwise noted, IBC reference numbers are the same as the FBC references.

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- 3.1.2.4. Performance for use without a thermal barrier in accordance with [IBC Section 2603.4](#) and [2603.5.2](#).
- 3.1.2.5. Performance with regard to the potential heat generated by the foam plastic insulating sheathing (FPIS) in accordance with [IBC Section 2603.5.3](#).
- 3.1.2.6. Performance with regard to vertical and lateral fire propagation in accordance with [IBC Section 2603.5.5](#).
- 3.1.2.7. Performance with regard to ignition in accordance with [IBC Section 2603.5.7](#)³.
- 3.1.2.8. Performance with regard to fire resistance rated wall assemblies in accordance with [IBC Section 2603.5.1](#).

3.1.3. The emissivity of the material in accordance with *ASTM C1371*.

3.2. Any code compliance issues not specifically addressed in this section are outside the scope of this TER.

4. Product Description and Materials:

4.1. EnergyShield® Pro, EnergyShield® Pro2, EnergyShield® CGF Pro and EnergyShield® Ply Pro are proprietary FPIS.

4.1.1. EnergyShield® Pro and EnergyShield® Pro2 are polyisocyanurate (polyiso) insulation boards that include a coated aluminum foil facer material on the front side and a reflective aluminum facer on the back side. The products are considered Class I vapor retarders at all thicknesses.

4.1.1.1. EnergyShield® Pro insulation boards are an *ASTM C1289* Type I, Class 1 sheathing.

4.1.1.2. EnergyShield® Pro2 insulation boards differ because they have a glass fiber reinforced polyiso core qualifying it as *ASTM C1289* Type I, Class 2 sheathing.

4.1.2. EnergyShield® CGF Pro is a polyiso insulation board that includes a coated glass facer material on the front side and on the back side (*ASTM C1289* Type II, Class 2 sheathing).

4.1.3. EnergyShield® Ply Pro is a polyiso insulation board that includes glass facers on both sides and is bonded on one side to an APA-TECO rated exposed fire retardant treated plywood (*ASTM C1289 Type V*).

4.2. Material Availability

4.2.1. EnergyShield® Pro, EnergyShield® Pro2 and EnergyShield® CGF Pro

4.2.1.1. Thickness: 1/2" (13 mm) through 4" (76 mm)

4.2.2. EnergyShield® Ply Pro

4.2.2.1. Available with either a 5/8" or 3/4" fire retardant treated plywood bonded to 1" through 4" coated glass faced polyiso.

4.2.2.2. Total thickness with 5/8" plywood: 1.6" through 4.6"

4.2.2.3. Total thickness with 3/4" plywood: 1.7" through 4.7"

4.2.3. Standard product width: 48" (1219 mm)

4.2.3.1. Panels can also be supplied in nominal 16" and 24" widths for use in cavity wall applications.

4.2.4. Standard lengths: 96" (2438 mm) and 108" (2743 mm)

5. Applications:

5.1. General

5.1.1. The insulation boards are FPIS complying with [IBC Section 2603](#).

5.1.1.1. EnergyShield® Pro, EnergyShield® Pro2 comply with [IRC Section R316](#).

³ 2015 [IBC Section 2603.5.7](#) includes an added exception providing for a minimum 1/4-inch (6.4 mm) thickness of fiber cement lap, panel or shingle siding in accordance with [IBC Sections 1405.16](#) and [1405.16.1](#) or [1405.16.2](#).

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- 5.1.2. The insulation boards are used in buildings of Type I-IV construction in accordance with [IBC Section 2603.5](#).
 - 5.1.2.1. EnergyShield® Pro, EnergyShield® Pro2 are also used in buildings of Type V construction in accordance with [IBC Section 2603.4](#), [2603.5](#) and [2603.10](#); and in residential construction in accordance with [IRC Section R316](#).
- 5.1.3. EnergyShield® Pro and EnergyShield® Pro2 have an emittance value for the reflective side of less than 0.1, as measured by *ASTM C1371*.
- 5.1.4. Where the application exceeds the limitations set forth herein, design shall be permitted in accordance with accepted engineering procedures, experience, and technical judgment.

5.2. Fire Safety Performance

5.2.1. Surface Burn Characteristics

Product Name ¹	Flame Spread	Smoke Developed
EnergyShield® Pro, EnergyShield® CGF Pro, EnergyShield® Pro2 & EnergyShield Ply Pro	< 25	< 450
1. Foam core tested in accordance with <i>UL 723</i> . Flame spread and smoke developed numbers are shown for comparison purposes only and are not intended to represent the performance of EnergyShield® Pro, EnergyShield® Pro2, EnergyShield® CGF Pro, EnergyShield Ply Pro and related components under actual fire conditions.		

Table 1: Fire Performance of Insulation Boards

- 5.2.2. EnergyShield® Pro insulation boards were tested in accordance with *NFPA 286* on walls and on ceilings and have met the acceptance criteria of [IBC Section 803.1.2.1](#) for use on either walls only or ceilings only without a thermal barrier, in accordance with [IBC Section 2603.4](#) and [2603.5.2](#).
 - 5.2.2.1. In addition, engineering analysis was performed to compare EnergyShield® Pro and EnergyShield® Pro2 insulation boards with respect to their flammability characteristics.
 - 5.2.2.2. Testing in accordance with the following test methods was compared for both of the products to determine the similarities between the products.
 - 5.2.2.2.1. *ASTM C1929 – Standard Test Method for Determining Ignition Temperature of Plastics*
 - 5.2.2.2.2. *NFPA 259 – Standard Test Method for Potential Heat of Building Materials*
 - 5.2.2.2.3. *UL 723 – Test for Surface Burning Characteristics of Building Materials*
 - 5.2.2.2.4. *ASTM E1354 – Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products using an Oxygen Consumption Calorimeter*
 - 5.2.2.3. Based on the similar performance of both products in these tests, EnergyShield® Pro and EnergyShield® Pro2 insulation boards are approved for use without a thermal barrier in accordance with [IBC Section 2603.9](#). However, installation on walls and ceilings in the same room is not approved.
- 5.2.3. The insulation boards were evaluated to assess performance with regard to ignition in accordance with [IBC Section 2603.5.7](#).
 - 5.2.3.1. The insulation boards comply with this section when the exterior side of the sheathing is protected with one or more of the following materials:
 - 5.2.3.1.1. A thermal barrier complying with [IBC Section 2603.4](#).
 - 5.2.3.1.2. A minimum 1" (25 mm) thickness of concrete or masonry.
 - 5.2.3.1.3. Glass-fiber-reinforced concrete panels of a minimum thickness of 3/8" (9.5 mm).
 - 5.2.3.1.4. Metal-faced panels having minimum 0.019"-thick (0.48 mm) aluminum or 0.016"-thick (0.41 mm) corrosion-resistant steel outer facings.
 - 5.2.3.1.5. A minimum 7/8" (22.2 mm) thickness of stucco complying with [IBC Section 2510](#).

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5.2.4. The insulation boards were tested to assess the potential heat generated by the FPIS in accordance with [IBC Section 2603.5.3](#) and are shown in [Table 2](#).

Product	Potential Heat (Btu/lb.) ¹
EnergyShield® Pro	12,000
EnergyShield® Pro2	
EnergyShield® CGF Pro	
EnergyShield® Ply Pro ²	
1. Tested in accordance with <i>NFPA 259</i> . 2. EnergyShield® Ply Pro foam only.	

Table 2: Potential Heat of Insulation Boards

5.2.5. EnergyShield® Pro and EnergyShield® Pro2 were tested to assess their performance with regard to vertical and lateral fire propagation in accordance with *NFPA 285* and [IBC Section 2603.5.5](#).

5.2.5.1. Engineering analysis has also been conducted to assess substitution of other products within the approved wall assemblies, including EnergyShield® CGF Pro.

5.2.5.2. The wall assemblies listed in [Table 3](#) are approved for use in buildings of Type I-IV construction.

NFPA 285 Approved Wall Assemblies ¹	
Wall Component	Materials
Base Wall System Use either 1, 2, 3 or 4	1. 1" minimum Concrete Wall 2. 1" minimum Concrete Masonry Wall 3. 20-gauge (min.) 3 ⁵ / ₈ " (min.) steel studs with 5 ⁵ / ₈ "-thick Type X gypsum wallboard on interior 4. FRT wood studs spaced at a maximum of 24" o.c. with 5 ⁵ / ₈ "-thick Type X gypsum wallboard on interior
Floor line Firestopping Use 1 or 2	1. None 2. 4 lb./cu ft. mineral wool (e.g., Thermafiber) in each stud cavity at each floor line – attached with Z-clips or equivalent
Cavity Insulation Use either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 or 15 Note: Cavity Insulations 5-15 must use Floorline Firestopping compliant with Item 2 and 5 ⁵ / ₈ " exterior gypsum sheathing.	1. None 2. Any noncombustible insulation per <i>ASTM E136</i> 3. Any mineral fiber (Board type Class A <i>ASTM E84</i> faced or unfaced) 4. Any Fiberglass (Batt type Class A <i>ASTM E84</i> faced or unfaced) 5. 5 ¹ / ₂ " (max.) Icynene LD-C-50 spray foam in 6" deep studs (max.) full fill without an air gap 6. 5 ¹ / ₂ " (max.) Icynene MD-C-200, 2 pcf spray foam in 6" deep studs (max.) full fill without an air gap 7. 5 ¹ / ₂ " (max.) Icynene MD-R-210, 2 pcf spray foam in 6" deep studs (max.) full fill without an air gap 8. 6" (max.) SWD Urethane QS 112, 2 pcf spray foam in 6" deep studs (max.) or partial fill with a maximum 2 ¹ / ₂ " air gap 9. 3 ¹ / ₂ " (max.) Gaco Western 183M spray foam in 3 ⁵ / ₈ " deep studs (max.) 10. 3 ¹ / ₂ " (max) Gaco Western F1850 with 5 ⁵ / ₈ " exterior sheathing in 3 ⁵ / ₈ " deep studs (max) 11. 3 ⁵ / ₈ " (max) Demilec SELECTION 500 with 5 ⁵ / ₈ " exterior sheathing in 3 ⁵ / ₈ " deep studs (max) 12. 3.4" (max) Demilec HeatLok Soy 200 Plus with 5 ⁵ / ₈ " exterior sheathing in 3 ⁵ / ₈ " deep studs (max) 13. 3" (max) Bayer Bayseal with 5 ⁵ / ₈ " exterior sheathing 14. 3" (max) Lapolla FoamLok FL 2000 with 5 ⁵ / ₈ " exterior sheathing in 3 ⁵ / ₈ " deep studs (max) 15. 3 ⁵ / ₈ " (max) BASF SrayTite 81206 or WallTite with 5 ⁵ / ₈ " exterior sheathing in 3 ⁵ / ₈ " deep studs (max)
Exterior Sheathing Use either 1, 2, 3 or 4 Must be used when SPF is used. See sheathing thickness specified above.	1. 1/2" or thicker exterior type gypsum sheathing 2. None, when cavity SPF insulation is not used 3. 2" precast concrete panels attached to structural elements of building 4. 1/2" or thicker GP DensElement sheathing with integrated WRB.
Air Barrier or Weather-Resistive Barrier Applied to Exterior Sheathing Use any of these options	1. None 2. Tyvek CommercialWrap® D – stapled (1 or 2 layers) 3. Henry Air-Bloc 32MR (75 wet mills) 4. Henry Air-Bloc 31MR 5. Henry Air-Bloc 33MR

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NFPA 285 Approved Wall Assemblies¹	
Wall Component	Materials
	<ol style="list-style-type: none"> 6. Henry Air-Bloc 21FR 7. Henry Air-Bloc VP 160 8. Any WRB that has been tested per <i>ASTM E1354</i> (at a min. of 20 kW/m² heat flux) and shown by analysis to be less flammable (improved T_{ign}, Pk. HRR) than those listed above². Examples of such are listed below: 9. BASF Enershield HP 10. BASF Enershield 1 11. CCW Fire Resist 705 12. CCW Fire Resist 705 VP 13. CCW Fire Resist 705 FR-A 14. CCW Fire Resist Barritech NP, VP, or VP LT 15. Dow Corning DefendAir 200 Low Temp 16. Dryvit Backstop NT 17. Dryvit Backstop NT Smooth 18. Dryvit Backstop NT Spray 19. Dryvit Backstop NT Texture 20. Dupont Fluid Applied (0.8 mm) 21. GE Momentive Elemax 2600 22. Grace Perm-A-Barrier PAB VPL LT, PAB NPL 10, PAB NPL, PAB NPS, PAB VPS, VPS, PAB VPL, PAB AWM or PAB VPL 50. 23. Hohmann & Barnard Enviro-Barrier VP 24. Hohmann & Barnard X Barrier 25. Hohmann & Barnard Enviro-Barrier 26. Jumpstart HWW-65A 27. Jumpstart HWW-65B 28. Jumpstart HWHP-80A 29. Jumpstart HWMP-90A 30. Jumpstart HWD2-72A 31. Jumpstart HWHPT-92A 32. Jumpstart HWMPC-110A 33. Parex WeatherSeal Spray and Roll On 34. Prosoco R-Guard Spray Wrap (12 mils) 35. Prosoco R-Guard Spray Wrap MVP 36. Prosoco R-Guard MVP (12 mils) 37. Prosoco R-Guard VB (19 mils) 38. Prosoco R-Guard Cat-5 or Cat-5 Rainscreen (14 mils) 39. Sto Emerald Coat 40. STS Wall Guardian FW 100A (40 wet mils) 41. Tremco ExoAir 230 (31.5 mils) 42. Tremco ExoAir 130 43. Tremco ExoAir ExoAir 111 44. Vaproshield Wrapshield SA 45. Vaproshield Revealshield SA 46. WR Meadows Air-Shield LMP (Gray) 47. WR Meadows Air-Shield LMP (Black) 48. WR Meadows Air-Shield TMP 49. WR Meadows Air-Shield LSR
<p>Exterior Insulation Use either 1, 2, 3, 4 or 5</p> <p>Items 2-4 may be multiple layers of 1 inch thick (minimum)</p>	<ol style="list-style-type: none"> 1. None 2. 4" (max) Atlas EnergyShield® Pro (or Pro2) 3. 4" (max) RBoard Pro (or EnergyShield® CGF Pro) 4. 4^{3/4}" (max) EnergyShield® Ply Pro (4" EnergyShield® CGF Pro with 5/8" or 3/4" FRT Plywood) 5. Any exterior insulation that has been tested per <i>ASTM E1354</i> (at a minimum of 20 kW/m² heat flux) and shown by analysis to be less flammable (improved T_{ign}, Pk. HRR) than those listed above

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NFPA 285 Approved Wall Assemblies¹	
Wall Component	Materials
Items 2-4 may be multiple layers of thinner product with facers on each side.	
<p>WRB Over Exterior Insulation Use any item 1-13</p> <p>Note – Item 2 is an insulation joint tape; not full coverage.</p>	<ol style="list-style-type: none"> 1. None 2. 3" IPG Cold Weather Foil Tape 3. CCW 705FR-A, 4. CCW Barritech NP, 5. CCW Barritech VP, 6. CCW VP LT, 705 VP, 7. Dow Corning DefendAir 200, 8. Dryvit Backstop NT, 9. Dryvit NT Smooth, 10. Dryvit NT Spray, 11. Dryvit NT Texture, 12. GE Momentive SEC 2500 Silshield, 13. GE SilShield SEC2600 AWB (aka Elemax 2600), 14. Grace Perm-a-barrier PAB AWM, 15. Grace PAB VPL, 16. Grace VPS, 17. Grace PAB VPS, 18. Grace PAB NPS, 19. Grace PAB NPL, 20. Grace PAB VPL LT, 21. Henry Foilskin, 22. Henry Metal Clad, 23. Henry Air Bloc 31MR, 24. Henry Air Bloc 33MR, 25. Henry Air Bloc 21FR, 26. Henry VP 160, 27. Henry AB 17, 28. Jumpstart HWW-65A, 29. Jumpstart HWW-65B, 30. Jumpstart HWHP-80A, 31. Jumpstart HWMP-90A, 32. Jumpstart HWD2-72A, 33. Jumpstart HWHPT-92A, 34. Jumpstart HWMPC-110A, 35. Parex WeatherSeal Spray, 36. Parex WeatherSeal Roll On 37. Proscos R-Guard VB, 38. Proscos R-Guard Cat-5, 39. Proscos R-Guard Cat-5 Rainscreen, 40. Proscos Spraywrap MVP, 41. Sto EmeraldCoat 42. Vaproshield Wrapshield SA, 43. Vaproshield Revealshield SA
Flashing	<p>Flash all exterior insulation joints and, as an option, veneer tie penetrations with maximum 4" width of one of the following:</p> <ul style="list-style-type: none"> • None • BT25XL™ by Protecto-Wrap • Any UL Listed tape by 3M Company's Venture Tape® • Aluminum foil tape • 3in. IPG Cold Weather Foil Tape • Asphalt or butyl-based flashing tape

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NFPA 285 Approved Wall Assemblies ¹	
Wall Component	Materials
	<p>Note: A small amount of spray primer may be used to aid in adhesion; maximum 5" width</p> <ul style="list-style-type: none"> • STS LT-100 Liquid Tape • Dow LiquidArmor CM Flashing and Sealant. Maximum 60 mil wet thickness, maximum 5" width • Dow Weathermate flashing • Dow Great Stuff Pro – use on joints <1/4" wide, vertical joints must be staggered and remove excess from face of insulation.
<p>Exterior Cladding Use any of these options</p> <p>Cladding & Zinc may only be used with EnergyShield Pro or Pro2)</p>	<ol style="list-style-type: none"> 1. Brick <ol style="list-style-type: none"> a. Brick veneer anchors – standard types – installed maximum 24" o.c. (max.) vertically on each stud b. Maximum 2" air gap between exterior insulation and brick c. Standard nominal 4"-thick clay brick or veneer 2. Stucco – Minimum 3/4"-thick, exterior cement plaster and lath. A secondary WRB can be installed between the exterior insulation and the lath. The secondary WRB shall not be full-coverage asphalt or butyl-based self-adhered membranes 3. Limestone – minimum 2" thick 4. Natural stone veneer – minimum 2" thick 5. Cast artificial stone – minimum 1.5" thick complying with <i>ICC-ES AC 51</i> 6. Terracotta Cladding – Use any terracotta cladding system in which terracotta is minimum 1 1/4" thick. Any standard installation technique can be used 7. Any ACM that has passed <i>NFPA 285</i> 8. Uninsulated sheet metal building panels including aluminum, steel, copper or zinc 9. Uninsulated fiber-cement cladding panels minimum 1/4" thick 10. Stone/Aluminum honeycomb composite building panels that have successfully passed <i>NFPA 285</i> criteria 11. Autoclaved-aerated-concrete (AAC) panels (minimum 1 1/2" thick) 12. Reynobond ZCM Zinc metal composite panel 13. Terreal Zephir Evolution Rainscreen System (terra cotta), minimum 9/16" thick
<p>Flashing of Windows, Doors & Other Exterior Wall Penetrations</p>	<p>As an option, flash window, door and other exterior penetrations with limited amounts of any tape specified in "Flashing" above or any acrylic, asphalt or butyl-based flashing tape – max. 12" width</p>
<p>1. The assemblies' combinations created herein and the various substitutions of products are based on testing and professional thermal engineering analysis by Hughes Associates and Priest and Associates.</p> <p>2. Acceptance criteria for <i>ASTM E1354</i> testing have not been well established in the referenced building codes and foam sheathing related sections. The criteria stated here for substitution of products is based on testing and professional thermal engineering analysis by Priest and Associates.</p> <p>3. T_{ign} is the time to ignition from the start of the test until the sheathing ignites. Pk. HRR is the peak heat release rate during the test.</p> <p>4. Tested panel joint locations appear to meet the proposed 2018 <i>NFPA 285</i> changes pertaining to panel joint locations in the test assembly.</p>	

Table 3: Approved NFPA 285 Wall Assemblies

5.2.6. EnergyShield® Pro and EnergyShield® Pro2 were tested to assess their performance with regard to fire resistance rated walls in accordance with *UL 263* (or *ASTM E119*) and [IBC Section 2603.5.1](#).

5.2.6.1. EnergyShield® Pro, EnergyShield® Pro2 and EnergyShield® CGF Pro have been accorded a UL BRYX listing per *UL 723*, which allows them to be used in *UL 263* tested assemblies permitting products classified in accordance with the UL BRYX classification. Therefore, EnergyShield® Pro, EnergyShield® Pro2 and EnergyShield® CGF Pro are approved for the following UL assemblies:

5.2.6.1.1. BXUV.U424

5.2.6.1.2. BXUV.U425

5.2.6.1.3. BXUV.V499

5.2.6.2. Additionally, EnergyShield® Pro and EnergyShield® Pro2 are UL Listed in the following designs:

5.2.6.2.1. BXUV.U026

5.2.6.2.2. BXUV.U326

5.2.6.2.3. BXUV.U330

5.2.6.2.4. BXUV.U355

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- 5.2.6.2.5. BXUV.U460
- 5.2.6.2.6. BXUV.U902
- 5.2.6.2.7. BXUV.U904
- 5.2.6.2.8. BXUV.U905
- 5.2.6.2.9. BXUV.U906
- 5.2.6.2.10. BXUV.U907
- 5.2.6.2.11. BXUV.V455

5.3. Air Barrier

5.3.1. EnergyShield® Pro and EnergyShield® Pro2 were tested to assess their performance and have met the requirements for use as the following:

5.3.1.1. Air barrier assembly in accordance with *ASTM E2357*, *CAN/ULC S-742* and [IECC Section C402.5.1.2.2](#), see [Table 4](#) of this TER.

EnergyShield® Pro & EnergyShield® Pro2 Air Barrier Assembly Properties	
ASTM E2357	< 0.2 (L/s.m ²) ¹ @ 75 Pa
CAN/ULC S-742	< 0.05 (L/s.m ²) ¹ @ 75 Pa
1. Liter per second per square meter	

Table 4: EnergyShield® Pro & EnergyShield® Pro2 Air Barrier Assembly Properties

5.3.1.2. Air barrier material in accordance with *ASTM E2178* and [IECC Section C402.5.1.2.1](#), see [Table 5](#) below.

EnergyShield® Pro & EnergyShield® Pro2 Air Barrier Material Properties	
ASTM E2178	< 0.02 (L/s.m ²) ¹ @ 75 Pa
1. Liter per second per square meter	

Table 5: EnergyShield® Pro & EnergyShield® Pro2 Air Barrier Material Properties

5.3.2. EnergyShield® Pro and EnergyShield® Pro2 shall be installed in accordance with the manufacturer's installation instructions and this TER with all seams, including the top and bottom edges, taped. Additionally, the following requirements must be met if using EnergyShield® Pro and EnergyShield® Pro2 as an air barrier assembly:

- 5.3.2.1. EnergyShield® Pro or EnergyShield® Pro2 must exceed ¾" in thickness.
- 5.3.2.2. Install directly over steel studs or over a structural sheathing.
- 5.3.2.3. Vertical joints of all rigid insulation shall be backed by studs or structural sheathing.
- 5.3.2.4. Joints shall be sealed with solvent acrylic adhesive tape min. 3" wide, such as Venture 1520CW or equivalent.
- 5.3.2.5. Penetrations, damage and transitions to other materials shall be flashed with solvent acrylic adhesive tape min. 3" wide (e.g., Venture 1520CW), butyl flashing tape min. 4" wide (e.g., 3M 8067), or caulk (e.g., Henry BES Sealant 925).
- 5.3.2.6. Seal Block Lok brick ties from Hohmann & Barnard with caulk as needed.
- 5.3.2.7. No sealant is needed for Pos-i-Tie brick ties with Rodenhouse Thermal-Grip ci prong washers.
- 5.3.2.8. No sealant is needed for Grip Deck screws with Rodenhouse Thermal-Grip ci prong washers.
- 5.3.2.9. Ties or fasteners collectively shall be spaced 12" o.c. on the perimeter, otherwise 16" o.c.

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6. Installation:

- 6.1. Installation shall comply with the manufacturer's installation instructions and this TER. In the event of a conflict between the manufacturer's installation instructions and this TER, the more restrictive shall govern.
- 6.2. All required wall bracing shall be installed prior to insulation board installation.
- 6.3. The insulation boards should be oriented with the printed side facing the exterior side of the building.
- 6.4. Insulation boards shall be installed horizontally with sheathing edges bearing directly on framing members and edges of abutting panels in moderate contact with each other.
- 6.5. Secure the insulation boards to framing members with fasteners capable of resisting the imposed loads. Fasteners will vary, depending on the substrate and cladding materials.
 - 6.5.1. Fastener heads shall be a minimum of $\frac{3}{8}$ " diameter. Do not allow the fastener head to penetrate the insulation board facer. Use of washers at the fastener head is recommended.
 - 6.5.2. Space fasteners a maximum of 12" o.c. at the perimeter and 16" o.c. in the field.
 - 6.5.3. For steel construction, fasteners shall be corrosion resistant, self drilling screws with a minimum $\frac{3}{4}$ "-diameter cap washer. Fasteners shall be of sufficient length to penetrate through the framing a minimum of three (3) threads.
- 6.6. Install cladding materials in accordance with the cladding manufacturer's installation instructions.
- 6.7. Additional information on the installation and detailing of foam sheathing can be found on the American Chemistry Council's Foam Sheathing Committee web page at fsc.americanchemistry.com.

7. Test and Engineering Substantiating Data:

- 7.1. Test reports and data supporting the following material properties and wall assembly performance:
 - 7.1.1. Flame spread and smoke developed ratings in accordance with *ASTM E84* by Intertek and in accordance with *UL 723* giving a BRYX classification.
 - 7.1.2. Fire performance criteria in accordance with *NFPA 285* by Intertek.
 - 7.1.3. Potential heat in accordance with *NFPA 259* by Intertek.
 - 7.1.4. Ignition temperature in accordance with *ASTM D1929* by Intertek.
 - 7.1.5. Contribution of materials to room fire growth in accordance with *NFPA 286* by Intertek.
 - 7.1.6. Emittance of materials near room temperature in accordance with *ASTM C1371* by R&D Services.
- 7.2. Engineering analysis comparing the fire resistance properties of EnergyShield® Pro and EnergyShield® Pro2 by Hughes Associates.
- 7.3. Engineering analysis assessing the substitution of products within the approved *NFPA 285* tested wall assemblies by Hughes Associates.
- 7.4. Engineering analysis assessing the substitution of products within the approved *NFPA 285* tested wall assemblies by Priest & Associates.
- 7.5. Manufacturer technical data sheets and installation instructions.
- 7.6. Manufacturer quality control manual and evidence of approved agency inspections.
- 7.7. Test reports and data for determining comparative equivalency for use as an alternative material in accordance with [IBC Section 104.11](#).
- 7.8. The product(s) evaluated by this TER falls within the scope of one or more of the model, state or local building codes for building construction. The testing and/or substantiating data used in this TER is limited to buildings, structures, building elements, construction materials and civil engineering related specifically to buildings.
- 7.9. The provisions of model, state or local building codes for building construction do not intend to prevent the installation of any material or to prohibit any design or method of construction. Alternatives shall use consensus standards, performance-based design methods or other engineered alternative means of compliance. This

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TER assesses compliance with defined standards, generally accepted engineering analysis, performance-based design methods, etc. in the context of the pertinent building code requirements.

- 7.10. Some information contained herein is the result of testing and/or data analysis by other sources, which DrJ relies on to be accurate as it undertakes its engineering analysis.
- 7.11. DrJ has reviewed and found the data provided by other professional sources are credible. This information has been approved in accordance with DrJ's procedure for acceptance of data from approved sources.
- 7.12. DrJ's responsibility for data provided by approved sources is in accordance with professional engineering law.
- 7.13. Where appropriate, DrJ relies on the derivation of design values, which have been codified into law through codes and standards (e.g., *IRC*, *WFCM*, *IBC*, *SDPWS*, etc.). This includes review of code provisions and any related test data that helps with comparative analysis or provides support for equivalency to an intended end-use application.

8. Findings:

- 8.1. EnergyShield® Pro and EnergyShield® Pro2 are approved for use in exterior or interior walls only or ceilings only without a thermal barrier in accordance with [IBC Section 2603.4](#).
- 8.2. EnergyShield® Pro, EnergyShield® Pro2 and EnergyShield® CGF Pro are approved for use in exterior walls of buildings of Type I-IV construction in accordance with [IBC Section 2603.5](#).
- 8.3. EnergyShield® Pro, EnergyShield® Pro2, EnergyShield® CGF Pro and EnergyShield® Ply Pro are approved for use in exterior walls of buildings of Type I-IV construction in accordance with [IBC Section 2603.5.1](#) for fire resistance rated walls per the assemblies listed in [Section 5.2.6](#).
- 8.4. EnergyShield® Pro, EnergyShield® Pro2 and EnergyShield® CGF Pro are approved for use in wall assemblies meeting the requirements of *NFPA 285* testing when constructed in accordance with [Table 3](#).
- 8.5. EnergyShield® Pro and EnergyShield® Pro2 are approved for use without a thermal barrier in accordance with [IBC Section 2603.9](#). However, installation on walls and ceilings in the same room is not approved.
- 8.6. EnergyShield® Pro, EnergyShield® Pro2 and EnergyShield® CGF Pro described in this TER comply with, or are a suitable alternative to, the applicable sections of the codes listed in [Section 2](#).
- 8.7. [IBC Section 104.11](#) and [IRC Section R104.11](#) ([IFC Section 104.9](#) is similar) state:

104.11 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 has been *approved*. An alternative material, design or method of construction shall be *approved* where the *building official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code. ... Where the alternative material, design or method of construction is not *approved*, the *building official* shall respond in writing, stating the reasons the alternative was not *approved*.⁴
- 8.8. This product has been evaluated with the codes listed in [Section 2](#), and is compliant with all known state and local building codes. Where there are known variations in state or local codes that are applicable to this evaluation, they are listed here:
 - 8.8.1. No known variations
- 8.9. This TER uses professional engineering law, the building code, ANSI/ASTM consensus standards and generally accepted engineering practice as its criteria for all testing and engineering analysis. DrJ's professional engineering work falls under the jurisdiction of each state Board of Professional Engineers, when signed and sealed.

9. Conditions of Use:

- 9.1. Where required by the authority having jurisdiction (AHJ) in which the project is to be constructed, this TER and the installation instructions shall be submitted at the time of permit application.

⁴ The last sentence is adopted language in the 2015 codes.

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- 9.2.** Any generally accepted engineering calculations needed to show compliance with this TER shall be submitted to the code official for review and approval.
- 9.3.** Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed.
- 9.3.1.** EnergyShield® Pro and EnergyShield® Pro2 are approved for use in both interior and exterior walls.
- 9.3.2.** When the insulation boards are used on exterior walls of buildings of Type I, II, III or IV, construction must be as described in [Table 3](#).
- 9.3.3.** 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.
- 9.3.4.** This product shall not be used as a structural nailing base for claddings.
- 9.3.5.** The insulation boards shall not be used to resist lateral loads. 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.
- 9.3.6.** The insulation boards are manufactured in East Moline, IL; Camp Hill, PA; Diboll, TX; and North Glenn, CO; under a quality control program with quality control inspections in accordance with [IBC Section 110.3.8](#) and [110.3.9](#).
- 9.3.7.** The wall assemblies listed in [Table 3](#) are based on compliance to the fire provisions of the codes listed in [Section 2](#). Consideration of wall assembly performance with regard to other attributes, such as water vapor control, condensation, energy code requirements, etc. are outside the scope of this TER.
- 9.4.** Design
- 9.4.1.** Building Designer Responsibility
- 9.4.1.1.** Unless the AHJ allows otherwise, the Construction Documents shall be prepared by a Building Designer (e.g., Owner, Registered Design Professional, etc.) for the Building and shall be in accordance with [IRC Section R106](#) and [IBC Section 107](#).
- 9.4.1.2.** The Construction Documents shall be accurate and reliable and shall provide the location, direction and magnitude of all applied loads and shall be in accordance with [IRC Section R301](#) and [IBC Section 1603](#).
- 9.4.2.** Construction Documents
- 9.4.2.1.** Construction Documents shall be submitted to the Building Official for approval and shall contain the plans, specifications and details needed for the Building Official to approve such documents.
- 9.5.** Responsibilities
- 9.5.1.** The information contained herein is a product, engineering or building code compliance TER performed in accordance with the referenced building codes, testing and/or analysis through the use of accepted engineering procedures, experience and technical judgment.
- 9.5.2.** DrJ TERs provide an assessment of only those attributes specifically addressed in the Products Evaluated or Code Compliance Process Evaluated section.
- 9.5.3.** The engineering evaluation was performed on the dates provided in this TER, within DrJ's professional scope of work.
- 9.5.4.** This product is manufactured under a third-party quality control program in accordance with [IRC Section R104.4](#) and [R109.2](#) and [IBC Section 104.4](#) and [110.4](#).
- 9.5.5.** The actual design, suitability and use of this TER for any particular building is the responsibility of the Owner or the Owner's authorized agent, and the TER shall be reviewed for code compliance by the Building Official.
- 9.5.6.** The use of this TER is dependent on the manufacturer's in-plant QC, the ISO/IEC 17020 third-party inspection process, proper installation per the manufacturer's instructions, the Building Official's

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inspection and any other code requirements that may apply to assure accurate compliance with the applicable building code.

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10. Identification:

- 10.1. The insulation boards described in this TER are identified by a label on the board or packaging material bearing the manufacturer's name, product name, TER number, and other information to confirm code compliance.
- 10.2. Additional technical information can be found at atlasroofing.com.

11. Review Schedule:

- 11.1. This TER is subject to periodic review and revision. For the most recent version of this TER, visit drjengineering.org.
- 11.2. For information on the current status of this TER, contact [DrJ Engineering](#).



- [Mission and Professional Responsibilities](#)
- [Product Evaluation Policies](#)
- [Product Approval – Building Code, Administrative Law and P.E. Law](#)