



**CERTIFICATION**



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## **Technical Evaluation Report**

**TER 1407-02**

**R2+ SHEATHE**

Air Barrier, Water-Resistive Barrier &  
Fire Performance in Exterior & Interior  
Walls of Buildings of Type I-IV  
Construction

**Carlisle Coatings &  
Waterproofing Incorporated  
(CCW)**

**Product:**

**R2+ SHEATHE**

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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 PRODUCT EVALUATED<sup>1</sup>

1.1 R2+ SHEATHE

2 APPLICABLE CODES AND STANDARDS<sup>2,3</sup>

2.1 Codes

2.1.1 *IBC—12, 15, 18: International Building Code®*

2.1.2 *IECC— 12, 15, 18: International Energy Conservation Code (IECC)*

2.1.3 *IRC—12, 15, 18: International Residential 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*

<sup>1</sup> Building codes require data from valid research reports be obtained from approved sources. An approved agency, which is an approved source, is defined as "an established and recognized agency that is regularly engaged in...furnishing product certification where such agency has been approved..." Being approved, defined as "acceptable to the building official," is accomplished via accreditation using ISO/IEC 17065 evaluation procedures meeting code requirements of independence, adequate equipment, and experienced personnel. DrJ is an ISO/IEC 17065 ANSI-Accredited Product Certification Body - Accreditation #1131.

Through ANSI accreditation, DrJ certification can be used to obtain product approval in any country that is an IAF MLA Signatory and covered by an IAF MLA Evaluation per the Purpose of the MLA - "certified once, accepted everywhere." Manufacturers can go to jurisdictions in any IAF MLA Signatory Country and have their products readily approved by authorities having jurisdiction using DrJ's ANSI accreditation.

For more information on any of these topics or our mission, product evaluation policies, product approval process, and engineering law, see [drjcertification.org](http://drjcertification.org).

<sup>2</sup> 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. As required by code, where this TER is not approved, the building official shall respond in writing stating the reasons this TER was not approved. For any variations in state and local codes, see Section 8.

<sup>3</sup> 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 750C*
- 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 Nonload-bearing Wall Assemblies Containing Combustible Components*
- 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 263: Standard for Fire Tests of Building Construction and Materials*
- 2.2.15 *UL 723: Test for Surface Burning Characteristics of Building Materials*

### 3 PERFORMANCE EVALUATION

3.1 R2+ SHEATHE was evaluated to determine:

- 3.1.1 Performance for use in exterior walls of buildings of any height and of Type I-IV construction in accordance with IBC Section 2603.5.
  - 3.1.2 Performance in accordance with *UL 723* for flame spread and smoke development ratings in accordance with IBC Section 2603.5.4.
  - 3.1.3 Performance for use without a thermal barrier in accordance with IBC Section 2603.5.2.
  - 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.
  - 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 1403.2<sup>4</sup>.
  - 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 1404.3<sup>5</sup>.
  - 3.1.10 Performance for use in exterior walls of buildings as an air barrier in accordance with IECC Section C402.5.1<sup>6</sup>.
- 3.2 Wind pressure resistance and other structural requirements in accordance with IBC Chapter 16 is outside the scope of this evaluation.

<sup>4</sup> 2015 IBC Section 1404.2

<sup>5</sup> 2015 IBC Section 1405.3

<sup>6</sup> 2012 IECC Section C402.4.1

- 3.3 Any code compliance issues not specifically addressed in this section are outside the scope of this TER.
- 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 R2+ SHEATHE (pictured in Figure 1) is a proprietary FPIS product.
  - 4.1.1 R2+ SHEATHE is a composite board consisting of a 25 psi closed cell polyisocyanurate foam core, coated on both sides with a glass-backed aluminum foil facer (ASTM C1289 Type I, Class 1).

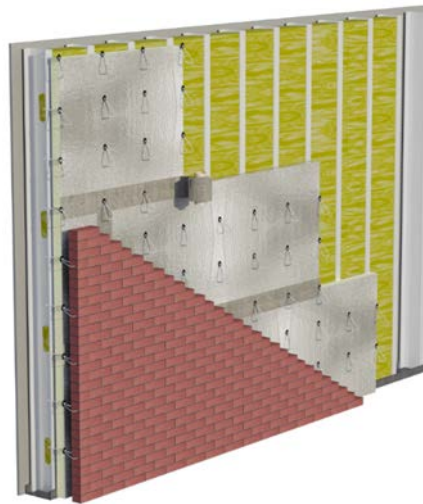


FIGURE 1. R2+ SHEATHE

#### 4.2 Material Availability

- 4.2.1 Thickness: 1" (25.4 mm) through 3.5" (88.9 mm)
- 4.2.2 Standard product width: 48" (1219 mm)
- 4.2.3 Standard length: 96" (2438 mm), 120" (3048 mm) and 144" (3657 mm)
- 4.2.4 Custom widths, lengths and thicknesses available are upon request.

#### 5 APPLICATIONS

##### 5.1 General

- 5.1.1 R2+ SHEATHE is a FPIS product complying with IBC Section 2603.
- 5.1.2 R2+ SHEATHE is used in exterior walls of buildings of any height and of Type I-IV construction in accordance with IBC Section 2603.5.
- 5.1.3 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 R2+ SHEATHE has a permeance rating of <1. Per IBC Section 1404.3.2<sup>7</sup>, 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 R2+ SHEATHE is indicated in Table 1.

TABLE 1. R2+ SHEATHE WATER VAPOR PERMEANCE

Test Method	Water Vapor Permeance (grains/h*ft <sup>2</sup> *in Hg) <sup>1</sup>
ASTM E96 A (Desiccant Method)	0.000
ASTM E96 B (Water Method)	0.009

SI: 1 in = 25.4 mm  
1. Results for 1" board thickness

5.3 Air Barrier

5.3.1 R2+ SHEATHE meets the requirements of IECC Section C402.5.1<sup>8</sup> for use as an air barrier material and 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.

TABLE 2. R2+ SHEATHE AIR BARRIER PROPERTIES

Test Method	Air Barrier Property
ASTM E2178	≤0.0000 L/s.m <sup>2</sup> @ 75 Pa [0.0000 CFM/ft <sup>2</sup> @ 1.57 PSF]
ASTM E2357	≤ 0.2 L/s.m <sup>2</sup> @ 75 Pa [0.04 CFM/ft <sup>2</sup> @ 1.57 PSF] <sup>1, 2</sup>

SI: 1 in = 25.4 mm, 1 psf = 0.0479 kN/m<sup>2</sup>, 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 butyl-based sealant.

5.4 Water-Resistive Barrier

- 5.4.1 R2+ SHEATHE may be used as a WRB as prescribed in IBC Section 1403.2<sup>9</sup> and IRC Section R703.2<sup>10</sup>, when installed on exterior walls as described in this section.
- 5.4.2 R2+ SHEATHE 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.
- 5.4.5 Flashing of penetrations is required and shall comply with the applicable code.

<sup>7</sup> 2015 IBC Section 1405.3.2

<sup>8</sup> 2012 IECC Section C402.4.1

<sup>9</sup> 2015 IBC Section 1404.2

<sup>10</sup> WRB is not required for detached accessory buildings.

5.5 Fire Safety Performance

5.5.1 Surface Burn Characteristics:

5.5.1.1 R2+ SHEATHE was evaluated to assess performance with regard to the flame spread and smoke developed index in accordance with *ASTM E84* as shown in Table 3.

TABLE 3. FIRE PERFORMANCE OF R2+ SHEATHE<sup>1,2</sup>

Product Name	Flame Spread Index	Smoke-Developed Index
R2+ SHEATHE	≤ 25	< 250
1. Foam core tested in accordance with <i>UL 723 (ASTM 84)</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 <i>UL BRYXR38030</i> certification.		

5.5.2 Ignition:

5.5.2.1 R2+ SHEATHE was evaluated to assess performance with regard to ignition in accordance with *IBC Section 2603.5.7*.

5.5.2.2 R2+ SHEATHE complies with this section, when the exterior side of the sheathing is protected with one of the following materials:

5.5.2.2.1 A thermal barrier complying with *IBC Section 2603.4*.

5.5.2.2.2 A minimum 1" (25.4 mm) thickness of concrete or masonry.

5.5.2.2.3 Glass fiber reinforced concrete panels. Minimum thickness of 3/8" (9.5 mm).

5.5.2.2.4 Metal faced panels having a minimum 0.019 inch (0.48mm) thick aluminum or 0.016" (0.41mm) thick corrosion resistant steel outer facings.

5.5.2.2.5 A minimum 3/8" (22.2mm) thickness of stucco complying with *IBC Section 2510*.

5.5.2.2.6 A minimum 1/4" (6.35 mm) thickness of fiber cement siding complying with *IBC Sections 1404.16<sup>11</sup>* and *1404.16.1<sup>12</sup>* or *1404.16.2<sup>13</sup>*.

5.5.2.3 Fire resistance rated wall assemblies in accordance with *IBC Section 2603.5.1* tested per *ANSI/UL 263 (ASTM E119)* see *UL CCVW.R38030<sup>14</sup>*.

5.5.3 Potential Heat:

5.5.3.1 R2+ SHEATHE was tested in accordance with *NFPA 259* to assess the potential heat generated by the FPIS in accordance with *IBC Section 2603.5.3*, as shown in Table 4.

TABLE 4. POTENTIAL HEAT OF R2+ SHEATHE

Product	Potential Heat (Btu/lb) <sup>1</sup>
R2+ SHEATHE	11,587
SI: 1 lb = 4.45 N 1. Tested in accordance with <i>NFPA 259</i> .	

<sup>11</sup> *2015 IBC Section 1405.16*

<sup>12</sup> *2015 IBC Section 1405.16.1*

<sup>13</sup> *2015 IBC Section 1405.16.2*

<sup>14</sup> Not evaluated by DrJ. Used only for reference.

5.5.4 *Vertical and Lateral Fire Propagation:*

- 5.5.4.1 R2+ SHEATHE was tested to assess its 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 Table 5 and Table 6 are approved for use in building of Type I-IV construction.

TABLE 5. APPROVED *NFPA 285* ASSEMBLIES WITH R2+ SHEATHE EXTERIOR INSULATION<sup>1</sup>

Wall Component	Materials
<b>Base Wall System</b> Use one Option: 1, 2, 3 or 4	1. Cast concrete walls 2. CMU concrete walls 3. 25-gauge min. 3 <sup>5</sup> / <sub>8</sub> " (min.) steel studs spaced 24" o.c. (max.) <ul style="list-style-type: none"> <li>a. 5/8" Type X gypsum wallboard interior</li> <li>b. Lateral bracing every 4'</li> </ul> 4. FRTW (fire-retardant-treated wood) studs: min. nominal 2x4 dimension, spaced 24" o.c. (max.) <ul style="list-style-type: none"> <li>a. 5/8" Type X gypsum wallboard interior</li> <li>b. Bracing as required by building code</li> </ul>
<b>Fire-Stopping at Floor Lines</b>	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.
<b>Cavity Insulation</b> 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.	1. None 2. 1½" (min.) of Covestro EcoBay CC SPF (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/m <sup>2</sup> heat flux) and shown by analysis to be less flammable (improved T <sub>ign</sub> , 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 inches (only with ½ in. [min.] exterior gypsum sheathing) 10. SWD Urethane Quik-Shiled 112 up to 6 inch (max.) stud cavities with an air gap not exceeding 2½" 11. 1½" (min.) Thermosteal 2000 (up to full cavity thickness)
<b>Exterior Sheathing</b> Use either 1, 2 or 3	1. None (only with cavity insulation 1, 4, 5 or 6) 2. ½" or thicker exterior gypsum sheathing 3. ½" (min.) FRTW structural panels in Type III construction
<b>WRB Over Base Wall Surface</b>	See Table 7
<b>Exterior Insulation</b>	1. 3½"-thick (max.) R2+ SHEATHE
<b>WRB Over Exterior Insulation</b>	See Table 7



Wall Component	Materials
<p><b>Exterior Cladding</b> 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"> <li>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.).</li> <li>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 #9 in WRB Over Exterior Insulation (<b>Table 7</b>) can be used as a slip sheet between the WRB/external insulation and the lath.</li> <li>3. Limestone – Minimum 2" thick using any standard non-open joint installation technique such as shiplap.</li> <li>4. Natural stone veneer – Minimum 2" thick using any standard non-open joint installation technique such as grouted/mortared stone.</li> <li>5. Cast Artificial Stone – Minimum 1/2" thick complying with ICC-ES AC 51 using any standard non-open joint installation technique such as shiplap.</li> <li>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.</li> <li>7. Any MCM that has passed <i>NFPA 285</i>.</li> <li>8. Uninsulated sheet metal building panels including steel, copper and aluminum.</li> <li>9. Uninsulated fiber-cement siding.</li> <li>10. Stone/Aluminum honeycomb composite building panels that have successfully passed <i>NFPA 285</i> criteria.</li> <li>11. Autoclaved-aerated-concrete (AAC) panels that have successfully passed <i>NFPA 285</i> criteria.</li> <li>12. Terra Cotta Cladding – Any Rain-screen Terra Cotta (min. 1/2" thick) with ventilated shiplap.</li> <li>13. 1/2" stucco – any one coat stucco (1/2" min.) which meets AC11 acceptance criteria or is approved for use in Type I-IV construction or has been tested per <i>NFPA 285</i> or stays in place when tested per <i>ASTM E119</i> (stucco exposed to fire) for at least 30 minutes.</li> <li>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 an <i>NFPA 285</i> test. Minimum 3/4". For these systems which require a more durable WRB system, any building wrap or 15# felt that meets requirement #9 in WRB Over Exterior Insulation (<b>Table 7</b>) can be used as a slip sheet between the WRB/AVP and the lath.</li> <li>15. Glen Gery Thin Tech Elite Series Masonry Veneer or TABS II Panel System with 1/2"-thick bricks using TABS Wall Adhesive.</li> <li>16. Natural Stone Veneer – minimum 1 1/4" thick using any standard installation technique.</li> <li>17. FunderMax M.Look Grey Core – minimum 1/4" thick using any standard installation technique</li> </ol>
<p>SI: 1 in = 25.4 mm</p> <ol style="list-style-type: none"> <li>1. The assemblies' combinations created herein and the various substitutions of products are based on testing and professional thermal engineering analysis.</li> <li>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.</li> <li>3. <math>T_{ign}</math> 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.</li> </ol>	



TABLE 6. APPROVED *NFPA 285* WALL ASSEMBLIES WITH R2+ SHEATHE INTERIOR INSULATION<sup>1</sup>

Wall Component	Materials
<b>Base Wall System</b> Use either 1 or 2	1. Cast concrete walls (min. 8" thick) 2. CMU concrete walls (min. 8" thick)
<b>Exterior Coating</b> Use one Option: 1, 2, 3 or 4	1. Portland cement or lime stucco 2. Any <i>ASTM E84</i> Class A Point or Elastomeric Coating 3. Any <i>ASTM E84</i> Class A Clear Sealer 4. None
<b>Air/Vapor Barrier Membrane Position 1 Over Base Wall Interior</b> 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.  Note: Some WRBs are only allowed with specific systems.  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.	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 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 R2+ SHEATHE, 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, 33MR, 16MR. 10. Tyvek CommercialWrap or CommercialWrap D. 11. PolyGuard Air Lok Flex VP, FlexGuard, Air Lok Flex (only with claddings 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. Cosella-Dörken Products, Inc., Delta-Vent SA, Delta-Vent S, Delta-Fassade S, Delta Maxx. 16. Any WRB that has been tested per <i>ASTM E1354</i> (at a minimum of 20 kW/m <sup>2</sup> heat flux) and shown by analysis to be less flammable (improved T <sub>ign</sub> , Pk. HRR) than those listed above 17. BASF Enershield HP or Enershield I 18. Soprema Sopraseal Stick VP, Soprasolin HD, Stick 1100T with Elastacool 600c Primer 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
<b>Continuous Insulation</b>	1. R2+ SHEATHE, max. 3 1/2" thick

Wall Component	Materials
<p><b>Air/Vapor Barrier Membrane Position 2 Over Insulation</b> 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> <p>Insulation Joints may be taped with Foil-Grip 1402, 4" width (max.)</p>	<ol style="list-style-type: none"> <li>1. None</li> <li>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</li> <li>3. GE Momentive SEC 2500 SilShield</li> <li>4. Vaproshield Wrapshield SA, RevealShield SA</li> <li>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.</li> <li>6. Henry Air-Bloc 17MR, 21S, 31MR, 33MR and 16MR.</li> <li>7. Tyvek CommercialWrap.</li> <li>8. PolyGuard Air Lok Flex VP, FlexGuard, Air Lok Flex (only with claddings 1-6) (Table 3)</li> <li>9. Prosoco R-Guard Cat 5, R-Guard Cat 5 Rainscreen, R-Guard VB or R-Guard Spray Wrap MVP</li> <li>10. Sto Gold coat</li> <li>11. Dryvit Backstop NT</li> <li>12. Any WRB that has been tested per <i>ASTM E1354</i> (at a minimum of 20 kW/m<sup>2</sup> heat flux) and shown by analysis to be less flammable (improved T<sub>ign</sub>, Pk. HRR) than those listed above</li> <li>13. 3" Aluma-GRIP 701 or 4" FG-1402 joint tape may be interchanged. (Hardcast AFT is a rebrand of Aluma-GRIP 701).</li> <li>14. WR Meadows Air Shield LMP (Gray), Air Shield LMP (Black), Air Shield TMP, Air Shield LSR</li> <li>15. Cosella-Dörken Products, Inc., Delta-Vent SA, Delta-Vent S, Delta-Fassade S, Delta Maxx.</li> <li>16. Soprema Sopraseal Stick VP, Soprasolin HD</li> <li>17. Pecora XL Perm Ultra VP</li> <li>18. Siga Majvest (for all claddings) or Majvest 500 SA (only with Claddings 1-6)</li> <li>19. Fortifiber Building Systems Group WeatherSmart Housewrap, WeatherSmart Drainable or WeatherSmart Commercial</li> <li>20. Dow Corning Dowsil DefendAir 200</li> </ol>
<b>Interior Cladding</b>	<ol style="list-style-type: none"> <li>1. 5/8" type X Interior Gypsum Sheathing Installed Directly over R2+ SHEATHE Insulation OR installed over Metal Hat or Z Furring, max. 2" Depth Air Gap. If an air gap is created, fire blocking per <u>IBC Section 718</u> should be installed.</li> </ol>
<p>SI: 1 in = 25.4 mm</p> <ol style="list-style-type: none"> <li>1. The assemblies' combinations created herein and the various substitutions of products are based on testing and professional thermal engineering analysis.</li> <li>2. Position 1 – Air vapor barrier installed directly on interior side of the base wall system.</li> <li>3. Position 2 – Air vapor barrier installed over continuous insulation on interior side of the wall assembly.</li> <li>4. CCW Membrane Used in Position 1 or 2, not both.</li> <li>5. R2+ SHEATHE insulation can be tacked in place with CAV-Grip or Travel-Tack during installation. Follow instructions on product data sheet.</li> </ol>	

TABLE 7. NFPA 285 ALLOWABLE WRB MATERIALS WITH R2+ SHEATHE

Wall Component	Materials
<p><b>WRB Over Base Wall Surface</b> 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"> <li>1. None</li> <li>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 FR-A may be used with CCW 702, 702LV, 702 WB, CAV-Grip, and Low VOC Travel-Tack adhesives.</li> <li>3. CCW-705 (with 702 LV, 702 WB, Cav-Grip, Low VOC Travel-Tack, or 702 adhesives may) be used with R2+ SHEATHE, or unfaced noncombustible insulation and cladding options 1-6 (Table 3)</li> <li>4. GE Momentive SEC 2500 SilShield, Elemax 2600</li> <li>5. Vaproshield Wrapshield SA, RevealShield SA</li> <li>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.</li> <li>7. StoGuard Vaporseal</li> <li>8. 3M 3015 (with Hold Fast 70 adhesive @ 6 mils)</li> <li>9. Henry Air-Bloc 17MR, 21S, 31MR, 33MR, 16MR.</li> <li>10. Tyvek CommercialWrap or CommercialWrap D, Fluid Applied WB (only with Xci Ply [Class A]).</li> <li>11. PolyGuard Air Lok Flex VP, FlexGuard, Air Lok Flex (only with claddings 1-6) (Table 3)</li> <li>12. Prosoco R-Guard Cat 5, R-Guard Cat 5 Rainscreen, R-Guard VB or R-Guard Spray Wrap MVP</li> <li>13. Dryvit Backstop NT</li> <li>14. WR Meadows Air Shield LMP (Gray), Air Shield LMP (Black), Air Shield TMP, Air Shield LSR</li> <li>15. Cosella-Dörken Products, Inc., Delta-Vent SA, Delta-Vent S, Delta-Fassade S, Delta Maxx.</li> <li>16. Any WRB that has been tested per ASTM E1354 (at a minimum of 20 kW/m<sup>2</sup> heat flux) and shown by analysis to be less flammable (improved T<sub>ign</sub>, Pk. HRR) than those listed above</li> <li>17. BASF Enershield HP or Enershield I</li> <li>18. Soprema Sopraseal Stick VP, Soprasolin HD, Stick 1100T with Elastacool 600c Primer (for use with R2+ SHEATHE)</li> <li>19. Pecora XL Perm Ultra VP</li> <li>20. Siga Majvest or Majvest 500 SA</li> <li>21. Sto Gold Coat or Emerald Coat</li> <li>22. Tremco ExoAir 230 and ExoAir 130</li> <li>23. Fortifiber Building Systems Group WeatherSmart Housewrap, WeatherSmart Drainable, WeatherSmart Commercial or Super Jumbo Tex 60</li> <li>24. USG Securock® Exoair® 430 System – see note on left and Air/Vapor System sections in Tables 5-8.</li> <li>25. 5/8" Georgia Pacific DenElement, flashed with Prosoco R-Guard FastFlash on sheathing joints.</li> <li>26. Dow Corning Dowsil DefendAir200</li> </ol>

Wall Component	Materials
<p><b>WRB Over Exterior Insulation</b>            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"> <li>1. None</li> <li>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</li> <li>3. GE Momentive SEC 2500 SilShield</li> <li>4. Vaproshield Wrapshield SA, RevealShield SA</li> <li>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.</li> <li>6. Henry Air-Bloc 17MR, 21S, 31MR, 33MR and 16MR.</li> <li>7. Tyvek CommercialWrap.</li> <li>8. PolyGuard Air Lok Flex VP, FlexGuard, Air Lok Flex (only with claddings 1-6) (Table 3)</li> <li>9. Prosoco R-Guard Cat 5, R-Guard Cat 5 Rainscreen, R-Guard VB or R-Guard Spray Wrap MVP</li> <li>10. Sto Gold coat</li> <li>11. Dryvit Backstop NT</li> <li>12. Any WRB that has been tested per <i>ASTM E1354</i> (at a minimum of 20 kW/m<sup>2</sup> heat flux) and shown by analysis to be less flammable (improved T<sub>ign</sub>, Pk. HRR) than those listed above</li> <li>13. 3" Aluma-GRIP 701 or 4" FG-1402 joint tape may be interchanged. (Hardcast AFT is a rebrand of Aluma-GRIP 701).</li> <li>14. WR Meadows Air Shield LMP (Gray), Air Shield LMP (Black), Air Shield TMP, Air Shield LSR</li> <li>15. Cosella-Dörken Products, Inc., Delta-Vent SA, Delta-Vent S, Delta-Fassade S, Delta Maxx.</li> <li>16. Soprema Sopraseal Stick VP, Soprasolin HD</li> <li>17. Pecora XL Perm Ultra VP</li> <li>18. Siga Majvest (for all claddings) or Majvest 500 SA (only with Claddings 1-6)</li> <li>19. Fortifiber Building Systems Group WeatherSmart Housewrap, WeatherSmart Drainable or WeatherSmart Commercial</li> <li>20. Dow Corning Dowsil DefendAir 200</li> </ol>

Wall Component	Materials
<p>SI: 1 in = 25.4 mm</p> <ol style="list-style-type: none"> <li>1. CCW LM 800 XL or Barribond 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.</li> <li>2. The following may be used as gap filler between insulation panels: FOMO HandiFoam FireBlock and TVM FireBlock.</li> <li>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.</li> <li>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"> <li>a. CCW-705, 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.</li> <li>b. CCW LiquiFiber-W imbedded in Fire Resist Barritech NP/VP (or VP LT)</li> <li>c. CCW DCH Reinforcing Fabric imbedded in Fire Resist Barritech NP/VP</li> <li>d. Barribond at 40 mils thickness</li> </ol> </li> <li>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"> <li>a. Barribond 2" width X 40 mil thick ribbon of sealant centered over joint. Barribond shall be covered with 40 mil dry thickness of Fire Resist Barritech NP/VP (or VP LT).</li> <li>b. 4" width maximum CCW DCH Reinforcing Fabric centered over joint and imbedded in Fire Resist Barritech NP/VP (or VP LT).</li> <li>c. Maximum 4"-wide, self-adhered flashing tape 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"> <li>i. Alum-GRIP-701</li> <li>ii. Fire Resist 705 FR-A</li> <li>iii. Foil-GRIP 1402</li> <li>iv. Barritape</li> </ol> </li> </ol> </li> <li>6. CCW Barribond may be used in the following applications:             <ol style="list-style-type: none"> <li>a. As a detail sealant with all CCW membranes (small discontinuous quantities - 1" width x 40 mil ribbon)</li> <li>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).</li> <li>c. As a liquid flashing (wrapping rough opening) in 705 VP systems (40 mil thickness, 3" onto wall, all the way into rough opening).</li> <li>d. As an insulation adhesive (alternative to LM 800 XL) for attaching R2+ SHEATHE.</li> <li>e. As an insulation adhesive (alternative to LM 800 XL) for attaching R2+ SHEATHE.</li> </ol> </li> </ol>	

**5.5.5 Special Approval:**

- 5.5.5.1 R2+ SHEATHE has been tested to *NFPA 286* in accordance with *IBC Section 2603.9* and met the criteria of *IBC Section 803.1.1*<sup>15</sup>. Therefore, R2+ SHEATHE requires no thermal barrier or ignition barrier protection.
- 5.5.5.2 R2+ SHEATHE can be used in walls or ceilings without a thermal barrier. R2+ SHEATHE 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.

**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 This section provides general guidelines for the installation of R2+ SHEATHE only. Refer to the manufacturer's installation instructions, in addition to this TER, for complete details and requirements.
    - 6.2.1.1 Protect surrounding areas and surfaces from damage.

<sup>15</sup> 2015 *IBC Section 803.1.2*



- 6.2.1.2 For installation of R2+ SHEATHE on exterior, over WRB on base wall: Ensure that WRB is installed correctly and is in good condition before covering with R2+ SHEATHE.
  - 6.2.1.2.1 When used in a *NFPA 285* approved assembly, WRB must be one of those identified in Table 5.
- 6.2.1.3 For installation of R2+ SHEATHE on interior, over air/water resistive barrier on base wall: Ensure that air/water resistive barrier is one of those identified in Table 6 and air/water resistive barrier is installed correctly and is in good condition before covering with R2+ SHEATHE.
  - 6.2.1.3.1 When used in a *NFPA 285* approved assembly, the air/water resistive barrier must be one of those identified in Table 6.
- 6.2.1.4 R2+ SHEATHE shall not be applied over walls while they are vulnerable to water intrusion from above or behind.
- 6.2.1.5 Do not block flashing, weeps or other drainage paths with R2+ SHEATHE.
- 6.2.1.6 Do not span expansion joints with R2+ SHEATHE.
- 6.2.1.7 During installation, take precautions to minimize moisture intrusion behind insulation.
- 6.2.1.8 Beginning at the base of the wall, apply horizontally using maximum board lengths to minimize the number of joints.
- 6.2.1.9 Offset R2+ SHEATHE board joints in neighboring rows a minimum of 6". Do not form four-corner intersections.
- 6.2.1.10 R2+ SHEATHE may be applied vertically, as required.
- 6.2.1.11 Pre-cut to fit openings and penetrations.
- 6.2.1.12 Cut with a knife, using a square to guide the cut, or use a table saw.
- 6.2.1.13 Abut all joints tightly and ensure an overall flush, level surface.
- 6.2.1.14 Mechanically fasten using the fastening pattern as indicated.
  - 6.2.1.14.1 Space fasteners 12" o.c. at the perimeter and 16" o.c. in the field.
  - 6.2.1.14.2 Set back perimeter fasteners 3/8" from board edges.
  - 6.2.1.14.3 Note for exterior application: Where R2+ SHEATHE is 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 R2+ SHEATHE 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.
  - 6.2.1.14.4 Note for interior application: Where R2+ SHEATHE is 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 R2+ SHEATHE attachment function shall be designed for this function. If the drywall attachment is 16" o.c. or closer, and it tightly secures the insulation, no additional fastening or adhesive is required.
- 6.2.1.15 When an approved adhesive is used, periodically verify adhesion. Properly installed adhesively applied R2+ SHEATHE will cohesively break the adhesive while still wet and destroy the substrate when dry.
  - 6.2.1.15.1 Consult the detailed manufacturer installation instructions for the proper adhesive pattern to maintain the drainage plane.
  - 6.2.1.15.2 When used in a *NFPA 285* approved assembly, adhesives must be one of those listed in Table 5, Table 6 or Table 7.
- 6.2.1.16 Fill gaps greater than 1/8" between insulation boards with expanding spray foam with approved sealant and strike flush. Expanding spray foam may also be applied onto the insulation board edges during installation.
- 6.2.1.17 Verify all materials are installed in accordance with current Carlisle Coatings & Waterproofing (CCW) published literature and local code requirements.



- 6.2.1.18 Additional information on the installation and detailing of R2+ SHEATHE can be found at [carlisleccw.com](http://carlisleccw.com).
- 6.2.2 This section provides additional guidelines for the installation of R2+ SHEATHE as an air and water-resistive barrier.
  - 6.2.2.1 When used in a *NFPA 285* approved assembly as an air/water resistive barrier, see also Section 5.4 and Table 6.
  - 6.2.2.2 When used in a *NFPA 285* approved assembly as a WRB, see also Section 5.5 and Table 7 with all notes.
  - 6.2.2.3 Use minimum 1" thickness R2+ SHEATHE.
  - 6.2.2.4 Install directly over wood or steel studs or over exterior sheathing fastened to wood or steel studs.
  - 6.2.2.5 Fasten R2+ SHEATHE boards with corrosion-resistant screws or HeckMann Pos-I-Ties fitted with Thermal-Grip CI plastic washers by Rodenhouse. Space fasteners 16" o.c. in the field and 12" o.c. at the perimeter.
    - 6.2.2.5.1 Other fastening used shall be installed 16" o.c. in the field and 12" o.c. 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.
  - 6.2.2.6 Tape over board joints with 4" width Aluma-GRIP 1402 tape by CCW.
  - 6.2.2.7 Cover inside/outside corners with Aluma-GRIP 701 by CCW. Aluma-GRIP-701 shall bear 3" minimum onto each side of angle.
  - 6.2.2.8 Wrap window openings with Aluma-GRIP 701. Aluma-GRIP 701 shall wrap at least 3" onto wall, and shall return far enough into the window opening to provide continuous air/water seal to window frame.
  - 6.2.2.9 Flash pipe and duct penetrations through R2+ SHEATHE with Aluma-GRIP 701.
  - 6.2.2.10 Consult CCW details and instructions for complete information about installation of R2+ SHEATHE as an air and water-resistive barrier.

## 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 Potential heat in accordance with *NFPA 259* by Intertek.
  - 7.1.5 Thermal resistance as per *ASTM C518* according to *ASTM C1289* requirements.
  - 7.1.6 Air barrier material in accordance with *ASTM E2178*.
  - 7.1.7 Air barrier assembly in accordance with *ASTM E2357*.
  - 7.1.8 Vapor impermeability in accordance with *ASTM E96* Method A and Method B.
  - 7.1.9 Water-resistive barrier testing in accordance with *ASTM E331*.
- 7.2 Engineering analysis comparing the fire resistance properties of R2+ SHEATHE 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 Manufacturer technical data sheets and installation instructions.
- 7.5 Manufacturer quality control manual and evidence of approved agency inspections.



- 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 R2+ SHEATHE is approved for use in exterior walls of buildings of any height of Type I-IV construction in accordance with IBC Section 2603.5.
  - 8.1.2 R2+ SHEATHE is approved for use in wall assemblies meeting the requirements of NFPA 285 testing when constructed in accordance with Table 5.
  - 8.1.3 R2+ SHEATHE described in this TER complies with, or is a suitable alternative to, the applicable sections of the codes listed in Section 2.
  - 8.1.4 R2+ SHEATHE is approved for use in exterior walls of buildings as a WRB in accordance with IBC Section 1403.2<sup>16</sup>.
  - 8.1.5 R2+ SHEATHE is approved for use in exterior walls of buildings as an air barrier in accordance with IECC Section C402.5.1.
- 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 evaluation, they are listed here.
- 8.3.1 No known variations

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<sup>16</sup> 2015 IBC Section 1404.2

## 9 CONDITIONS OF USE

- 9.1 R2+ SHEATHE is 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 on the exterior side of exterior walls of buildings of Type I, II, III or IV construction must be as described in Table 5.
  - 9.1.3 When the insulation boards are used on the interior side of exterior walls of buildings of Type I, II, III or IV construction must be as described in Table 6.
  - 9.1.4 R2+ SHEATHE is not to be used as a structural nailing base for claddings.
  - 9.1.5 R2+ SHEATHE 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.
  - 9.1.7 R2+ SHEATHE is manufactured in Smithfield, Pennsylvania; Franklin Park, Illinois; or Puyallup, WA under a quality control program with quality control inspections in accordance with IBC Section 110.3.9<sup>17</sup> and 110.3.10<sup>18</sup>.
  - 9.1.8 The wall assemblies listed in Table 5, Table 6, and Table 7 are based on compliance to the fire provisions of the codes listed in Section 2. Consideration of wall assembly performance with regard to other attributes, such as water vapor control, condensation, energy code requirements, etc. are outside the scope of this TER.
- 9.2 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.
- 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.

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<sup>17</sup> 2015 IBC Section 110.3.8

<sup>18</sup> 2015 IBC Section 110.3.9

## 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 [carlisleccw.com](http://carlisleccw.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](http://drjcertification.org).
- 11.2 For information on the current status of this TER, contact [DrJ Certification](#).