



Listing and Technical Evaluation Report™

A Duly Authenticated Report from an Approved Agency

Report No: 2403-05



Issue Date: July 23, 2024

Revision Date: September 30, 2025

Subject to Renewal: October 1, 2026

PAC-Shield CI Coated Glass, PAC-Shield CL Foil, and PAC-Shield CI Ply Fire Performance in Exterior Walls of Buildings of Type I-IV Construction

Trade Secret Report Holder:

Petersen Aluminum Corporation

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CSI Designations:

DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

Section: 06 10 00 - Rough Carpentry

DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION

Section: 07 21 00 - Thermal Insulation

Section: 07 48 00 - Exterior Wall Assemblies

1 Innovative Products Evaluated¹

1.1 PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply.

2 Product Description and Materials

2.1 The innovative products evaluated in this report are shown in **Figure 1**.







Figure 1. PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply









- 2.2 PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply are Foam Plastic Insulation Sheathing (FPIS) products.
 - 2.2.1 PAC-Shield CI Foil is a polyisocyanurate insulation board adhered to foil facers.
 - 2.2.2 PAC-Shield CI Coated Glass is a polyisocyanurate insulation board adhered to coated glass facers.
 - 2.2.3 PAC-Shield CI Ply is a polyisocyanurate insulation board bonded to APA-TECO rated exposure fire treated plywood.
- 2.3 The foam core of PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply is manufactured in accordance with ASTM C1289.
 - 2.3.1 PAC-Shield Foil is ASTM C1289 Type I, Class 1 and Class 2, Grade 2 or Grade 3 compliant.
 - 2.3.2 PAC-Shield CI Coated Glass is ASTM C1289 Type II, Class 2 Grade 2 or Grade 3 compliant.
 - 2.3.3 PAC-Shield CI Ply is ASTM C1289 Type V compliant with Type II Class 2 foam.
- 2.4 Material Availability
 - 2.4.1 Thickness:
 - 2.4.1.1 PAC-Shield CI Foil and PAC-Shield CI Coated Glass:
 - 2.4.1.1.1 1" (25 mm) through 4" (102 mm)
 - 2.4.1.2 PAC-Shield CI Ply:
 - 2.4.1.2.1 Available with either a 5/8" or 3/4" fire treated plywood and 1" through 4" coated glass polyiso
 - 2.4.1.2.1.1 Total thickness with 15/8" substrate: 1.6" (41 mm) through 45/8" (117 mm)
 - 2.4.1.2.1.2 Total thickness with ³/₄" substrate: 13/4" (43 mm) through 4³/₄" (119 mm)
 - 2.4.2 Standard Product Width:
 - 2.4.2.1 48" (1,220 mm)
 - 2.4.3 Standard Lengths:
 - 2.4.3.1 PAC-Shield CI Foil and PAC-Shield CI Coated Glass:
 - 2.4.3.1.1 96" (2,438 mm)
 - 2.4.3.1.2 120" (3,048 mm)
 - 2.4.3.1.3 144" (3,658 mm)
 - 2.4.3.2 PAC-Shield CI Ply:
 - 2.4.3.2.1 96" (2,438 mm)
 - 2.4.4 Custom widths, lengths and thicknesses for PAC-Shield CI Foil and PAC-Shield CI Coated Glass are available upon request.
- 2.5 As needed, review material properties for design in **Section 6** and the regulatory evaluation in **Section 8**.

3 Definitions²

- 3.1 New Materials³ 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 tests⁵ and/or engineering analysis.⁶
- 3.2 <u>Duly authenticated reports</u>⁷ and <u>research reports</u>⁸ are test reports and related engineering evaluations that are written by an <u>approved agency</u>⁹ and/or an <u>approved source</u>.¹⁰
 - 3.2.1 These reports utilize 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 secretes under the regulation, 18.US.Code.90, also known as <u>Defend Trade Secrets Act of 2016</u> (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 <u>approved source</u> is "approved" when a professional engineer (i.e., <u>Registered Design Professional</u>, hereinafter <u>RDP</u>) is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the <u>state legislature</u> via its professional engineering regulations.¹²
- 3.5 Testing and/or inspections conducted for this <u>duly authenticated report</u> were performed by an <u>ISO/IEC 17025</u> accredited testing laboratory, an <u>ISO/IEC 17020</u> accredited inspection body, and/or a licensed <u>RDP</u>.
 - 3.5.1 The Center for Building Innovation (CBI) is ANAB¹³ ISO/IEC 17025 and ISO/IEC 17020 accredited.
- 3.6 The regulatory authority shall <a href="englished-color: blue, color: blue, col
- 3.7 The regulatory authority shall accept <u>duly authenticated reports</u> from an <u>approved agency</u> and/or an <u>approved source</u> 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, 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; Regulations²⁰

- 4.1 Local, State, and Federal
 - 4.1.1 Approved in all local jurisdictions pursuant to ISO/IEC 17065 <u>duly authenticated report</u> 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, Texas Department of Insurance, and Wichita.²¹
 - 4.1.2 Approved in all state jurisdictions pursuant to ISO/IEC 17065 <u>duly authenticated report</u> 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 3282.14²³ and Part 3280²⁴ 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 Standards
 - 4.2.1 ASTM C1289: Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
 - 4.2.2 ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials
 - 4.2.3 ASTM E119: Standard Test Methods for Fire Tests of Building Construction and Materials
 - 4.2.4 ASTM E136: Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C









- 4.2.5 ASTM E1354: Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter
- 4.2.6 ASTM E2178: Standard Test Method for Air Permeance of Building Materials
- 4.2.7 FM 4880: Approval Standard for Class 1 Fire Rating of Building Panels or Interior Finish Materials
- 4.2.8 NFPA 259: Standard Test Method for Potential Heat of Building Materials
- 4.2.9 NFPA 268: Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source
- 4.2.10 NFPA 285: Standard Fire Test Method for the Evaluation of Fire Propagation Characteristics of Exterior Nonload-bearing Wall Assemblies Containing Combustible Components
- 4.2.11 NFPA 286: Standard Methods of Fire Test for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth
- 4.2.12 UL 1040: Fire Test of Insulated Wall Construction
- 4.2.13 UL 1715: Fire Test of Interior Finish Material
- 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®

5 Listed²⁵

5.1 Equipment, materials, products, or services included in a List published by a <u>nationally recognized testing</u> <u>laboratory</u> (i.e., CBI), an <u>approved agency</u> (i.e., CBI and DrJ), and/or and <u>approved source</u> (i.e., DrJ), or other organization(s) concerned with product evaluation (i.e., DrJ), that maintains periodic inspection (i.e., 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 General
 - 6.1.1 PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply are FPIS complying with <u>IBC</u> Section 2603 and IRC Section R303.²⁶
 - 6.1.2 PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply are used in exterior walls of buildings of any height and of Type I-IV construction in accordance with IBC Section 2603.5 and IRC Section R303.5.12.27
 - 6.1.3 Environmental Product Declarations (EPD) for PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply are available at www.polyiso.org.
- 6.2 Structural Applications
 - 6.2.1.1 Where the application exceeds the limitations set forth herein, design shall be permitted in accordance with accepted engineering procedures, experience and technical judgment.









6.3 Fire Safety Performance

6.3.1 Surface Burning Characteristics:

- 6.3.1.1 PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply were evaluated to assess performance with regard to flame spread and smoke-developed indices in accordance with ASTM E84 as specified in IBC Section 2603.3, IBC Section 2603.5.4, and IRC Section R303.3.²⁸
- 6.3.1.2 Results are shown in **Table 1**. Surface Burning Characteristics¹.

Table 1. Surface Burning Characteristics1

Product Name	Flame Spread Index	Smoke Developed Index	Classification
PAC-Shield Foil			
PAC-Shield CI Coated Glass	≤ 75	≤ 450	Class B
PAC-Shield CI Ply			

[.] Foam core tested in accordance with ASTM E84. Flame spread and smoke-developed indices are shown for comparison purposes only and are not intended to represent the performance under actual fire conditions.

6.3.2 *Ignition:*

- 6.3.2.1 PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply were evaluated to assess performance with regard to ignition (NFPA 268) in accordance with IBC Section 2603.5.7.
- 6.3.2.2 PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply comply with this section when the exterior side of the sheathing is protected with one of the following materials:
 - 6.3.2.2.1 A thermal barrier complying with <u>IBC Section 2603.4</u>, <u>IBC Section 2603.5.2</u>, and <u>IRC Section R303.4</u>.²⁹
 - 6.3.2.2.2 A minimum 1" (25 mm) thickness of concrete or masonry.
 - 6.3.2.2.3 Glass-fiber reinforced concrete panels of a minimum thickness of ³/₈" (9.5 mm).
 - 6.3.2.2.4 Metal-faced panels having minimum 0.019" thickness (0.48 mm) aluminum or 0.016" thickness (0.41 mm) corrosion-resistant steel outer facings.
 - 6.3.2.2.5 A minimum ⁷/₈" (22.2 mm) thickness of stucco complying with IBC Section 2510.
 - 6.3.2.2.6 A minimum ¹/₄" (6.4 mm) thickness of fiber-cement lap, panel or shingle siding complying with IBC Section 1404.17, and IBC Section 1404.17.1 or IBC Section 1404.17.2.









6.3.3 Potential Heat:

6.3.3.1 PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply were tested in accordance with NFPA 259 to assess the potential heat generated by the FPIS in accordance with IBC Section 2603.5.3, IRC Section R303.5.7, and IRC Section R303.5.8, as shown in **Table 2**.

Table 2. Potential Heat

Product Name	Potential Heat (Btu/lb)¹
PAC-Shield CI Foil	
PAC-Shield CI Coated Glass	11,503
PAC-Shield CI Ply	
SI: 1 Btu/lb = 0.0023 MJ/kg 1. Tested in accordance with NFPA 259 - foam core only.	

- 6.3.4 Vertical and Lateral Fire Propagation:
 - 6.3.4.1 PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply were tested to assess their performance with regard to vertical and lateral fire propagation in accordance with NFPA 285 and 2018 IBC Section 2603.5.5.
 - 6.3.4.2 Engineering analysis has also been conducted to assess substitution of other products within the approved wall assemblies.
 - 6.3.4.3 The wall assemblies listed in **Table 3**, **Table 4**, **Table 5**, **Table 6**, and **Table 7** are approved for use in buildings of Type I-IV construction by demonstrating equivalency to similar assemblies tested in accordance with NFPA 285-19 and NFPA 285-23, meeting the prescriptive requirement for less than 25 Flame Spread Index (FSI) material as required in IBC Section 2603.5.4.
 - 6.3.4.3.1 For building codes based on 2018 IBC (NFPA 285-12) or earlier, the tables in **Appendix A** may be used instead of **Table 3**, **Table 4**, **Table 5**, **Table 6**, and **Table 7** throughout the rest of this document.

Table 3. NFPA 285 Approved Wall Assemblies with PAC-Shield CI Coated Glass Exterior Insulation^{1,2,3}

Wall Component	Materials
Base Wall System Use either 1, 2, 3 or 4	 Cast concrete walls CMU concrete walls 25-gauge min. 3⁵/₈" (min.) steel studs spaced 24" o.c. (max.) a. ⁵/₈" Type X gypsum wallboard interior b. Lateral bracing every 4' optional or as required by code FRTW studs: min. nominal 2"x4" dimension, spaced 24" o.c. (max.) a. ⁵/₈" Type X gypsum wallboard interior b. Bracing as required by building code
Fire-Stopping at Floor Lines Use Item 1 or 2	 Any approved mineral-fiber-based safing insulation in each stud cavity at floor line. Safing thickness must match stud cavity depth. Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction.









Table 3. NFPA 285 Approved Wall Assemblies with PAC-Shield CI Coated Glass Exterior Insulation^{1,2,3}

Wall Component	Materials
Cavity Insulation Use any Item 1-11	 None 11/2" (max.) of Carlisle SPI SealTite PRO, SealTite PRO Closed Cell or SealTite PRO One Zero Any noncombustible insulation per ASTM E136 Any mineral fiber (Board type faced or unfaced) Any fiberglass (Batt type faced or unfaced) 31/4" (max.) of Carlisle SPI SealTite PRO, SealTite PRO Closed Cell, or SealTite PRO One Zero – only with Sheathing 2 Carlisle SealTite PRO HFO, SealTite PRO Open Cell, SealTite PRO High Yield, SealTite PRO No Mix, SealTite PRO No Trim 21, SealTite PRO OCX. 35/8" max. Use with ½" exterior sheathing JM Corbond III or IV - 35/8" max. Use with 5/8" exterior sheathing BASF WallTite Max - 35/8" max. Use with 1/2" exterior sheathing Huntsman HeatLok HFO Pro. Huntsman HeatLok HFO High Lift. 35/8" max. Use with 5/8" exterior sheathing SWD Urethane Quik-Shield Goblin or Yeti - 1 to 35/8" thick for use in 35/8" studs (max.). Use with 5/8" exterior sheathing
Exterior Sheathing Use either 1, 2 or 3	 None (only with Claddings 1 – 6 and Cavity Insulations 1, 3, 4, or 5). 1/2" or thicker exterior gypsum sheathing 1/2" (min.) FRTW structural panels in Type III construction
Multi-Function Sheathing & WRB Products Use 1 or 2	1. USG Securock® Exoair® 430 System – See note and Table 6 2. ⁵ / ₈ " Georgia Pacific DensElement, flashed with Prosoco R-Guard FastFlash on sheathing joints. **Note:* Item 1 or 2 replaces the exterior sheathings above. When either of these items is used, do not use exterior sheathings or WRBs on base wall surface in Table 6 .
WRB Over Base Wall Surface	See Table 6
Exterior Insulation Use any Item 1 or 2	 4" thick (max.) PAC-Shield CI Coated Glass or PAC-Shield CI Coated Glass (Class A) for Claddings 1 - 6. 31/2" thick (max.) PAC-Shield CI Coated Glass or PAC-Shield CI Coated Glass (Class A) for claddings 7 - 17 (with special Opening Perimeter).
WRB Over Exterior Insulation	1. See Table 6 The exterior insulation may be used with or without CavClear® Masonry Mat over the insulation with a maximum 1" air gap between the CavClear and the cladding. When CavClear is used, this may only be used with Cladding 1, 2, 3, 4, 5 or 6 or with thin brick/thin stone adhered to stucco as long as the total thickness is $^{3}/_{4}$ " minimum.
Exterior Cladding Use any Item 1-17 Cladding 1 – 6 for 4" (max) insulation thickness Cladding 7- 17 for 31/2" (max) insulation thickness with unique opening perimeter.	 Brick – Nominal 4" thick, clay or concrete brick or veneer with maximum 2" air gap behind the brick. Brick ties/Anchors 24" o.c. (maximum). Stucco – Minimum ³/₄" thick, exterior cement plaster and lath Limestone – Minimum 2" thick using any standard non-open joint installation technique such as shiplap. Natural stone veneer – Minimum 2" thick using any standard non-open joint installation technique such as grouted/mortared stone. Cast Artificial Stone – Minimum 1¹/₂" thick complying with ICC-ES AC 51 using any standard non-open joint installation technique such as shiplap. Terra Cotta Cladding – Minimum 1¹/₄" thick (solid or equivalent by weight) using any standard open or non-open joint installation technique such as shiplap. Any ACM or MCM that has passed NFPA 285 with foam of comparable thickness. Uninsulated sheet metal building panels including steel, copper, aluminum.









Table 3. NFPA 285 Approved Wall Assemblies with PAC-Shield CI Coated Glass Exterior Insulation^{1,2,3}

Wall Component	Materials
Exterior Cladding (continued) Max. Air Gap 2" for Claddings 1 - 6. Max. Air Gap 11/2" for Claddings 7 - 17. If Claddings 2, 3, 4, 5, 11, 12 or 14 are on stucco base with lath, a secondary WRB (WRB items above allowed over foam) can be installed between the insulation and lath and must not be full coverage asphalt or butyl-based self-adhering membranes, but may be butyl-based slip sheet (stapled) with no adhesive.	 1/4" (min.) uninsulated fiber-cement siding, or porcelain or ceramic tile mechanically attached. Autoclaved-aerated-concrete (AAC) panels that have successfully passed NFPA 285 criteria. Thin brick/cultured stone set in thin set adhesive and metal lath. Glen Gery Thin Tech® Elite Series Masonry Veneer or TABS II Panel System with 1/2" thick bricks using TABS Wall Adhesive. Terra Cotta Cladding – Any Rain-screen Terra Cotta (min. 1/2" thick) using any installation technique with ventilated shiplap. 3/6" or 1/2" Stucco – Any one-coat stucco (1/2" min.) that meets AC11 acceptance criteria. Natural Stone Veneer – minimum 11/4" thick using any standard installation technique. AFC Terraslat by Tonality Classic26 or Tonality Classic22. 8mm (min.) or 5/16" (min.) SwissPearl Fiber Cement cladding. Note 1. Armatherm Z Girts may be used horizontally in Hunter assemblies. Note 2. Strongirt (Mix U) horizontal fiberglass Z Girt may be used for all claddings listed, other than ACM or MCM.
Special Opening Perimeter Use with Claddings 7 - 17	 Tested Opening – 2 layers ⁵/₈" gypsum, with 18-gauge steel flashing at header and 1 layer ⁵/₈" and 18-gauge galvanized steel flashing at jambs and sill. 2" mineral wool 4 lb/ft³ density 1¹/₂" thick FRT wood buck Two layers of ³/₄" FRT Plywood

- 1. The assemblies' combinations created herein and the various substitutions of products are based on testing and professional thermal engineering analysis.
- 2. Acceptance criteria for ASTM E1354 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.
- 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.









Table 4. NFPA 285 Approved Wall Assemblies with PAC-Shield CI Foil Exterior Insulation^{1,2,3}

Wall Component	Materials
Base Wall System Use either 1, 2, 3 or 4	 Cast concrete walls CMU concrete walls 25-gauge min. 35/8" (min.) steel studs spaced 24" o.c. (max.) a. 5/8" Type X gypsum wallboard interior b. Lateral bracing every 4' optional or as required by code FRTW studs: min. nominal 2"x4" dimension, spaced 24" o.c. (max.) a. 5/8" Type X gypsum wallboard interior b. Bracing as required by building code
Fire-Stopping at Floor Lines Use Item 1 or 2	 Any approved mineral-fiber-based safing insulation in each stud cavity at floor line. Safing thickness must match stud cavity depth. Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction.
Cavity Insulation Use any Item 1-11	 None 1¹/₂" (max.) of Carlisle SPI SealTite PRO, SealTite PRO Closed Cell, or SealTite PRO One Zero Any noncombustible insulation per ASTM E136 Any mineral fiber (Board type faced or unfaced) Any fiberglass (Batt type faced or unfaced) 3¹/₄" (max.) of Carlisle SPI SealTite PRO, SealTite PRO Closed Cell, or SealTite PRO One Zero – only with Sheathing 2 Carlisle SealTite PRO HFO, SealTite PRO Open Cell, SealTite PRO High Yield, SealTite PRO No Mix, SealTite PRO No Trim 21, SealTite PRO OCX. 3⁵/₀" max. Use with ¹/₂" exterior sheathing JM Corbond III or IV - 3⁵/₀" max. Use with ⁵/₀" exterior sheathing BASF WallTite Max - 3⁵/₀" max. Use with ¹/₂" exterior sheathing Huntsman HeatLok HFO Pro. Huntsman HeatLok HFO High Lift. 3⁵/₀" max. Use with ⁵/₀" exterior sheathing SWD Urethane Quik-Shield Goblin or Yeti - 1 to 3⁵/₀" thick for use in 3⁵/₀" studs (max.). Use with ⁵/₀" exterior sheathing
Exterior Sheathing Use either 1, 2 or 3	 None (only with Claddings 1 - 6, and cavity insulation 1, 3, 4 or 5). ½" or thicker exterior gypsum sheathing ½" (min.) FRTW structural panels in Type III construction
Multi-Function Sheathing & WRB Products Use 1 or 2	USG Securock Exoair 430 System – See note and Table 6 5/8" Georgia Pacific DensElement, flashed with Prosoco R-Guard FastFlash on sheathing joints. Note: Item 1 or 2 replaces the exterior sheathings above. When either of these items are used, do not use exterior sheathings or WRBs on base wall surface in Table 6 .
WRB Over Base Wall Surface	See Table 6
Exterior Insulation Use either 1 or 2 depending on cladding	 4" thick (max.) PAC-Shield CI Foil for Claddings 1 - 6. 3¹/₂" thick (max.) PAC-Shield CI Foil for Claddings 7 - 16 (with special Opening Perimeter).
WRB Over Exterior Insulation	See Table 6 The exterior insulation may be used with or without CavClear Masonry Mat over the insulation with a maximum 1" air gap between the CavClear and the cladding. When CavClear is used, this may only be used with Cladding 1, 2, 3, 4, 5 or 6 or with thin brick/thin stone adhered to stucco as long as the total thickness is $^{3}/_{4}$ " minimum.









Table 4. NFPA 285 Approved Wall Assemblies with PAC-Shield CI Foil Exterior Insulation 1,2,3

Wall Component	Materials
Exterior Cladding Use any Item 1-17 Cladding 1 - 6 for 4" (max.) insulation thickness Cladding 7 - 17 for 31/2" (max.) insulation thickness with special opening perimeter Max. Air Gap 2" for Claddings 1 - 6. Max. Air Gap 11/2" for Claddings 7 - 17. If Claddings 2, 3, 4, 5, 11, 12 or 14 are on stucco base with lath, a secondary WRB (WRB items above allowed over foam) can be installed between the insulation and lath and must not be full coverage asphalt or butyl-based self- adhering membranes, but may be butyl-based slip sheet (stapled) with no adhesive.	 Brick – Nominal 4" thick, clay or concrete brick or veneer with maximum 2" air gap behind the brick. Brick ties/Anchors 24" o.c. (maximum). Stucco – Minimum 3/4" thick, exterior cement plaster and lath Limestone – Minimum 2" thick using any standard non-open joint installation technique such as shiplap. Natural stone veneer – Minimum 2" thick using any standard non-open joint installation technique such as grouted/mortared stone. Cast Artificial Stone – Minimum 11/2" thick complying with ICC-ES AC 51 using any standard non-open joint installation technique such as shiplap. Terra Cotta Cladding – Minimum 11/4" thick (solid or equivalent by weight) using any standard open or non-open joint installation technique such as shiplap. Any ACM or MCM that has passed NFPA 285 with foam of comparable thickness. Uninsulated sheet metal building panels including steel, copper, aluminum. 1/4" (min.) uninsulated fiber-cement siding, or porcelain or ceramic tile mechanically attached. Autoclaved-aerated-concrete (AAC) panels that have successfully passed NFPA 285 criteria. Thin brick/cultured stone set in thin set adhesive and metal lath. Glen Gery Thin Tech Elite Series Masonry Veneer or TABS II Panel System with 1/2" thick bricks using TABS Wall Adhesive. Terra Cotta Cladding – Any Rain-screen Terra Cotta (min. 1/2" thick) with ventilated shiplap. 3/8" or 1/2" Stucco – Any one coat stucco (1/2" min.) that meets AC11 acceptance criteria. Natural Stone Veneer – minimum 11/4" thick using any standard installation technique. AFC Terraslat by Tonality – Tonality Classic26 or Tonality Classic22 8 mm (min.) or 5/16" (min.) SwissPearl Fiber Cement Cladding Note 1. Armatherm Z Girts may be used horizontally in Hunter assemblies. Note 2. Strongirt (Mix U) horizontal fiberglass Z Girt may be u
Special Opening Perimeter Use with Claddings 7 - 17	 Tested Opening – 2 layers ⁵/₈" gypsum, with 18-gauge steel flashing at header and 1 layer ⁵/₈" and 18-gauge galvanized steel flashing at jambs and sill. 2" mineral wool 4 lb/ft³ density 11/₂" thick FRT wood buck Two layers of ³/₄" FRT Plywood

- 1. The assemblies' combinations created herein and the various substitutions of products are based on testing and professional thermal engineering analysis.
- 2. Acceptance criteria for ASTM E1354 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.
- 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.









Table 5. NFPA 285 Approved Wall Assemblies with PAC-Shield CI Ply Exterior Insulation^{1,2,3}

Wall Commonant	Metariala
Wall Component	Materials
Base Wall System Use either 1, 2, 3 or 4	 Cast concrete walls CMU concrete walls 25-gauge min. 3⁵/₈" (min.) steel studs spaced 24" o.c. (max.) a. 5/₈" Type X gypsum wallboard interior b. Lateral bracing every 4' optional or as required by code. FRTW studs: min. nominal 2"x4" dimension, spaced 24" o.c. (max.) a. 5/₈" Type X gypsum wallboard interior b. Bracing as required by code
Fire-Stopping at Floor Lines	 Any approved mineral-fiber-based safing insulation in each stud cavity at floor line. Safing thickness must match stud cavity depth. Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction.
Cavity Insulation Use any Item 1-11	 None 1¹/₂" (max.) of Carlisle SPI SealTite PRO, SealTite PRO Closed Cell or SealTite PRO One Zero Any noncombustible insulation per ASTM E136 Any mineral fiber (Board type faced or unfaced) Any fiberglass (Batt type faced or unfaced) 3¹/₄" (max.) of Carlisle SPI SealTite PRO, SealTite PRO Closed Cell or SealTite PRO One Zero – only with Sheathing 2 Carlisle SealTite PRO HFO, SealTie PRO Open Cell, SealTite PRO High Yield, SealTite PRO No Mix, SealTie PRO No Trim 21, SealTite PRO OCX. 3⁵/₅" max. Use with ¹/₂" exterior sheathing JM Corbond III or IV - 3⁵/₅" max. Use with ⁵/₅" exterior sheathing BASF WallTite Max - 3⁵/₅" max. Use with ¹/₂" exterior sheathing Huntsman HeatLok HFO Pro. Huntsman HEatLok HFP High Lift. 3⁵/₅" max. Use with ⁵/₅" exterior sheathing SWD Urethane Quik-Shield Goblin or Yeti - 1 to 3⁵/₅" thick for use in 3⁵/₅" studs (max.). Use with ⁵/₅" exterior sheathing
Exterior Sheathing Use either 1, 2 or 3	 None (only with Claddings 1 - 6 and Cavity Insulation 1, 3, 4 or 5). Also see note for Cavity Insulation 1/2" or thicker exterior gypsum sheathing 1/2" (min.) FRTW structural panels in Type III construction.
Multi-Function Sheathing and WRB Products Use 1 or 2	USG Securock Exoair 430 System – See note and Table 6 . ⁵ /8" Georgia Pacific DensElement, flashed with Prosoco R-Guard FastFlash on sheathing joints. Note: Item 1 or 2 replaces the exterior sheathings above. When either of these items are used, do not use exterior sheathings or WRBs on base wall surface Table 6 .
WRB Over Base Wall Surface	See Table 6
Exterior Insulation Use either 1 or 2 depending on cladding	 43/4" thick (max.) PAC-Shield CI Ply or PAC-Shield CI Ply (Class A) (4" foam max., 3/4" FRT Plywood max.) may be used with Claddings 1 - 6. 41/4" thick (max.) PAC-Shield CI Ply or PAC-Shield CI Ply (Class A) (31/2" foam max., 3/4" FRT Plywood max.) with Claddings 7 - 17 (with special Opening Perimeter).
WRB Over Exterior Insulation	See Table 6 The exterior insulation may be used with or without CavClear Masonry Mat over the insulation with a maximum 1" air gap between the CavClear and the cladding. When CavClear is used, this may only be used with Cladding 1 - 6 or with thin brick/thin stone adhered to stucco as long as the total thickness is 3 / ₄ " min.









Table 5. NFPA 285 Approved Wall Assemblies with PAC-Shield CI Ply Exterior Insulation^{1,2,3}

Wall Component	Materials
Exterior Cladding Use any Item 1-17 Cladding 1 - 6 for 4³/4" (max.) insulation thickness. Cladding 7 - 16 for 4¹/4" (max.) Xci thickness with special opening perimeter. Max. Air Gap 2" for Claddings 1 - 6. Max. Air Gap 1¹/2" for Claddings 7 - 16. If Claddings 2, 3, 4, 5, 11, 12 or 14 are on stucco base with lath, a secondary WRB (WRB items above allowed over foam) can be installed between the insulation and lath and must not be full coverage asphalt or butyl-based self-adhering membranes, but may be butyl-based slip sheet (stapled) with no adhesive.	 Brick – Nominal 4" thick, clay or concrete brick or veneer with maximum 2" air gap behind the brick. Brick ties/Anchors 24" o.c. (maximum). Stucco – Minimum 3/4" thick, exterior cement plaster and lath Limestone – Minimum 2" thick using any standard non-open joint installation technique such as shiplap. Natural stone veneer – Minimum 2" thick using any standard non-open joint installation technique such as grouted/mortared stone. Cast Artificial Stone – Minimum 11/2" thick complying with ICC-ES AC 51 using any standard non-open joint installation technique such as shiplap. Terra Cotta Cladding – Minimum 11/4" thick (solid or equivalent by weight) using any standard open or non-open joint installation technique such as shiplap. Any ACM or MCM that has passed NFPA 285 with foam of comparable thickness. Uninsulated sheet metal building panels including steel, copper, aluminum. 1/4" (min.) uninsulated fiber-cement siding, or porcelain or ceramic tile mechanically attached. Autoclaved-aerated-concrete (AAC) panels that have successfully passed NFPA 285 criteria. Thin brick/cultured stone set in thin set adhesive and metal lath. Glen Gery Thin Tech Elite Series Masonry Veneer or TABS II Panel System with 1/2" thick bricks using TABS Wall Adhesive. Terra Cotta Cladding – Any Rain-screen Terra Cotta (min. 1/2" thick) with ventilated shiplap. 1/2" Stucco – Any one coat stucco (1/2" min.) that meets AC11 acceptance criteria. Natural Stone Veneer – minimum 11/4" thick using any standard installation technique. AFC Terraslat by Tonality Classic26 or Tonality Classic26 8 mm (min.) or 5/16" (min.) SwissPearl Fiber Cement cladding Note 1. Armatherm Z Girts may be used horizontally in Hunter assemblies. Note 2. Strongirt (Mix U) horizontal fiberglass Z Girt may be used for all claddin
Special Opening Perimeter Use with Claddings 7-16	 Tested Opening – 2 layers ⁵/s" gypsum, with 18-gauge steel flashing at header and 1 layer ⁵/s" and 18-gauge galvanized steel flashing at jambs and sill. 2" mineral wool 4 lb/ft³ density 1¹/₂" thick FRT wood buck Two layers of ³/₄" FRT Plywood

- 1. The assembly combinations created herein and the various substitutions of products are based on testing and professional thermal engineering analysis.
- 2. Acceptance criteria for ASTM E1354 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.
- 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.









Table 6. NFPA 285 Allowable WRB Materials with PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply¹⁻⁸

Wall Component	Materials
WRB Over Base Wall	Hunter Xci VP-SA WRB
Surface	2. Carlisle Fire Resist 705 RS, Fire Resist Barrithane VP, Fire Resist 705 VP, Fire Resist 705 FR-A, Fire
Use any of Items 1-33	Resist Barritech NP (or NP LT), Fire Resist Barritech VP (or VP LT).
or None.	Fire Resist 705 VP may be used with 702 WB, Cav-Grip, or Low VOC Travel-Tack adhesives. Fire Resist 705 FR-A may be used with CCW 702, 702LV, 702 WB, CAV-Grip, and Low VOC Travel-
Note: Some WRBs are	Tack adhesives.
only allowed with	3. CCW-705 (with 702 LV, 702 WB, Cav-Grip, Low VOC Travel-Tack, or 702 adhesives)
specific systems.	4. GE Momentive SEC 2500 SilShield, Elemax 2600
Itam 22 (Caguragic	5. VaproShield Wrapshield SA, RevealShield SA, BlockShield SA, PanelShield SA
Item 22 (Securock	6. WR Grace Perm-A-Barrier® VPS, Perm-A-Barrier® NPL (AKA: PAB NP20), Perm-A-Barrier® VPL,
Exoair 430) or 23 (DensElement with	Perm-A-Barrier Aluminum Wall Membrane (AWM), Perm-A-Barrier VPL LT, Perm-A-Barrier NPL 10, Perm-A-Barrier VPL 50.
FastFlash) replaces the	7. StoGuard Vaporseal
exterior sheathings in	8. 3M 3015 (with Hold Fast 70 adhesive @ 6 mils) or 3M 3015 NP or 3015 VP
Table 3 through Table	9. Henry Air-Bloc® 17MR, Air-Bloc® 21S, All Weather STPE, Blueskin SA, Air-Bloc 16MR, Blueskin VP
5. When either of these	160, Henry Blueskin MetalClad.
items are used, do not	10. Tyvek CommercialWrap or CommercialWrap D, StuccoWrap, Fluid Applied WB [only with PAC-Shield
use exterior sheathings	CI Ply, PAC-Shield CI Ply (Class A), or PAC-Shield CI Foil (Class A)].
listed in Table 3 through	11. PolyGuard Spray-N-Roll (STPE), Air Lok Sheet UV400NP, Air Lok Flex VP, FlexGuard, Stretch Flex
Table 5 or WRBs on	12. Prosoco R-Guard Cat 5, R-Guard Cat 5 Rainscreen, R-Guard VB, or R-Guard Spray Wrap MVP
base wall surface in this	13. Dryvit Backstop NT
table (Table 6).	 WR Meadows Air Shield LMP (Gray), Air Shield LMP (Black), Air Shield TMP, Air Shield LSR or Air- Shield SMP
	15. Dörken Systems, Inc., Delta-Vent SA, Delta-Vent S, Delta-Fassade S, Delta Maxx, Delta Stratus SA
	16. Soprema Sopraseal Stick VP, Soprasolin HD, LM 204 VP, Stick 1100T with Elastacool 600c Primer
	17. Pecora XL Perm Ultra VP, XL-Perm Ultra NP, ProPerm VP
	18. Siga Majvest or Majvest 500 SA
	19. Sto Gold Coat or Emerald Coat
	20. Tremco ExoAir 230 and ExoAir 130
	21. Fortifiber Building Systems Group WeatherSmart Housewrap, WeatherSmart Drainable, WeatherSmart Commercial or Super Jumbo Tex 60
	22. USG Securock Exoair 430 System – see note on left and Air/Vapor System sections in Tables 5-8.
	23. 5/8" Georgia Pacific DensElement, flashed with Prosoco R-Guard FastFlash on sheathing joints.
	24. Dow Chemical DefendAir200 (or LT version) or DefendAir 200C (Charcoal)
	25. Hohmann & Barnard Enviro Barrier and Enviro Barrier VP
	26. STS FW100 or FW100A
	27. Karnak 321 K-NRG
	28. NaturaSeal AirSeal NS-A-250LP, AirSeal NS-A-250HP
	29. Jumpstart HWW-65A, HWW-65B, HWHP-80A, HWMP-90A, HWD2-72A, HWHPT-92A, HWMPC-105A
	30. Master Wall Rollershield
	31. Parex WeatherSeal Spray & Roll-On
	32. Protecto Wrap Protecto Wall VP or Universal Primer Free Membrane
	33. Sika Sikagard 535 or Sikagard AWB 660









Table 6. NFPA 285 Allowable WRB Materials with PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply¹⁻⁸

Wall Component	Materials
WRB Over Exterior Insulation Use any Item 1-29 or None Note: Some WRBs are only allowed with specific systems	 Hunter Xci VP-SA WRB Carlisle Fire Resist 705 RS, Fire Resist Barrithane VP, Fire Resist 705 VP (with 702 WB, Cav-Grip, or Low VOC Travel-Tack adhesives), Fire Resist 705 FR-A (with CCW 702, 702LV, 702 WB, CAV-Grip, and Low VOC Travel Tack Adhesives), Fire Resist Barritech VP (or VP LT), Fire Resist Barritech NP (or Fire Resist Barritech NP LT) GE Momentive SEC 2500 SilShield, Elemax 2600 VaproShield WrapShield SA, RevealShield SA, PanelShield SA Grace Perm-A-Barrier NPL (AKA: PAB NP20), Perm-A-Barrier VPL, Perm-A-Barrier Aluminum Wall Membrane (AWM), Perm-A-Barrier VPL LT, Perm-A-Barrier VPS. Henry Air-Bloc 17MR, Air-Bloc 21S, Blueskin VP160 (only with PAC-Shield CI Ply), All Weather STPE, and Air-Bloc 16MR. Tyvek CommercialWrap, StuccoWrap, or CommericalWrap D Polyguard Air Lok Sheet UV400 NP, Stretch Flex (only with Claddings 1 - 6), Air Lok Flex VP (over PAC-Shield CI Ply with any cladding listed or over the other Xci foams listed with Claddings 1 - 6) Prosoco R-Guard Cat 5, R-Guard Cat 5 Rainscreen, R-Guard VB, or R-Guard Spray Wrap MVP Sto Gold coat or Emerald Coat (only with Xci-Ply) Dryvit Backstop NT Any WRB that has been tested per ASTM E1354 (at a minimum of 50 kW/m² heat flux) and shown by analysis to be less flammable (improved Tign, Pk. HRR) than those listed above 3" Aluma-GRIP 701 or 4" FG-1402 joint tape may be interchanged. (Hardcast AFT is a rebrand of Aluma-GRIP 701). WR Meadows Air Shield LMP (Gray), Air Shield LMP (Black), Air Shield TMP, Air Shield LSR or Air-Shield SMP
	14. WR Meadows Air Shield LMP (Gray), Air Shield LMP (Black), Air Shield TMP, Air Shield LSR or

- 1. The following adhesives may be used for attachment of the polyisocyanurate (polyiso) insulation:
 - a. Adhesive applied discontinuously at a rate of 3/8" x 3" dabs, 16" o.c.: LM 800 XL or BarriBond HP
 - b. Aerosol adhesive at the application rate as per mfg. instructions: CAV-Grip™, Blueskin LVC Spray Primer, or Blueskin Spray Prep
- 2. The following may be used as gap filler between insulation panels: FOMO HandiFoam FireBlock or TVM FireBlock.
- 3. These Henry detailing materials may be used over the base wall assembly. The detailing materials can be used alone or with any approved WRB for the construction.
 - a. Board Joint Treatments:
 - i. 2" x 40 mil ribbon of BarriBond HP, Air-Bloc LF, 925BES, or Moistop Sealant









Table 6. NFPA 285 Allowable WRB Materials with PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply¹⁻⁸

Wall Component Materials

- ii. 4" Blueskin Butyl Flash
- iii. 4" Blueskin Zero Flash
- iv. 4" CCW-705/XLT*
- v. 4" Blueskin SA*
- vi. 4" Metal Clad 705FR*
- Termination Mastic for Flashing/Membrane: 1" x 40 mil ribbon or tooled ³/₆" bead of SURE-SEAL Lap Sealant, CCW-704, LM 800 XL, BarriBond HP, Henry #212, Air-Bloc LF, 925BES, or Moistop Sealant
- c. Detail Flashing, 3" on each side, at Openings, Terminations, Penetrations, Transitions, and Angle Changes:
 - i. CCW-705/XLT*, Blueskin SA/LT, CCW-705 TWF*, Blueskin TWF or Metal Clad 705FR/LT*
 - ii. Blueskin Butyl Flash, Blueskin Zero Flash, or Fortiflash Butyl
 - iii. SURE-SEAL P/S Elastoform* or SURE-SEAL P/S Cover Strip*
 - iv. LiquiFiber embedded in Barritech VP/NP/NP LT or Air-Bloc 16MR/17MR
 - v. Up to 40 mil applications of BarriBond HP, Air-Bloc LF, or Air-Bloc All Weather STPE

*Prepare the surface as Henry recommends using Blueskin Adhesive, CCW-702, Blueskin LVC Adhesive, CCW-702 LV, CCW-702 WB, Aquatac Primer, Blueskin Spray Prep, CAV-GRIP, Blueskin LVC Spray Primer, Low VOC Bonding Adhesive 1168, Low COV EPDM Primer per instructions on the Product Data Sheet.

- 4. These Henry detailing materials may be used over the polyiso insulation and can be use alone or with any approved WRB for the assembly:
 - a. Board Joint Treatments:
 - i. 2" x 40 mil ribbon of BarriBond HP, Air-Bloc LF, 925BES, or Moistop Sealant
 - ii. 4" Blueskin Butyl Flash
 - iii. 4" Blueskin Zero Flash
 - iv. 4" Metal Clad 705FR*
 - b. Termination Mastic for Flashing/Membrane: 1" x 40 mil ribbon or tooled 3/8" bead of SURE-SEAL Lap Sealant, LM 800 XL, BarriBond HP, Air-Bloc LF, 925BES, or Moistop Sealant
 - c. Detail Flashing, 3" on each side at Openings, Terminations, Penetrations, Transitions and Angle Changes.
 - i. Metal Clad 705FR/LT*
 - ii. Blueskin Butyl Flash, Blueskin Zero Flash, or Fortiflash Butyl
 - iii. SURE-SEAL P/S Elastoform* or SURE-SEAL P/S Cover Strip*
 - iv. LiquiFiber embedded in Barritech VP/NP/NP LT or AirBloc 16MR/17MR
 - v. 40 mil application of BarriBond HP, Air-Bloc LF, or Air-Bloc All Weather STPE

*Prepare the surface as CCW recommends using CCW-702, Blueskin Adhesive, CCW-702 LV, Blueskin LVC Adhesive, CCW-702 WB, Aquatac, Blueskin Spray Prep, CAV-GRIP, Blueskin LVC Spray Primer, Low VOC Bonding Adhesive 1168, Low COV EPDM Primer per instructions on the Product Data Sheet.

- 5. In the NFPA 285 test, flashing for fenestration, including Through-Wall Flashing (TWF), are not considered part of the WRB (ref: 2021 IBC Section 1402.5). Therefore, suitable combustible or non-combustible flashings are permitted in wall assemblies as required in the Building Code. TWF is permitted for use in wall assemblies clad with masonry or stone at the base of wall, head of wall, relieving angle, window head, windowsill and at other interruptions in the exterior cavity. TWF shall be applied a maximum of 8" onto the back-up wall and terminate at daylight or onto a drip edge. The following TWF products may be used:
 - a. CCW-705 TWF*
 - b. Blueskin TWF*
 - c. Pre-Kleened EPDM TWF loose-laid or adhered with Low VOC Bonding Adhesive 1168
 - d. Metal TWF by others
- 6. Up to 40 mils of BarriBond HP may be used over CCW-705RS at membrane splices, terminations, and penetrations. Membrane splices and terminations may be adhered with CAV-GRIP, Blueskin LVC Spray Primer, or Blueskin Spray Prep.
- 7. CCW-705 RS may be used with the following applications:
 - a. Over the exterior insulation, while another approved WRB is used over the base wall assembly
 - o. Over a WRB on the base wall assembly while no exterior inulsation is used. Use only the following WRBs: Metal Clad 705FR, or other WRBs that produce no ignition when tested per ASTM E1354 at a heat flux of 50 kW/m².
- 8. Insulating coating applied over noncombustible substrate can be used for mitigating thermal bridging at wall assembly terminations and penetrations. Coating applied in these conditions cover a small percentage of the total wall surface area. The following products are allowed:
 - a. Aerolon 945 tape with primer by Tnemec
 - b. Aerolon 971 coating with primer by Tnemec

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Table 7. Mass Wall Interior Insulation^{1,2}

Wall Component	Materials
Base Wall Use either 1 or 2	Cast concrete walls (min. 2" thick) CMU concrete walls (min. 4" thick)
Exterior Coating Use either 1, 2, 3, or 4	 Portland cement or Lime Stucco Any ASTM E84 Class A Paint or Elastomeric Coating Any ASTM E84 Class A Clear Sealer None
Air/Vapor Barrier Membrane Position 1 over Base Wall Interior	See Table 6 -WRB over Base Wall Surface
Continuous Insulation Use either 1, 2, or 3	 31/2" thick (max.) PAC-Shield CI Foil (Class A) (or Xci-286) 31/2" thick (max.) PAC-Shield CI Coated Glass or PAC-Shield CI Coated Glass (Class A) 31/2" thick (max.) PAC-Shield CI Foil
Air/Vapor Barrier Membrane Position 2 over Insulation	See Table 6 -WRB over Base Wall Surface Insulation joints may be taped with Foil-Grip 1402, 4" width (max.)
Interior Cladding	s/8" type X Interior Gypsum Sheathing installed directly over the insulation or installed to 35/8" (max.) steel studs or Metal Hat or Z Furring directly (no gap between the stud/hat/Z and insulation – see drawing below). If an air gap between the stud/hat/Z and insulation is created, fire blocking with mineral wool per IBC Section 718 shall be installed. See the drawings below. The Air Gap between the stud face and the insulation requires fireblocking per IBC 718. Mass wall designs are assumed to use platform construction (concrete floor line intersects exterior concrete, creating a firestop at floor lines). If the floor line is separated from the exterior concrete, fireblocking with mineral wool must be installed to prevent uncontrolled vertical flame spread. See the drawing below.

- 1. WRBs shall be used in Position 1 or Position 2, not both
- 2. The insulation can be tracked in place with Cav-Grip or Travel-Tack during installation. Follow the instructions on the Product Data Sheet









- 6.3.5 Special Approval 2012 IBC (or Earlier):
 - 6.3.5.1 PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply have been tested in accordance with NFPA 285, which is a full-scale fire test that evaluates the use of foam plastics in exterior wall assemblies using actual end-use configurations. See **Section 6.3.4** and the evaluations listed in **Section 10**.
 - 6.3.5.2 Special approval by large-scale testing is allowed by 2012 IBC Section 2603.10, which states:

2603.10 Special approval. Foam plastic shall not be required to comply with the requirements of Sections 2603.4 through 2603.8 where specifically approved based on large-scale tests such as, but not limited to, NFPA 286 (with the acceptance criteria of Section 803.1.2.1), FM 4880, UL 1040 or UL 1715. Such testing shall be related to the actual end-use configuration and be performed on the finished manufactured foam plastic assembly in the maximum thickness intended for use. Foam plastics that are used as interior finish on the basis of special tests shall also conform to the flame spread and smoke-developed requirements of Chapter 8. Assemblies tested shall include seams, joints and other typical details used in the installation of the assembly and shall be tested in the manner intended for use. The testing listed in this section (NFPA 286, FM 4880, UL 1040 or UL 1715) are all tests that evaluate the potential for fire growth of combustible interior finishes.

- 6.3.5.2.1 PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply are not intended for use as interior finishes, these are not the appropriate end-use tests for these applications.
- 6.3.5.2.2 This section allows the use of other larger-scale tests. NFPA 285 is a large-scale test that evaluates the wall assembly in fire conditions after flashover occurs, and it is indicative of the end use conditions.
- 6.3.5.2.3 This special approval exempts a product from the need to comply with <u>2012 IBC Section 2603.4</u> through <u>2012 IBC Section 2603.8</u>. This includes the exemption from <u>2012 IBC Section 2603.5.4</u>, which requires a flame spread index of 25 or less.
- 6.3.5.2.4 PAC-Shield CI Foil and PAC-Shield CI Coated Glass are not interior finish materials and shall be covered with a minimum ¹/₂" gypsum wallboard, which meets the requirements of <u>2012 IBC Section 2603.5.2</u> for thermal barriers.
- 6.3.5.2.5 There is no flame spread requirement in <u>2012 IBC Chapter 8</u> that applies to foam plastics used as insulation inside exterior non-load bearing wall assemblies in which foam is covered by a thermal barrier.
- 6.3.5.2.6 Based upon the above analysis and interpretation, PAC-Shield CI Foil and PAC-Shield CI Coated Glass meet the requirements of <u>2012 IBC Section 2603.10</u>, which specifically exempts the foam from the requirement of <u>2012 IBC Section 2603.5.4</u> that requires a flame spread index of 25 or less.
- 6.3.5.2.7 Per the above analysis, PAC-Shield CI Ply integrates Fire Retardant Treated (FRT) plywood with a flame spread rating of 25 or less and that has been tested in accordance with NFPA 285, allows it to meet the requirements of 2012 IBC Section 2603.10.









- 6.3.6 Special Approval –2018, 2021 and 2024 IBC:
 - 6.3.6.1 PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply have been tested in accordance with NFPA 285, which is a full-scale fire test that evaluates the use of foam plastics in exterior wall assemblies using actual end-use configurations. See **Section 6.3.4** and the evaluations listed in **Section 10**.
 - 6.3.6.2 Special approval by large-scale testing is allowed by <u>IBC Section 2603.9</u> and <u>IRC Section R303.6</u>, which states:

2603.9 Special Approval. Foam plastic shall not be required to comply with the requirements of Section 2603.6 where specifically approved based on one of the following large-scale tests: NFPA 286 (with the acceptance criteria of Section 803.1.1.1) FM 4880, UL 1040 or UL 1715. Such testing shall be related to the actual end-use configuration and be performed on the finished manufactured foam plastic assembly in the maximum thickness intended for use. Foam plastics that are used as interior finish on the basis of special tests shall conform to the flame spread and smoke-developed requirements of Chapter 8. Assemblies tested shall include seams, joints and other typical details used in the installation of the assembly and shall be tested in the manner intended for use.

- 6.3.6.2.1 Since PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply are not intended for use as interior finishes, these are not the appropriate end-use tests for these applications.
- 6.3.6.2.2 This section allows the use of other larger-scale tests. NFPA 285 is a large-scale test that evaluates the wall assembly in fire conditions after flashover occurs, and it is indicative of the end use conditions.
- 6.3.6.2.3 This special approval exempts a product from the need to comply with <u>IBC Section 2603.4</u> and <u>IBC Section 2603.6</u>. This change in the code language from the 2012 version does not include the exemption from <u>IBC Section 2603.5.4</u>, which requires a flame spread rating of 25 or less.
- 6.3.6.2.4 PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply are not interior finish materials and shall be covered with a minimum ¹/₂" gypsum wallboard, which meets the requirements of IBC Section 2603.5.2 for thermal barriers.
- 6.3.6.2.5 There is no flame spread requirement in <u>IBC Chapter 8</u> that applies to foam plastics used as insulation inside exterior non-load bearing wall assemblies in which foam is covered by a thermal barrier.
- 6.3.6.2.6 The foam plastic materials in PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply do not have a flame spread index of 25 or less as required by IBC Section 2603.5.4. However, they have met the intent of the code by showing that in their end-use configuration, they meet the requirements of the NFPA 285 assembly test and, for the assemblies defined herein, are equivalent to assemblies containing foam plastics with a flame spread index of 25 or less.
- 6.3.6.2.7 Based upon the above analysis and interpretation, PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply meet the requirements of IBC Section 2603.9 when installed in accordance with the provisions of this report.









6.4 Air Barrier

- 6.4.1 PAC-Shield CI Coated Glass may be used as an air barrier material as prescribed in <u>IRC Section</u> N1102.5,³⁰ IECC Section C402.6,³¹ and IECC Section R402.5.³²
- 6.4.2 PAC-Shield CI Coated Glass was evaluated in accordance with ASTM E2178 per IRC Section N1101.10.5, IECC Section R303.1.5, and IECC Section C402.6.2.3.1.33
- 6.4.3 Air permeability test results are recorded in Table 8.

Table 8. Air Permeability¹

Product Name	Air Pressure	Air Permeability
PAC-Shield CI Coated Glass	75 Pa	< 0.02 L/(s·m²)

SI: 1 in = 25.4 mm

- 1. Foam core tested in accordance with ASTM E2178. Air pressure and permeability numbers shown represent PAC-Shield CI Coated Glass compliance and are not intended to represent the performance under actual conditions.
- 6.5 Where the application falls outside of the performance evaluation, conditions of use, and/or installation requirements set forth herein, alternative techniques shall be permitted in accordance with accepted engineering practice and experience. This includes but is not limited to the following areas of engineering: mechanics or materials, structural, building science, and fire science.

7 Certified Performance³⁴

- 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.³⁵
- 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.³⁶

8 Regulatory Evaluation and Accepted Engineering Practice

- 8.1 PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply comply with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:
 - 8.1.1 Performance for use in exterior walls of buildings of any height and of Type I-IV construction in accordance with IBC Section 2603.5.
 - 8.1.2 Performance in accordance with ASTM E84 for flame spread and smoke-developed index ratings in accordance with <u>IBC Section 2603.3</u>, <u>IBC Section 2603.5.4</u>, and <u>IRC Section R303.3</u>.³⁷
 - 8.1.3 Performance for use without a thermal barrier in accordance with <u>IBC Section 2603.9</u> and <u>IRC Section</u> R303.6³⁸ as modified per **Section 6.3.5** and **Section 6.3.6** of this report.
 - 8.1.4 Performance with regard to the potential heat generated by the FPIS in accordance with <u>IBC Section</u> 2603.5.3.
 - 8.1.5 Performance with regard to vertical and lateral fire propagation in accordance with IBC Section 2603.5.5.
 - 8.1.6 Performance with regard to ignition in accordance with IBC Section 2603.5.7.
 - 8.1.7 Performance as an air barrier material in accordance with <u>IECC Section C402.5.1</u> and ASTM E2178 for PAC-Shield CI Coated Glass.









- 8.2 Wind pressure resistance in accordance with <u>IBC Section 2603.10</u> is outside of the scope of this report.
- 8.3 Fire resistance rated wall assemblies in accordance with <u>IBC Section 2603.5.1</u> are outside of the scope of this report.
- 8.4 Any building code, regulation and/or accepted engineering evaluations (i.e., 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 qualified³⁹ to practice product and regulatory compliance services within its scope of accreditation and engineering expertise, 40 respectively.
- 8.5 Engineering evaluations are conducted with DrJ's ANAB <u>accredited ICS code scope</u> of expertise, which is also its areas of professional engineering competence.
- 8.6 Any regulation specific issues not addressed in this section are outside the scope of this report.

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 Installation Procedure
 - 9.3.1 Protect surrounding areas and surfaces from damage.
 - 9.3.2 If wall assembly design calls for WRB installed over the base wall, ensure that the WRB is one of those identified in **Table 6**, and the WRB is installed correctly and in good condition before covering with FPIS.
 - 9.3.3 FPIS shall not be applied over walls while they are vulnerable to water intrusion from above or behind.
 - 9.3.4 Do not block flashing, weeps or other drainage paths with FPIS.
 - 9.3.5 Do not span expansion joints with FPIS.
 - 9.3.6 During installation, take precautions to minimize moisture intrusion behind insulation.
 - 9.3.7 Beginning at the base of the wall, apply FPIS horizontally or vertically using maximum board lengths to minimize the number of joints.
 - 9.3.8 Pre-cut FPIS to fit openings and penetrations.
 - 9.3.9 Offset FPIS board joints a minimum of 6". Do not form four-corner intersections.
 - 9.3.10 Form a "corner lock" pattern by staggering vertical joints at inside and outside corners.
 - 9.3.11 Fill gaps greater than ¹/₈" between FPIS boards with expanding spray foam or approved sealant and strike flush. Expanding spray foam may also be applied onto the FPIS board edges during installation.
 - 9.3.12 Verify all materials are installed in accordance with current Petersen Aluminum Corporation published literature and local code requirements.
 - 9.3.13 Additional information on the installation and detailing of PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply can be found at www.pac-clad.com.









- 9.4 This section provides additional general guidelines for the *installation of PAC-Shield CI Foil and PAC-Shield CI Coated Glass only*. Refer to the manufacturer installation instructions and this report for complete details and requirements.
 - 9.4.1 Cut with a knife using a square to guide the cut or use a table saw.
 - 9.4.2 Abut all joints tightly and ensure an overall flush, level surface.
 - 9.4.3 Mechanically fasten using the fastening pattern as indicated.
 - 9.4.3.1 Space fasteners 12" o.c. at the perimeter and 16" o.c. in the field.
 - 9.4.3.2 Set back perimeter fasteners ³/₈" from board edges.
 - 9.4.3.3 **Note**: Where PAC-Shield CI Foil or PAC-Shield CI Coated Glass are installed by the same trade as the cladding or in close cooperation with that trade, cladding attachment hardware can supplement or replace the insulation fasteners and insulation adhesive. Cladding fasteners fulfilling the PAC-Shield CI Foil or PAC-Shield CI Coated Glass attachment function shall be designed for this function. If the cladding attachment is 16" o.c. or closer and it tightly secures the insulation, no additional fastening or adhesive is required.
 - 9.4.4 When adhesive is used, periodically verify adhesion. Properly installed adhesively applied PAC-Shield CI Foil or PAC-Shield CI Coated Glass will cohesively break the adhesive while still wet and destroy the substrate when dry.
 - 9.4.5 Consult the detailed manufacturer installation instructions for the proper adhesive pattern to maintain the drainage plane.
- 9.5 This section provides additional general guidelines for the *installation of PAC-Shield Cl Ply only*. Refer to the manufacturer installation instructions and this report for complete details and requirements.
 - 9.5.1 Provide separation of the edge of PAC-Shield CI Ply from concrete at grade with pressure-treated lumber sill plate, sill gasket or non-permeable flashing material.
 - 9.5.2 Begin at base of wall from firm, permanent support.
 - 9.5.3 Fasten PAC-Shield CI Ply with proper fasteners and spacing to accommodate design. Fasten PAC-Shield CI Ply to the structure using SIP fasteners or similar hardware driven into steel studs, wood studs, concrete or CMU substrate. Fastening shall be approved by a structural engineer, as the fastening must be sufficient to support both the weight of the PAC-Shield CI Ply and the weight of the cladding for the project conditions.
 - 9.5.4 Allow a minimum ¹/₈" and a maximum ¹/₄" gap between PAC-Shield CI Ply boards to accommodate hydric movement of wood. Fasten boards tightly to provide a flush, level surface.
 - 9.5.5 Apply WRB from the approved list in **Table 12**, over plywood side of PAC-Shield CI Ply according to WRB manufacturer instructions.

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 Flame spread and smoke developed rating testing in accordance with ASTM E84
 - 10.1.2 Fire performance criteria testing in accordance with NFPA 285
 - 10.1.3 Potential heat testing in accordance with NFPA 259
 - 10.1.4 Air barrier material testing in accordance with ASTM E2178









- 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 <u>duly authenticated reports</u> from <u>approved agencies</u> and/or <u>approved sources</u> 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 <u>duly authenticated report</u>, 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.⁴¹
- 10.6 Where additional condition of use and/or regulatory compliance information is required, please search for PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply on the DrJ Certification website.

11 Findings

- 11.1 As outlined in **Section 6**, PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply 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 <u>duly authenticated report</u> and the manufacturer installation instructions, PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply shall be approved for the following applications:
 - 11.2.1 PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply are approved for use in exterior walls of buildings of Type I-IV construction in accordance with IBC Section 2603.5.
 - 11.2.2 PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply are approved for use in wall assemblies meeting the requirements of NFPA 285 testing when constructed in accordance with **Table 3**, **Table 4**, **Table 5**, **Table 6**, and **Table 7**.
 - 11.2.3 PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply comply with, or are a suitable alternative to, the applicable sections of the codes listed in **Section 4**.
- 11.3 Unless exempt by state statute, when PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply 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 <u>RDP</u>. Assistance with engineering is available from Petersen Aluminum Corporation.
- 11.5 IBC Section 104.2.3⁴² (IRC Section R104.2.2⁴³ and IFC Section 104.2.3⁴⁴ 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:⁴⁵ Building regulations require that the <u>building official</u> shall accept <u>duly authenticated reports</u>.⁴⁶
 - 11.6.1 An approved agency is "approved" when it is ANAB ISO/IEC 17065 accredited.
 - 11.6.2 An <u>approved source</u> is "approved" when an <u>RDP</u> is properly licensed to transact engineering commerce.
 - 11.6.3 Federal law, <u>Title 18 US Code Section 242</u>, 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 <u>RDP</u>s and is an <u>ANAB Accredited Product</u> Certification Body Accreditation #1131.
- 11.8 Through the <u>IAF Multilateral Arrangement</u> (MLA), this <u>duly authenticated report</u> can be used to obtain product approval in any <u>jurisdiction</u> or <u>country</u> because all ANAB ISO/IEC 17065 <u>duly authenticated reports</u> are equivalent.⁴⁷

12 Conditions of Use

- 12.1 Material properties shall not fall outside the boundaries defined in **Section 6**.
- 12.2 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.
- 12.3 As listed herein, PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply shall not be used:
 - 12.3.1 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.
- 12.4 PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply are approved for use in exterior walls of buildings of any height and of Type I, II, III or IV construction as described in **Table 3**, **Table 4**, **Table 5**, **Table 6**, and **Table 7**.
- 12.5 PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply shall be separated from the interior of the building with an approved thermal barrier in accordance with <u>IBC Section 2603.4</u> or <u>IRC Section R303.4</u>,⁴⁸ where applicable.
- 12.6 PAC-Shield CI Ply may be used as a structural nailing base for claddings.
 - 12.6.1 PAC-Shield CI Foil and PAC-Shield CI Coated Glass shall not be used as a nailing base for claddings.
- 12.7 In areas where the probably of termite infestation is labeled "*very heavy*" and PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply boards are installed on buildings or structures of wood-framed construction, the installation shall follow the provisions of <u>IBC Section 2603.8</u> and <u>IRC Section R305.4</u>,⁴⁹ where applicable.
- 12.8 When required by adopted legislation and enforced by the <u>building official</u>, also known as the Authority Having Jurisdiction (AHJ) in which the project is to be constructed:
 - 12.8.1 Any calculations incorporated into the construction documents shall conform to accepted engineering practice and, when prepared by an <u>approved source</u>, shall be approved when signed and sealed.
 - 12.8.2 This report and the installation instructions shall be submitted at the time of permit application.
 - 12.8.3 These innovative products have an internal quality control program and a third-party quality assurance program.
 - 12.8.4 At a minimum, these innovative products shall be installed per **Section 9**.
 - 12.8.5 The review of this report by the AHJ shall comply with IBC Section 104.2.3.2 and IBC Section 105.3.1.









- 12.8.6 These innovative products have an internal quality control program and a third party quality assurance program in accordance with <u>IBC Section 104.7.2</u>, <u>IBC Section 110.4</u>, <u>IBC Section 1703</u>, <u>IRC Section R104.7.2</u>, and <u>IRC Section R109.2</u>.
- 12.8.7 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.
- 12.9 The approval of this report by the AHJ shall comply with <u>IBC Section 1707.1</u>, where legislation states in part, "the <u>building official</u> shall make, or cause to be made, the necessary tests and investigations; or the <u>building official</u> shall accept duly authenticated reports from <u>approved agencies</u> in respect to the quality and manner of use of new materials or assemblies as provided for in <u>Section 104.2.3</u>", all of <u>IBC Section 104</u>, and <u>IBC Section 105.3</u>.
- 12.10 <u>Design loads</u> shall be determined in accordance with the regulations adopted by the <u>jurisdiction</u> in which the project is to be constructed and/or by the building designer (i.e., owner or RDP).
- 12.11 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 <u>owner</u>.

13 Identification

- 13.1 The innovative products 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.pac-clad.com.

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.









Appendix A. NFPA 285-12

Table 9. NFPA 285 Approved Wall Assemblies with PAC-Shield CI Coated Glass as Exterior Insulation^{1,2,3}

Wall Component	Materials
Base Wall System Use either 1, 2, 3 or 4	 Cast concrete walls CMU concrete walls 25-gauge min. 3⁵/₈" (min.) steel studs spaced 24" o.c. (max.) a. ⁵/₈" Type X gypsum wallboard interior b. Lateral bracing every 4' FRTW (Fire-Retardant-Treated Wood) studs: min. nominal 2x4 dimension, spaced 24" o.c. (max.) a. ⁵/₈" Type X gypsum wallboard interior b. Bracing as required by building code
Fire-Stopping at Floor Lines	 Any approved mineral-fiber-based safing insulation in each stud cavity at floor line. Safing thickness must match stud cavity depth. Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction.
Cavity Insulation Use either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 or 15. Items 8, 9, 10 and 11 may only be used with exterior sheathing 2.	 None 11/2" min. Carlisle® SPI SealTite PRO (up to full cavity thickness) 11/2" min. BASF Walltite SPF (up to full cavity thickness) Any noncombustible insulation per ASTM E136 Any mineral fiber (Board type Class A ASTM E84 faced or unfaced) Any fiberglass (Batt type Class A ASTM E84 faced or unfaced) Any foam plastic insulation (SPF or board type) that has been tested per ASTM E1354 (at a minimum of 20 kW/m² heat flux) and shown by analysis to be less flammable (improved Tign, Pk. HRR) than Covestro EcoBay CC or BASF Walltite NCFI InsulBloc SPF (up to full cavity thickness) Icynene MD-C-200v3 (Proseal) up to 5¹/2" (only with ¹/2" [min.] exterior gypsum sheathing) SWD Urethane Quik-Shield 112 up to 6 inches in 6" (max.) stud cavities with an air gap not exceeding 2¹/2" 11/2" (min.) ThermoSeal 2000 (up to full cavity thickness) Carlisle SealTite PRO High Yield, SealTite PRO Open Cell, SealTite PRO No Mix, SealTite PRO No Trim 21, or SealTite PRO OCX – up to full cavity thickness with ¹/2" (min.) exterior gypsum sheathing Gaco (Firestone) F6500R, 052N, F4500, 183M, F1850, F1880 – 3¹/2" (max.) for use with ⁵/8" Exterior Gypsum Sheathing JM Corbond III or Corbond IV – Full stud cavity depth or less for use with ⁵/8" exterior gypsum sheathing Huntsman ProSeal HFO (8" max. thickness with no air gap, 6" max. thickness with air gap) for use with ¹/2" or thicker exterior gypsum sheathing
Exterior Sheathing Use either 1, 2 or 3	 None (only with claddings 1-6 and cavity insulation 1, 2, 4, 5, 6, or 11) 1/2" or thicker exterior gypsum sheathing 1/2" (min.) FRTW structural panels in Type III construction
Multi-Function Sheathing & WRB Products Use 1 or 2	1. USG Securock Exoair 430 System – See note and Table 12 2. ⁵ / ₈ " Georgia Pacific DensElement, flashed with Prosoco R-Guard FastFlash on sheathing joints Note: Item 1 or 2 replaces the exterior sheathings above. When either of these items are used, do not use exterior sheathings or WRB's on base wall surface in Table 12
WRB Over Base Wall Surface	See Table 12









Table 9. NFPA 285 Approved Wall Assemblies with PAC-Shield CI Coated Glass as Exterior Insulation^{1,2,3}

Wall Component	Materials	
Exterior Insulation Use 1 or 2 depending on cladding	 3¹/₂" (max.) PAC-Shield CI Coated Glass for all claddings. 4" thick (max.) PAC-Shield CI Coated Glass for Claddings 1-6. 	
WRB Over Exterior Insulation	See Table 12 The exterior insulation may be used with or without CavClear Masonry Mat over the insulation with a maximum 1" air gap between the CavClear and the cladding. When CavClear is used, this may only be used with Cladding 1, 2, 3, 4, 5, or 6 or with thin brick/thin stone adhered to stucco as long as the total thickness is ³ / ₄ " min.	
Exterior Cladding Use 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 or 17 Item 7 may use any tested/approved installation technique. Items 8, 9 or 12 may use any standard installation technique.	 Brick – Nominal 4" thick, clay or concrete brick or veneer with maximum 2" air gap behind the brick. Brick ties/Anchors 24" o.c. (max.). Stucco – Minimum 3/4" thick, exterior cement plaster and lath. For systems that require a more durable WRB system, any building wrap or 15# felt that meets requirement #11 in WRB over Exterior Insulation (Table 12) can be used as a slip-sheet between the WRB/exterior insulation and the lath. Limestone – Minimum 2" thick using any standard non-open joint installation technique such as shiplap. Natural stone veneer – Minimum 2" thick using any standard non-open joint installation technique such as grouted/mortared stone. Cast artificial stone – Minimum 11/2" thick complying with ICC-ES AC 51 using any standard non-open joint installation technique such as shiplap. Terra Cotta Cladding – Minimum 11/4" thick (solid or equivalent by weight) using any standard non-open joint installation technique such as shiplap. Any MCM that has successfully passed NFPA 285. Uninsulated sheet metal building panels including steel, copper, aluminum. 1/4" (min.) uninsulated fiber-cement siding or porcelain or ceramic tile mechanically attached. Stone, porcelain, ceramic/aluminum honeycomb composite building panels that have successfully passed NFPA 285 criteria. Terra Cotta Cladding – Any rain-screen Terra Cotta (min. 1/2" thick) with ventilated shiplap. 1/2" stucco – any one coat stucco (1/2" min.) which meets AC11 acceptance criteria or is approved for use in Type I-IV construction or has been tested per NFPA 285 or stays in place when tested per ASTM E119 (brick exposed to furnace) and remains in place for a minimum of 30 minutes, or has passed an NFPA 285 test. Minimum 3/4". For these systems that require a more durable WRB system, any building wrap or 15# felt that meets requirement #111 in WRB over Exterior Insulation (Table 12) can be used	
	17. FunderMax m.look Grey Core – minimum 1/4" thick using any standard installation technique.	

- 1. The assemblies' combinations created herein and the various substitutions of products are based on testing and professional thermal engineering analysis by Priest and Associates.
- 2. Acceptance criteria for ASTM E1354 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.
- 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.









Table 10. NFPA 285 Approved Wall Assemblies with PAC-Shield CI Foil as Exterior Insulation^{1,2,3}

Wall Component	Materials
Base Wall System Use either 1, 2, 3 or 4	 Cast concrete walls CMU concrete walls 25-gauge min. 35/8" (min.) steel studs spaced 24" o.c. (max.) 5/8" Type X gypsum wallboard interior Lateral bracing every 4' FRTW studs: min. nominal 2x4 dimension, spaced 24" o.c. (max.) 5/8" Type X gypsum wallboard interior Bracing as required by code
Fire-Stopping at Floor Lines	 Any approved mineral-fiber-based safing insulation in each stud cavity at floor line. Safing thickness must match stud cavity depth. Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction.
Cavity Insulation Use either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 or 15. Items 2, 3, 8, 9, 10 and 11 may only be used with exterior sheathing 2.	 None 1½" min. Carlisle SPI SealTite PRO (up to full cavity thickness) 1½" min. BASF Walltite SPF (up to full cavity thickness) Any noncombustible insulation per ASTM E136 Any mineral fiber (Board type Class A ASTM E84 faced or unfaced) Any fiberglass (Batt type Class A ASTM E84 faced or unfaced) Any foam plastic insulation (SPF or board type) that has been tested per ASTM E1354 (at a minimum of 20 kW/m² heat flux) and shown by analysis to be less flammable (improved T_{ign}, Pk. HRR) than Covestro EcoBay CC or BASF Walltite NCFI InsulBloc SPF (up to full cavity thickness) Icynene MD-C-200v3 (Proseal) up to 5½" (only with ½" [min.] exterior gypsum sheathing) SWD Urethane Quik-Shield 112 up to 6 inches in 6" (max.) stud cavities with an air gap not exceeding 2½" 1½" (min.) ThermoSeal 2000 (up to full cavity thickness) Carlisle SealTite PRO High Yield, SealTite PRO Open Cell, SealTite PRO No Mix, SealTite PRO No Trim 21 or SealTite PRO OCX – up to full cavity thickness with ½" (min.) exterior gypsum sheathing Gaco (Firestone) F6500R, 052N, F4500, 183M, F1850 or F1880 – 3½" (max.) for use with ½" exterior gypsum sheathing JM Corbond III or Corbond IV – Full stud cavity depth or less for use with ½" exterior gypsum sheathing Huntsman ProSeal HFO (8" max. thickness with no air gap, 6" max. thickness with air gap) for use with ½" or thicker exterior gypsum sheathing
Exterior Sheathing Use either 1, 2 or 3	 None (only with cavity insulation 1, 4, 5 or 6) 1/2" or thicker exterior gypsum sheathing 1/2" (min.) FRTW structural panels in Type III construction allowed in place of gypsum sheathing when combustible cavity insulation is not used.
Multi-Function Sheathing & WRB Products Use 1 or 2	1. USG Securock Exoair 430 System – See note and Table 12 2. ⁵ / ₈ " Georgia Pacific DensElement, flashed with Prosoco R-Guard FastFlash on sheathing joints <i>Note:</i> Item 1 or 2 replaces the exterior sheathings above. When either of these items are used, do not use exterior sheathings or WRB's on base wall surface in Table 12
WRB Over Base Wall Surface	See Table 12
Exterior Insulation Use option 1	1. 4" (max.) PAC-Shield CI Foil









Table 10. NFPA 285 Approved Wall Assemblies with PAC-Shield CI Foil as Exterior Insulation^{1,2,3}

Wall Component	Materials	
WRB Over Exterior Insulation	See Table 12 The exterior insulation may be used with or without CavClear Masonry Mat over the insulation with a maximum 1" air gap between the CavClear and the cladding. When CavClear is used, this may only be used with Cladding 1, 2, 3, 4, 5 or 6 or with thin brick/thin stone adhered to stucco as long as the total thickness is $\frac{3}{4}$ " min.	
Exterior Cladding Use 1, 2, 3, 4, 5 or 6	 Brick – Nominal 4" thick, clay or concrete brick or veneer with maximum 2" air gap behind the brick. Brick ties/Anchors 24" o.c. (max.). Stucco – Minimum ³/₄" thick, exterior cement plaster and lath. For systems that require a more durable WRB system, any building wrap or 15# felt that meets requirement #11 in WRB over Exterior Insulation (Table 12) can be used as a slip-sheet between the WRB/exterior insulation and the lath. Limestone – Minimum 2" thick using any standard non-open joint installation technique such as grouted/mortared stone. Cast Artificial Stone – Minimum 11/₂" thick complying with ICC-ES AC51 using any standard non-open joint installation technique such as shiplap. Terra Cotta Cladding – Minimum 11/₄" thick (solid or equivalent by weight) using any standard non-open joint installation technique such as shiplap. 	

- The assemblies' combinations created herein and the various substitutions of products are based on testing and professional thermal engineering analysis by Priest and Associates.
- 2. Acceptance criteria for ASTM E1354 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.
- 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.

Table 11. NFPA 285 Approved Wall Assemblies with PAC-Shield CI Ply as Exterior Insulation^{1,2,3}

Wall Component	Materials
Base Wall System Use either 1, 2, 3 or 4	 Cast concrete walls CMU concrete walls 25-gauge min. 3⁵/₈" (min.) steel studs spaced 24" o.c. (max.) a. ⁵/₈" Type X gypsum wallboard interior b. Lateral bracing every 4' FRTW studs: min. nominal 2x4 dimension, spaced 24" o.c. (max.) a. ⁵/₈" Type X gypsum wallboard interior b. Bracing as required by code
Fire-Stopping at Floor Lines	 Any approved mineral-fiber-based safing insulation in each stud cavity at floor line. Safing thickness must match stud cavity depth. Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction.









Table 11. NFPA 285 Approved Wall Assemblies with PAC-Shield CI Ply as Exterior Insulation^{1,2,3}

Wall Component	Materials	
Cavity Insulation Use either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 or 15. Items 3, 8, 9, 10 and 11 may only be used with exterior sheathing 2.	 None 11/2" min. Carlisle SPI SealTite PRO (up to full cavity thickness) 11/2" min. BASF Walltite SPF (up to full cavity thickness) Any noncombustible insulation per ASTM E136 Any mineral fiber (Board type Class A ASTM E84 faced or unfaced) Any fiberglass (Batt type Class A ASTM E84 faced or unfaced) Any foam plastic insulation (SPF or board type) that has been tested per ASTM E1354 (at a minimum of 20 kW/m² heat flux) and shown by analysis to be less flammable (improved T_{ign}, PK. HRR) than Covestro EcoBay CC or BASF Walltite NCFI InsulBloc SPF (up to full cavity thickness) Icynene MD-C-200v3 (Proseal) up to 5¹1/2" (only with ¹1/2" [min.] exterior gypsum sheathing) SWD Urethane Quik-Shield 112 up to 6 inches in 6" (max.) stud cavities with an air gap not exceeding 2¹1/2" 1¹1/2" (min.) Thermoseal 2000 (up to full cavity thickness) Carlisle SealTite PRO High Yield, SealTite PRO Open Cell, SealTite PRO No Mix, SealTite PRO No Trim 21, or SealTite PRO OCX – up to full cavity thickness with ¹1/2" (min.) exterior gypsum sheathing Gaco (Firestone) F6500R, 052N, F4500, 183M, F1850, F1880 – 3¹1/2" (max.) for use with ⁵1/8" Exterior Gypsum Sheathing JM Corbond III or Corbond IV – Full stud cavity depth or less for use with ⁵1/8" exterior gypsum sheathing Huntsman ProSeal HFO (8" max. thickness with no air gap, 6" max. thickness with air gap) for use with ¹1/2" or thicker exterior gypsum sheathing 	
Exterior Sheathing Use either 1, 2 or 3	 None (only with cavity insulation 1, 2, 4, 5 or 6) 1/2" or thicker exterior gypsum sheathing 1/2" (min.) FRTW structural panels in Type III construction 	
Multi-Function Sheathing & WRB Products Use 1 or 2	USG Securock Exoair 430 System – See note and Table 12 *5/8" Georgia Pacific DensElement, flashed with Prosoco R-Guard FastFlash on sheathing joints. Note: Item 1 or 2 replaces the exterior sheathings above. When either of these items are used, do not use exterior sheathings or WRB's on base wall surface in Table 12	
WRB Over Base Wall Surface	See Table 12	
Exterior Insulation Use either 1 or 2 depending on cladding	 4¹/₄" thick (max.) PAC-Shield CI Ply (3¹/₂" foam max., ³/₄" FR Plywood max.) with all claddings. 4³/₄" thick (max.) PAC-Shield CI Ply (4" foam max., ³/₄" FR Plywood max.) may be used with claddings 1-6 	
WRB Over Exterior Insulation	See Table 12 The exterior insulation may be used with or without CavClear Masonry Mat over the insulation with a maximum 1" air gap between the CavClear and the cladding. When CavClear is used, this may only be used with Cladding 1, 2, 3, 4, 5, or 6 or with thin brick/thin stone adhered to stucco as long as the total thickness is ³ / ₄ " min.	









Table 11. NFPA 285 Approved Wall Assemblies with PAC-Shield CI Ply as Exterior Insulation^{1,2,3}

Wall Component	Materials
Exterior Cladding	1. Brick – Nominal 4" thick, clay or concrete brick or veneer with maximum 2" air gap behind the brick.
Use 1, 2, 3, 4, 5, 6, 7, 8, 9,	Brick ties/Anchors 24" o.c. (max.).
, , , , , ,	2. Stucco – Minimum ³ / ₄ " thick, exterior cement plaster and lath. For systems that require a more durable
or 17	WRB system, any building wrap or 15# felt that meets requirement #11 in WRB over Exterior Insulation (Table 12) can be used as a slip-sheet between the WRB/exterior insulation and the lath.
Item 9 may use any	3. Limestone – Minimum 2" thick using any standard non-open joint installation technique such as shiplap.
tested/approved	4. Natural Stone Veneer – Minimum 2" thick using any standard non-open joint installation technique such
installation technique.	as grouted/mortared stone.
Items 10, 11 or 14 may	5. Cast Artificial Stone – Minimum 1 ¹ / ₂ " thick complying with ICC-ES AC51 using any standard non-open joint installation technique such as shiplap.
use any standard	6. Terra Cotta Cladding – Minimum 1 ¹ / ₄ " thick (solid or equivalent by weight) using any standard non-open
installation technique.	joint installation technique such as shiplap.
·	7. Thin brick/cultured stone set in thin set adhesive and metal lath that has been tested to ASTM E119
	(brick exposed to furnace) and remains in place for a minimum of 30 minutes, or has passed an NFPA 285 test. Minimum ³ / ₄ ". For these systems which require a more durable WRB system, any building wrap or 15# felt that meets requirement #11 in WRB over Exterior Insulation (Table 12) can be used as
	a slip-sheet between the WRB/AVP and the lath.
	8. Glen Gery Thin Tech Elite Series Masonry Veneer or TABS II Panel System with 1/2" thick bricks using
	TABS Wall Adhesive. 9. Any MCM that has passed NFPA 285.
	 Any MCM that has passed NFPA 285. Uninsulated sheet metal building panels including steel, copper, aluminum or zinc
	11. 1/4" (min.) uninsulated fiber-cement siding, or porcelain or ceramic tile mechanically attached.
	12. Stone, porcelain, ceramic/aluminum honeycomb composite building panels that have successfully
	passed NFPA 285 criteria.
	13. Autoclaved-aerated-concrete (AAC) panels that have successfully passed NFPA 285 criteria.
	14. Terra Cotta Cladding – Any Rain-screen Terra Cotta (min. 1/2" thick) with ventilated shiplap.
	15. 1/2" Stucco – Any one coat stucco (1/2" min.) that meets AC11 acceptance criteria or is approved for use
	in Type I-IV construction or has been tested per NFPA 285 or stays in place when tested per ASTM
	E119 (stucco exposed to fire) for at least 30 minutes.
	16. Natural Stone Veneer – minimum 11/4" thick using any standard installation technique.
	17. FunderMax m.look Grey Core – minimum 1/4" thick using any standard installation technique

- 1. The assemblies' combinations created herein and the various substitutions of products are based on testing and professional thermal engineering analysis by Priest and Associates
- 2. Acceptance criteria for ASTM E1354 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.
- 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.









Table 12. NFPA 285 Allowable WRB Materials with PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply ¹⁻⁸

Wall Component	Materials	
WRB Over Base Wall	Hunter Xci VP-SA WRB	
Surface	Carlisle Fire Resist 705RS, Fire Resist 705 VP, Fire Resist 705 FR-A, Fire Resist Barri	
Use either 1, 2, 3, 4, 5, 6	Resist Barritech NP, Fire Resist Barritech VP (or VP LT). Fire Resist 705 VP may be us	
7, 8, 9, 10,11, 12 or 13,	WB, Cav-Grip™, or Low VOC Travel-Tack adhesives. Fire Resist 705 FR-A may be us	ed with CCW
14, 15, 16, 17, 18, 19, 20,	702, 702LV, 702 WB, CAV-Grip, and Low VOC Travel-Tack adhesives.	
21, 22, 23, 24, 25, 26, 27,	GE Momentive SEC 2500 SilShield, Elemax 2600	
28, 29, 30, 31, 32 or None.	Vaproshield Wrapshield SA, RevealShield SA	
	WR Grace Perm-A-Barrier VPS, Perm-A-Barrier NPL (aka PAB NP20), Perm-A-Barrier	
Note: Some WRBs are	Barrier® Aluminum Wall Membrane, Perm-A-Barrier® VPL LT. The following may only	be used with
only allowed with specific	claddings 1-6: Perm-A-Barrier® NPL 10, Perm-A-Barrier® VPL 50	
systems.	StoGuard Vaporseal	
	3M 3015 (with Hold Fast 70 adhesive @ 6 mils)	
Item 23 (Securock Exoair	Henry Air-Bloc® 17MR, 21s, 31MR, 32 MR (only with PAC-Shield CI Ply), 33MR, Air-B	loc 16MR,
430) or 24 (DensElement	Blueskin VP 160.	
w/ FastFlash) replaces the	Tyvek CommercialWrap or CommercialWrap D or StuccoWrap	
exterior sheathings in	PolyGuard Spray-N-Roll (STPE), Air Lok Sheet UV400 NP, Air Lok Flex VP, Flex Guar	d, Air Lok Flex,
Tables 5-8. When either of	Air Lok Sheet 400NP (Only with Cladding 1-6)	M/D
these items are used, do	Prosoco R-Guard Cat 5, R-Guard Cat 5 Rainscreen, R-Guard VB or R-Guard Spray W	rap MVP
not use exterior	Dryvit Backstop NT	41 CD
sheathings listed in Tables 5-8 or WRBs on base wall	WR Meadows Air Shield LMP (Gray), Air Shield LMP (Black), Air Shield TMP, Air Shield LMP (Black), Air Shield TMP, Air Shield LMP (Black), Air Shield TMP, Air Shield LMP (Black), Air Shield LMP (Black), Air Shield LMP (Brack), Air Shield LMP, Air Shield LMP (Black), Air Shield LMP, Air Shield LMP (Black), Air Shield LMP, Air Shield L	
surface in this table.	Dörken Systems, Inc., Delta-Vent SA, Delta-Vent S, Delta-Fassade S, Delta Maxx, Del Any WRB that has been tested per ASTM E1354 (at a minimum of 20 kW/m² heat flux)	
Surface III triis table.	analysis to be less flammable (improved T _{ign} , Pk. HRR) than those listed above.	and Shown by
	BASF Enershield HP or Enershield I	
	Soprema Sopraseal Stick VP, Soprasolin HD, LM 204 VP, Stick 1100T with Elastacool	600c Primer (for
	use with PAC-Shield CI Coated Glass, or PAC-Shield CI Ply)	oooci iiiiici (ioi
	Pecora XL Perm Ultra VP	
	Siga Majvest or Majvest 500 SA	
	Sto Gold Coat or Emerald Coat	
	Tremco ExoAir 230 and ExoAir 130	
	Fortifiber Building Systems Group WeatherSmart Housewrap, WeatherSmart Drainable	e. WeatherSmart
	Commercial or Super Jumbo Tex 60	,
	USG Securock Exoair 430 System – see note on left and Air/Vapor System sections in	Tables 5-8.
	5/8" Georgia Pacific DensElement, flashed with Prosoco R-Guard FastFlash on sheathing	
	Dow Chemical Dowsil DefendAir 200 (or LT version) or DefendAir 200C (Charcoal)	0,
	Hohmann & Barnard Enviro Barrier and Enviro Barrier VP	
	STS FW100 or FW100A	
	Karnak 321 K-NRG	
	NaturaSeal AirSeal NS-A-250LP, AirSeal NS-A-250HP	
	Jumpstart HWW-65A, HWW-65B, HWHP-80A, HWMP-90A, HWD2-72A, HWHPT-92A	, HWMPC-105A
	Master Wall Rollershield	
	Parex WeatherSeal Spray & Roll-On	









Table 12. NFPA 285 Allowable WRB Materials with PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply ¹⁻⁸

Wall Component	Materials
WRB Over Exterior Insulation Use 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26 or None. Note: Some WRBs are only allowed with specific systems Insulation Joints may be taped with Foil-Grip 1402, 4" width (max.)	 Hunter Xci VP-SA WRB Carlisle Fire Resist 705 RS, Fire Resist Barrithane VP, Fire Resist 705 VP (with 702 WB, Cav-Grip, or Low VOC Travel-Tack adhesives), Fire Resist 705 FR-A (with CCW 702, 702LV, 702 WB, CAV-Grip, and Low VOC Travel Adhesives), Fire Resist Barritech VP (or VP LT), Fire Resist Barritech NP GE Momentive SEC 2500 SilShield, Elemax 2600 Vaproshield Wrapshield SA, RevealShield SA WR Grace Perm-A-Barrier NPL (aka PAB NP20), Perm-A-Barrier VPL, Perm-A-Barrier Aluminum Wall Membrane, Perm-A-Barrier VPL LT, Perm-A-Barrier VPS Henry Air-Bloc 17MR, 21S, 31MR, 33MR, 16MP, and Blueskin VP160 (only with PAC-Shield Cl Ply) Tyvek CommercialWrap or StuccoWrap PolyGuard Air Lok Sheet UV400 NP, Air Lok Flex (only with claddings 1-6), Air Lok Flex VP (over PAC-Shield Cl Ply with any claddings 1-6), FlexGuard (over PAC-Shield Cl Ply with any cladding listed or over the other PAC-Shield Cl products listed with claddings 1-6) Prosoco R-Guard Cat 5, R-Guard Cat 5 Rainscreen, R-Guard VB or R-Guard Spray Wrap MVP Sto Gold coat or Emerald Coat (only with PAC-Shield Cl Ply) Dryvit Backstop NT Any WRB that has been tested per ASTM E1354 (at a minimum of 20 kW/m² heat flux) and shown by analysis to be less flammable (improved Tign, Pk. HRR) than those listed above 3" Aluma-GRIP 701 or 4" FG-1402 joint tape may be interchanged (Hardcast AFT is a rebrand of Aluma-GRIP 701) WR Meadows Air Shield LMP (Gray), Air Shield LMP (Black), Air Shield TMP, Air Shield LSR Dörken Systems, Inc., Delta-Vent SA, Delta-Vent S, Delta-Fassade S, Delta Maxx Soprema Sopraseal Stick VP (with claddings 1-6, not with PAC-Shield Cl Foil), Soprasolin HD Pecora XL Perm Ultra VP Siga Majvest (for all claddings) or Majvest 500 SA (only with Claddings 1-6) Fortifiber Building Systems Group WeatherSmart Housewra
	 Jumpstart HWW-65A, HWW-65B, HWHP-80A, HWMP-90A, HWD2-72A, HWHPT-92A, HWMPC-105A Master Wall Rollershield Parex WeatherSeal Spray & Roll-On

- 1. The following adhesives may be used for attachment of the polyisocyanurate (polyiso) insulation:
 - a. Adhesive applied discontinuously at a rate of 3/8" x 3" dabs, 16" o.c.: LM 800 XL or BarriBond or BarriBond XL
 - b. Aerosol adhesive at the application rate as per mfg. instructions: CAV-Grip or Low VOC Travel-Tack
 - c. The following may be used as gap filler between insulation panels: FOMO HandiFoam FireBlock and TVM FireBlock.
- 2. These CCW detailing materials may be used over the base wall assembly. The detailing materials can be used alone or with any approved WRB for the construction.
 - a. Board Joint Treatments:
 - i. 2" x 40 mil ribbon of BarriBond or BarriBond XL
 - ii. 4" DCH Reinforcing Rabric embedded in Fire-Resist Barritech VP/NP/NP LT or embedded in Fire Resist Barrithane VP
 - iii. 4" Foil-GRIP 1402 (with surface preparation as recommended by CCW using CCW-702, CCW-702 LV, CCW-702 WB, CCW-715, Low VOC Travel-Tack, CAV-Grip, HP 250 Primer or Low VOC EPDM Primer per instructions on Product Data Sheet)
 - iv. 4" AlumaGRIP 701 (with surface preparation as recommended by CCW using CCW-702, CCW-702 LV, CCW-702 WB, CCW-715, Low VOC Travel-Tack, CAV-Grip, HP 250 Primer or Low VOC EPDM Primer per instructions on Product Data Sheet)









Table 12. NFPA 285 Allowable WRB Materials with PAC-Shield CI Foil, PAC-Shield CI Coated Glass, and PAC-Shield CI Ply ¹⁻⁸

Wall Component Materials

- b. Termination Mastic for Flashing/Membrane: 1" x 40 mil ribbon or tooled 3/8" bead of SURE-SEAL Lap Sealant, CCW-704, LM 800 XL, BarriBond, or BarriBond XL
- c. Detail Flashing, 3" on each side, at Openings, Terminations, Penetrations, Transitions and Angle Changes.
 - i. CCW-705/XLT, CCW-705 TWF/XLT, or Fire Resist 705 FR-A/XLT (all with surface preparation as recommended by CCW using CCW-702 LV, CCW-702 WB, CCW-715, Low VOC Travel-Tack, CAV-Grip, HP 250 Primer or Low VOC EPDM Primer per instructions on Product Data Sheet)
 - ii. SURE-SEAL P/S Elastoform or SURE-SEAL P/S Cover Strip (both with surface preparation as recommended by CCW using CCW-702, CCW-702 LV, CCW-702 WB, CCW-715, Low VOC Travel-Tack, CAV-Grip, HP 250 Primer or Low VOC EPDM Primer per instructions on Product Data Sheet)
 - iii. LiquiFiber or DCH Reinforcing Fabric embedded in Barritech VP/NP/NP LT
 - iv. 40 mil application of BarriBond, BarriBond XL or Barrithane VP
- 3. These CCW detailing materials may be used over the polyiso insulation and can be use alone or with any approved WRB for the assembly.
 - a. Board Joint Treatments:
 - i. 2" x 40 mil ribbon of BarriBond or BarriBond XL
 - ii. 4" DCH Reinforcing Rabric embedded in Fire-Resist Barritech VP/NP/NP LT or embedded in Fire Resist Barrithane VP
 - iii. 4" Foil-GRIP 1402 (with surface preparation as recommended by CCW using CCW-702, CCW-702 LV, CCW-702 WB, CCW-715, Low VOC Travel-Tack, CAV-Grip, HP 250 Primer or Low VOC EPDM Primer per instructions on Product Data Sheet)
 - iv. 4" AlumaGRIP 701 (with surface preparation as recommended by CCW using CCW-702, CCW-702 LV, CCW-702 WB, CCW-715, Low VOC Travel-Tack, CAV-Grip, HP 250 Primer or Low VOC EPDM Primer per instructions on Product Data Sheet)
 - b. Termination Mastic for Flashing/Membrane: 1" x 40 mil ribbon or tooled 3/8" bead of SURE-SEAL Lap Sealant, LM 800 XL, BarriBond or BarriBond XL
 - c. Detail Flashing, 3" on each side, at Openings, Terminations, Penetrations, Transitions and Angle Changes.
 - i. Fire Resist 705 FR-A/XLT (with surface preparation as recommended by CCW using CCW-702, CCW-702 LV, CCW-702 WB, CCW-715, Low VOC Travel-Tack, CAV-Grip, HP 250 Primer or Low VOC EPDM Primer per instructions on Product Data Sheet)
 - ii. SURE-SEAL P/S Elastoform or SURE-SEAL P/S Cover Strip (both with surface preparation as recommended by CCW using CCW-702, CCW-702 LV, CCW-702 WB, CCW-715, Low VOC Travel-Tack, CAV-Grip, HP 250 Primer or Low VOC EPDM Primer per instructions on Product Data Sheet)
 - iii. LiquiFiber or DCH Reinforcing Fabric embedded in Barritech VP/NP/NP LT
 - iv. 40 mil application of BarriBond, BarriBond XL or Barrithane VP
- 4. In the NFPA 285 test, flashing for fenestration, including Through-Wall Flashing (TWF), are not considered part of the WRB (ref: 2015 IBC Section 1405.4). TWF is permitted for use in wall assemblies clad with masonry or stone at the base of wall, head of wall, relieving angle, window head, windowsill and at other interruptions in the exterior cavity. TWF shall be applied a maximum of 8" onto the back-up wall and terminate at daylight or onto a drip edge. The following TWF products may be used:
 - a. CCW TWF/XLT (with surface preparation as recommended by CCW using CCW-702, CCW-702 LV, CCW-702 WB, CCW-715, Low VOC Travel-Tack, CAV-Grip, HP 250 Primer or Low VOC EPDM Primer per instructions on Product Data Sheet)
 - b. Pre-Kleened EPDM TWF loose-laid or adhered with SURE-SEAL 90-8-30A bonding Adhesive, or SURE-SEAL Low VOC Bonding Adhesive
 - c. Metal TWF by others
 - d. BRT-801 tape may be used over Fire-Resist 705 RS at membrane splices, terminations, and penetrations. Fire-Resist 705 RS and the substrate may be treated with CCW-702, CCW-702 LV, CCW-702 WB or Low VOC Travel-Tack to promote adhesion of BRT-801.
- 5. Fire-Resist 705 RS may be used in the following applications:
 - a. Over the exterior insulation, while another approved WRB is used over the base wall assembly.
 - b. Over a WRB on the base wall assembly while no exterior insulation is used. Use only WRBs listed below:
 - i. CC Fire Resist 705 FR-A
 - ii. Other WRBs that produce no ignition when tested per ASTM E1354 at a heat flux of 50 kW/m².
- 6. Insulating coating applied over noncombustible substrate can be used for mitigating thermal bridging at wall assembly terminations and penetrations. Coating applied in these conditions cover a small percentage of the total wall surface area. The following products are allowed:
 - a. Aerolon 945 tape with primer by Tnemec
 - b. Aerolon 971 coating with primer by Tnemec









Notes

- For more information, visit <u>dricertification.org</u> 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 TPL1, 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.
- https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1702
- 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 http
- 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
- 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
- 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%2 0and%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
- https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#approved_agency
- https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#approved_source
- https://www.law.comell.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.
- 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/
- https://up.codes/viewer/mississippi/libc-2024/chapter/1/scope-and-administration#104.1:~:text=directed%20to%20enforce%20the%20provisions%20of%20this%20code
- 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
- https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1
- 17 <u>https://iaf.nu/en/about-iaf-</u>
 - mla/#:~:text=Once%20an%20accreditation%20body%20is%20a%20signatory%20of%20the%20IAF%20MLA%2C%20it%20is%20required%20to%20recognise%20certificates%20 and%20validation%20and%20verification%20statements%20issued%20by%20conformity%20assessment%20bodies%20accredited%20by%20all%20other%20signatories%20of%20the%20IAF%20MLA%2C%20with%20the%20appropriate%20scope
- True for all ANAB accredited product evaluation agencies and all International Trade Agreements.
- https://www.justice.gov/crt/deprivation-rights-under-color-law AND https://www.justice.gov/atr/mission
- 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
- https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3282/subpart-A/section-3282.14
- https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280
- https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280.2(Listed%20or%20certified); https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#listedAND https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#labeled
- 26 2021 IRC Section R316
- 27 2021 IRC Section R316.5.12
- 28 2021 IRC Section R316.3
- 29 2021 IRC Section R316.4
- 30 2021 IRC Section N1102.4
- 31 2021 IECC Section C402.5
- 32 <u>2021 IECC Section R402.4</u>
- 33 <u>2021 IECC Section C402.5.1.3 and 2018 IECC Section C402.5.1.2.1</u>









- 34 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1703.4
- 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%20liv able%2C%20and%20safe%20housing%20and%20shall%20demonstrate%20acceptable%20workmanship%20reflecting%20journeyman%20quality%20of%20work%20of%20the%20various%20trades
- 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
- 37 2021 IRC Section R316.3
- 38 2021 IRC Section R316.6
- 39 Qualification is performed by a legislatively defined <u>Accreditation Body</u>. <u>ANSI National Accreditation Board (ANAB)</u> is the largest independent accreditation body in North America and provides services in more than 75 countries. <u>Dr.J.</u> is an ANAB accredited <u>product certification body</u>.
- 40 https://anabpd.ansi.org/Accreditation/product-certification/AllDirectoryDetails?prgID=1&orgID=2125&statusID=4#:~:text=Bill%20Payment%20Date-,Accredited%20Scopes,-13%20ENVIRONMENT.%20HEALTH
- 41 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
- 42 <u>2021 IBC Section 104.11</u>
- 43 2021 IRC Section R104.11
- 44 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
- 45 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.
- https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1
- Multilateral approval is true for all ANAB accredited product evaluation agencies and all International Trade Agreements.
- 48 <u>2021 IRC Section R316.4</u>
- 49 IRC Section R318.4