



CERTIFICATION



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Technical Evaluation Report

TER 1402-01

Xci CG (Class A), Xci Ply (Class A), Xci Foil (Class A), and Xci 286 Air Barrier, Water-Resistive Barrier, and Fire Performance in Exterior & Interior Walls of Buildings of Type I-V Construction

Hunter Panels LLC

Product:

Xci CG (Class A), Xci Ply (Class A), Xci Foil (Class A), and Xci 286

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COMPANY
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DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION
SECTION: 07 21 00 - Thermal Insulation
SECTION: 07 27 23 - Board Product Air Barriers
SECTION: 07 48 00 - Exterior Wall Assemblies

1 PRODUCTS EVALUATED¹

- 1.1 Xci CG (Class A), Xci Ply (Class A), Xci Foil (Class A), and Xci 286

2 APPLICABLE CODES AND STANDARDS^{2,3}

2.1 Codes

- 2.1.1 *IBC—12, 15, 18: International Building Code®*
- 2.1.2 *IRC—12, 15, 18: International Residential Code®*
- 2.1.3 *IECC—12, 15, 18: International Energy Conservation Code®*

2.2 Standards and Referenced Documents

- 2.2.1 *ASTM C1289: Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board*
- 2.2.2 *ASTM C518: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus*
- 2.2.3 *ASTM E119: Standard Test Methods for Fire Tests of Building Construction and Materials*

¹ Building codes require data from valid [research reports](#) be obtained from [approved sources](#). Agencies who are accredited through ISO/IEC 17065 have met the [code requirements](#) for approval by the [building official](#). DrJ is an ISO/IEC 17065 ANAB-Accredited Product Certification Body – [Accreditation #1131](#).

Through ANAB accreditation and the [IAF MLA](#), DrJ certification can be used to obtain product approval in any [jurisdiction](#) or country that has [IAF MLA Members & Signatories](#) to meet the [Purpose of the MLA](#) – “certified once, accepted everywhere.”

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² Unless otherwise noted, all references in this TER are from the 2018 version of the codes and the standards referenced therein (e.g., ASCE 7, NDS, ASTM). This material, design, or method of construction also complies with the 2000-2015 versions of the referenced codes and the standards referenced therein.

³ All terms defined in the applicable building codes are italicized.



- 2.2.4 *ASTM E1354: Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter*
- 2.2.5 *ASTM E136: Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C*
- 2.2.6 *ASTM E2178: Standard Test Method for Air Permeance of Building Materials*
- 2.2.7 *ASTM E2357: Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies*
- 2.2.8 *ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference*
- 2.2.9 *ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials*
- 2.2.10 *ASTM E96: Standard Test Methods for Water Vapor Transmission of Materials*
- 2.2.11 *NFPA 259: Standard Test Method for Potential Heat of Building Materials*
- 2.2.12 *NFPA 285: Standard Fire Test Method for the Evaluation of Fire Propagation Characteristics of Exterior*
- 2.2.13 *NFPA 286: Standard Methods of Fire Test for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*
- 2.2.14 *UL 1715: Fire Test of Interior Finish Material*
- 2.2.15 *UL 263: Standard for Fire Tests of Building Construction and Materials*
- 2.2.16 *UL 723: Test for Surface Burning Characteristics of Building Materials*

3 PERFORMANCE EVALUATION

- 3.1 Xci CG (Class A), Xci Ply (Class A), Xci Foil (Class A), and Xci 286 were evaluated to determine:
 - 3.1.1 Performance for use in exterior walls of buildings of any height and of Type I-V construction in accordance with [IBC Section 2603.5](#) and [IRC Section R316.5.12](#).
 - 3.1.2 Performance in accordance with [UL 723](#) for flame spread and smoke-development index ratings in accordance with [IBC Section 2603.5.4](#) and [IRC Section R316.3](#).
 - 3.1.3 Performance for use without a thermal barrier in accordance with [IBC Section 2603.5.2](#) and [IRC Section R316.4](#).
 - 3.1.4 Performance with regard to the potential heat generated by the foam plastic insulating sheathing (FPIS) in accordance with [IBC Section 2603.5.3](#) and [IRC Section R316.4](#).
 - 3.1.5 Performance with regard to vertical and lateral fire propagation in accordance with [IBC Section 2603.5.5](#).
 - 3.1.6 Performance with regard to ignition in accordance with [IBC Section 2603.5.7](#).
 - 3.1.7 Performance for use in exterior walls of buildings as a water-resistive barrier (WRB) in accordance with [IBC Section 1403.2⁴](#) and [IRC Section R703.2](#).
 - 3.1.8 Performance for use in exterior walls of buildings as continuous insulation (ci) in accordance with [IECC Section C402.1.3](#).
 - 3.1.9 Performance in exterior walls of buildings as vapor retarding FPIS in accordance with [IBC Section 1404.3⁵](#).
 - 3.1.10 Performance for use in exterior walls of buildings as an air barrier in accordance with [IECC Section C402.4.1](#).
- 3.2 Other structural requirements in accordance with [IBC Chapter 16](#) are outside the scope of this TER.
- 3.3 Any code compliance issues not specifically addressed in this section are outside the scope of this TER.

⁴ [2015 IBC Section 1404.2](#)

⁵ [2015 IBC Section 1405.3](#)



3.4 Any engineering evaluation conducted for this TER was performed on the dates provided in this TER and within Dr.J's professional scope of work.

4 PRODUCT DESCRIPTION AND MATERIALS

4.1 Xci CG (Class A), Xci Ply (Class A), Xci Foil (Class A), and Xci 286 (all shown in Figure 1) are proprietary FPIS products.

4.1.1 Xci CG (Class A) is a polyisocyanurate insulation board adhered to coated glass facers.

4.1.2 Xci Ply (Class A) is a polyisocyanurate insulation board bonded to APA-TECO Exposure 1, fire treated plywood.

4.1.3 Xci Foil (Class A) and Xci 286 are composite boards consisting of a 25 psi closed cell polyisocyanurate insulation foam core, coated on both sides with a glass-backed aluminum foil facer (ASTM C1289 Type I, Class 1).

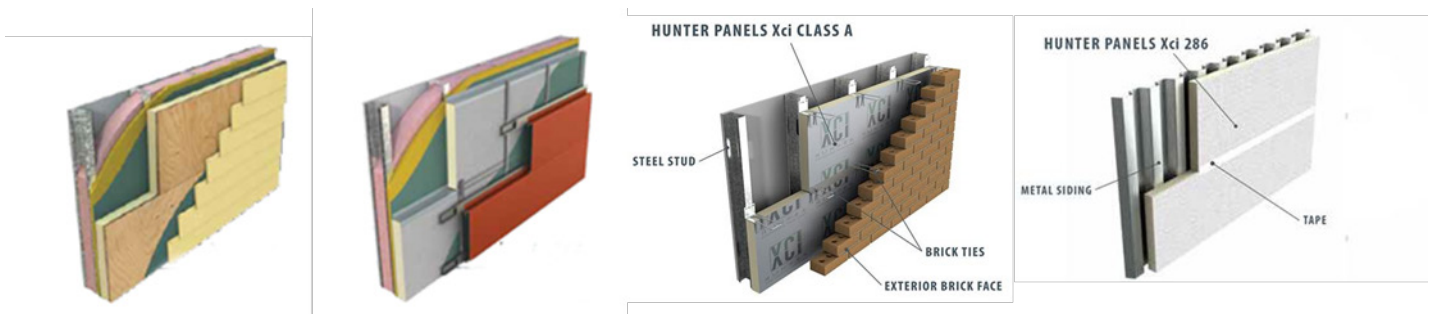


FIGURE 1. XCI CG (CLASS A), XCI PLY (CLASS A), XCI FOIL (CLASS A), AND XCI 286

4.2 Material Availability

4.2.1 Thickness:

4.2.1.1 Xci Ply (Class A): either a $\frac{5}{8}$ " or $\frac{3}{4}$ " fire treated plywood with 1" (25.4 mm) through 3.5" (88.9 mm) coated glass polyiso

4.2.1.2 Xci CG (Class A), Xci Foil (Class A), and Xci 286: 1" (25.4 mm) through 3.5" (88.9 mm)

4.2.2 Standard Product width: 48" (1219 mm)

4.2.3 Standard Length:

4.2.3.1 Xci Ply (Class A): 96" (2438 mm)

4.2.3.2 Xci CG (Class A), Xci Foil (Class A), and Xci 286: 96" (2438 mm), 120" (3048 mm), and 144" (3657 mm)

4.2.4 Custom widths, lengths, and thicknesses are available upon request.

5 APPLICATIONS

5.1 General

5.1.1 Xci CG (Class A), Xci Ply (Class A), Xci Foil (Class A), and Xci 286 are FPIS products complying with IBC Section 2603 and IRC Section R316.

5.1.2 Xci CG (Class A), Xci Ply (Class A), Xci Foil (Class A), and Xci 286 are used in exterior walls of buildings of any height and of Type I-V construction in accordance with IBC Section 2603.5 and IRC Section R316.5.12.

5.1.3 Environmental Product Declarations (EPD) for Xci CG (Class A), Xci Ply (Class A), Xci Foil (Class A), and Xci 286 are available at polyiso.org.

5.1.4 Where the application exceeds the limitations set forth herein, design shall be permitted in accordance with accepted engineering procedures, experience, and technical judgment.



5.2 Vapor-Retarding Insulated Sheathing

- 5.2.1 Xci Foil (Class A) and Xci 286 have a permeance rating of <1. Per [IBC Section 1404.3.2](#)⁶, only Class III vapor retarders shall be used on the interior side of walls framed with insulated sheathing with <1 perm installed on the exterior side of the framed wall. Water vapor permeance of Xci Foil (Class A) and Xci 286 is indicated in Table 1.

TABLE 1. XCI FOIL (CLASS A) AND XCI 286 WATER VAPOR PERMEANCE

Test Method	Water Vapor Permeance (grains/h*ft ² *in Hg) ¹
ASTM E96 A (Desiccant Method)	0.000
ASTM E96 B (Water Method)	0.009
1. Results for 1" thickness board	

5.3 Air Barrier

- 5.3.1 Xci 286 is an air barrier material and meets the requirements of [IECC Section C402.5.1.2.1](#) for use as part of an air barrier material and an air barrier assembly when installed in accordance with the manufacturer's installation instructions, this TER, and with all seams (including the top and bottom edges) taped.
- 5.3.2 Xci Foil (Class A) and Xci CG (Class A) meet the requirements of [IECC Section 402.5.1.2.2](#) for use as part of an air barrier assembly when installed in accordance with the manufacturer's installation instructions and this TER with all seams (including the top and bottom edges) taped. See Table 2.
- 5.3.2.1 As an alternative to the tape specified in Section 5.3.2, Xci Foil (286) sheathing joints and penetrations are permitted to be sealed with Hunter Panels Xci BarriBond Liquid Flashing and Detail Sealant.

TABLE 2. XCI FOIL (CLASS A), XCI CG (CLASS A), AND XCI 286 AIR BARRIER PROPERTIES

Test Method	Air Barrier Performance
ASTM E2178	≤0.00012 L/s.m ² @ 75 Pa [0.000024 CFM/ft ² @ 1.57 PSF]
ASTM E2357	≤ 0.020 L/s.m ² @ 75 Pa [0.0004 CFM/ft ² @ 1.57 PSF] ^{1, 2}
SI: 1 psf = 0.0479 kN/m ² , 1 psi = 0.00689 MPa 1. All seams and joints between boards shall be covered by 4" wide Carlisle® Coatings & Waterproofing Foil-Grip 1402 pressure sensitive foil-faced flashing tape. 2. All fenestrations and penetrations shall be sealed with 9" wide Carlisle® Coatings & Waterproofing Aluma-Grip 701 foil-faced self-adhering flashing tape with the top of the flashing sealed with a butyl-based sealant.	

5.4 Water-Resistive Barrier

- 5.4.1 Xci Foil (Class A) is approved for use as a WRB as prescribed in [IBC Section 1403.2](#)⁷ and [IRC Section R703.2](#)⁸ when installed on exterior walls as described in this section.
- 5.4.2 Xci Foil (Class A) shall be installed horizontally or vertically with board joints placed directly over exterior framing spaced a maximum of 24" (610 mm) o.c. The fasteners used to attach the board shall be installed in accordance with Section 6.
- 5.4.3 All seams and joints between boards shall be covered by 4" wide Carlisle® Coatings & Waterproofing Foil Grip 1402 pressure sensitive foil-faced flashing tape.
- 5.4.4 A separate WRB may also be provided. If a separate WRB method is used, taping of the sheathing joints is not required.

⁶ 2015 IBC Section 1405.3.2

⁷ 2015 IBC Section 1404.2

⁸ WRB is not required for detached accessory buildings.



5.4.5 Flashing of penetrations is required and shall comply with the applicable code.

5.5 Fire Safety Performance

5.5.1 Surface Burn Characteristics:

5.5.1.1 Xci CG (Class A), Xci Ply (Class A), Xci Foil (Class A), and Xci 286 were evaluated to assess performance with regard to flame spread and smoke-developed index in accordance with *ASTM E84* as shown in Table 3.

TABLE 3. SURFACE BURN CHARACTERISTICS^{1,2}

Product Name	Flame Spread Index	Smoke-Developed Index
Xci CG (Class A), Xci Ply (Class A), Xci Foil (Class A), and Xci 286	≤ 25	< 250
1. Foam core tested in accordance with <i>UL 723 (ASTM E84)</i> . Flame spread and smoke-developed indexes are shown for comparison purposes only and are not intended to represent the performance under actual fire conditions. 2. See also UL BRYX.R27090 certification.		

5.5.2 Ignition:

5.5.2.1 Xci CG (Class A), Xci Ply (Class A), Xci Foil (Class A), and Xci 286 were evaluated to assess performance with regard to ignition in accordance with *IBC Section 2603.5.7*. Xci CG (Class A), Xci Ply (Class A), Xci Foil (Class A), and Xci 286 comply with this section when the exterior side of the sheathing is protected with one of the following materials:

- 5.5.2.1.1 A thermal barrier complying with *IBC Section 2603.4*.
- 5.5.2.1.2 A minimum 1" (25.4 mm) thickness of concrete or masonry.
- 5.5.2.1.3 Glass fiber reinforced concrete panels with a minimum thickness of 3/8" (9.5 mm).
- 5.5.2.1.4 Metal faced panels having a minimum 0.019" (0.48 mm) thick aluminum or 0.016" (0.41 mm) thick corrosion resistant steel outer facings.
- 5.5.2.1.5 A minimum 7/8" (22.2 mm) thickness of stucco complying with *IBC Section 2510*.
- 5.5.2.1.6 A minimum 1/4" (0.4 mm) thickness of fiber cement siding complying with *IBC Sections 1404.16⁹* and *1404.16.1¹⁰* or *Section 1404.16.2¹¹*.
- 5.5.2.2 Fire resistance rated wall assemblies in accordance with *IBC Section 2603.5.1* tested per *ANSI/UL 263 (ASTM E119)* see UL CCVW.R38030.¹²

⁹ 2015 *IBC Section 1405.16*

¹⁰ 2015 *IBC Section 1405.16.1*

¹¹ 2015 *IBC Section 1405.16.2*

¹² Not evaluated by DrJ. Used only for reference.



5.5.3 **Potential Heat:**

5.5.3.1 Xci CG (Class A), Xci Ply (Class A), Xci Foil (Class A), and Xci 286 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 R316.5.7, as shown in Table 4.

TABLE 4. POTENTIAL HEAT

Product	Potential Heat (Btu/lb) ¹
Xci CG (Class A)	11,503
Xci Ply (Class A)	11,503
Xci Foil (Class A)	11,587
Xci 286	11,587
SI: 1 lb. = 4.45 N	
1. Tested in accordance with <i>NFPA 259</i> .	

5.5.4 **Vertical and Lateral Fire Propagation:**

5.5.4.1 Xci CG (Class A), Xci Ply (Class A), Xci Foil (Class A), and Xci 286 were tested to assess their performance with regard to vertical and lateral fire propagation in accordance with *NFPA 285* and IBC Section 2603.5.5.

5.5.4.2 Engineering analysis has also been conducted to assess substitution of other products within the approved wall assemblies.

5.5.4.3 The wall assemblies listed in Appendix A are approved for use in buildings of Type I-IV construction.

5.5.5 **Special Approval:**

5.5.5.1 Xci 286 up to 3½" (88.9 mm) thick has been tested on walls only or ceilings only to *NFPA 286* in accordance with IBC Section 2603.9¹³ and IRC Section 316.6 and met the criteria of IBC Section 803.1.1.¹⁴ Therefore, Xci 286 requires no thermal barrier or ignition barrier protection.

5.5.5.2 Xci 286 up to 3½" (88.9 mm) thick has been tested for use on walls and/or ceilings in attics and crawl spaces to *NFPA 286* in accordance with IBC Section 2603.9¹⁵ and IRC Section 316.6. Therefore, Xci 286 requires no ignition barrier protection in attics and crawl spaces.

5.5.5.3 Xci 286 up to 8" (203 mm) thick has been tested to *UL 1715* in accordance with IBC Section 2603.9¹⁶ and IRC Section 316.6 and met the requirements of the standard. Therefore, Xci 286 up to 8" thick is approved for use on ceilings and floors without a thermal barrier.

5.5.5.4 Xci 286 is not recommended for applications requiring an aesthetic or wear-resistant surface.

5.6 Where the application exceeds the limitations set forth herein, design shall be permitted in accordance with accepted engineering procedures, experience, and technical judgment.

¹³ 2012 IBC Section 2603.10

¹⁴ 2015 IBC Section 803.1.2

¹⁵ 2012 IBC Section 2603.10

¹⁶ 2012 IBC Section 2603.10



6 INSTALLATION

- 6.1 Installation shall comply with the manufacturer's installation instructions and this TER. In the event of a conflict between the manufacturer's installation instructions and this TER, the more restrictive shall govern.
- 6.2 *Installation Procedure*
- 6.2.1 Protect surrounding areas and surfaces from damage.
 - 6.2.2 If wall assembly design calls for WRB installed over the base wall, ensure that the WRB is one of those identified in Table 9 (Appendix A) and the WRB is installed correctly and in good condition before covering with FPIS.
 - 6.2.3 For installation of FPIS on interior, over air/water resistive barrier on base wall: ensure that the WRB is one of those identified in Table 9. *NFPA 285* Allowable WRB Materials (Appendix A) and the WRB is installed correctly and in good condition before covering with FPIS.
 - 6.2.4 FPIS shall not be applied over walls while they are vulnerable to water intrusion from above or behind.
 - 6.2.5 Do not block flashing, weeps, or other drainage paths with FPIS.
 - 6.2.6 Do not span expansion joints with FPIS.
 - 6.2.7 During installation, take precautions to minimize moisture intrusion behind insulation.
 - 6.2.8 Beginning at the base of the wall, apply horizontally using maximum board lengths to minimize number of joints.
 - 6.2.9 Offset FPIS board joints in neighboring rows a minimum of 6". Do not form four-corner intersections.
 - 6.2.10 Form a "corner lock" pattern by staggering vertical joints at inside and outside corners.
 - 6.2.11 FPIS may be applied vertically, as required.
 - 6.2.12 Pre-cut FPIS to fit openings and penetrations.
 - 6.2.13 Cut with a knife, using a square to guide the cut, or use a table saw.
 - 6.2.14 Abut all joints tightly and ensure an overall flush, level surface.
 - 6.2.15 Mechanically fasten using the fastening pattern as indicated.
 - 6.2.15.1 Space fasteners 12" o.c (305 mm) at the perimeter and 16" o.c. (406 mm) in the field.
 - 6.2.15.2 Set back perimeter fasteners $\frac{3}{8}$ " (9.5 mm) from board edges.
 - 6.2.15.3 Note for Exterior Application: Where Xci Foil (Class A) and Xci 286 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 (Class A) and Xci 286 attachment function shall be designed for this function. If the cladding attachment is 16" o.c. (406 mm) or closer and it tightly secures the insulation, no additional fastening or adhesive is required.
 - 6.2.15.4 Note for Interior Application: Where Xci Foil (Class A) and Xci 286 are installed by the same trade as the interior drywall, or in close cooperation with that trade, drywall attachment hardware can supplement or replace the insulation fasteners and insulation adhesive. Drywall fasteners fulfilling the Xci Foil (Class A) and Xci 286 attachment function shall be designed for this function. If the drywall attachment is 16" o.c. (406 mm) or closer and it tightly secures the insulation, no additional fastening or adhesive is required.



- 6.2.16 When an approved adhesive is used, periodically verify adhesion. Properly installed adhesively applied Xci Foil (Class A) and Xci 286 will cohesively break the adhesive while still wet and destroy the substrate when dry.
 - 6.2.16.1 Consult the detailed manufacturer's installation instructions for the proper adhesive pattern to maintain the drainage plane.
 - 6.2.16.2 When used in a *NFPA 285* approved assembly, adhesives must be one of those listed in the tables found in Appendix A.
- 6.2.17 Fill gaps greater than 1/8" (3 mm) between FPIS boards with expanding spray foam or butter edge of board with approved sealant and strike flush. Expanding spray foam may also be applied onto the FPIS board edges during installation.
- 6.2.18 Verify all materials are installed in accordance with current Hunter Panels published literature and local code requirements.
- 6.2.19 Additional information on the installation and detailing of Xci Foil (Class A) and Xci 286 can be found at hunterpanels.com.
- 6.3 *Xci Foil (Class A) and Xci 286 as an Air and Water-Resistive Barrier*
 - 6.3.1 When used in a *NFPA 285* approved assembly as an air/water resistive barrier, see also Section 5.4 and Table 9. *NFPA 285* Allowable WRB Materials in Appendix A.
 - 6.3.2 When used in a *NFPA 285* approved assembly as a WRB, see also Section 5.5 and Table 9 (Appendix A) with all notes.
 - 6.3.3 Use minimum 1" (25.4 mm) thickness Xci Foil (Class A) and Xci 286.
 - 6.3.4 Install directly over wood or steel studs or over exterior sheathing fastened to wood or steel studs.
 - 6.3.5 Fasten Xci Foil (Class A) and Xci 286 boards with corrosion-resistant screws or HeckMann Pos-I-Ties, either fitted with Thermal-Grip CI plastic washers by Rodenhouse or equivalent. Space fasteners 16" o.c. (406 mm) in the field and 12" o.c. (305 mm) at the perimeter.
 - 6.3.5.1 Other fastening used shall be installed 16" o.c. (406 mm) in the field and 12" o.c. (305 mm) at the perimeter. Other fastening shall be verified as air and water tight through *ASTM E2357* and *ASTM E331* testing, or it shall be sealed with caulk or flashing tape.
 - 6.3.6 Tape over board joints with 4" (102 mm) width Aluma-GRIP 1402 tape by CCW.
 - 6.3.7 Cover inside/outside corners with Aluma-GRIP 701 by CCW. Aluma-GRIP-701 shall bear 3" (76 mm) minimum onto each side of angle.
 - 6.3.8 Wrap window openings with Aluma-GRIP 701. Aluma-GRIP 701 shall wrap at least 3" (76 mm) onto wall and shall return far enough into the window opening to provide a continuous air/water seal to window frame.
 - 6.3.9 Flash pipe and duct penetrations through Xci Foil (Class A) and Xci 286 with Aluma-GRIP 701.
 - 6.3.10 Consult Hunter Panels details and instructions for complete information about installation of Xci Foil (Class A) and Xci 286 as an air and water-resistive barrier.
- 6.4 *Xci Foil (Class A) and Xci CG (Class A)*
 - 6.4.1 Refer to the manufacturer's installation instructions, in addition to this TER, for complete details and requirements.
 - 6.4.2 Cut with a knife using a square to guide the cut or use a table saw.
 - 6.4.3 Abut all joints tightly and ensure an overall flush, level surface.



- 6.4.4 Mechanically fasten using the fastening pattern as indicated.
 - 6.4.4.1 Space fasteners 12" o.c. (305 mm) at the perimeter and 16" o.c. (406 mm) in the field.
 - 6.4.4.2 Set back perimeter fasteners $\frac{3}{8}$ " (9.5 mm) from board edges.
 - 6.4.4.3 Note: where Xci Foil (Class A) or Xci CG (Class A) 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 (Class A) or Xci CG (Class A) attachment function shall be designed for this function. If the cladding attachment is 16" o.c. (406 mm) or closer and it tightly secures the insulation, no additional fastening or adhesive is required.
- 6.4.5 When adhesive is used, periodically verify adhesion. Properly installed adhesively-applied Xci Foil (Class A) or Xci CG (Class A) will cohesively break the adhesive while still wet and destroy the substrate when dry.
- 6.4.6 Consult the detailed manufacturer's installation instructions for the proper adhesive pattern to maintain the drainage plane.
- 6.5 *Xci Ply (Class A)*
 - 6.5.1 Refer to the manufacturer's installation instructions, in addition to this TER, for complete details and requirements.
 - 6.5.2 Provide separation of the edge of Xci Ply (Class A) from concrete at grade with pressure-treated lumber sill plate, sill gasket, or non-permeable flashing material.
 - 6.5.3 Begin at base of wall from firm, permanent support.
 - 6.5.4 Fasten Xci Ply (Class A) with proper fasteners and spacing to accommodate design. Fasten Xci Ply (Class A) to the structure using SIPs 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 (Class A) and the weight of the cladding for the project conditions.
 - 6.5.5 Allow a minimum $\frac{1}{8}$ " (3.2 mm) and a maximum $\frac{1}{4}$ " (6.4 mm) gap between Xci Ply (Class A) boards to accommodate hydric movement of wood. Fasten boards tightly to provide a flush, level surface.
 - 6.5.6 Apply WRB over plywood side of Xci Ply (Class A) according to WRB manufacturer's instructions.

7 TEST ENGINEERING SUBSTANTIATING DATA

- 7.1 Test reports and data supporting the following material properties and wall assembly performance:
 - 7.1.1 Flame spread and smoke developed ratings in accordance with *UL 723* by Underwriters Laboratories
 - 7.1.2 Fire performance criteria in accordance with *NFPA 285* by Intertek and Architectural Testing
 - 7.1.3 Fire performance criteria in accordance with *NFPA 286* by Intertek
 - 7.1.4 Fire performance criteria in accordance with *UL 1715* by Intertek
 - 7.1.5 Potential heat in accordance with *NFPA 259* by Intertek
 - 7.1.6 Thermal resistance as per *ASTM C518* according to *ASTM C1289* requirements
 - 7.1.7 Air barrier material in accordance with *ASTM E2178*
 - 7.1.8 Air barrier assembly in accordance with *ASTM E2357*
 - 7.1.9 Vapor impermeability in accordance with *ASTM E96* Method A and Method B
 - 7.1.10 Water-resistive barrier testing in accordance with *ASTM E331* by Intertek
- 7.2 Engineering analysis comparing the fire resistance properties of Xci Foil (Class A) and Xci 286 by Priest and Associates
- 7.3 Engineering analysis assessing the substitution of products within the approved *NFPA 285* tested wall assemblies by Priest and Associates



- 7.4 Engineering analysis comparing the fire resistance properties of Xci Foil, Xci CG, and Xci Ply by Priest and Associates
- 7.5 Engineering analysis assessing the substitution of products within the approved *NFPA 285* tested wall assemblies by Priest and Associates
- 7.6 Some information contained herein is the result of testing and/or data analysis by other sources which conform to *IBC Section 1703* and relevant [professional engineering law](#). DrJ relies on accurate data from these sources to perform engineering analysis. DrJ has reviewed and found the data provided by other professional sources to be credible.
- 7.7 Where appropriate, DrJ's analysis is based on design values that have been codified into law through codes and standards (e.g., *IBC*, *IRC*, *NDS*®, and *SDPWS*). This includes review of code provisions and any related test data that aids in comparative analysis or provides support for equivalency to an intended end-use application. Where the accuracy of design values provided herein is reliant upon the published properties of commodity materials (e.g., lumber, steel, and concrete), DrJ relies upon the grade mark, stamp, and/or design values provided by raw material suppliers to be accurate and conforming to the mechanical properties defined in the relevant material standard.

8 FINDINGS

- 8.1 When used and installed in accordance with this TER and the manufacturer's installation instructions, the product(s) listed in Section 1.1 are approved for the following:
 - 8.1.1 Xci CG (Class A), Xci Ply (Class A), Xci Foil (Class A), and Xci 286 are approved for use in exterior walls of buildings of any height of Type I-V construction in accordance with [IBC Section 2603.5](#) and [IRC Section R316.5.12](#).
 - 8.1.2 Xci CG (Class A), Xci Ply (Class A), Xci Foil (Class A), and Xci 286 are approved for use in wall assemblies meeting the requirements of *NFPA 285* testing when constructed in accordance with the tables in Appendix A.
 - 8.1.3 Xci CG (Class A), Xci Ply (Class A), Xci Foil (Class A), and Xci 286 described in this TER comply with, or are a suitable alternative to, the applicable sections of the codes listed in Section 2.
 - 8.1.4 Xci 286 up to 3½" (88.9 mm) thick has been tested on walls only or ceilings only to *NFPA 286*, in accordance with [IBC Section 2603.9](#) and [IRC Section 316.6](#), and met the criteria of [IBC Section 803.1.1](#).¹⁷ Therefore, Xci 286 may be left exposed and requires no thermal barrier or ignition barrier protection.
 - 8.1.5 Xci Foil (Class A) and Xci 286 are approved for use in exterior walls of buildings as a WRB in accordance with [IBC Section 1403.2](#)¹⁸ and [IRC Section R703.2](#) when constructed in accordance with Table 9 (Appendix A).
 - 8.1.6 Xci CG (Class A), Xci Foil (Class A), and Xci 286 are approved for use in exterior walls of buildings as an air barrier in accordance with [IECC Section C402.4.1](#) when constructed in accordance with the tables in Appendix A.

¹⁷ [2015 IBC Section 803.1.2](#)

¹⁸ [2015 IBC Section 1404.2](#)



8.2 IBC Section 104.11 (IRC Section R104.11 and IFC Section 104.9 are similar) states:

104.11 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *building official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code...Where the alternative material, design or method of construction is not *approved*, the *building official* shall respond in writing, stating the reasons the alternative was not *approved*.

8.3 This product has been evaluated in the context of the codes listed in Section 2 and is compliant with all known state and local building codes. Where there are known variations in state or local codes applicable to this TER, they are listed here.

8.3.1 No known variations

9 CONDITIONS OF USE

9.1 Xci CG (Class A), Xci Ply (Class A), Xci Foil (Class A), and Xci 286 are subject to the following conditions:

- 9.1.1 This TER and the installation instructions, when required by a code official, shall be submitted at the time of permit application.
 - 9.1.2 When the insulation boards are used in assemblies requiring compliance with *NFPA 285* and are installed on the exterior side of exterior walls, construction must be as described in Appendix A.
 - 9.1.3 When the insulation boards are used in assemblies requiring compliance with *NFPA 285* and are installed on the interior side of exterior walls, construction must be as described in Table 8 (Appendix A).
 - 9.1.4 Xci Ply (Class A) may be used as a nail base provided cladding attachments are designed in accordance with IRC Section R703.3.3 or an approved design. Xci CG (Class A), Xci Foil (Class A), and Xci 286 shall not be used as a nail base.
 - 9.1.5 FPIS shall not be used to resist lateral loads. Walls shall be braced by other materials in accordance with the applicable code, and the exterior wall covering shall be capable of resisting the full design wind pressure.
 - 9.1.6 When installed in areas where the probability of termite infestation is “very heavy,” the installation must meet the requirements of IBC Section 2603.8 and IRC Section 316.7.
 - 9.1.7 Xci CG (Class A), Xci Ply (Class A), Xci Foil (Class A), and Xci 286 are available in Montgomery, New York; Tooele, Utah; Terrell, Texas; Smithfield, Pennsylvania; Franklin Park, Illinois; Puyallup, Washington; and Lake City, Florida, and are manufactured in Smithfield, Pennsylvania; Franklin Park, Illinois; and Puyallup, Washington under a quality control program with quality control inspections in accordance with IBC Section 110.3.9¹⁹ and 110.3.10²⁰ and IRC Section R109.1.5.
 - 9.1.8 The wall assemblies listed in Appendix A are based on compliance to the fire provisions of the codes listed in Section 2. Consideration of wall assembly performance with regard to other attributes, such as water vapor control, condensation, and energy code requirements are outside the scope of this TER.
- 9.2 Where required by the *building official*, also known as the authority having jurisdiction (AHJ) in which the project is to be constructed, this TER and the installation instructions shall be submitted at the time of *permit* application.
- 9.3 Any generally accepted engineering calculations needed to show compliance with this TER shall be submitted to the AHJ for review and approval.

¹⁹ 2015 IBC Section 110.3.8

²⁰ 2015 IBC Section 110.3.9



- 9.4 Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed and/or by the Building Designer (e.g., owner or registered design professional).
- 9.5 At a minimum, this product shall be installed per Section 6 of this TER.
- 9.6 This product is manufactured under a third-party quality control program in accordance with IBC Section 104.4 and 110.4 and IRC Section R104.4 and R109.2.
- 9.7 The actual design, suitability, and use of this TER, for any particular building, is the responsibility of the owner or the owner's authorized agent. Therefore, the TER shall be reviewed for code compliance by the building official for acceptance.
- 9.8 The use of this TER is dependent on the manufacturer's in-plant QC, the ISO/IEC 17020 third-party quality assurance program and procedures, proper installation per the manufacturer's instructions, the building official's inspection, and any other code requirements that may apply to demonstrate and verify compliance with the applicable building code.

10 IDENTIFICATION

- 10.1 The product(s) listed in Section 1.1 are identified by a label on the board or packaging material bearing the manufacturer's name, product name, TER number, and other information to confirm code compliance.
- 10.2 Additional technical information can be found at www.hunterpanels.com.

11 REVIEW SCHEDULE

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



APPENDIX A

TABLE 5. NFPA 285 APPROVED WALL ASSEMBLIES WITH XCI FOIL (CLASS A) OR XCI 286 EXTERIOR INSULATION^{1,4}

Wall Component	Materials
Base Wall System Use either 1, 2, 3 or 4	<ol style="list-style-type: none"> 1. Cast concrete walls 2. CMU concrete walls 3. 25 gauge min. 3⁵/₈" (min.) steel studs spaced 24" o.c. (max.) <ol style="list-style-type: none"> a. 5/8" Type X gypsum wallboard interior b. Lateral bracing every 4' 4. FRTW (fire-retardant-treated wood) studs: min. nominal 2"x4" dimension, spaced 24" o.c. (max.) <ol style="list-style-type: none"> a. 5/8" Type X gypsum wallboard interior b. Bracing as required by code
Fire-Stopping at Floor Lines	<ol style="list-style-type: none"> 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 either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 or 11. Items 8, 9, 10 and 11 may only be used with exterior sheathing 2.	<ol style="list-style-type: none"> 1. None 2. 1½" (min.) of Carlisle® SPI SealTite PRO (up to full cavity thickness) 3. 1½" (min.) of BASF Walltite SPF (up to full cavity thickness) 4. Any noncombustible insulation per <i>ASTM E136</i> 5. Any mineral fiber (Board type Class A <i>ASTM E84</i> faced or unfaced) 6. Any fiberglass (Batt type Class A <i>ASTM E84</i> faced or unfaced) 7. Any foam plastic insulation (SPF or board type) that has been tested per <i>ASTM E1354</i> (at a min. of 20 kW/m² heat flux) and shown by analysis to be less flammable (improved T_{ign}, PK. HRR) than Covestro EcoBay CC or BASF Walltite 8. NCFI InsulBloc SPF (up to full cavity thickness) 9. Icynene MD-C-200v3 (Proseal) up to 5½" (only with ½" [min.] exterior gypsum sheathing) 10. SWD Urethane Quik-Shield 112 up to 6" (max.) stud cavities with an air gap not exceeding 2½" 11. 1½" (min.) Thermoseal 2000 (up to full cavity thickness)
Exterior Sheathing Use either 1, 2 or 3	<ol style="list-style-type: none"> 1. None (only with cavity insulation 1, 2, 3, 4, 5 or 6) 2. ½" or thicker exterior gypsum sheathing 3. ½" (min.) FRTW structural panels in Type III construction
Multi-Function Sheathing and WRB Products Use 1 or 2	<ol style="list-style-type: none"> 1. USG Securock® Exoair® 430 System – See note and Table 9 2. 5/8" Georgia Pacific DensElement, flashed with Prosoco R-Guard FastFlash on sheathing joints <p>Note: Item 1 or 2 replaces the exterior sheathings above. When either of these items are used, do not use exterior sheathings or WRB's on base wall surface in Table 9</p>
WRB Over Base Wall Surface	See Table 9
Exterior Insulation Use either 1 or 2 depending on cladding. Note: A construction which utilizes no exterior sheathing may not use spray foam cavity insulation	<ol style="list-style-type: none"> 1. 3½" thick (max.) Xci Foil (Class A) or Xci-286 for all claddings 2. 4" thick Xci Foil (Class A) or Xci-286 for claddings 1-6
WRB Over Exterior Insulation	See Table 9



Wall Component	Materials
<p>Exterior Cladding Use either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 or 17</p> <p>Item 7 may use any tested/approved installation technique.</p> <p>Items 8, 9, or 12 may use any standard installation technique.</p>	<ol style="list-style-type: none"> 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. (max.). 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 #12 in WRB Over Exterior Insulation (Table 9) can be used as a slip sheet between the WRB/external 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 open or non-open joint installation technique such as shiplap. 7. Any MCM that has passed <i>NFPA 285</i>. 8. Uninsulated sheet metal building panels including steel, copper, aluminum or zinc. 9. 1/4" (min.) uninsulated fiber-cement siding, or porcelain or ceramic tile mechanically attached. 10. Stone, porcelain, ceramic/aluminum honeycomb composite building panels that have successfully passed <i>NFPA 285</i> criteria. 11. Autoclaved-aerated-concrete (AAC) panels that have successfully passed <i>NFPA 285</i> criteria. 12. Terra Cotta Cladding – Any Rain-screen Terra Cotta (min. 1/2" thick) with ventilated shiplap. 13. 1/2" Stucco – Any one coat stucco (1/2" min.) that meets AC11 acceptance criteria or is approved for use in Type I-IV construction or has been tested per <i>NFPA 285</i> or stays in place when tested per <i>ASTM E119</i> (stucco exposed to fire) for at least 30 minutes. 14. Thin brick/cultured stone set in thin set adhesive and metal lath that has been tested to <i>ASTM E119</i> (brick exposed to furnace) and remains in place for a minimum of 30 minutes, or has passed a <i>NFPA 285</i> test. Minimum 3/4". For these systems that require a more durable WRB system, any building wrap or 15# felt that meets requirement #12 in WRB Over Exterior Insulation (Table 9) 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
<p>SI: 1 in = 25.4 mm</p> <ol style="list-style-type: none"> 1. The assemblies' combinations created herein and the various substitutions of products are based on testing and professional thermal engineering analysis. 2. Acceptance criteria for <i>ASTM E1354</i> testing have not been well established in the referenced building codes and foam sheathing related sections. The criteria stated here for substitution of products is based on testing and professional thermal engineering analysis. 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. 4. Use of 1 mm VM Zinc Hook Seam Flack Lock panels as an exterior cladding option is approved, provided the assembly meets the following: <ol style="list-style-type: none"> a. Interior sheathing min. 5/8" type X b. Framing min. 16 ga. Steel studs space 24" o.c. max. c. Any cavity insulation items 1-11 d. Exterior sheathing min. 5/8" Gypsum board e. WRB as allowed in Table 9 f. Exterior insulation min. 3" Xci Foil (Class A) g. Exterior support of 3/4" solid steel horizontal hat channels spaced 4' o.c., creating a 3/4" air gap (max) h. Exterior fastener base 3/4" FRT plywood i. Exterior WRB VaproShield RevealShield SA j. 20 ga. sheet steel installed in window header and jambs 	



TABLE 6. NFPA 285 APPROVED WALL ASSEMBLIES WITH XCI CG (CLASS A) EXTERIOR INSULATION^{1,4}

Wall Component	Materials
Base Wall System Use either 1, 2, 3 or 4	<ol style="list-style-type: none"> 1. Cast concrete walls 2. CMU concrete walls 3. 25- gauge min. 3⁵/₈" (min.) steel studs spaced 24" o.c. (max.) <ol style="list-style-type: none"> a. 5/8" Type X gypsum wallboard interior b. Lateral bracing every 4' 4. FRTW (fire-retardant-treated wood) studs: min. nominal 2"x4" dimension, spaced 24" o.c. (max.) <ol style="list-style-type: none"> a. 5/8" Type X gypsum wallboard interior b. Bracing as required by building code
Fire-Stopping at Floor Lines	<ol style="list-style-type: none"> 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 either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 or 11. Items 8, 9 and 10 may only be used with exterior sheathing 2.	<ol style="list-style-type: none"> 1. None 2. 1/2" (min.) of Carlisle® SPI SealTite PRO (up to full cavity thickness) 3. 1/2" (min.) of 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 min. of 20 kW/m² heat flux) and shown by analysis to be less flammable (improved T_{ign}, PK. HRR) than Covestro EcoBay CC or BASF Walltite 8. NCFI InsulBloc SPF (up to full cavity thickness) 9. Icynene MD-C-200v3 (Proseal) up to 5 1/2" (only with 1/2" [min.] exterior gypsum sheathing) 10. SWD Urethane Quik-Shield 112 up to 6" in 6" (max.) stud cavities with an air gap not exceeding 2 1/2" 11. 1/2" (min.) Thermosteal 2000 (up to full cavity thickness)
Exterior Sheathing Use either 1, 2 or 3	<ol style="list-style-type: none"> 1. None (only with claddings 1-6, and cavity insulation 1, 2, 3, 4, 5, 6, or 11). 2. 1/2" or thicker exterior gypsum sheathing 3. 1/2" (min.) FRTW structural panels in Type III construction
Multi-Function Sheathing & WRB Products Use 1 or 2	<ol style="list-style-type: none"> 1. USG Securock® Exoair® 430 System – See note and Table 9 2. 5/8" Georgia Pacific DensElement, flashed with Prosoco R-Guard FastFlash on sheathing joints. <p>Note: Item 1 or 2 replaces the exterior sheathings above. When either of these items are used, do not use exterior sheathings or WRB's on base wall surface in Table 9.</p>
WRB Over Base Wall Surface	See Table 9
Exterior Insulation Use either 1 or 2 depending on cladding.	<ol style="list-style-type: none"> 1. 3 1/2" thick (max.) Xci CG or Xci CG (Class A) for all claddings. 2. 4" thick (max.) Xci CG or Xci CG (Class A) for claddings 1-6.
WRB Over Exterior Insulation	See Table 9
Exterior Cladding Use either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 or 17 Item 7 may use any tested/approved installation technique.	<ol style="list-style-type: none"> 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. (max.) 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 #12 in WRB Over Exterior Insulation (Table 9) can be used as a slip sheet between the WRB/external 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.



<p>Items 8, 9, or 12 may use any standard installation technique.</p>	<ol style="list-style-type: none"> 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 MCM that has passed <i>NFPA 285</i>. 8. Uninsulated sheet metal building panels including steel, copper, aluminum (or zinc only with Xci CG [Class A]) 9. 1/4" (min.) uninsulated fiber-cement siding, or porcelain or ceramic tile mechanically attached. 10. Stone, porcelain, ceramic/aluminum honeycomb composite building panels that have successfully passed <i>NFPA 285</i> criteria. 11. Autoclaved-aerated-concrete (AAC) panels that have successfully passed <i>NFPA 285</i> criteria. 12. Terra Cotta Cladding – Any Rain-screen Terra Cotta (min. 1/2" thick) with ventilated shiplap. 13. 1/2" Stucco – Any one coat stucco (1/2" min.) that meets AC11 acceptance criteria or is approved for use in Type I-IV construction or has been tested per <i>NFPA 285</i> or stays in place when tested per <i>ASTM E119</i> (stucco exposed to fire) for at least 30 minutes. 14. Thin brick/cultured stone set in thin set adhesive and metal lath that has been tested to <i>ASTM E119</i> (brick exposed to furnace) and remains in place for a minimum of 30 minutes, or has passed a <i>NFPA 285</i> test. Minimum 3/4". For these systems that require a more durable WRB system, any building wrap or 15# felt that meets requirement #12 in WRB Over Exterior Insulation (Table 9) 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
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<p>SI: 1 in = 25.4 mm</p> <ol style="list-style-type: none"> 1. The assemblies' combinations created herein and the various substitutions of products are based on testing and professional thermal engineering analysis. 2. Acceptance criteria for <i>ASTM E1354</i> testing have not been well established in the referenced building codes and foam sheathing related sections. The criteria stated here for substitution of products is based on testing and professional thermal engineering analysis. 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. 4. Use of 1 mm VM Zinc Hook Seam Flack Lock panels as an exterior cladding option is approved, provided the assembly meets the following: <ol style="list-style-type: none"> a. Interior sheathing min. 5/8" type X b. Framing min. 16 ga. Steel studs space 24" o.c. max. c. Any cavity insulation items 1-11 d. Exterior sheathing min. 5/8" Gypsum board e. WRB as allowed in Table 9 f. Exterior insulation min. 3" Xci CG (Class A) g. Exterior support of 3/4" solid steel horizontal hat channels spaced 4' o.c., creating a 3/4" air gap (max) h. Exterior fastener base 3/4" FRT plywood i. Exterior WRB VaproShield RevealShield SA j. 20 ga. sheet steel installed in window header and jambs



TABLE 7. NFPA 285 APPROVED WALL ASSEMBLIES WITH XCI PLY (CLASS A) EXTERIOR INSULATION^{1,4}

Wall Component	Materials
Base Wall System Use either 1, 2, 3 or 4	<ol style="list-style-type: none"> 1. Cast concrete walls 2. CMU concrete walls 3. 25 gauge min. 3⁵/₈" (min.) steel studs spaced 24" o.c. (max.) <ol style="list-style-type: none"> a. 5⁵/₈" Type X gypsum wallboard interior b. Lateral bracing every 4' 4. FRTW (fire-retardant-treated wood) studs: min. nominal 2"x4" dimension, spaced 24" o.c. (max.) <ol style="list-style-type: none"> a. 5⁵/₈" Type X gypsum wallboard interior b. Bracing as required by code
Fire-Stopping at Floor Lines	<ol style="list-style-type: none"> 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 either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 or 11. Items 3, 8, 9, 10 and 11 may only be used with exterior sheathing 2.	<ol style="list-style-type: none"> 1. None 2. 1¹/₂" (min.) of Carlisle® SPI SealTite PRO (up to full cavity thickness) 3. 1¹/₂" (min.) of 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 min. of 20 kW/m² heat flux) and shown by analysis to be less flammable (improved T_{ign}, PK. HRR) than Covestro EcoBay CC or BASF Walltite 8. NCFI InsulBloc SPF (up to full cavity thickness) 9. Icynene MD-C-200v3 (Proseal) up to 5¹/₂" (only with 1/2" [min.] exterior gypsum sheathing) 10. SWD Urethane Quik-Shield 112 up to 6" in 6" (max.) stud cavities with an air gap not exceeding 2¹/₂" 11. 1¹/₂" (min.) Thermosteal 2000 (up to full cavity thickness)
Exterior Sheathing Use either 1, 2 or 3	<ol style="list-style-type: none"> 1. None (only with cavity insulation 1, 2, 4, 5 or 6). Also see note for Cavity Insulation 2. 1/2" or thicker exterior gypsum sheathing 3. 1/2" (min.) FRTW structural panels in Type III construction.
Multi-Function Sheathing and WRB Products Use 1 or 2	<ol style="list-style-type: none"> 1. USG Securock® Exoair® 430 System – See note and Table 9. 2. 5/8" Georgia Pacific DensElement, flashed with Prosoco R-Guard FastFlash on sheathing joints. <p>Note: Item 1 or 2 replaces the exterior sheathings above. When either of these items are used, do not use exterior sheathings or WRB's on base wall surface Table 9.</p>
WRB Over Base Wall Surface	See Table 9
Exterior Insulation Use either 1 or 2 depending on cladding.	<ol style="list-style-type: none"> 1. 4¹/₄" thick (max.) Xci Ply (Class A) (3¹/₂" foam max., 3/4" FR Plywood max.) with all claddings. 2. 4³/₄" thick (max.) Xci Ply (Class A) (4" foam max., 3/4" FR Plywood max.) may be used with claddings 1-6.
WRB Over Exterior Insulation	See Table 9



Wall Component	Materials
<p>Exterior Cladding Use either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 or 17</p> <p>Item 9 may use any tested/approved installation technique.</p> <p>Items 10, 11 or 14 may use any standard installation technique.</p>	<ol style="list-style-type: none"> 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. (max.) 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 #12 in WRB Over Exterior Insulation (Table 9) can be used as a slip sheet between the WRB/external 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 open or 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 <i>ASTM E119</i> (brick exposed to furnace) and remains in place for a minimum of 30 minutes, or has passed a <i>NFPA 285</i> test. Minimum 3/4". For these systems that require a more durable WRB system, any building wrap or 15# felt that meets requirement #12 in WRB Over Exterior Insulation (Table 9) 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 <i>NFPA 285</i>. 10. Uninsulated sheet metal building panels including steel, copper, aluminum (or zinc only with Xci Ply [Class A]) 11. 1/4" (min.) uninsulated fiber-cement siding, or porcelain or ceramic tile mechanically attached. 12. Stone, porcelain, ceramic/aluminum honeycomb composite building panels that have successfully passed <i>NFPA 285</i> criteria. 13. Autoclaved-aerated-concrete (AAC) panels that have successfully passed <i>NFPA 285</i> criteria. 14. Terra Cotta Cladding – Any Rain-screen Terra Cotta (min. 1/2" thick) with ventilated shiplap. 15. 1/2" Stucco – Any one coat stucco (1/2" min.) that meets AC11 acceptance criteria or is approved for use in Type I-IV construction or has been tested per <i>NFPA 285</i> or stays in place when tested per <i>ASTM E119</i> (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 – minimum 1/4" thick using any standard installation technique
<p>SI: 1 in = 25.4 mm</p> <ol style="list-style-type: none"> 1. The assemblies' combinations created herein and the various substitutions of products are based on testing and professional thermal engineering analysis. 2. Acceptance criteria for <i>ASTM E1354</i> testing have not been well established in the referenced building codes and foam sheathing related sections. The criteria stated here for substitution of products is based on testing and professional thermal engineering analysis. 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 8. *NFPA 285* APPROVED MASS WALL ASSEMBLIES WITH XCI AS INTERIOR INSULATION¹

Wall Component	Materials
Base Wall System Use either 1, or 2	<ol style="list-style-type: none"> 1. Cast concrete walls (min. 2" thick) 2. CMU concrete walls (min. 4" thick)
Exterior Coating Use either 1, 2, 3 or 4	<ol style="list-style-type: none"> 1. Portland cement or lime stucco 2. Any <i>ASTM E84</i> Class A Paint or Elastomeric Coating 3. Any <i>ASTM E84</i> Class A Clear Sealer 4. None
Air/Vapor Barrier Membrane Position 1 Over Base Wall Interior Note: Some WRBs are only allowed with specific systems.	See Table 9 - WRB over Base Wall Surface.
Continuous Insulation Use 1, 2 or 3	<ol style="list-style-type: none"> 1. Xci Foil (Class A) (or Xci-286), 3¹/₂" thick (max.) 2. Xci CG (Class A) or Xci CG, 3¹/₂" thick (max.) 3. Xci Foil, 3¹/₂" thick (max.)
Air/Vapor Barrier Membrane Position 2 Over Insulation Note: Some WRB's are only allowed with specific systems	<p>See Table 9 - WRB over Base Wall Surface.</p> <p>Note: Insulation Joints may be taped with Foil-Grip 1402, 4" width (max.)</p>
Interior Cladding	<ol style="list-style-type: none"> 1. 5/8" type X interior gypsum sheathing installed directly over the insulation or installed over metal hat or Z furring, max. 2" depth air gap. If an air gap is created, fire blocking per <i>IBC</i> Section 718 should be installed.
<p>SI: 1 in = 25.4 mm</p> <ol style="list-style-type: none"> 1. The assemblies' combinations created herein and the various substitutions of products are based on testing and professional thermal engineering analysis. 2. Position 1 – Air vapor barrier installed directly on interior side of the base wall system. 3. Position 2 – Air vapor barrier installed over continuous insulation on interior side of the wall assembly. 4. CCW Membrane used in position 1 or 2, not both. 5. Xci Foil (Class A) (or Xci-286) insulation can be tacked in place with CAV-Grip or Travel-Tack during installation. Follow instructions on product data sheet. 	



TABLE 9. NFPA 285 ALLOWABLE WRB MATERIALS

Wall Component	Materials
<p>WRB Over Base Wall Surface Use either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 or 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25 or 26.</p> <p>Note: Some WRBs are only allowed with specific systems.</p> <p>Item 24 (Securock® Exoair® 430) or 25 (DensElement w/ FastFlash) replaces the exterior sheathings in Tables 5-8. When either of these items are used, do not use exterior sheathings listed in Tables 5-8 or WRB's on base wall surface in this table.</p>	<ol style="list-style-type: none"> 1. None 2. Carlisle® Fire Resist 705 RS, Fire Resist Barrithane VP, Fire Resist 705 VP, Fire Resist 705 FR-A, 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. CCW-705 (with 702 LV, 702 WB, Cav-Grip, Low VOC Travel-Tack, or 702 adhesives may) be used with Xci Foil (Class A) (or Xci 286), or unfaced noncombustible insulation and cladding options 1-6 (Table 3) 4. GE Momentive SEC 2500 SilShield, Elemax 2600 5. VaproShield Wrapshield SA, RevealShield 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. The following may only be used with claddings 1-6 - Perm-A-Barrier® NPL 10, Perm-A-Barrier® VPL 50. 7. StoGuard Vaporseal 8. 3M 3015 (with Hold Fast 70 adhesive @ 6 mils) 9. Henry Air-Bloc® 17MR, 21S, 31MR, 32MR (only with Xci-Ply [Class A]), 33MR, Blueskin SA (only with Xci Ply [Class A] and claddings 1-6), Air-Bloc® 16MR, Blueskin VP 160. 10. Tyvek CommercialWrap or CommercialWrap D, Fluid Applied WB (only with Xci Ply [Class A] or Xci Foil [Class A]). 11. PolyGuard Spray-N-Roll (STPE), Air Lok Sheet UV400NP, Air Lok Flex VP, FlexGuard, Air Lok Flex, Air Lok Sheet 400 NP (Only with Cladding 1-6) (Table 3) 12. Prosoco R-Guard Cat 5, R-Guard Cat 5 Rainscreen, R-Guard VB or R-Guard Spray Wrap MVP 13. Dryvit Backstop NT 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, Delta Stratus SA 16. Any WRB that has been tested per ASTM E1354 (at a minimum of 20 kW/m² heat flux) and shown by analysis to be less flammable (improved T_{ign}, Pk. HRR) than those listed above 17. BASF Enershield HP or Enershield I 18. Soprema Sopraseal Stick VP, Soprasolin HD, LM 204 VP, Stick 1100T with Elastacool 600c Primer (for use with Xci-CG, Xci-CG [Class A]), Xci Foil [Class A], Xci-Ply or Xci-ply [Class A]) 19. Pecora XL Perm Ultra VP 20. Siga Majvest or Majvest 500 SA 21. Sto Gold Coat or Emerald Coat 22. Tremco ExoAir 230 and ExoAir 130 23. Fortifiber Building Systems Group WeatherSmart Housewrap, WeatherSmart Drainable, WeatherSmart Commercial or Super Jumbo Tex 60 24. USG Securock® Exoair® 430 System – see note on left and Air/Vapor System sections in Tables 5-8. 25. 5/8" Georgia Pacific DenElement, flashed with Prosoco R-Guard FastFlash on sheathing joints. 26. Dow Corning Dowsil DefendAir200 (or LT version) or DefendAir 200C (Charcoal) 27. Hohmann & Barnard Enviro Barrier and Enviro Barrier VP 28. STS FW100 or FW100A
<p>WRB Over Exterior Insulation Use either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 or 20</p> <p>Note: Some WRB's are only allowed with specific systems</p>	<ol style="list-style-type: none"> 1. None 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 NP 3. GE Momentive SEC 2500 SilShield, Elemax 2600 4. VaproShield WrapShield SA, RevealShield 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, 21S, 31MR, Blueskin® VP160 (only with Xci Ply [Class A]), Air-Bloc® 33MR and 16MR. 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 cladding listed or over the other Xci foams listed with claddings 1-6) (Table 3)



Wall Component	Materials
	<ol style="list-style-type: none"> 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/m² 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 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
<p>SI: 1 in. = 25.4 mm</p>	<ol style="list-style-type: none"> 1. CCW LM 800 XL adhesive applied discontinuously at a rate of 3/8" x 3" dabs, 16" o.c. may be used to adhere exterior insulation to WRB over sheathing, concrete or CMU for those applications requiring this adhesive to be used. 2. The following may be used as gap filler between insulation panels: FOMO HandiFoam FireBlock and TVM FireBlock. 3. CAV-Grip™ or Low VOC Travel Tack may be used as an adhesive (application rate as per mfg. instructions) to attach exterior insulation panels to the WRB surface. 4. The following can be used with Fire Resist Barritech NP/VP (of VP LT) for detailing window openings, inside/outside corners, transitions, terminations and penetrations: <ol style="list-style-type: none"> a. Aluma-GRIP 701 or Fire Resist 705 FR-A with any of these contact adhesives as surface prep: CCW-702, CCW-702 LV, CCW-702 WB, CAV-Grip, Low VOC Travel Tack. b. CCW LiquiFiber-W imbedded in Fire Resist Barritech NP/VP (or VP LT) c. CCW DCH Reinforcing Fabric imbedded in Fire Resist Barritech NP/VP 5. The following may be used for detailing maximum 1/4" width exterior gypsum sheathing joints on the base wall assembly with the Fire Resist Barritech NP/VP (or VP LT) membrane: <ol style="list-style-type: none"> a. CCW LM 800 XL or other approved (less flammable than LM 800 XL) polyurethane or latex sealant. Sealant fills sheathing joint, and has a maximum 1" width x 3/8" thickness profile over sheathing joint. Caulking shall be covered with 40 mil dry thickness of Fire Resist Barritech NP/VP (or VP LT). b. 4" width maximum CCW DCH Reinforcing Fabric centered over joint and imbedded in Fire Resist Barritech NP/VP (or VP LT). c. Maximum 4" wide, self-adhered flashing tap centered over joint. Gypsum sheathing surface may be prepared with any of these contact adhesives to improve bond of the flashing tape: CCW-702, CCW-702 LV, CCW-702 WB, CAV-Grip, Low VOC Travel Tack. Flashing tape shall be covered with 40 mil dry thickness of Fire Resist Barritech NP/VP (or VP LT). The following flashings tapes are allowed: <ol style="list-style-type: none"> i. Alum-GRIP-701 ii. Fire Resist 705 FR-A iii. Foil-GRIP 1402 iv. Barritape 6. CCW Barribond may be used in the following applications: <ol style="list-style-type: none"> a. As a detail sealant with all CCW membranes (small discontinuous quantities - 1" width x 40 mil ribbon) b. As a liquid flashing (wrapping rough opening and corners) in Barritech VP and Barritech NP systems (40 mil thickness, 3" onto wall, all the way into rough opening, 40 mil thick 3" onto each side of corners). c. As a liquid flashing (wrapping rough opening) in 705 VP systems (40 mil thickness, 3" onto wall, all the way into rough opening). d. As an insulation adhesive (alternative to LM 800 XL) for attaching Xci-Foil, Xci-CG or Xci-CG (Class A) or Xci-Foil (Class A) or Xci-286. e. As an insulation adhesive (alternative to LM 800 XL) for attaching Xci-Foil, Xci-CG and Xci-Class A (or Xci-286).