Listing and Technical Evaluation Report™

A Duly Authenticated Report from an Approved Agency

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Xci Foil, Xci CG and Xci Ply Fire Performance in Exterior Walls of Building of Type I–IV Construction

Trade Secret Report Holder:

Hunter Panels, LLC

Phone: 888-746-1114 Website: www.hunterpanels.com

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 Evaluated[1]

1.1 Xci Foil, Xci CG, and Xci Ply

2 Product Description and Materials

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

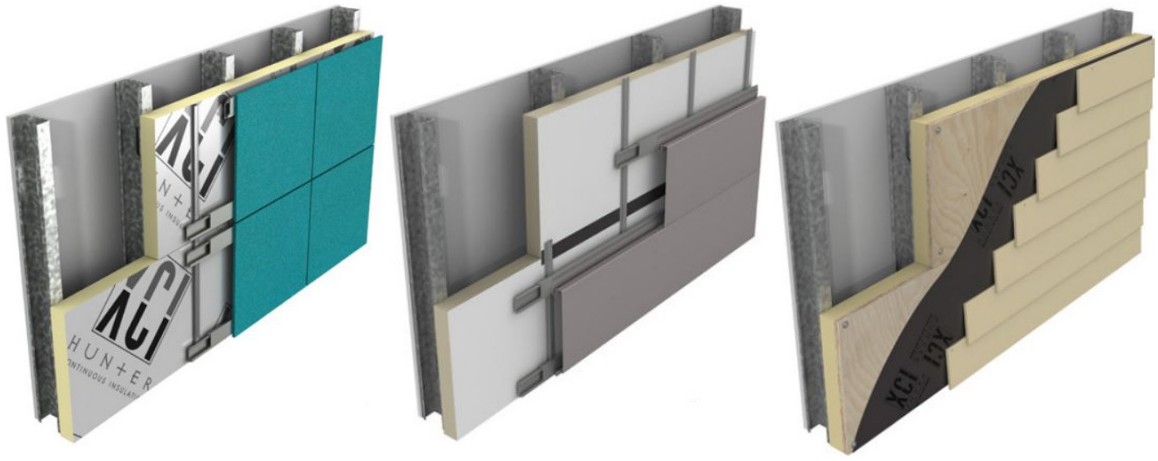


Figure 1. Xci Foil, Xci CG, and Xci Ply

2.2 Xci Foil, Xci CG, and Xci Ply are Foam Plastic Insulation Sheathing (FPIS) products.

2.2.1 Xci Foil is a polyisocyanurate insulation board core adhered to foil facers.

2.2.2 Xci CG is a polyisocyanurate insulation board adhered to coated glass facers.

2.2.3 Xci Ply is a polyisocyanurate insulation board bonded to APA-TECO rated exposure fire treated plywood on one side and a coated glass facer on the other.

2.3 The foam core of Xci Foil, Xci CG, and Xci Ply is manufactured in accordance with ASTM C1289.

2.3.1 Xci Foil is ASTM C1289 Type I, Class 1 and Class 2, Grade 2 or Grade 3 compliant.

2.3.2 Xci CG is ASTM C1289 Type II, Class 2, Grade 2 or Grade 3 compliant.

2.3.3 Xci 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 *Xci Foil and Xci CG:*

2.4.1.1.1 1" (25 mm) through 4" (102 mm)

2.4.1.2 *Xci 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 $^{5}/_{8}$" substrate: nominal $1^{5}/_{8}$" (41 mm) through $4^{5}/_{8}$" (117 mm)

2.4.1.2.1.2 Total thickness with $^{3}/_{4}$" substrate: nominal $1^{3}/_{4}$" (43 mm) through $4^{3}/_{4}$" (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 *Xci Foil and Xci CG:*

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 *Xci Ply:*

2.4.3.2.1 96" (2,438 mm)

2.4.4 Custom widths, lengths and thicknesses for Xci Foil and Xci CG are available upon request.

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

3 Definitions[2]

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

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

3.2.1 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 Defend Trade Secrets Act of 2016 (DTSA).[11]

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

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

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

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

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

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

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

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

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

4.1 *Local, State, and Federal*

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

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

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

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

4.2 *Regulations*

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

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

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

4.3 *Standards*

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

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

4.3.3 *ASTM E119: Standard Test Methods for Fire Tests of Building Construction and Materials*

4.3.4 *ASTM E136: Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C*

4.3.5 *ASTM E1354: Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter*

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

4.3.7 *FM 4880: Approval Standard for Class 1 Fire Rating of Building Panels or Interior Finish Materials*

4.3.8 *NFPA 259: Standard Test Method for Potential Heat of Building Materials*

4.3.9 *NFPA 268: Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source*

4.3.10 *NFPA 285-19 & 23: Standard Fire Test Method for the Evaluation of Fire Propagation Characteristics of Exterior Nonload-bearing Wall Assemblies Containing Combustible Components*

4.3.11 *NFPA 286: Standard Methods of Fire Test for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*

4.3.12 *UL 1040: Fire Test of Insulated Wall Construction*

4.3.13 *UL 1715: Fire Test of Interior Finish Material*

5 Listed[25]

5.1 Equipment, materials, products, or services included in a List published by a nationally recognized testing laboratory (i.e., CBI), an approved agency (e.g., CBI and DrJ), and/or and approved source (i.e., DrJ), or other organization(s) concerned with product evaluation (e.g., 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 Xci Foil, Xci CG, and Xci Ply are FPIS products complying with IBC Section 2603 and IRC Section R303.[26]

6.1.2 Xci Foil, Xci CG, and Xci Ply may be 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 Xci Foil, Xci CG, and Xci Ply are available at www.polyiso.org/page/EPDs and www.hunterpanels.com/technical-sustainability.

6.2 *Structural Applications*

6.2.1 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 Xci Foil, Xci CG, and Xci 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**.

Table 1. Surface Burning Characteristics[1] of Xci Foil, Xci CG, and Xci Ply

Product Name	Flame Spread Index	Smoke Developed Index	Classification
Xci Foil	≤ 75	≤ 450	Class B
Xci CG			
Xci Ply			

1. Foam core tested in accordance with ASTM E84. Flame spread and smoke-developed indexes 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 Xci Foil, Xci CG, and Xci Ply were evaluated to assess performance with regard to ignition (NFPA 268) in accordance with IBC Section 2603.5.7.

6.3.2.2 Xci Foil, Xci CG, and Xci 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 IBC Section 2603.4, IBC Section 2603.5.2, and IRC Section R303.4.[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 $^{1}/_{4}$" (0.4 mm) thickness of fiber cement siding complying with IBC Section 1404.17[30] and IBC Section 1404.17.1[31] or IBC Section 1404.17.2.[32]

6.3.3 *Potential Heat:*

6.3.3.1 Xci Foil, Xci CG, and Xci 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 and IRC Section R303.5.7.[33]

6.3.3.2 Results are provided in **Table 2**.

Table 2. Potential Heat

Product Name	Potential Heat (Btu/lb)[1]
Xci Foil	11,503
Xci CG	
Xci 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 Xci Foil, Xci CG, and Xci 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**, and **Table 6** are approved for use in buildings of Type I-IV construction by demonstrating equivalency to similar assemblies tested in accordance with NFPA 285 and 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 or earlier, the tables in **Appendix A** may be used instead of **Table 3**, **Table 4**, **Table 5**, and **Table 6** throughout the rest of this report.

Table 3. NFPA 285 Approved Wall Assemblies with Xci CG Exterior Insulation[1]

Wall Component	Materials
Base Wall System Use either 1, 2, 3, or 4	1. Cast concrete walls 2. CMU concrete walls 3. 25-gauge minimum 3 5/8" (minimum) steel studs spaced 24" o.c. (maximum) a. 5/8" Type X gypsum wallboard interior b. Lateral bracing every 4' optional or as required by code 4. FRTW studs: minimum nominal 2" x 4" dimension, spaced 24" o.c. (maximum) 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	1. Any approved mineral-fiber-based safing insulation in each stud cavity at floor line. Safing thickness must match stud cavity depth. 2. Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction.
Cavity Insulation Use any Item 1 - 11	1. None 2. 1 1/2" (maximum) of Carlisle SPI SealTite PRO, SealTite PRO Closed Cell, or SealTite PRO One Zero 3. Any noncombustible insulation per ASTM E136 4. Any mineral fiber (Board type faced or unfaced) 5. Any fiberglass (Batt type faced or unfaced) 6. 3 1/4" (maximum) of Carlisle SPI SealTite PRO, SealTite PRO Closed Cell, or SealTite PRO One Zero – only with Sheathing 2 7. Carlisle SealTite PRO HFO, SealTite PRO Open Cell, SealTite PRO High Yield, SealTite PRO No Mix, SealTite PRO No Trim 21, SealTite PRO OCX. 3 5/8" maximum. Use with 1/2" exterior sheathing 8. JM Corbond III or IV - 3 5/8" maximum. Use with 5/8" exterior sheathing 9. BASF WallTite Max - 3 5/8" maximum. Use with 1/2" exterior sheathing 10. Huntsman HeatLok HFO Pro. Huntsman HeatLok HFO High Lift. 3 5/8" maximum. Use with 5/8" exterior sheathing 11. SWD Urethane Quik-Shield Goblin or Yeti - 1 to 3 5/8" thick for use in 3 5/8" studs (maximum). Use with 5/8" exterior sheathing
Exterior Sheathing Use either 1, 2 or 3	1. None (only with Claddings 1 – 6 and Cavity Insulations 1, 3, 4, or 5). 2. 1/2" or thicker exterior gypsum sheathing 3. 1/2" (minimum) FRTW structural panels in Type III construction

Table 3. NFPA 285 Approved Wall Assemblies with Xci CG Exterior Insulation[1]

Wall Component	Materials
Multi-Function Sheathing and 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 WRB on base wall surface in **Table 6**.
WRB Over Base Wall Surface	1. See **Table 6**
Exterior Insulation Use any Item 1 or 2	1. 4" thick (maximum) Xci CG for Claddings 1 - 6 2. 3 1/2" thick (maximum) Xci CG for Claddings 7 - 17 (with special Opening Perimeter)
WRB Over Exterior Insulation	1. See **Table 6** ***Note:*** 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" (maximum) insulation thickness Cladding 7- 17 for 3 1/2" (maximum) insulation thickness with unique opening perimeter. Maximum Air Gap 2" for Claddings 1 - 6. Maximum Air Gap 1 1/2" 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. 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) 2. Stucco – Minimum 3/4" thick, exterior cement plaster and lath 3. Limestone – Minimum 2" thick using any standard non-open joint installation technique such as shiplap 4. Natural stone veneer – Minimum 2" thick using any standard non-open joint installation technique such as grouted/mortared stone 5. Cast Artificial Stone – Minimum 1 1/2" thick complying with ICC-ES AC 51 using any standard non-open joint installation technique such as shiplap 6. Terra Cotta Cladding – Minimum 1 1/4" thick (solid or equivalent by weight) using any standard open or non-open joint installation technique such as shiplap 7. Any ACM or MCM that has passed NFPA 285 with foam of comparable thickness 8. Uninsulated sheet metal building panels including steel, copper, aluminum 9. 1/4" (minimum) uninsulated fiber-cement siding, or porcelain or ceramic tile mechanically attached 10. Autoclaved-Aerated-Concrete (AAC) panels that have successfully passed NFPA 285 criteria 11. Thin brick/cultured stone set in thin set adhesive and metal lath 12. Glen Gery Thin Tech® Elite Series Masonry Veneer or TABS II Panel System with 1/2" thick bricks using TABS Wall Adhesive 13. Terra Cotta Cladding – Any Rain-screen Terra Cotta (minimum 1/2" thick) using any installation technique with ventilated shiplap 14. 3/8" or 1/2" Stucco – Any one-coat stucco (1/2" minimum) that meets AC11 acceptance criteria 15. Natural Stone Veneer – minimum 1 1/4" thick using any standard installation technique 16. AFC Terraslat by Tonality – Tonality Classic26 or Tonality Classic22 17. 8mm (minimum) or 5/16" (minimum) 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.

Table 3. NFPA 285 Approved Wall Assemblies with Xci CG Exterior Insulation[1]

Wall Component	Materials
Special Opening Perimeter Use with Claddings 7 - 17	1. Tested Opening – 2 layers 5/8" gypsum with 18-gauge steel flashing at header and 1 layer 5/8" gypsum and 18-gauge galvanized steel flashing at jambs and sill 2. 2" mineral wool 4 lb/ft3 density 3. 1 1/2" thick FRT wood buck 4. Two layers of 3/4" FRT Plywood

SI: 1 in = 25.4 mm

1. The assemblies' combinations created herein and the various substitutions of products are based on testing and professional thermal engineering analysis.

Table 4. NFPA 285 Approved Wall Assemblies with Xci Foil Exterior Insulation[1]

Wall Component	Materials
Base Wall System Use either 1, 2, 3, or 4	1. Cast concrete walls 2. CMU concrete walls 3. 25-gauge minimum 3 5/8" (minimum) steel studs spaced 24" o.c. (maximum) a. 5/8" Type X gypsum wallboard interior b. Lateral bracing every 4' optional or as required by code 4. FRTW studs: minimum nominal 2" x 4" dimension, spaced 24" o.c. (maximum) 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	1. Any approved mineral fiber-based safing insulation in each stud cavity at floor line. Safing thickness must match stud cavity depth. 2. Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction.
Cavity Insulation Use any Item 1 - 11	1. None 2. 1 1/2" (maximum) of Carlisle SPI SealTite PRO, SealTite PRO Closed Cell, or SealTite PRO One Zero 3. Any noncombustible insulation per ASTM E136 4. Any mineral fiber (Board type faced or unfaced) 5. Any fiberglass (Batt type faced or unfaced) 6. 3 1/4" (maximum) of Carlisle SPI SealTite PRO, SealTite PRO Closed Cell, or SealTite PRO One Zero – only with Sheathing 2 7. Carlisle SealTite PRO HFO, SealTite PRO Open Cell, SealTite PRO High Yield, SealTite PRO No Mix, SealTite PRO No Trim 21, SealTite PRO OCX. 3 5/8" maximum. Use with 1/2" exterior sheathing 8. JM Corbond III or IV - 3 5/8" maximum. Use with 5/8" exterior sheathing 9. BASF WallTite Max - 3 5/8" maximum. Use with 1/2" exterior sheathing 10. Huntsman HeatLok HFO Pro. Huntsman HeatLok HFO High Lift. 3 5/8" maximum. Use with 5/8" exterior sheathing 11. SWD Urethane Quik-Shield Goblin or Yeti - 1 to 3 5/8" thick for use in 3 5/8" studs (maximum). Use with 5/8" exterior sheathing

Table 4. NFPA 285 Approved Wall Assemblies with Xci Foil Exterior Insulation[1]

Wall Component	Materials
Exterior Sheathing Use either 1, 2, or 3	1. None (only with Claddings 1 – 6 and Cavity Insulations 1, 3, 4, or 5). 2. 1/2" or thicker exterior gypsum sheathing 3. 1/2" (minimum) FRTW structural panels in Type III construction
Multi-Function Sheathing and 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 WRB on base wall surface in **Table 6**.
WRB Over Base Wall Surface	1. See **Table 6**
Exterior Insulation Use any Item 1 or 2, depending on cladding	1. 4" thick (maximum) Xci Foil for Claddings 1 - 6. 2. 3 1/2" thick (maximum) Xci Foil for Claddings 7 - 16 (with special Opening Perimeter).
WRB Over Exterior Insulation	1. See **Table 6** ***Note:*** 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" (maximum) insulation thickness Cladding 7- 17 for 3 1/2" (maximum) insulation thickness with unique opening perimeter. Maximum Air Gap 2" for Claddings 1 - 6. Maximum Air Gap 1 1/2" 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. 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) 2. Stucco – Minimum 3/4" thick, exterior cement plaster and lath 3. Limestone – Minimum 2" thick using any standard non-open joint installation technique such as shiplap 4. Natural stone veneer – Minimum 2" thick using any standard non-open joint installation technique such as grouted/mortared stone 5. Cast Artificial Stone – Minimum 1 1/2" thick complying with ICC-ES AC 51 using any standard non-open joint installation technique such as shiplap 6. Terra Cotta Cladding – Minimum 1 1/4" thick (solid or equivalent by weight) using any standard open or non-open joint installation technique such as shiplap 7. Any ACM or MCM that has passed NFPA 285 with foam of comparable thickness 8. Uninsulated sheet metal building panels including steel, copper, aluminum 9. 1/4" (minimum) uninsulated fiber-cement siding, or porcelain or ceramic tile mechanically attached 10. Autoclaved-Aerated-Concrete (AAC) panels that have successfully passed NFPA 285 criteria 11. Thin brick/cultured stone set in thin set adhesive and metal lath 12. Glen Gery Thin Tech® Elite Series Masonry Veneer or TABS II Panel System with 1/2" thick bricks using TABS Wall Adhesive 13. Terra Cotta Cladding – Any Rain-screen Terra Cotta (minimum 1/2" thick) with ventilated shiplap 14. 3/8" or 1/2" Stucco – Any one-coat stucco (1/2" minimum) that meets AC11 acceptance criteria 15. Natural Stone Veneer – minimum 1 1/4" thick using any standard installation technique 16. AFC Terraslat by Tonality – Tonality Classic26 or Tonality Classic22 17. 8mm (minimum) or 5/16" (minimum) 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.

Table 4. NFPA 285 Approved Wall Assemblies with Xci Foil Exterior Insulation[1]

Wall Component	Materials
Special Opening Perimeter Use with Claddings 7 - 17	1. Tested Opening – 2 layers 5/8" gypsum, with 18-gauge steel flashing at header and 1 layer 5/8" gypsum and 18-gauge galvanized steel flashing at jambs and sill 2. 2" mineral wool 4 lb/ft3 density 3. 1 1/2" thick FRT wood buck 4. Two layers of 3/4" FRT Plywood
SI: 1 in = 25.4 mm 1. The assemblies' combinations created herein and the various substitutions of products are based on testing and professional thermal engineering analysis.	

Table 5. NFPA 285 Approved Wall Assemblies with Xci Ply Exterior Insulation[1]

Wall Component	Materials
Base Wall System Use either 1, 2, 3, or 4	1. Cast concrete walls 2. CMU concrete walls 3. 25-gauge minimum 3 5/8" (minimum) steel studs spaced 24" o.c. (maximum) a. 5/8" Type X gypsum wallboard interior b. Lateral bracing every 4' optional or as required by code 4. FRTW studs: minimum nominal 2" x 4" dimension, spaced 24" o.c. (maximum) 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	1. Any approved mineral-fiber-based safing insulation in each stud cavity at floor line. Safing thickness must match stud cavity depth. 2. Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction.
Cavity Insulation Use any Item 1 - 11	1. None 2. 1 1/2" (maximum) of Carlisle SPI SealTite PRO, SealTite PRO Closed Cell, or SealTite PRO One Zero 3. Any noncombustible insulation per ASTM E136 4. Any mineral fiber (Board type faced or unfaced) 5. Any fiberglass (Batt type faced or unfaced) 6. 3 1/4" (maximum) of Carlisle SPI SealTite PRO, SealTite PRO Closed Cell, or SealTite PRO One Zero – only with Sheathing 2 7. Carlisle SealTite PRO HFO, SealTite PRO Open Cell, SealTite PRO High Yield, SealTite PRO No Mix, SealTite PRO No Trim 21, SealTite PRO OCX. 3 5/8" maximum. Use with 1/2" exterior sheathing 8. JM Corbond III or IV - 3 5/8" maximum. Use with 5/8" exterior sheathing 9. BASF WallTite Max - 3 5/8" maximum. Use with 1/2" exterior sheathing 10. Huntsman HeatLok HFO Pro. Huntsman HeatLok HFO High Lift. 3 5/8" maximum. Use with 5/8" exterior sheathing 11. SWD Urethane Quik-Shield Goblin or Yeti - 1 to 3 5/8" thick for use in 3 5/8" studs (maximum). Use with 5/8" exterior sheathing

Table 5. NFPA 285 Approved Wall Assemblies with Xci Ply Exterior Insulation[1]

Wall Component	Materials
Exterior Sheathing Use either 1, 2, or 3	1. None (only with Claddings 1 – 6 and Cavity Insulations 1, 3, 4, or 5). See note for Cavity Insulation 2. 1/2" or thicker exterior gypsum sheathing 3. 1/2" (minimum) FRTW structural panels in Type III construction
Multi-Function Sheathing and 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 WRB on base wall surface in **Table 6**.
WRB Over Base Wall Surface	1. See **Table 6**
Exterior Insulation Use any Item 1 or 2, depending on cladding	1. 4 3/4" thick (maximum) Xci Ply (4" foam maximum, 3/4" FRT Plywood maximum) may be used with Claddings 1 - 6 2. 4 1/4" thick (maximum) Xci Ply (3 1/2" foam maximum, 3/4" FRT Plywood maximum) with Claddings 7 - 17 (with special Opening Perimeter)
WRB Over Exterior Insulation	1. See **Table 6** ***Note:*** 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 3/4" (maximum) insulation thickness Cladding 7 - 17 for 4 1/4" (maximum) insulation thickness with unique opening perimeter. Maximum Air Gap 2" for Claddings 1 - 6. Maximum Air Gap 1 1/2" 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. 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) 2. Stucco – Minimum 3/4" thick, exterior cement plaster and lath 3. Limestone – Minimum 2" thick using any standard non-open joint installation technique such as shiplap 4. Natural stone veneer – Minimum 2" thick using any standard non-open joint installation technique such as grouted/mortared stone 5. Cast Artificial Stone – Minimum 1 1/2" thick complying with ICC-ES AC 51 using any standard non-open joint installation technique such as shiplap 6. Terra Cotta Cladding – Minimum 1 1/4" thick (solid or equivalent by weight) using any standard open or non-open joint installation technique such as shiplap 7. Any ACM or MCM that has passed NFPA 285 with foam of comparable thickness 8. Uninsulated sheet metal building panels including steel, copper, aluminum 9. 1/4" (minimum) uninsulated fiber-cement siding, or porcelain or ceramic tile mechanically attached 10. Autoclaved-Aerated-Concrete (AAC) panels that have successfully passed NFPA 285 criteria 11. Thin brick/cultured stone set in thin set adhesive and metal lath 12. Glen Gery Thin Tech® Elite Series Masonry Veneer or TABS II Panel System with 1/2" thick bricks using TABS Wall Adhesive 13. Terra Cotta Cladding – Any Rain-screen Terra Cotta (minimum 1/2" thick) with ventilated shiplap 14. 1/2" Stucco – Any one-coat stucco (1/2" minimum) that meets AC11 acceptance criteria 15. Natural Stone Veneer – minimum 1 1/4" thick using any standard installation technique 16. AFC Terraslat by Tonality – Tonality Classic26 or Tonality Classic22 17. 8mm (minimum) or 5/16" (minimum) SwissPearl Fiber Cement cladding

Table 5. NFPA 285 Approved Wall Assemblies with Xci Ply Exterior Insulation[1]

Wall Component	Materials
Exterior Cladding Continued	***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	1. Tested Opening – 2 layers $^5/_8$" gypsum, with 18-gauge steel flashing at header and 1 layer $^5/_8$" gypsum and 18-gauge galvanized steel flashing at jambs and sill 2. 2" mineral wool 4 lb/ft^3 density 3. $1^1/_2$" thick FRT wood buck 4. Two layers of $^3/_4$" FRT Plywood
SI: 1 in = 25.4 mm 1. The assemblies' combinations created herein and the various substitutions of products are based on testing and professional thermal engineering analysis.	

Table 6. NFPA 285 Allowable WRB Materials with Xci Foil, Xci CG, and Xci Ply[1-10]

Wall Component	Materials
WRB Over Base Wall Surface	1. Hunter Xci VP-SA WRB 2. Carlisle Fire Resist 705 RS, Fire Resist Barrithane VP, Fire Resist 705 VP, Fire Resist 705 FR-A, Fire Resist Barritech NP (or NP LT), Fire Resist Barritech VP (or VP LT). 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-Tack adhesives. 3. CCW-705 (with 702 LV, 702 WB, CAV-GRIP, Low VOC Travel-Tack, or 702 adhesives) 4. GE Momentive SEC 2500 SilShield, Elemax 2600 5. VaproShield Wrapshield SA, RevealShield SA, BlockShield SA, PanelShield SA 6. WR Grace Perm-A-Barrier® VPS, 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 NPL 10, Perm-A-Barrier VPL 50 7. StoGuard Vaporseal 8. 3M 3015 (with Hold Fast 70 adhesive at 6 mils) or 3M 3015 NP or 3015 VP 9. Henry Air-Bloc® 17MR, Air-Bloc® 21S, All Weather STPE, Blueskin SA, Air-Bloc 16MR, Blueskin VP 160, Henry Blueskin MetalClad. 10. Tyvek CommercialWrap or CommercialWrap D, StuccoWrap, Fluid Applied WB (only with Xci Ply) 11. PolyGuard Spray-N-Roll (STPE), Air Lok Sheet UV400NP, Air Lok Flex VP, FlexGuard, Stretch Flex 12. Prosoco R-Guard Cat 5, R-Guard Cat 5 Rainscreen, R-Guard VB, or R-Guard Spray Wrap MVP 13. Dryvit Backstop NT or Dryvit Backstop NTX 14. 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

Table 6. NFPA 285 Allowable WRB Materials with Xci Foil, Xci CG, and Xci Ply[1-10]

Wall Component	Materials
WRB Over Base Wall Surface Continued	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 34. GMX Air Guard HVWZ
WRB Over Exterior Insulation Use any item 1 – 29, or none ***Note:*** Some WRB are only allowed with specific systems	1. Hunter Xci VP-SA WRB 2. 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) 3. GE Momentive SEC 2500 SilShield, Elemax 2600 4. VaproShield WrapShield SA, RevealShield SA, PanelShield SA 5. 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 6. Henry Air-Bloc 17MR, Air-Bloc 21S, Blueskin VP160 (only with Xci Ply), All Weather STPE, and Air-Bloc 16MR 7. Tyvek CommercialWrap, StuccoWrap, or CommericalWrap D 8. PolyGuard Air Lok Sheet UV400 NP, Stretch Flex (only with Claddings 1 - 6), Air Lok Flex VP (over Xci Ply with any cladding listed or over the other Xci foams listed with Claddings 1 - 6), FlexGuard (over Xci Ply with any cladding listed or over the other Xci foams listed with Claddings 1-6) 9. Prosoco R-Guard Cat 5, R-Guard Cat 5 Rainscreen, R-Guard VB, or R-Guard Spray Wrap MVP 10. Sto Gold coat or Emerald Coat (only with Xci Ply) 11. Dryvit Backstop NT or Dryvit Backstop NTX 12. Any WRB that has been tested per ASTM E1354 (at a minimum of 50 kW/m^2 heat flux) and shown by analysis to be less flammable (improved T_{ign}, Pk HRR) than those listed above 13. 3" Aluma-GRIP 701 or 4" FG-1402 joint tape may be interchanged. (Hardcast® AFT is a rebrand of Aluma GRIP 701). 14. WR Meadows Air Shield LMP (Gray), Air Shield LMP (Black), Air Shield TMP, Air Shield LSR or Air Shield SMP

Table 6. NFPA 285 Allowable WRB Materials with Xci Foil, Xci CG, and Xci Ply[1-10]

Wall Component	Materials
WRB Over Exterior Insulation Continued	15. Dörken Systems, Inc., Delta-Vent SA, Delta-Vent S, Delta-Fassade S, Delta Maxx 16. Soprema Sopraseal Stick VP (with Claddings 1 - 6, not with Xci Foil), Soprasolin HD 17. Pecora XL Perm Ultra VP, XL-Perm Ultra NP, ProPerm VP 18. Siga Majvest (for all claddings) or Majvest 500 SA (only with Claddings 1 - 6) 19. Fortifiber Building Systems Group WeatherSmart Housewrap, WeatherSmart Drainable or WeatherSmart Commercial 20. Dow Chemical DefendAir 200 (or LT version) or DefendAir 200C (Charcoal) 21. Hohmann & Barnard Enviro Barrier VP 22. STS FW100A 23. Karnak 321 K-NRG 24. Jumpstart HWW-65A, HWW-65B, HWHP-80A, HWMP-90A, HWD2-72A, HWHPT-92A, HWMPC-105A 25. Master Wall Rollershield 26. Parex WeatherSeal Spray & Roll-On 27. 3M 3015 VP 28. Protecto Wrap Protecto Wall VP or Universal Primer Free Membrane 29. NaturaSeal AirSeal NS-A-250-HP

SI: 1 in. = 25.4 mm

1. 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.
2. 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.
3. 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 manufacturer instructions: CAV-GRIP™, Blueskin LVC Spray Primer, or Blueskin Spray Prep
4. The following may be used as gap filler between insulation panels: FOMO HandiFoam FireBlock or TVM FireBlock.
5. 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
      ii. 4" Blueskin Butyl Flash
      iii. 4" Blueskin Zero Flash
      iv. 4" CCW-705/XLT*
      v. 4" Blueskin SA*
      vi. 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, 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.*

Table 6. NFPA 285 Allowable WRB Materials with Xci Foil, Xci CG, and Xci Ply[1-10]

Wall Component	Materials
6.	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.*
7.	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
8.	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.
9.	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 b. Over a WRB on the base wall assembly while no exterior insulation is used. Use only the following WRB: Metal Clad 705FR or other WRB that produce no ignition when tested per ASTM E1354 at a heat flux of 50 kW/m^2.
10.	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

Table 7. Mass Wall Interior Insulation[1,2]

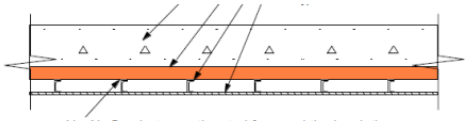
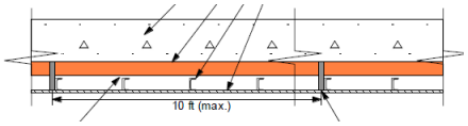
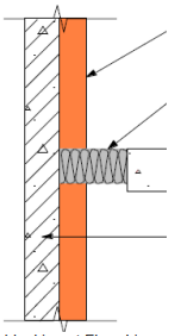
Wall Component	Materials
Base Wall System Use either 1 or 2	1. Cast concrete walls (minimum 2" thick) 2. CMU concrete walls (minimum 4" thick)
Exterior Coating Use either 1, 2, 3, or 4	1. Portland cement or Lime Stucco 2. Any ASTM E84 Class A Paint or Elastomeric Coating 3. Any ASTM E84 Class A Clear Sealer 4. None
Air/Vapor Barrier Membrane Position 1 Over Base Wall Interior	1. See **Table 6**. NFPA 285 Allowable WRB Materials with Xci Foil, Xci CG, and Xci Ply
Continuous Insulation Use either 1, 2, or 3	1. 3 1/2" thick (maximum) Xci Foil (Class A) (or Xci 286) 2. 3 1/2" thick (maximum) Xci CG or Xci CG (Class A) 3. 3 1/2" thick (maximum) Xci Foil
Air/Vapor Barrier Membrane Position 2 Over Insulation	1. See **Table 6**. NFPA 285 Allowable WRB Materials with Xci Foil, Xci CG, and Xci Ply ***Note:*** Insulation joints may be taped with Foil-Grip 1402, 4" width (maximum)
Interior Cladding	1. 5/8" type X Interior Gypsum Sheathing installed directly over the insulation or installed to 3 5/8" (maximum) 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:  No Air Gap between the stud face and the insulation  The Air Gap between the stud face and insulation requires fireblocking per IBC 718. 2. 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:  Fireblocking at Floor Line

Table 7. Mass Wall Interior Insulation[1,2]

Wall Component	Materials

SI: 1 in. = 25.4 mm

1. WRB 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 – 2018 (or Earlier) IBC:*

6.3.5.1 Xci Foil, Xci CG, and Xci 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 **Appendix A. NFPA 285-12** and the evaluations listed in **Section 10**.

6.3.5.2 Special approval by large-scale testing is allowed by 2018 IBC Section 2603.9, which states:

> **2603.9 Special Approval.** Foam plastic shall not be required to comply with the requirements of Section 2603.4 or those of Section 2603.6 where specifically approved based on large-scale tests such as, but not limited to, 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.

6.3.5.2.1 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.

6.3.5.2.2 Since Xci Foil, Xci CG, and Xci Ply are not intended for use as interior finishes, these are not the appropriate end-use tests for these applications.

6.3.5.2.3 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.

6.3.5.2.4 This special approval exempts a product from the need to comply with 2018 IBC Section 2603.4 or those of 2018 IBC Section 2603.6. This includes exemption from 2018 IBC Section 2603.5.4, which requires a flame spread index of 25 or less.

6.3.5.2.5 Xci Foil and Xci CG are not interior finish materials and shall be covered with a minimum 1/2" gypsum wallboard, which meets the requirements of 2018 IBC Section 2603.5.2 for thermal barriers.

6.3.5.2.6 There is no flame spread requirement in 2018 IBC Chapter 8 that applies to foam plastics used as insulation inside exterior non-load bearing wall assemblies in which foam is covered by a thermal barrier.

6.3.5.2.7 Based upon the above analysis and interpretation, Xci Foil and Xci CG meet the requirements of 2018 IBC Section 2603.9, which specifically exempts the foam from the requirement of 2018 IBC Section 2603.5.4 that requires a flame spread index of 25 or less.

6.3.5.2.8 Xci Ply integrates FRT plywood, which has a flame spread rating of 25 or less and has been tested in accordance with NFPA 285 which, per the above analysis, allows it to meet the requirements of 2018 IBC Section 2603.9.

6.3.6 *Special Approval – 2021 and 2024 IBC:*

6.3.6.1 Xci Foil, Xci CG, and Xci 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 IBC Section 2603.9, which states:

> **2603.9 Special Approval.** Foam plastic shall not be required to comply with the requirements of Section 2603.4 or those 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 The tests 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.

6.3.6.2.2 Since Xci Foil, Xci CG, and Xci Ply are not intended for use as interior finishes, these are not the appropriate end-use tests for these applications.

6.3.6.2.3 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.

6.3.6.2.4 This special approval exempts a product from the need to comply with IBC Section 2603.4 and IBC Section 2603.6. This change in the code language from the 2012 version does not include the exemption from IBC Section 2603.5.4, which requires a flame spread rating of 25 or less.

6.3.6.2.5 Xci Foil, Xci CG, and Xci 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.

6.3.6.2.6 There is no flame spread requirement in IBC Chapter 8 that applies to foam plastics used as insulation inside exterior non-load bearing wall assemblies in which foam is covered by a thermal barrier.

6.3.6.2.7 The foam plastic materials in Xci Foil, Xci CG, and Xci 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 meets 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.

6.3.6.2.8 Based upon the above analysis and interpretation, Xci Foil, Xci CG, and Xci 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 Xci CG may be used as an air-impermeable insulation or air barrier material as prescribed in IRC Section N1102.5,[34] IECC Section C402.6,[35] and IECC Section R402.5.[36]

6.4.2 Xci CG 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.[37]

6.4.3 Air permeability test results are displayed in **Table 8**.

Table 8. Air Permeability[1]

Product Name	Air Pressure	Air Permeability
Xci CG	75 Pa	< 0.02 L/(s·m²)

Imperial: 1 L/(s·m²) = 0.02 cfm/ft²

1. Foam core tested in accordance with ASTM E2178. Air pressure and permeability numbers shown, represent Xci CG 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 Performance[38]

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.[39]

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.[40]

8 Regulatory Evaluation and Accepted Engineering Practice

8.1 Xci Foil, Xci CG, and Xci 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 IBC Section 2603.3, IBC Section 2603.5.4, and IRC Section R303.3.[41]

8.1.3 Performance for use without a thermal barrier in accordance with IBC Section 2603.9 and IRC Section R303.6,[42] as modified per **Section 6.3.5** and **Section 6.3.6**.

8.1.4 Performance with regard to the potential heat generated by the FPIS in accordance with IBC Section 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.

8.2 Wind pressure resistance in accordance with IBC Section 2603.10 is outside of the scope of this report.

8.3 Fire resistance rated wall assemblies in accordance with IBC Section 2603.5.1 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 qualified[43] to practice product and regulatory compliance services within its scope of accreditation and engineering expertise,[44] respectively.

8.5 Engineering evaluations are conducted with DrJ's ANAB accredited ICS code scope 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 that 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 Hunter Panels, LLC published literature and local code requirements.

9.3.13 Additional information on the installation and detailing of Xci Foil, Xci CG, and Xci Ply can be found at www.hunterpanels.com/products/wall-products.

9.4 This section provides additional general guidelines for the ***installation of Xci Foil and Xci CG only***. In addition to this report, refer to the manufacturer installation instructions 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 Xci Foil or Xci CG 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 Xci Foil or Xci CG 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 Xci Foil or Xci CG 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 Xci Ply only***. In addition to this report, refer to the manufacturer installation instructions for complete details and requirements.

9.5.1 Provide separation of the edge of Xci 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 Xci Ply with proper fasteners and spacing to accommodate design. Fasten Xci 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 Xci 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 Xci Ply boards to accommodate hydric movement of wood. Fasten boards tightly to provide a flush, level surface.

9.5.5 Apply WRB from approved list in **Table 6** over plywood side of Xci 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 duly authenticated reports from approved agencies and/or approved sources provided by the supplier. These are presumed to be minimum properties and relied upon to be accurate. The reliability of DrJ's engineering practice, as contained in this duly authenticated report, may be dependent upon published design properties by others.

10.5 *Testing and Engineering Analysis*

10.5.1 The strength, rigidity, and/or general performance of component parts and/or the integrated structure are determined by suitable tests that simulate the actual conditions of application that occur and/or by accepted engineering practice and experience.[45]

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

11 Findings

11.1 As outlined in **Section 6**, Xci Foil, Xci CG, and Xci 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 duly authenticated report and the manufacturer installation instructions, Xci Foil, Xci CG, and Xci Ply shall be approved for the following applications:

11.2.1 Xci Foil, Xci CG, and Xci 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 Xci Foil, Xci CG, and Xci 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**, and **Table 6**.

11.2.2.1 For approved wall assemblies meeting the requirements of NFPA 285-12 (i.e., 2018 IBC or earlier), see **Appendix A. NFPA 285-12**.

11.2.3 Xci Foil, Xci CG, and Xci 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 Xci Foil, Xci CG, and Xci 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 RDP. Assistance with engineering is available from Hunter Panels, LLC.

11.5 IBC Section 104.2.3[46] (IRC Section R104.2.2[47] and IFC Section 104.2.3[48] 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:**[49] Building regulations require that the building official shall accept duly authenticated reports.[50]

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

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

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

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

11.8 Through the IAF Multilateral Arrangement (MLA), this duly authenticated report can be used to obtain product approval in any jurisdiction or country because all ANAB ISO/IEC 17065 duly authenticated reports are equivalent.[51]

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, Xci Foil, Xci CG, and Xci 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 Xci Foil, Xci CG, and Xci Ply are approved for use in exterior walls of buildings of any height, and of Type I, II, III, or IV construction when constructed in accordance with **Table 3**, **Table 4**, **Table 5**, and **Table 6**.

12.4.1 For 2018 IBC or earlier, Xci Foil, Xci CG, and Xci Ply are approved for use in exterior walls of buildings of any height, and of Type I, II, III, or IV construction when constructed in accordance with **Table 9**, **Table 10**, **Table 11**, and **Table 12** in **Appendix B. NFPA 285-12**.

12.5 Xci Foil, Xci CG, and Xci Ply shall be separated from the interior of the building with an approved thermal barrier in accordance with IBC Section 2603.4 or IRC Section R303.4,[52] where applicable.

12.6 Xci Ply may be used as a structural nailing base for claddings. Xci Foil and Xci CG shall not be used as a nailing base for claddings.

12.7 In areas where the probably of termite infestation is labeled *"very heavy"*, Xci Foil, Xci CG, and Xci Ply boards are installed on buildings or structures of wood-framed construction, the installation shall follow the provisions of IBC Section 2603.8 and IRC Section R305.4,[53] where applicable.

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

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

12.8.2 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 IBC Section 104.7.2, IBC Section 110.4, IBC Section 1703, IRC Section R104.7.2, and IRC Section R109.2.

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

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

12.11 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 owner.

13 Identification

13.1 Xci Foil, Xci CG, and Xci Ply, as listed in **Section 1.1**, are identified by a label on the board or packaging material bearing the manufacturer name, product name, this report number, and other information to confirm code compliance.

13.2 Additional technical information can be found at www.hunterpanels.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 Xci CG as Exterior Insulation[1,2,3]

Wall Component	Materials
Base Wall System Use either 1, 2, 3, or 4	1. Cast concrete walls 2. CMU concrete walls 3. 25-gauge minimum 3 5/8" (minimum) steel studs spaced 24" o.c. (maximum) a. 5/8" Type X gypsum wallboard interior b. Lateral bracing every 4' 4. FRTW (Fire-Retardant Treated Wood) studs: minimum nominal 2 x 4 dimension, spaced 24" o.c. (maximum) a. 5/8" Type X gypsum wallboard interior b. Bracing as required by building code
Fire-Stopping at Floor Lines	1. Any approved mineral-fiber-based safing insulation in each stud cavity at floor line. Safing thickness must match stud cavity depth. 2. Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction.
Cavity Insulation Use any item 1 - 16. Items 8 - 16 may only be used with exterior sheathing 2 or the specified thickness.	1. None 2. 1 1/2" minimum Carlisle® SPI SealTite PRO (up to full cavity thickness) 3. 1 1/2" minimum BASF Walltite SPF (up to full cavity thickness) 4. Any noncombustible insulation per ASTM E136 5. Any mineral fiber (Board type Class A ASTM E84 faced or unfaced) 6. Any fiberglass (Batt type Class A ASTM E84 faced or unfaced) 7. Any foam plastic insulation (SPF or board type) that has been tested per ASTM E1354 (at a minimum of 20 kW/m^2 heat flux) and shown by analysis to be less flammable (improved T_{ign}, Pk. HRR) than Covestro EcoBay CC or BASF Walltite 8. NCFI InsulBloc SPF (up to full cavity thickness) 9. Icynene MD-C-200v3 (Proseal) up to 5 1/2" (only with 1/2" [minimum] exterior gypsum sheathing) 10. SWD Urethane Quik-Shield 112 up to 6" (maximum) stud cavities with an air gap not exceeding 2 1/2" 11. 1 1/2" (minimum) ThermoSeal 2000 (up to full cavity thickness) 12. 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" (minimum) exterior gypsum sheathing 13. Gaco (Firestone) F6500R, 052N, F4500, 183M, F1850, F1880 – 3 1/2" (maximum) for use with 5/8" Exterior Gypsum Sheathing 14. JM Corbond III or Corbond IV – Full stud cavity depth or less for use with 5/8" exterior gypsum sheathing 15. Huntsman ProSeal HFO (8" maximum thickness with no air gap, 6" maximum thickness with air gap) for use with 1/2" or thicker exterior gypsum sheathing 16. Huntsman HeatLok HFO High Lift – maximum 3 5/8" thickness for use with 5/8" exterior gypsum sheathing

Table 9. NFPA 285 Approved Wall Assemblies with Xci CG as Exterior Insulation[1,2,3]

Wall Component	Materials
Exterior Sheathing Use either 1, 2, or 3	1. None (only with claddings 1 - 6 and cavity insulation 1, 2, 4, 5, 6, or 11) 2. 1/2" or thicker exterior gypsum sheathing 3. 1/2" (minimum) FRTW structural panels in Type III construction
Multi-Function Sheathing and 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 on base wall surface in **Table 12**
WRB Over Base Wall Surface	1. See **Table 12**
Exterior Insulation Use 1 or 2, depending on cladding	1. 3 1/2" (maximum) Xci CG for all claddings 2. 4" thick (maximum) Xci CG for Claddings 1 - 6
WRB Over Exterior Insulation	1. See **Table 12** ***Note:*** 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 1 – 17 Item 7 may use any tested/approved installation technique. Items 8, 9, or 12 may use any standard installation technique. If claddings 2, 3, 4, 5, 13, 14, 15, or 16 are on a 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 asphalt or butyl based slip sheet (stapled) with no adhesive	1. 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) 2. 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 3. Limestone – Minimum 2" thick using any standard non-open joint installation technique such as shiplap 4. Natural stone veneer – Minimum 2" thick using any standard non-open joint installation technique such as grouted/mortared stone 5. Cast artificial stone – Minimum 1 1/2" thick complying with ICC-ES AC 51 using any standard non-open joint installation technique such as shiplap 6. Terra Cotta Cladding – Minimum 1 1/4" thick (solid or equivalent by weight) using any standard non-open joint installation technique such as shiplap 7. Any MCM that has successfully passed NFPA 285 8. Uninsulated sheet metal building panels including steel, copper, aluminum 9. 1/4" (minimum) uninsulated fiber-cement siding or porcelain or ceramic tile mechanically attached 10. Stone, porcelain, ceramic/aluminum honeycomb composite building panels that have successfully passed NFPA 285 criteria 11. Autoclaved-Aerated-Concrete (AAC) panels that have successfully passed NFPA 285 criteria 12. Terra Cotta Cladding – Any rain-screen Terra Cotta (minimum 1/2" thick) with ventilated shiplap 13. 1/2" stucco – any one coat stucco (1/2" minimum) 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 (stucco exposed to fire) for at least 30 minutes

Table 9. NFPA 285 Approved Wall Assemblies with Xci CG as Exterior Insulation[1,2,3]

Wall Component	Materials
Exterior Cladding Continued	14. 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 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/AVP and the lath. 15. Glen Gery Thin Tech® Elite Series Masonry Veneer or TABS II Panel System with 1/2" thick bricks using TABS Wall Adhesive 16. Natural Stone Veneer – minimum 1 1/4" thick using any standard installation technique 17. FunderMax m.look– minimum 1/4" thick using any standard installation technique.

SI: 1 in = 25.4 mm

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 Xci Foil as Exterior Insulation[1,2,3]

Wall Component	Materials
Base Wall System Use either 1, 2, 3, or 4	1. Cast concrete walls 2. CMU concrete walls 3. 25-gauge minimum 3 5/8" (minimum) steel studs spaced 24" o.c. (maximum) a. 5/8" Type X gypsum wallboard interior b. Lateral bracing every 4' 4. FRTW studs: minimum nominal 2 x 4 dimension, spaced 24" o.c. (maximum) a. 5/8" Type X gypsum wallboard interior b. Bracing as required by code
Fire-Stopping at Floor Lines	1. Any approved mineral fiber-based safing insulation in each stud cavity at floor line. Safing thickness must match stud cavity depth. 2. Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction.
Cavity Insulation Use any item 1 - 16. Items 2, 3, 8, 9, 10, 11, 12, 13, 14, 15, or 16 may only be used with exterior sheathing 2 or the specified thickness.	1. None 2. 1 1/2" minimum Carlisle® SPI SealTite PRO (up to full cavity thickness) 3. 1 1/2" minimum BASF Walltite SPF (up to full cavity thickness) 4. Any noncombustible insulation per ASTM E136 5. Any mineral fiber (Board type Class A ASTM E84 faced or unfaced) 6. Any fiberglass (Batt type Class A ASTM E84 faced or unfaced) 7. Any foam plastic insulation (SPF or board type) that has been tested per ASTM E1354 (at a minimum of 20 kW/m^2 heat flux) and shown by analysis to be less flammable (improved T_{ign}, Pk HRR) than Covestro EcoBay CC or BASF Walltite 8. NCFI InsulBloc SPF (up to full cavity thickness) 9. Icynene MD-C-200v3 (Proseal) up to 5 1/2" (only with 1/2" [minimum] exterior gypsum sheathing)

Table 10. NFPA 285 Approved Wall Assemblies with Xci Foil as Exterior Insulation[1,2,3]

Wall Component	Materials
Cavity Insulation Continued	10. SWD Urethane Quik-Shield 112 up to 6" (maximum) stud cavities with an air gap not exceeding 2 1/2" 11. 1 1/2" (minimum) ThermoSeal 2000 (up to full cavity thickness) 12. 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" (minimum) exterior gypsum sheathing 13. Gaco (Firestone) F6500R, 052N, F4500, 183M, F1850, or F1880 – 3 1/2" (maximum) for use with 5/8" exterior gypsum sheathing 14. JM Corbond III or Corbond IV – Full stud cavity depth or less for use with 5/8" exterior gypsum sheathing 15. Huntsman ProSeal HFO (8" maximum thickness with no air gap, 6" maximum thickness with air gap) for use with 1/2" or thicker exterior gypsum sheathing 16. Huntsman HeatLok HFO High Lift – max 3 5/8" thickness for use with 5/8" exterior gypsum sheathing
Exterior Sheathing Use either 1, 2, or 3	1. None (only with cavity insulation 1, 4, 5, or 6) 2. 1/2" or thicker exterior gypsum sheathing 3. 1/2" (minimum) FRTW structural panels in Type III construction allowed in place of gypsum sheathing when combustible cavity insulation is not used.
Multi-Function Sheathing and 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 on base wall surface in **Table 12**
WRB Over Base Wall Surface	1. See **Table 12**
Exterior Insulation Use option 1	1. 4" (maximum) Xci Foil
WRB Over Exterior Insulation	1. See **Table 12** ***Note:*** 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, it 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 10. NFPA 285 Approved Wall Assemblies with Xci Foil as Exterior Insulation[1,2,3]

Wall Component	Materials
Exterior Cladding Use 1, 2, 3, 4, 5, or 6 If Claddings 2, 3, 4, or 5 are on a 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 asphalt or butyl based slip sheet (stapled) with no adhesive	1. 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) 2. 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 3. Limestone – Minimum 2" thick using any standard non-open joint installation technique such as shiplap 4. Natural Stone Veneer – Minimum 2" thick using any standard non-open joint installation technique such as grouted/mortared stone 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 6. Terra Cotta Cladding – Minimum 1 1/4" thick (solid or equivalent by weight) using any standard non-open joint installation technique such as shiplap.

SI: 1 in = 25.4 mm

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 11. NFPA 285 Approved Wall Assemblies with Xci Ply as Exterior Insulation[1,2,3]

Wall Component	Materials
Base Wall System Use either 1, 2, 3, or 4	1. Cast concrete walls 2. CMU concrete walls 3. 25-gauge minimum 3 5/8" (minimum) steel studs spaced 24" o.c. (maximum) a. 5/8" Type X gypsum wallboard interior b. Lateral bracing every 4' 4. FRTW studs: minimum nominal 2 x 4 dimension, spaced 24" o.c. (maximum) a. 5/8" Type X gypsum wallboard interior b. Bracing as required by code
Fire-Stopping at Floor Lines	1. Any approved mineral fiber-based safing insulation in each stud cavity at floor line. Safing thickness must match stud cavity depth. 2. Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction.
Cavity Insulation Use any 1 - 16. Items 3, 8, 9, 10, and 11 may only be used with exterior sheathing 2.	1. None 2. 1 1/2" minimum Carlisle® SPI SealTite PRO (up to full cavity thickness) 3. 1 1/2" minimum BASF Walltite SPF (up to full cavity thickness) 4. Any noncombustible insulation per ASTM E136 5. Any mineral fiber (Board type Class A ASTM E84 faced or unfaced) 6. Any fiberglass (Batt type Class A ASTM E84 faced or unfaced) 7. Any foam plastic insulation (SPF or board type) that has been tested per ASTM E1354 (at a minimum of 20 kW/m^2 heat flux) and shown by analysis to be less flammable (improved T_{ign}, PK HRR) than Covestro EcoBay CC or BASF Walltite 8. NCFI InsulBloc SPF (up to full cavity thickness) 9. Icynene MD-C-200v3 (Proseal) up to 5 1/2" (only with 1/2" [minimum] exterior gypsum sheathing) 10. SWD Urethane Quik-Shield 112 up to 6" (maximum) stud cavities with an air gap not exceeding 2 1/2" 11. 1 1/2" (minimum) ThermoSeal 2000 (up to full cavity thickness) 12. 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" (minimum) exterior gypsum sheathing 13. Gaco (Firestone) F6500R, 052N, F4500, 183M, F1850, F1880 – 3 1/2" (maximum) for use with 5/8" Exterior Gypsum Sheathing 14. JM Corbond III or Corbond IV – Full stud cavity depth or less for use with 5/8" exterior gypsum sheathing 15. Huntsman ProSeal HFO (8" maximum thickness with no air gap, 6" maximum thickness with air gap) for use with 1/2" or thicker exterior gypsum sheathing 16. Huntsman HeatLok HFO High Lift – maximum 3 5/8" thickness for use with 5/8" exterior gypsum sheathing
Exterior Sheathing Use 1, 2, or 3	1. None (only with cavity insulation 1, 2, 4, 5, or 6) 2. 1/2" or thicker exterior gypsum sheathing 3. 1/2" (minimum) FRTW structural panels in Type III construction

Table 11. NFPA 285 Approved Wall Assemblies with Xci Ply as Exterior Insulation[1,2,3]

Wall Component	Materials
Multi-Function Sheathing and 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 on base wall surface in **Table 12**
WRB Over Base Wall Surface	1. See **Table 12**
Exterior Insulation Use 1 or 2, depending on cladding	1. 4 1/4" thick (maximum) Xci Ply (3 1/2" foam maximum, 3/4" FR Plywood maximum) with all claddings 2. 4 3/4" thick (maximum) Xci Ply (4" foam maximum, 3/4" FR Plywood maximum) may be used with claddings 1-6
WRB Over Exterior Insulation	1. See **Table 12** ***Note:*** 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, it 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 – 18 Item 9 may use any tested/approved installation technique Items 10, 11, or 14 may use any standard installation technique. If Claddings 2, 3, 4, 5, 7, 8, 15, or 16 are on a 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 asphalt or butyl based slip sheet (stapled) with no adhesive	1. 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) 2. 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 3. Limestone – Minimum 2" thick using any standard non-open joint installation technique such as shiplap 4. Natural Stone Veneer – Minimum 2" thick using any standard non-open joint installation technique such as grouted/mortared stone 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 6. Terra Cotta Cladding – Minimum 1 1/4" thick (solid or equivalent by weight) using any standard non-open 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 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/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 10. Uninsulated sheet metal building panels including steel, copper, aluminum, or zinc 11. 1/4" (minimum) 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. AAC panels that have successfully passed NFPA 285 criteria 14. Terra Cotta Cladding – Any Rain-screen Terra Cotta (minimum 1/2" thick) with ventilated shiplap

Table 11. NFPA 285 Approved Wall Assemblies with Xci Ply as Exterior Insulation[1,2,3]

Wall Component	Materials
Exterior Cladding Continued	15. 1/2" Stucco – Any one coat stucco (1/2" minimum) 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 1 1/4" thick using any standard installation technique 17. FunderMax m.look Grey Core – minimum 1/4" thick using any standard installation technique 18. AFC TerraSlat by Tonality® – Tonality Classic26 or Tonality Classic22

SI: 1 in = 25.4 mm

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 Xci CG, Xci Foil, & Xci Ply[1-8]

Wall Component	Materials
WRB Over Base Wall Surface Use any items 1 – 34, or None ***Note:*** Some WRB are only allowed with specific systems. Item 23 (Securock® Exoair® 430) or 24 (DensElement w/ FastFlash) replaces the exterior sheathings in **Table 9** - **Table 11**. When either of these items are used, do not use exterior sheathings listed in **Table 9** - **Table 11** or WRB on base wall surface in this table.	1. Hunter Xci VP-SA WRB 2. Carlisle® Fire Resist 705RS, Fire Resist 705 VP, Fire Resist 705 FR-A, Fire Resist Barrithane VP, Fire Resist Barritech NP, Fire Resist Barritech VP (or VP LT). 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-Tack adhesives. 3. GE Momentive SEC 2500 SilShield, Elemax 2600 4. Vaproshield Wrapshield SA, RevealShield SA 5. WR Grace Perm-A-Barrier® VPS, Perm-A-Barrier® NPL (aka PAB NP20), Perm-A-Barrier® VPL, Perm-A-Barrier® Aluminum Wall Membrane, Perm-A-Barrier® VPL LT. The following may only be used with claddings 1-6: Perm-A-Barrier® NPL 10, Perm-A-Barrier® VPL 50 6. StoGuard Vaporseal 7. 3M 3015 (with Hold Fast 70 adhesive at 6 mils) 8. Henry Air-Bloc® 17MR, 21s, 31MR, 32 MR (only with Xci Ply), 33MR, Air-Bloc® 16MR, Blueskin VP 160 9. Tyvek CommercialWrap or CommercialWrap D or StuccoWrap 10. PolyGuard Spray-N-Roll (STPE), Air Lok Sheet UV400 NP, Air Lok Flex VP, Flex Guard, Air Lok Flex, Air Lok Sheet 400NP (Only with Cladding 1 - 6) 11. Prosoco R-Guard Cat 5, R-Guard Cat 5 Rainscreen, R-Guard VB or R-Guard Spray Wrap MVP 12. Dryvit Backstop NT 13. WR Meadows Air Shield LMP (Gray), Air Shield LMP (Black), Air Shield TMP, Air Shield LSR 14. Dörken Systems, Inc., Delta-Vent SA, Delta-Vent S, Delta-Fassade S, Delta Maxx, Delta Stratus SA 15. Any WRB that has been tested per ASTM E1354 (at a minimum of 20 kW/m^2 heat flux) and shown by analysis to be less flammable (improved T_{ign}, Pk HRR) than those listed above. 16. BASF Enershield HP or Enershield I 17. Soprema Sopraseal Stick VP, Soprasolin HD, LM 204 VP, Stick 1100T with Elastacool 600c Primer (for use with Xci-CG or Xci Ply) 18. Pecora XL Perm Ultra VP

Table 12. NFPA 285 Allowable WRB Materials with Xci CG, Xci Foil, & Xci Ply[1-8]

Wall Component	Materials
WRB Over Base Wall Surface Continued	19. Siga Majvest or Majvest 500 SA 20. Sto Gold Coat or Emerald Coat 21. Tremco ExoAir 230 and ExoAir 130 22. Fortifiber Building Systems Group WeatherSmart Housewrap, WeatherSmart Drainable, WeatherSmart Commercial or Super Jumbo Tex 60 23. USG Securock® Exoair® 430 System – see note on left and Air/Vapor System sections in **Table 5** – **Table 8** 24. 5/8" Georgia Pacific DensElement, flashed with Prosoco R-Guard FastFlash on sheathing joints 25. Dow Chemical Dowsil DefendAir 200 (or LT version) or DefendAir 200C (Charcoal) 26. Hohmann & Barnard Enviro Barrier and Enviro Barrier VP 27. STS FW100 or FW100A 28. Karnak 321 K-NRG 29. NaturaSeal AirSeal NS-A-250LP, AirSeal NS-A-250HP 30. Jumpstart HWW-65A, HWW-65B, HWHP-80A, HWMP-90A, HWD2-72A, HWHPT-92A, HWMPC-105A 31. Master Wall Rollershield 32. Parex WeatherSeal Spray & Roll-On 33. Protecto Wrap Protecto Wall VP or Universal Primer Free Membrane 34. Sika Sikagard® 535, Sikagard® AWB 665, or Sikagard® AWB 660
WRB Over Exterior Insulation Use any items 1 – 28 or None ***Note:*** Some WRB are only allowed with specific systems Insulation Joints may be taped with Foil-Grip 1402, 4" width (maximum)	1. Hunter Xci VP-SA WRB 2. 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 3. GE Momentive SEC 2500 SilShield, Elemax 2600 4. Vaproshield Wrapshield SA, RevealShield SA 5. 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 6. Henry Air-Bloc 17MR, 21S, 31MR, 33MR, 16MP, and Blueskin VP160 (only with Xci Ply) 7. Tyvek CommercialWrap or StuccoWrap 8. PolyGuard Air Lok Sheet UV400 NP, Air Lok Flex (only with claddings 1 - 6), Air Lok Flex VP (over Xci Ply with any claddings 1 - 6), FlexGuard (over Xci Ply with any cladding listed or over the other Xci foams listed with claddings 1 - 6) 9. Prosoco R-Guard Cat 5, R-Guard Cat 5 Rainscreen, R-Guard VB or R-Guard Spray Wrap MVP 10. Sto Gold coat or Emerald Coat (only with Xci Ply) 11. Dryvit Backstop NT 12. Any WRB that has been tested per ASTM E1354 (at a minimum of 20 kW/m^2 heat flux) and shown by analysis to be less flammable (improved T_{ign}, Pk HRR) than those listed above 13. 3" Aluma-GRIP 701 or 4" FG-1402 joint tape may be interchanged (Hardcast AFT is a rebrand of Aluma-GRIP 701) 14. WR Meadows Air Shield LMP (Gray), Air Shield LMP (Black), Air Shield TMP, Air Shield LSR 15. Dörken Systems, Inc., Delta-Vent SA, Delta-Vent S, Delta-Fassade S, Delta Maxx 16. Soprema Sopraseal Stick VP (with claddings 1-6, not with Xci Foil), Soprasolin HD 17. Pecora XL Perm Ultra VP

Table 12. NFPA 285 Allowable WRB Materials with Xci CG, Xci Foil, & Xci Ply[1-8]

Wall Component	Materials
WRB Over Exterior Insulation Continued	18. Siga Majvest (for all claddings) or Majvest 500 SA (only with Claddings 1 - 6) 19. Fortifiber Building Systems Group WeatherSmart Housewrap, WeatherSmart Drainable or WeatherSmart Commercial 20. Dow Chemical DefendAir 200 (or LT version) or DefendAir 200C (Charcoal) 21. Hohmann & Barnard Enviro Barrier VP 22. STS FW100A 23. Karnak 321 K-NRG 24. Jumpstart HWW-65A, HWW-65B, HWHP-80A, HWMP-90A, HWD2-72A, HWHPT-92A, HWMPC-105A 25. Master Wall Rollershield 26. Parex WeatherSeal Spray & Roll-On 27. 3M 3015 VP 28. Protecto Wrap Protecto Wall VP or Universal Primer Free Membrane

SI: 1 in = 25.4 mm

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
2. The following may be used as gap filler between insulation panels: FOMO HandiFoam FireBlock and TVM FireBlock.
3. 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)
   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, 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. 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

Table 12. NFPA 285 Allowable WRB Materials with Xci CG, Xci Foil, & Xci Ply[1-8]

Wall Component	Materials
5.	In the NFPA 285 test, flashing for fenestration, including Through-Wall Flashing (TWF), are not considered part of the WRB. 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
6.	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.
7.	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 WRB that produce no ignition when tested per ASTM E1354 at a heat flux of 50 kW/m^2.
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

Notes

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

26 2021 IRC Section R316

27 2021 IRC Section R316.5.12

28 2021 IRC Section R316.3

29 2021 IRC Section R316.4

30 2021 IBC Section 1404.16

31 2021 IBC Section 1404.16.1

32 2021 IBC Section 1404.16.2

33 2021 IRC Section R316.5.7

[34] 2021 IRC Section N1102.4

[35] 2021 IECC Section C402.5

[36] 2021 IECC Section R402.4

[37] 2021 IECC Section C402.5.1.3 and 2018 IECC Section C402.5.1.2.1

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

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

[40] 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

[41] 2021 IRC Section R316.3

[42] 2021 IRC Section R316.6

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

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

[45] 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

[46] 2021 IBC Section 104.11

[47] 2021 IRC Section R104.11

[48] 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

[49] 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.

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

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

[52] 2021 IRC Section R316.4

[53] IRC Section R318.4