



**PRIEST & ASSOCIATES  
CONSULTING, LLC**

## ENGINEERING EVALUATION

NEXGEN MAXTERRA™ MgO with Various Polyiso  
Foam Insulations in NFPA 285 Assemblies

Project No. 11255G, Revision 2

Prepared for:

NEXGEN Building Products  
1904 Manatee Ave W #300  
Bradenton, FL 34205

December 23, 2024

*Abstract*

*Various NFPA 285 approvals are referenced to determine Engineering Extensions of alternate sheathing products manufactured by NEXGEN Building Products. These reports and/or approvals, along with noncombustible reference (ASTM E136) data from ICC-ES, were used to create a matrix of constructions using various combinations of insulation, claddings, and WRB products that could meet NFPA 285 with specific limitations.*

This evaluation's conclusions are true and correct, within the bounds of sound engineering practice. This document contains all the reasoning for our decisions.

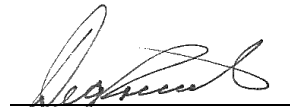
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December 23, 2024

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December 23, 2024



## INTRODUCTION

This evaluation aims to allow using various NEXGEN sheathing products (Refs. 2 & 3) with various insulations in existing NFPA 285 approval tables (Refs. 4, 5, 6, 7, & 8). The goal of this evaluation is to allow the following:

1. Replace exterior gypsum sheathing with NEXGEN MAXTERRA™ MgO Board
2. Replace polyiso insulation with mineral wool
3. Allow use of no exterior insulation (only with WRBs listed over polyiso)
4. Allow use of NEXGEN MAXTERRA MgO Board over polyiso (only with WRBs listed over polyiso)

*This document provides an expert opinion on the properties of the materials, products, or assemblies identified in this report related to meeting a specific code or standard. Suitability to use is to be determined by the end-user.*

## REFERENCED DOCUMENTS

- 1) *NFPA 285-12 Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-loadbearing Wall Assemblies Containing Combustible Components*
- 2) *ICC-ES ESR 5193 – NEXGEN 12mm, 16mm Maxterra MgO Approval*
- 3) *ICC-ES ESR 5193 – NEXGEN 20mm Maxterra MgO Approval*
- 4) *DrJ TER 1306-03 Atlas Approved NFPA 285 Assemblies (see Appendix A)*
- 5) *DrJ TER 1402-01 Hunter Approved NFPA 285 Assemblies (See Appendix B)*
- 6) *DrJ TER 1309-03 Rmax Thermasheath/TSX Approved NFPA 285 Assemblies (See Appendix C)*
- 7) *DrJ TER 1407-02 – Carlisle R2+ Approved NFPA 285 Assemblies (See Appendix D)*
- 8) *DrJ TER 1601-06 Kingspan Kooltherm Approved NFPA 285 Assemblies (See Appendix E)*

## EVALUATION METHOD

### NFPA 285 Criteria

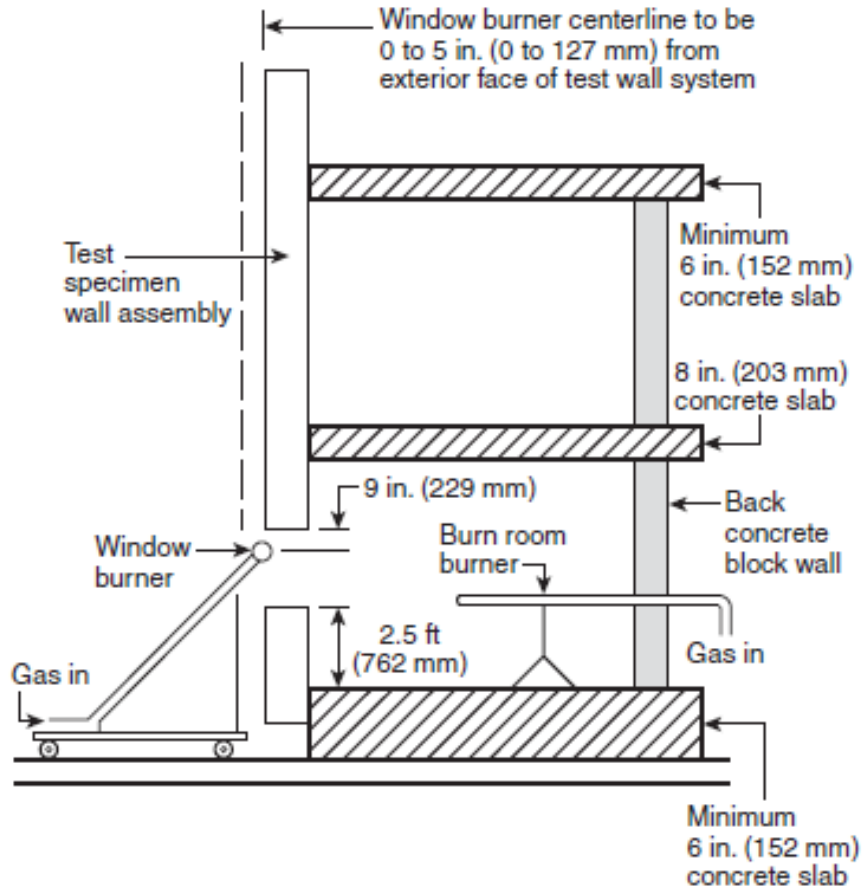
The NFPA 285 fire test (Ref. 1) tests the flame spread properties of exterior walls containing combustible components. Two noncombustible rooms are stacked to simulate two stories of a multi-story building. The wall assembly is then attached to the exterior face of the rooms. A typical test wall measures 14 ft x 18 ft with a 30 in. x 78 in. window opening placed on the bottom floor.

During a test, a calibrated fire starts in the bottom room. After 5 minutes, the exterior burner is ignited to produce a specific heat flux/temperature pattern on the exterior of the wall. Both burners remain ignited during the 30-minute test. A computer data acquisition system monitors and records the thermocouples' temperatures. Personnel monitor flame spread visually during the test. The criteria for passing (Ref. 1) are as follows (reworded in simple terms for this analysis):

- 1) Flames shall not spread vertically 10 ft above the window opening as determined visually or by thermocouples at the 10 ft level. Failure occurs when thermocouples 11 or 14 - 17 exceed 1000 °F.
- 2) Flames shall not spread (visually) horizontally 5 ft on either side of the centerline of the window opening.
- 3) Flames shall not spread inside the wall cavity as determined by thermocouples placed within the wall cavity insulation and air gaps if present. Failure occurs when thermocouples 28 or 31 - 40 or 55 - 65 and 68 - 79 exceed 750 °F above ambient.
- 4) Flames shall not spread horizontally within the wall cavity past the interior room dimension as determined by wall cavity thermocouples. Failure occurs when thermocouples 18 - 19, 66 - 67, or 79 - 80 exceed 750 °F above ambient.
- 5) Flames shall not spread to the second-story room as determined by interior wall surface thermocouples. Failure occurs when thermocouples 49 - 54 exceed 500 °F above ambient.



- 6) Flames shall not occur in the second story (visually).
- 7) Flames shall not escape (visually) from the interior to the exterior at the wall/wall intersection of the bottom story room.

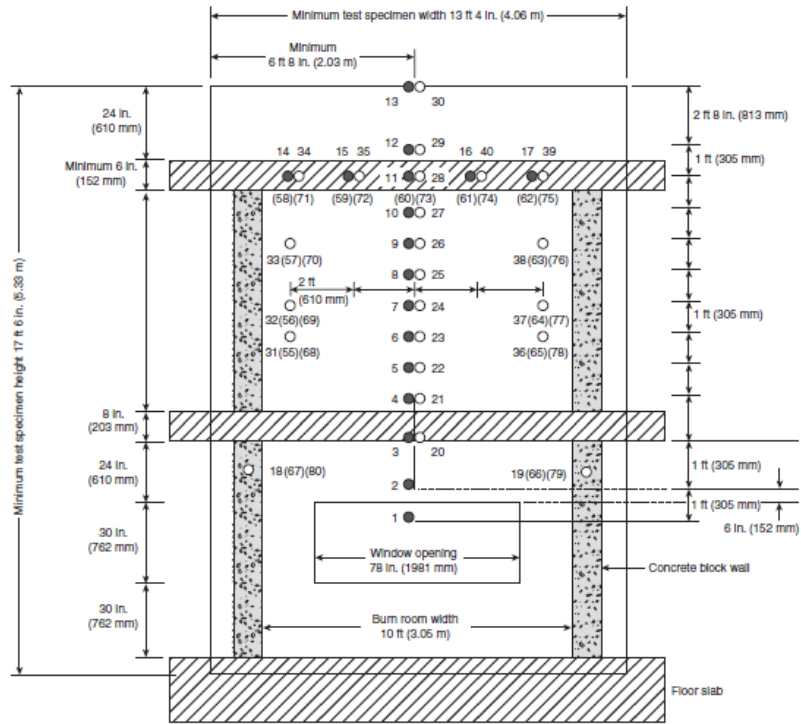


Two burners are ignited to produce a specific time-temperature profile in the room and on the exterior face of the wall.

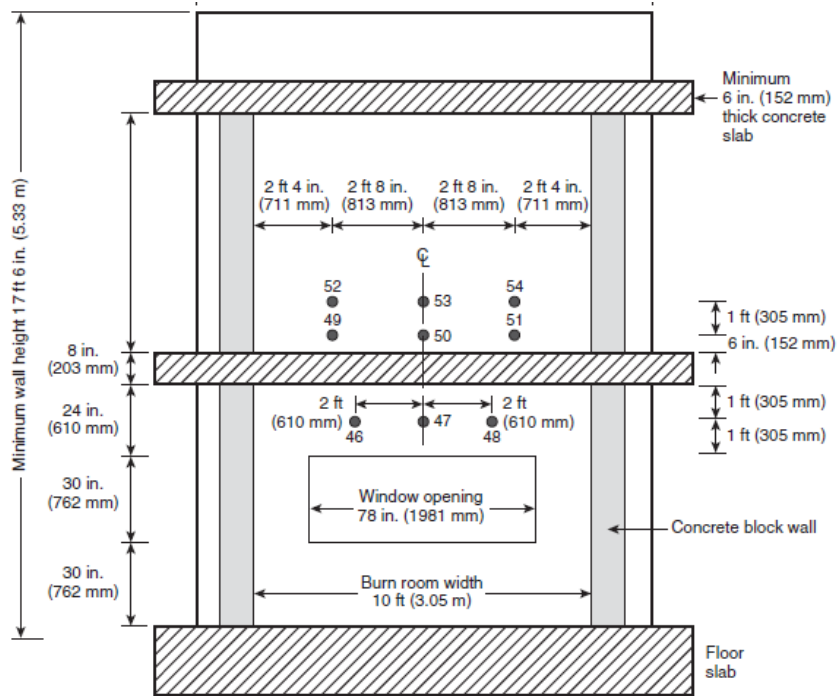
Thermocouples are placed strategically to monitor temperature as an indicator of flame spread.

In the depictions below, thermocouples 1 - 10 and 20 - 27 are not used for compliance. The remainders are used to monitor flame spread.





- Thermocouples — 1 in. (25 mm) from exterior wall surface
- Thermocouples — in the wall cavity air space or the insulation, or both, as shown in Figure 6.1(b) Details A through I.
- ( ) Thermocouples — Additional thermocouples in the insulation or the stud cavity, or both, where required for the test specimen construction being tested, as shown in Figure 6.1(b) Details C through I.



- Thermocouples — 1 in. (25 mm) from interior wall surface

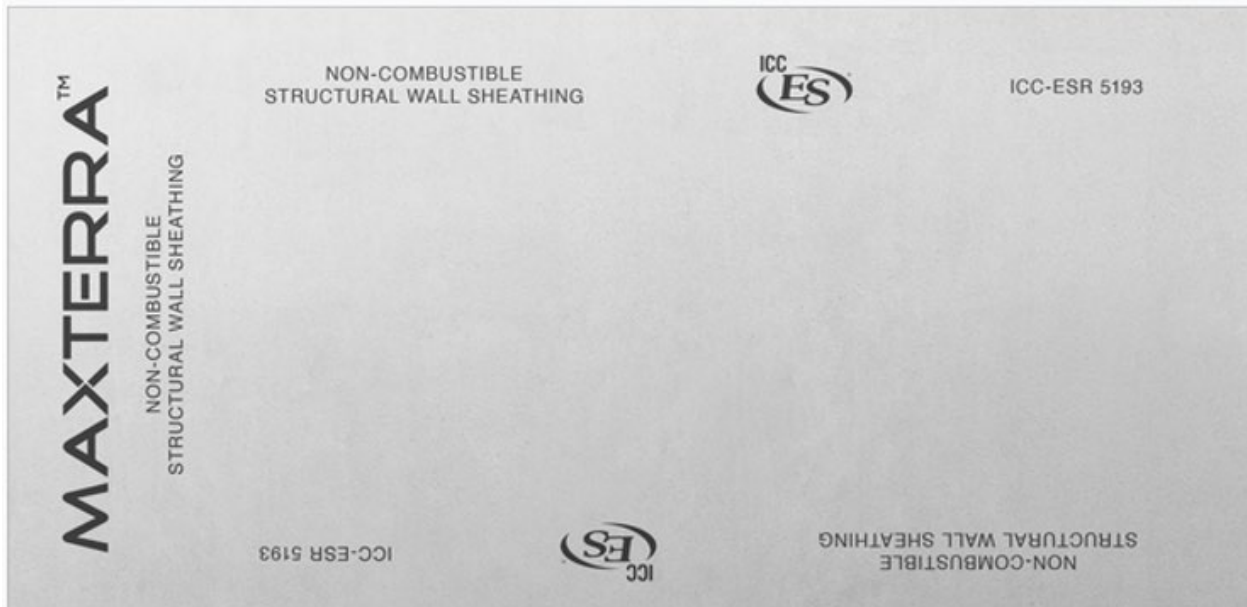


**Constructions Tested**

This evaluation is based on the DrJ TER reports submitted as the basis documents (Refs. 4, 5, 6, 7, & 8). The NFPA 285 section of these approvals is based on NFPA 285 tests deemed worst-case assemblies, allowing various component options based on the testing. Each report includes the specific construction(s) tested per NFPA 285 and alternate constructions deemed less severe than the tested assemblies. The particular constructions are confidential but include multiple combinations of wall components. These include cavity insulation, exterior sheathing, water-resistive barrier (WRB), exterior insulation, exterior WRB, air gap, claddings, and window details.

**NEXGEN MAXTERRA MgO Flammability Analysis**

MAXTERRA Magnesium Oxide (MgO) Boards come in three thicknesses. These are 12 mm, 16 mm, and 20 mm. They are described as follows:



**EASY AND QUICK TO USE**

**MAXTERRA™ MgO Panels**

NEXGEN supplies MgO panels in various sizes and thicknesses for many construction applications including subflooring, floor underlayment, interior walls, exterior sheathing, and roof sheathing. It is especially useful in basement installations given MAXTERRA MgO panels energy-saving ratings, resistance to water, and insects/pests.

As listed below, these are approved for noncombustible classification (Refs. 2 & 3) per ASTM E136 testing.

- ICC NTA Test Report No.: NBPA010924-19
- ICC NTA Test Report No.: NBPA012524-28
- ICC NTA Test Report No.: NBAP063023-55



The ESR reports (Refs. 2 & 3) list the following:

**2.0 USES**

MAXTERRA™ panels are 12mm (0.472 inch) and 16 mm (0.630 inch) thick magnesium-oxide panels are intended for use as structural wall sheathing (interior or exterior), floor underlayment, interior substrate sheets, and the construction of structural insulated panels (SIPs) in Types I-V construction under the IBC and any construction type under the IRC.



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**3.0 DESCRIPTION**

**3.1 General:**

MAXTERRA™ panels are magnesium oxide panels reinforced with multiple embedded fiberglass mesh sheets. The panels are available in thicknesses of 12mm (0.472 inch) and 16 mm (0.630 inch) and nominal 4-foot (1.22 m) widths at a nominal length of 8, 10 or 12 feet (2.44 m, 3.05 m, or 3.66 m)

**3.2 Surface Burning Characteristics:**

MAXTERRA™ panels have a flame spread index of 25 or less and a smoke developed index of 450 or less when tested in accordance with ASTM E84. The panels exhibit a Class A interior finish in accordance with Section 803.1.2 of the 2021 and 2018 IBC (Section 803.1.1 of the 2015 IBC).

**3.3 Non-combustibility:**

MAXTERRA™ panels are classified as noncombustible building materials in accordance with ASTM E136 and Section 703.3.1 of the 2021 IBC (Section 703.5.1 of the 2018 and 2015 IBC).

Ref. ESR 5193 - <https://icc-es.org/report-listing/esr-5193/>

**2.0 USES**

MAXTERRA™ panels are 20 mm (0.787-inch) thick magnesium-oxide panels are intended for use in single floor applications, subfloor applications, or as floor underlayment. The panels may also be used as substrate sheets for tile and resilient flooring. The product has been evaluated for use in Types I-V construction under the IBC and all construction types under the IRC.

**3.0 DESCRIPTION**

**3.1 General:**

MAXTERRA™ panels are 20 mm (0.787 inch) thick magnesium oxide panels reinforced with multiple embedded fiberglass mesh sheets. The panels are available in nominal 4-foot (1.22 m) widths at a nominal



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length of 4, 8, 10 or 12 feet (1.22 m, 2.44 m, 3.05 m, or 3.66 m). The panels have tongue and groove features on the edges along the length of the panels.

**3.2 Surface Burning Characteristics:**

MAXTERRA™ panels have a flame spread index of 25 or less and a smoke developed index of 450 or less when tested in accordance with ASTM E84. The panels exhibit a Class A interior finish in accordance with Section 803.1.2 of the 2021 and 2018 IBC (Section 803.1.1 of the 2015 IBC).

**3.3 Non-combustibility:**

MAXTERRA™ panels are classified as noncombustible building materials in accordance with ASTM E136 and Section 703.3.1 of the 2021 IBC (Section 703.5.1 of the 2018 and 2015 IBC).

Ref ESR 5194 - <https://icc-es.org/report-listing/esr-5193/>



The following may be allowed based on the noncombustible nature of these MgO products.

1. Replace exterior gypsum sheathing with NEXGEN MAXTERRA MgO Board
  - a. The MgO Board will not detract from NFPA 285 compliance where approvals list gypsum exterior sheathing. Gypsum sheathing is "limited combustible," whereas NEXGEN MgO Board is noncombustible.

See Limited Combustible Definition below.

#### AI Overview

The International Building Code (IBC) covers combustible materials in a number of ways, including:

##### Combustible materials in Type I and II construction

Section 603 of the IBC allows combustible materials in certain applications, such as balconies, porches, decks, and exterior stairways.

##### Combustible exterior wall coverings

Section 1405.1 of the IBC limits the amount of combustible exterior wall coverings that are permitted.

##### Combustible decorative materials

Section 806.2 of the IBC covers combustible decorative materials.

##### Flammable and combustible liquids

Chapter 57 of the IBC provides requirements to reduce the likelihood of fires involving flammable and combustible liquids.

A material is considered limited combustible if it meets certain criteria, including:

- It has a heat value of less than 3,500 BTU/lb when tested in accordance with NFPA 259
- It has a noncombustible base with a surface that doesn't have a flame spread index greater than 50
- The surface on top of the noncombustible base can't be thicker than 1/8th inch (3.2mm)

The term "limited combustible" is generally intended to apply to gypsum wallboard, though some paper-backed insulation materials are also technically limited combustible.

Ref. <https://www.google.com/search?q=ibc+code+limited+combustible>

2. Replace polyiso insulation with mineral wool

Mineral wool is noncombustible, whereas the NFPA 285-approved polyiso (Refs. 4 - 8) is combustible.

3. Allow use of no exterior insulation (only with WRBs approved over polyiso)

Some polyiso approvals (Refs. 4 - 8) allow specific weather barriers over the polyiso (based on testing a worst-case WRB over the polyiso). Removing the insulation places the WRB directly





- over the exterior sheathing. Compared to using the WRB over combustible polyiso, this design is less combustible.
4. Allow use of NEXGEN MAXTERRA MgO Board over polyiso (only with WRBs approved over polyiso)
    - a. Attaching a noncombustible MAXTERRA MgO board over the polyiso reduces the overall flammability of the approved design. This is because the NFPA 285 fire cannot burn through the MgO board during the 30 min fire test. This is based on experience witnessing MgO board during NFPA 285 testing. The exterior side of the MgO board should have a WRB to protect the MgO board from moisture/weather. Based on Points 1 and 3 above, the WRBs listed for use over the polyiso insulation may be allowed over the MgO board. The following method of attachment shall apply.
    - b. Where NexGen MAXTERRA 12 mm, 16 mm, or 20 mm is applied over polyiso, it shall be mechanically attached (per wind load design) or adhered with approved construction adhesive 2 in. dabs spaced 18 in. apart or 1 ft long ¼ in. wide ribbons spaced 1 foot apart.
  5. WRBs not included in the 3<sup>rd</sup> party approvals (see Appendix A-E) may be allowed on a case-by-case basis referencing NFPA 285 testing and/or cone calorimeter analysis. The following WRBs were analyzed and found to have been tested per NFPA 285 and/or be less combustible than at least 1 WRB on the lists in the approvals (for use over polyiso).

These WRBs may be used over the MAXTERRA MgO that is applied over the foam insulation board (or with no insulation) or under the polyiso insulation (since these qualify over the MAXTERRA).

    - 3M 3015 VP

## CONCLUSIONS

Based on the discussion above, the following Tables of NFPA 285 Assemblies shall apply to the NexGen MAXTERRA MgO board (12, 16, and 20 mm).

The following tables show the relevant content for specific WRBs for use with various insulation brands based on the referenced approvals.

Four pcf (min.), one inch thick (min.) mineral wool may replace the polyiso since mineral wool is noncombustible. Only the WRBs allowed for use over the insulation may be used on the base wall surface if no insulation is used or if the MgO boards are installed over the polyiso insulation.

The following Tables of NFPA 285 Assemblies shall apply based on the discussion above.

The following tables show the relevant content for specific WRBs for use with particular insulation based on the referenced documents.

**IMPORTANT** – The approved assemblies listed in the appendix are to be used according to the approval cited. Do not substitute materials (WRB or Insulation or Cladding, etc.) from one approval table to another. The materials used in each approval table must be used together and not mixed with other tables.



**NFPA 285-12 Wall Details for use with JumpStart (see Appendices A - E for exact allowances)  
For Type I-IV – Buildings of Any Height**

Wall Component	Optional Components
<p><b>Base Wall System</b> Use any Item 1 - 2</p>	<p>1) 20 GA. (min.) 3<math>\frac{5}{8}</math> in. (min.) steel studs spaced max. 24 in. OC with <math>\frac{5}{8}</math> in. type X gypsum wallboard Interior 2) Any Base Wall in Appendices A - E</p> <p><b>IMPORTANT</b> Do not substitute the base wall from one approval to another. The materials used in each approval must be used together and not mixed with others.</p>
<p><b>Firestopping in Stud Cavity at Floor Lines</b> Use Item 1 or 2</p>	<p>1) 4-inch (min.), four pcf (min.) mineral fiber (mineral wool) installed friction fit or with z-clips 2) Any firestop in Appendices A - E</p> <p><b>IMPORTANT</b> Do not substitute fire stops for one approval to another. The materials used in each approval must be used together and not mixed with others.</p>
<p><b>Cavity Insulation</b> Use any Item 1 - 5</p>	<p>1) None 2) Any noncombustible insulation per ASTM E136 3) Any Mineral Fiber (faced or unfaced) complying with the applicable code 4) Any Fiberglass (faced or unfaced) complying with the appropriate code 5) Any cavity insulation listed in Appendices A - E</p> <p><b>IMPORTANT</b> Do not substitute cavity insulation from one approval to another; the materials used in each approval must be used together and not mixed with those in another. Some cavity insulations require <math>\frac{5}{8}</math> in. exterior gypsum sheathing.</p>
<p><b>Exterior Sheathing</b> Use any Item 1 - 2</p>	<p>1) None - Only for polyiso approval, where “None” is an option for exterior sheathing. “None” is allowed for specific Atlas, Hunter, CCW, Rmax, or mineral wool insulations, but “None” is not an option for Kingspan. 2) NEXGEN MAXTERRA 12 mm, 16 mm, or 20 mm</p>
<p><b>WRB on Base Wall</b> Use any Item 1 - 8</p> <p><b>IMPORTANT</b> Do not substitute WRB or Insulation or Cladding from one approval to another.</p> <p>Do not use WRB under and over the insulation.</p> <p>WRB may only be used under or over the insulation (or with no insulation where applicable).</p>	<p>1) None (where applicable). 2) Any WRB – When 2 in. (min.) 4 pcf (min.) Mineral Wool (unfaced noncombustible) covers the WRB 3) For use with Atlas EnergyShield Polyiso Table (Ref TER 1306-03) – See Appendix A 4) For use with Hunter Xci-Polyiso Tables (Ref TER 1402-01) – See Appendix B 5) For use with Rmax Polyiso Table (Ref. TER 1309-03) – See Appendix C 6) For use with Carlisle R2+-Polyiso (Ref. TER 1407-02) – See Appendix D 7) For use with Kingspan Kooltherm (Ref. ESR 1601-06) – See Appendix E 8) The following specific WRBs may be under the polyiso insulation for any brand of insulation listed within this report when MAXTERRA MgO replaces the exterior sheathing listed in the approvals in Appendix A-E.</p> <ul style="list-style-type: none"> <li>• 3M 3015 VP</li> </ul> <p>These WRBs are only used under the insulation.</p>



Wall Component	Optional Components
	<p><b>IMPORTANT</b>                      The materials used in each approval number should be used together and not mixed with other materials. Each approval number component list is shown in a specific Appendix in this report (see Appendices A - E).                      Do not use WRB under <u>and</u> over the insulation.</p>
<p><b>Exterior Insulation</b>                      Use any Item 1 – 7</p> <p>Important – Each insulation has specific maximum thicknesses depending on the cladding used.</p>	<ol style="list-style-type: none"> <li>1) None (with WRB listed below – for use over insulation but may be used with no exterior insulation directly on the NEXGEN MgO Board).</li> <li>2) Mineral Wool (unfaced noncombustible) – 1 in. (min.), four pcf density (min.).</li> <li>3) Atlas EnergyShield Polyiso (Ref TER 1306-03) – See Appendix A</li> <li>4) Hunter Xci-Polyiso (Ref TER 1402-01) – See Appendix B</li> <li>5) Rmax Polyiso (Ref. TER 1309-03) – See Appendix C</li> <li>6) Carlisle R2+-Polyiso (Ref. TER 1407-02) – See Appendix D</li> <li>7) Kingspan Kooltherm (Ref. ESR 1601-06) – See Appendix E</li> </ol> <p><b>IMPORTANT</b>                      The materials used in each approval number should be used together and not mixed with other materials. Each approval number component list is shown in a specific Appendix in this report (See Appendices A - E).</p>
<p><b>Sheathing over Polyiso</b>                      Use Item 1 or 2</p>	<ol style="list-style-type: none"> <li>1) None</li> <li>2) NEXGEN MAXTERRA 12 mm, 16 mm, or 20 mm</li> </ol> <p>Where MAXTERRA 12 mm, 16 mm, or 20 mm is applied over polyiso, it shall be mechanically attached (per wind load design) or adhered with approved construction adhesive 2" dabs spaced 18" apart or 1 ft long, ¼ in. wide ribbons spaced 1 ft apart.</p>
<p><b>WRB over Insulation</b>                      Use any Items 1 - 10.</p> <p>Important                      Do not use WRB under <u>and</u> over the insulation.</p> <p>WRB may only be used under <u>or</u> over the insulation (or with no insulation where applicable).</p>	<ol style="list-style-type: none"> <li>1) None (where applicable).</li> <li>2) Any WRB listed below – when mineral wool is used as exterior insulation.</li> <li>3) For use with Atlas EnergyShield Polyiso Table (Ref TER 1306-03) – See Appendix A – WRB list over insulation</li> <li>4) For use with Hunter Xci-Polyiso Tables (Ref TER 1402-01) – See Appendix B - WRB list over insulation</li> <li>5) For use with Rmax Polyiso Table (Ref. TER 1309-03) – See Appendix C - WRB list over insulation</li> <li>6) For use with Carlisle R2+-Polyiso (Ref. TER 1407-02) – See Appendix D - WRB list over insulation</li> <li>7) For use with Kingspan Kooltherm (Ref. ESR 1601-06) – None – This approval does not allow WRB over insulation</li> <li>8) Any WRB listed above (from Item 3, 4, 5, or 6) – when no exterior insulation is used, apply WRB to the NEXGEN MgO Board.</li> <li>9) Any WRB listed above – when the NEXGEN MgO Board is applied over the polyiso (except for Kingspan), apply WRB to the surface of the NEXGEN MgO Board. When MgO board over Kingspan insulation is used, use a WRB approved for the specific cladding being used.</li> <li>10) The following specific WRB's may be used over the MAXTERRA MgO that is applied over the foam insulation board, for any brand of insulation listed within this report in Appendix A-E - or with MAXTERRA MgO with no insulation.                         <ul style="list-style-type: none"> <li>• 3M 3015 VP</li> </ul> </li> </ol>



Wall Component	Optional Components
	<p>These WRBs are only used over the exterior insulation or on the surface of the NexGen MgO Board when no exterior insulation is used or when the MgO Board covers the polyiso.</p> <p><b>Important</b> - WRB over insulation – Items 1 - 7 only for use with Atlas, Hunter, Rmax, CCW, or mineral wool insulations listed herein (Insulations 2, 3, 4, 5, or 6, but not Insulation 7).</p>
<p><b>Cladding</b> Use any Item 1 - 7.</p>	<ol style="list-style-type: none"> <li>1) For mineral wool exterior insulation, use any cladding listed in Appendix A-E.</li> <li>2) For no exterior insulation, use any cladding listed in Appendix A-E (only with WRBs listed for use over insulation (or over MAXTERRA as described herein)</li> <li>3) For Atlas EnergyShield Polyiso (Ref. TER 1306-03) – See Appendix A claddings.</li> <li>4) For Hunter Xci-Polyiso (Ref. DrJ TER 1402-01)– See Appendix B Claddings.</li> <li>5) For Rmax Polyiso (Ref. TER1309-03) – See Appendix C Claddings</li> <li>6) For Carlisle R2+-Polyiso (Ref. TER 1407-02) – See Appendix D Claddings</li> <li>7) For Kingspan Kooltherm (Ref. ESR 1601-06) – See Appendix E</li> </ol> <p>When mineral wool or no insulation is used, any cladding in Appendices A - E may be used.</p> <p><b>IMPORTANT</b> The materials used in each approval number should be used together and not mixed with other materials. Each approval number component list is shown in a specific Appendix in this report (See Appendices A - E).</p>



**APPENDIX A**  
**Atlas EnergyShield Polyiso Table (Ref DrJ TER 1306-03)**

TABLE 3. APPROVED NFPA 285 WALL ASSEMBLIES<sup>1</sup>

Wall Component	Materials
<b>Base Wall</b> Use any of these items	1. Cast Concrete Walls (1" minimum) 2. CMU Concrete Walls (1" minimum) 3. 20 ga. (min.) 3 <sup>5</sup> / <sub>8</sub> " (min.) steel studs with <sup>5</sup> / <sub>8</sub> "-thick Type X gypsum wallboard on interior 4. FRT wood studs spaced at a maximum of 24" o.c. with <sup>5</sup> / <sub>8</sub> "-thick Type X gypsum wallboard on interior
<b>Floor Line Fire-Stopping</b> Use any of these items	1. None – only with exterior sheathing option 1, 3, or 4 (gypsum wallboard, concrete, or DensElement®) 2. 4", 4 pcf mineral fiber (wool) safing insulation (e.g., Thermafiber) installed with Z-clips or equivalent 3. 1 <sup>1</sup> / <sub>2</sub> " FRT lumber for use with FRT studs
<b>Cavity Insulation</b> Use any of these items  Note: SPF cavity insulations 5 - 16 must use fire stopping at floor lines (compliant with Item 2) and <sup>5</sup> / <sub>8</sub> " exterior gypsum sheathing.	1. None 2. Any noncombustible insulation per ASTM E136 3. Any mineral fiber (Board Type Class A ASTM E84 faced or unfaced) 4. Any fiberglass (Batt Type Class A ASTM E84 faced or unfaced) 5. 5 <sup>1</sup> / <sub>2</sub> " (max.) Icynene LD-C-50 spray foam in 6" deep studs (max.) full fill without an air gap 6. 5 <sup>1</sup> / <sub>2</sub> " (max.) Icynene MD-C-200, 2 pcf spray foam in 6" deep studs (max.) full fill without an air gap 7. 5 <sup>1</sup> / <sub>2</sub> " (max.) Icynene MD-R-210, 2 pcf spray foam in 6" deep studs (max.) full fill without an air gap 8. 6" (max.) SWD Urethane Quik-Shield (QS) 112, 2 pcf spray foam in 6" deep studs (max.) or partial fill with a maximum 2 <sup>1</sup> / <sub>2</sub> " air gap 9. 3 <sup>1</sup> / <sub>2</sub> " (max.) Gaco™ Western 183M spray foam in 3 <sup>5</sup> / <sub>8</sub> " deep studs (max.) 10. 3 <sup>1</sup> / <sub>2</sub> " (max) Gaco™ Western F1850 with <sup>5</sup> / <sub>8</sub> " exterior sheathing in 3 <sup>5</sup> / <sub>8</sub> " deep studs (max.) 11. 3 <sup>5</sup> / <sub>8</sub> " (max.) Demilec Sealection® 500 with <sup>5</sup> / <sub>8</sub> " exterior sheathing in 3 <sup>5</sup> / <sub>8</sub> " deep studs (max.) 12. 3 <sup>5</sup> / <sub>8</sub> " (max.) Demilec HeatLok Soy 200 Plus® with <sup>5</sup> / <sub>8</sub> " exterior sheathing in 3 <sup>5</sup> / <sub>8</sub> " deep studs (max.) 13. 3" (max.) Bayer Bayseal® with <sup>5</sup> / <sub>8</sub> " exterior sheathing 14. 3" (max.) Lapolla FoamLok™ FL 2000 with <sup>5</sup> / <sub>8</sub> " exterior sheathing in 3 <sup>5</sup> / <sub>8</sub> " deep studs (max.) 15. 3 <sup>5</sup> / <sub>8</sub> " (max.) BASF SprayTite® 81206 or WallTite® (US & US-N) with <sup>5</sup> / <sub>8</sub> " exterior sheathing in 3 <sup>5</sup> / <sub>8</sub> " deep studs (max.) 16. 3 <sup>5</sup> / <sub>8</sub> " (max.) Acella (Premium Spray Products) Foamsulate™ 220 with <sup>5</sup> / <sub>8</sub> " exterior sheathing in 3 <sup>5</sup> / <sub>8</sub> " deep studs (max.)

FIRE PERFORMANCE OF ENERGYSHIELD® PRODUCTS IN BUILDINGS OF TYPE I-V CONSTRUCTION  
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SUBJECT TO RENEWAL 4/1/2022  
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TER 1306-03



Wall Component	Materials
<b>Exterior Sheathing</b> Use any of these items  Note: when Items 4 or 5 (integrated sheathing WRBs) are used, WRBs listed below may not be added on top of the sheathing.	1. 1/2" or thicker exterior type gypsum sheathing 2. None – when cavity SPF insulation is not used 3. 2" precast concrete panels attached to structural elements of building 4. 1/2" or thicker GP DensElement® sheathing with integrated water-resistive barrier (WRB) 5. 1/2" or 5/8" thick USG Securock ExoAir 430  When SPF is used in the cavity, exterior sheathing must be used. See specific sheathing thicknesses above.



Exterior Sheathing 1, 3, 4, and 5 may be replaced by NEXGEN MAXTERRA 12 mm, 16 mm, or 20 mm.

<p><b>WRB over Exterior Sheathing</b> Use any of these items</p>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. DuPont™ Tyvek CommercialWrap® or CommercialWrap® D or other Tyvek Wraps in ESR 2375 – stapled (one or two layers)</li> <li>3. Henry Air-Bloc® 32MR (75 wet mils)</li> <li>4. Any WRB which 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>90</sub>, Pk. HRR) than those listed above.<sup>2</sup> Examples of such are listed below:</li> <li>5. BASF Enershield® HP, Enershield®-I</li> <li>6. CCW 705, 705 VP, or 705 FR-A, Fire Resist Barritech NP, VP, or VP LT</li> <li>7. Dow Chemical DefendAir 200 Low Temp or DefendAir 200 C (Charcoal)</li> <li>8. Dryvit Backstop® NT™, NT™ Smooth, NT™ Spray, NT™ Texture</li> <li>9. DuPont™ Fluid Applied (0.8 mm)</li> <li>10. GE Momentive Elemax 2600</li> <li>11. Grace Perm-A-Barrier® PAB VPL LT, PAB NPL 10, PAB NPL, PAB NPS, PAB VPS, PAB VPL, PAB AWM or PAB VPL 50</li> <li>12. Henry Air-Bloc® 31MR, Air-Bloc® 33MR, Air-Bloc® 21FR, Air-Bloc® VP 160</li> <li>13. Hohmann &amp; Barnard Enviro-Barrier™ VP, X Barrier™, Enviro-Barrier™</li> <li>14. Jumpstart HWW-65A, HWW-65B, HWHP-80A, HWMP-90A, HWD2-72A, HWHPT-92A, HWMPC-110A</li> <li>15. Parex WeatherSeal Spray and Roll On</li> <li>16. Proscoco R-Guard® Spray Wrap, Spray Wrap MVP, R-Guard® MVP, R-Guard® VB, R-Guard® Cat-5, or Cat-5 Rainscreen</li> <li>17. Sto Emerald Coat® or Gold Coat®</li> <li>18. STS Wall Guardian® FW 100A</li> <li>19. Tremco ExoAir® 230 (31.5 mils), ExoAir® 130, ExoAir® 111</li> <li>20. Vaproshield Wrapshield SA®, Revealshield SA®</li> <li>21. WR Meadows Air-Shield™ LMP (Gray), Air-Shield™ LMP (Black), Air-Shield™ TMP, Air-Shield™ LSR, Air-Shield™ SMP</li> <li>22. Soprema® LM 204 VP, Sopraseal® Stick VP, Sopraseal® 1100T, Soprasolin HD</li> <li>23. Siga Majvest 500 SA</li> <li>24. Dörken Systems Inc. DELTA®-STRATUS SA</li> <li>25. Fortifiber WeatherSmart, WeatherSmart Drainable, WeatherSmart Commercial</li> <li>26. Pecora XL-Perm<sup>ULTRA</sup> VP, XL-Perm<sup>ULTRA</sup> NP, ProPerm VP</li> <li>27. NaturaSeal NS-A-250LP, NS-A-250HP</li> </ol>
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<p><b>Exterior Insulation</b> Use any of these items</p> <p>Items 1-3 may be multiple layers of 1 inch thick (minimum)</p> <p>Items 1, 2, and 3 may be multiple layers of thinner product with facers on each side.</p>	<ol style="list-style-type: none"> <li>1. 4" (max.) Atlas® EnergyShield® Pro (or Pro2)</li> <li>2. 4" (max.) RBoard® Pro (or EnergyShield® CGF Pro)</li> <li>3. 4 3/4" (max.) EnergyShield® Ply Pro (4" Energyshield® CGF Pro with 5/8" or 3/4" FRT Plywood)</li> </ol> <p>Note: 1/2" (min.) exterior gypsum sheathing may be attached to exterior side of any item listed above. 5/8" (min) FRT plywood may be attached to exterior side of item 1 or 2 listed above.</p>
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FRT plywood or 1/2 in. gypsum sheathing panels over exterior insulation may be replaced by NEXGEN MAXTERRA 12 mm, 16 mm, or 20 mm.

Where MAXTERRA 12 mm, 16 mm, or 20 mm is applied over polyiso, it shall be mechanically attached (per wind load design) or adhered with approved construction adhesive 2 in. dabs spaced 18 in. apart or 1 ft long, 1/4 in. wide ribbons spaced 1 ft apart. Use the WRBs listed for use over the exterior insulation on the MgO surface. See the WRB list below.



<p><b>WRB Over Exterior Insulation</b> Use any of these items</p> <p>Note – Item 2 is an insulation joint tape, not full coverage.</p> <p>Items 15 and 16 may only be used with claddings 1 - 6</p>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Atlas® 3" IPG Cold Weather Foil Tape</li> <li>3. CCW 705FR-A, Barritech NP, Barritech VP, VP LT, 705 VP</li> <li>4. Dow Chemical DefendAir 200 Low Temp or DefendAir 200 C (Charcoal)</li> <li>5. Dryvit Backstop® NT™, NT™ Smooth, NT™ Spray, NT™ Texture</li> <li>6. GE Momentive SEC 2500 Silshield, SilShield SEC2600 AWB (aka Elemax 2600)</li> <li>7. Grace Perm-a-Barrier® PAB AWM, PAB VPL, PAB VPS, PAB NPS, PAB NPL, PAB VPL LT</li> <li>8. Henry Foilskin, Metal Clad, Air-Bloc® 31MR, Air-Bloc® 33MR, Air-Bloc® 21FR, VP 160, AB 17</li> <li>9. Jumpstart HWW-65A, HWW-65B, HWHP-80A, HWMP-90A, HWD2-72A, HWHPT-92A, HWMPC-110A</li> <li>10. Parex WeatherSeal Spray and Roll On</li> <li>11. Prosoco R-Guard® VB, R-Guard® Cat-5, R-Guard® Cat-5 Rainscreen, Spraywrap MVP</li> <li>12. Sto EmeraldCoat®</li> <li>13. Vaproshield Wrapshield SA®, Vaproshield Revealshield SA®</li> <li>14. Soprema® Soprasolin HD (with any cladding)</li> <li>15. Soprema® Sopraseal Stick VP (only with claddings 1-6)</li> <li>16. Siga Majvest® 500 SA (only with claddings 1-6)</li> <li>17. DuPont™ Tyvek® CommercialWrap or CommercialWrap D or other Tyvek Wraps in ESR 2375</li> <li>18. WR Meadows Air-Shield SMP</li> <li>19. Fortifiber WeatherSmart, WeatherSmart Drainable, WeatherSmart Commercial</li> <li>20. Pecora XL-Perm<sup>ULTRA</sup> VP, XL-Perm<sup>ULTRA</sup> NP, ProPerm VP</li> </ol>
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<p><b>Exterior Cladding</b> Use any of these items</p> <p>Note: Cladding 8 (zinc) may only be used with Energyshield® Pro or Pro2.</p>	<ol style="list-style-type: none"> <li>1. Brick – nominal 4" clay brick or veneer with maximum 2" air gap behind the brick. Brick ties/anchors 24" o.c. (max.)</li> <li>2. Stucco – minimum ¼" thick exterior cement plaster and lath. A secondary WRB (WRB items above allowed over foam) can be installed between the insulation and lath and must not be full-coverage asphalt or butyl-based self-adhered membranes, but may be asphalt or butyl-based slip sheet (stapled) with no adhesive.</li> <li>3. Limestone – minimum 2" thick</li> <li>4. Natural stone veneer – minimum 2" thick</li> <li>5. Cast artificial stone – minimum 1½" thick complying with ICC-ES AC 51</li> <li>6. Terracotta cladding – minimum 1¼" thick</li> <li>7. Any ACM that has successfully passed NFPA 285</li> <li>8. Uninsulated sheet metal building panels including aluminum, steel, copper, or zinc (see note)</li> <li>9. Uninsulated fiber-cement cladding siding minimum ¼" thick</li> <li>10. Stone/aluminum honeycomb composite building panels that have successfully passed NFPA 285 criteria</li> <li>11. Autoclaved-aerated-concrete (AAC) panels (minimum 1½" thick)</li> <li>12. Reynobond® ZCM zinc metal composite panel</li> <li>13. Terreal Zephir® Evolution Rainscreen System (terra cotta), minimum 9/16" thick</li> <li>14. FunderMax® M.Look using the manufacturer standard installation technique. The air gap between the cladding and insulation or WRB must not exceed 1½".</li> <li>15. CERACLAD using the manufacturer standard installation technique with an air gap not exceeding 0.59" (15 mm).</li> <li>16. CUPACLAD Slate: 101 Logic, 101 Random, 101 Parallel, 210 Vanguard</li> <li>17. Glen-Gery Thin Tech Masonry Veneer (only with optional noncombustible mortar)</li> <li>18. Glen-Gery Tru-Brix (only with optional noncombustible mortar)</li> <li>19. Telling Corium Thin Brick System (only with steel or aluminum brick tray and optional noncombustible mortar)</li> </ol>
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**APPENDIX B  
Hunter Xci Tables (Ref. DrJ TER 1402-01)**

TABLE 5. NFPA 285 APPROVED WALL ASSEMBLIES WITH XCI FOIL (CLASS A) OR XCI 286 EXTERIOR INSULATION<sup>1,4</sup>

Wall Component	Materials
<b>Base Wall System</b> Use either 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.) 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.) a. 5/8" Type X gypsum wallboard interior b. Bracing as required by code
<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, 11, 12, 13, 14, or 15.  Items 8, 9, 10 and 11 may only be used with exterior sheathing 2.	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 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/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" (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.) Thermosteal 2000 (up to full cavity thickness) 12. Carlisle SealTite PRO High Yield, SealTite PRO Open Cell, SealTite PRO No Mix, SealTite PRO No Trim 21, or SealTite PRO OCX – up to full cavity thickness with ½" (min.) exterior gypsum sheathing 13. Gaco (Firestone) F6500R, 052N, F4500, 183M, F1850, F1880 – 3½" (max.) for use with 5/8" Exterior Gypsum Sheathing 14. JM Corbond III or Corbond IV – Full stud cavity depth or less for use with 5/8" exterior gypsum sheathing 15. Huntsman ProSeal HFO (8 in. max. thickness with no air gap, 6 inch max. thickness with air gap) for use with ½" or thicker exterior gypsum sheathing
<b>Exterior Sheathing</b> Use either 1, 2 or 3	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
<b>Multi-Function Sheathing and WRB Products</b> Use 1 or 2	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  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
<b>WRB Over Base Wall Surface</b>	See Table 9

Exterior Sheathing 2, 3, or Multi-Function Sheathing/WRB 1, or 2 may be replaced by NEXGEN MAXTERRA 12 mm, 16 mm, or 20 mm.





Wall Component	Materials
<p><b>Exterior Insulation</b> Use either 1 or 2 depending on cladding.</p> <p>Note: A construction which utilizes no exterior sheathing may not use spray foam cavity insulation</p>	<ol style="list-style-type: none"> <li>3 1/2" thick (max.) Xci Foil (Class A) or Xci-286 for all claddings</li> <li>4" thick Xci Foil (Class A) or Xci-286 for claddings 1-6</li> </ol>
<p><b>WRB Over Exterior Insulation</b></p>	<p>See Table 9</p> <p>The exterior insulation may be used with or without CavClear® Masonry Mat over the insulation with a maximum 1" air gap between the CavClear® and the cladding. When CavClear® is used, this may only be used with Cladding 1, 2, 3, 4, 5, or 6 or with thin brick/thin stone adhered to stucco as long as the total thickness is 3/4" min.</p>

Where MAXTERRA 12 mm, 16 mm, or 20 mm is applied over polyiso, it shall be mechanically attached (per wind load design) or adhered with approved construction adhesive 2 in. dabs spaced 18 in. apart or 1 ft long, 1/4 in. wide ribbons spaced 1 ft apart. Use the WRBs listed for use over the exterior insulation on the MgO surface. See Table 9 – WRB over insulation.

<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>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>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.</li> <li>Limestone – Minimum 2" thick using any standard non-open joint installation technique such as shiplap.</li> <li>Natural stone veneer – Minimum 2" thick using any standard non-open joint installation technique such as grouted/mortared stone.</li> <li>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.</li> <li>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.</li> <li>Any MCM that has passed <i>NFPA 285</i>.</li> <li>Uninsulated sheet metal building panels including steel, copper, aluminum or zinc.</li> <li>1/4" (min.) uninsulated fiber-cement siding, or porcelain or ceramic tile mechanically attached.</li> <li>Stone, porcelain, ceramic/aluminum honeycomb composite building panels that have successfully passed <i>NFPA 285</i> criteria.</li> <li>Autoclaved-aerated-concrete (AAC) panels that have successfully passed <i>NFPA 285</i> criteria.</li> <li>Terra Cotta Cladding – Any Rain-screen Terra Cotta (min. 1/2" thick) with ventilated shiplap.</li> <li>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.</li> <li>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.</li> <li>Glen Gery Thin Tech Elite Series Masonry Veneer or TABS II Panel System with 1/2" thick bricks using TABS Wall Adhesive.</li> <li>Natural Stone Veneer – minimum 1 1/4" thick using any standard installation technique.</li> <li>FunderMax M.Look – minimum 1/4" thick using any standard installation technique</li> </ol>
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TABLE 6. NFPA 285 APPROVED WALL ASSEMBLIES WITH XCI CG (CLASS A) EXTERIOR INSULATION<sup>1,4</sup>

Wall Component	Materials
<b>Base Wall System</b> Use either 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.) a. 5 <sup>8</sup> / <sub>8</sub> " 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.) a. 5 <sup>8</sup> / <sub>8</sub> " Type X gypsum wallboard interior b. Bracing as required by building code
<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, 11, 12, 13, 14, or 15.  Items 8, 9 and 10 may only be used with exterior sheathing 2.	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 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/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" (only with ½" [min.] exterior gypsum sheathing) 10. SWD Urethane Quik-Shield 112 up to 6" in 6" (max.) stud cavities with an air gap not exceeding 2½" 11. 1½" (min.) Thermoseal 2000 (up to full cavity thickness) 12. Carlisle SealTite PRO High Yield, SealTite PRO Open Cell, SealTite PRO No Mix, SealTite PRO No Trim 21, or SealTite PRO OCX – up to full cavity thickness with ½" (min.) exterior gypsum sheathing 13. Gaco (Firestone) F6500R, 052N, F4500, 183M, F1850, F1880 – 3½" (max.) for use with 5 <sup>8</sup> / <sub>8</sub> " Exterior Gypsum Sheathing 14. JM Corbond III or Corbond IV – Full stud cavity depth or less for use with 5 <sup>8</sup> / <sub>8</sub> " exterior gypsum sheathing 15. Huntsman ProSeal HFO (8 in. max. thickness with no air gap, 6 inch max. thickness with air gap) for use with ½" or thicker exterior gypsum sheathing
<b>Exterior Sheathing</b> Use either 1, 2 or 3	1. None (only with claddings 1-6, and cavity insulation 1, 2, 3, 4, 5, 6, or 11). 2. ½" or thicker exterior gypsum sheathing 3. ½" (min.) FRTW structural panels in Type III construction
<b>Multi-Function Sheathing &amp; WRB Products</b> Use 1 or 2	1. USG Securock® Exoair® 430 System – See note and Table 9 2. 5 <sup>8</sup> / <sub>8</sub> " Georgia Pacific DensElement, flashed with Prosoco R-Guard FastFlash on sheathing joints.  Note: Item 1 or 2 replaces the exterior sheathings above. When either of these items are used, do not use exterior sheathings or WRB's on base wall surface in Table 9.
<b>WRB Over Base Wall Surface</b>	See Table 9

Exterior Sheathing 2, 3, or Multi-Function Sheathing/WRB 1, or 2 may be replaced by NEXGEN MAXTERRA 12 mm, 16 mm, or 20 mm.

<b>Exterior Insulation</b> Use either 1 or 2 depending on cladding.	1. 3½" 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.
<b>WRB Over Exterior Insulation</b>	See Table 9 The exterior insulation may be used with or without CavClear® Masonry Mat over the insulation with a maximum 1" air gap between the CavClear® and the cladding. When CavClear® is used, this may only be used with Cladding 1.

Where MAXTERRA 12 mm, 16 mm, or 20 mm is applied over polyiso, it shall be mechanically attached (per wind load design) or adhered with approved construction adhesive 2 in. dabs spaced 18 in. apart or 1 ft long, ¼ in. wide ribbons spaced 1 ft apart. Use the WRBs listed for use over the exterior insulation on the MgO surface. See Table 9 – WRB over insulation.



<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 #12 in WRB Over Exterior Insulation (Table 9) 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 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 open or 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, aluminum (or zinc only with Xci CG [Class A])</li> <li>9. 1/4" (min.) uninsulated fiber-cement siding, or porcelain or ceramic tile mechanically attached.</li> <li>10. Stone, porcelain, ceramic/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.) 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.</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 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.</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 – minimum 1/4" thick using any standard installation technique</li> </ol>
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TABLE 7. NFPA 285 APPROVED WALL ASSEMBLIES WITH XCI PLY (CLASS A) EXTERIOR INSULATION<sup>1,4</sup>

Wall Component	Materials
<b>Base Wall System</b> Use either 1, 2, 3 or 4	<ol style="list-style-type: none"> <li>Cast concrete walls</li> <li>CMU concrete walls</li> <li>25 gauge min. 3<sup>5</sup>/<sub>8</sub>" (min.) steel studs spaced 24" o.c. (max.)                             <ol style="list-style-type: none"> <li>5<sup>8</sup>" Type X gypsum wallboard interior</li> <li>Lateral bracing every 4'</li> </ol> </li> <li>FRTW (fire-retardant-treated wood) studs: min. nominal 2"x4" dimension, spaced 24" o.c. (max.)                             <ol style="list-style-type: none"> <li>5<sup>8</sup>" Type X gypsum wallboard interior</li> <li>Bracing as required by code</li> </ol> </li> </ol>
<b>Fire-Stopping at Floor Lines</b>	<ol style="list-style-type: none"> <li>Any approved mineral-fiber-based safing insulation in each stud cavity at floor line. Safing thickness must match stud cavity depth.</li> <li>Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction.</li> </ol>
<b>Cavity Insulation</b> Use either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15.  Items 3, 8, 9, 10 and 11 may only be used with exterior sheathing 2.	<ol style="list-style-type: none"> <li>None</li> <li>1½" (min.) of Carlisle® SPI SealTite PRO (up to full cavity thickness)</li> <li>1½" (min.) of BASF Walltite SPF (up to full cavity thickness)</li> <li>Any noncombustible insulation per ASTM E136</li> <li>Any mineral fiber (Board type Class A ASTM E84 faced or unfaced)</li> <li>Any fiberglass (Batt type Class A ASTM E84 faced or unfaced)</li> <li>Any foam plastic insulation (SPF or board type) that has been tested per ASTM E1354 (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</li> <li>NCFI InsulBloc SPF (up to full cavity thickness)</li> <li>Icynene MD-C-200v3 (Proseal) up to 5½" (only with ½" [min.] exterior gypsum sheathing)</li> <li>SWD Urethane Quik-Shield 112 up to 6" in 6" (max.) stud cavities with an air gap not exceeding 2½"</li> <li>1½" (min.) Thermosteal 2000 (up to full cavity thickness)</li> <li>Carlisle SealTite PRO High Yield, SealTite PRO Open Cell, SealTite PRO No Mix, SealTite PRO No Trim 21, or SealTite PRO OCX – up to full cavity thickness with ½" (min.) exterior gypsum sheathing</li> <li>Gaco (Firestone) F6500R, 052N, F4500, 183M, F1850, F1880 – 3½" (max.) for use with 5<sup>8</sup>" Exterior Gypsum Sheathing</li> <li>JM Corbond III or Corbond IV – Full stud cavity depth or less for use with 5<sup>8</sup>" exterior gypsum sheathing</li> <li>Huntsman ProSeal HFO (8 in. max. thickness with no air gap, 6 inch max. thickness with air gap) for use with ½" or thicker exterior gypsum sheathing</li> </ol>
<b>Exterior Sheathing</b> Use either 1, 2 or 3	<ol style="list-style-type: none"> <li>None (only with cavity insulation 1, 2, 4, 5 or 6). Also see note for Cavity Insulation</li> <li>½" or thicker exterior gypsum sheathing</li> <li>½" (min.) FRTW structural panels in Type III construction.</li> </ol>
<b>Multi-Function Sheathing and WRB Products</b> Use 1 or 2	<ol style="list-style-type: none"> <li>USG Securock® Exoair®430 System – See note and Table 9.</li> <li>5<sup>8</sup>" Georgia Pacific DensElement, flashed with Prosoco R-Guard FastFlash on sheathing joints.</li> </ol> <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>

Exterior Sheathing 2, 3, or Multi-Function Sheathing/WRB 1 or 2 may be replaced by NEXGEN MAXTERRA 12 mm, 16 mm, or 20 mm.

<b>Exterior Insulation</b> Use either 1 or 2 depending on cladding.	<ol style="list-style-type: none"> <li>4¼" thick (max.) Xci Ply (Class A) (3½" foam max., ¾" FR Plywood max.) with all claddings.</li> <li>4¼" thick (max.) Xci Ply (Class A) (4" foam max., ¾" FR Plywood max.) may be used with claddings 1-6.</li> </ol>
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Where MAXTERRA 12 mm, 16 mm, or 20 mm is applied over polyiso, it shall be mechanically attached (per wind load design) or adhered with approved construction adhesive 2 in. dabs spaced 18 in. apart or 1 ft long, ¼ in. wide ribbons spaced 1 ft apart. Use the WRBs listed for use over the exterior insulation on the MgO surface. See Table 9 – WRB over insulation.

<b>WRB Over Exterior Insulation</b>	See Table 9 The exterior insulation may be used with or without CavClear® Masonry Mat over the insulation with a maximum 1" air gap between the CavClear® and the cladding. When CavClear® is used, this may only be used with Cladding 1, 2, 3, 4, 5, or 6 or with thin brick/thin stone adhered to stucco as long as the total thickness is ¾" min.
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<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 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"> <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 #12 in WRB Over Exterior Insulation (Table 9) 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 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 open or non-open joint installation technique such as shiplap.</li> <li>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.</li> <li>8. Glen Gery Thin Tech Elite Series Masonry Veneer or TABS II Panel System with 1/2" thick bricks using TABS Wall Adhesive.</li> <li>9. Any MCM that has passed <i>NFPA 285</i>.</li> <li>10. Uninsulated sheet metal building panels including steel, copper, aluminum (or zinc only with Xci Ply [Class A])</li> <li>11. 1/4" (min.) uninsulated fiber-cement siding, or porcelain or ceramic tile mechanically attached.</li> <li>12. Stone, porcelain, ceramic/aluminum honeycomb composite building panels that have successfully passed <i>NFPA 285</i> criteria.</li> <li>13. Autoclaved-aerated-concrete (AAC) panels that have successfully passed <i>NFPA 285</i> criteria.</li> <li>14. Terra Cotta Cladding – Any Rain-screen Terra Cotta (min. 1/2" thick) with ventilated shiplap.</li> <li>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.</li> <li>16. Natural Stone Veneer – minimum 1 1/4" thick using any standard installation technique.</li> <li>17. FunderMax M.Look – minimum 1/4" thick using any standard installation technique</li> </ol>
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<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, 26, 27, 28, 29, 30, 31, 32, 33, or None.</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. Hunter Xci VP-SA WRB</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 705 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 Xci Foil (Class A) (or Xci 286), 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, 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.</li> <li>10. Tyvek CommercialWrap or CommercialWrap D, Fluid Applied WB (only with Xci Ply [Class A] or Xci Foil [Class A]).</li> <li>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)</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. Dörken Systems, Inc., Delta-Vent SA, Delta-Vent S, Delta-Fassade S, Delta Maxx, Delta Stratus SA</li> <li>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 <math>T_{ign}</math>, Pk. HRR) than those listed above</li> <li>17. BASF Enershield HP or Enershield I</li> <li>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])</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 (or LT version) or DefendAir 200C (Charcoal)</li> <li>27. Hohmann &amp; Barnard Enviro Barrier and Enviro Barrier VP</li> <li>28. STS FW100 or FW100A</li> <li>29. Karnak 321 K-NRG</li> <li>30. NaturaSeal AirSeal NS-A-250LP, AirSeal NS-A-250HP</li> <li>31. Jumpstart HWW-65A, HWW-65B, HWHP-80A, HWMP-90A, HWD2-72A, HWHPT-92A, HWMPC-105A</li> <li>32. Master Wall Rollershield</li> <li>33. Parex WeatherSeal Spray &amp; Roll-On</li> </ol>
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<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, 20, 21,	<ol style="list-style-type: none"> <li>1. Hunter Xci VP-SA WRB</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 NP</li> <li>3. GE Momentive SEC 2500 SilShield, Elemax 2600</li> <li>4. VaproShield WrapShield SA, RevealShield SA</li> </ol>
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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  
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Wall Component	Materials
22, 23, 24, 25, 26, or None.  Note: Some WRB's are only allowed with specific systems	<ol style="list-style-type: none"> <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, Blueskin® VP160 (only with Xci Ply [Class A]), Air-Bloc® 33MR and 16MR.</li> <li>7. Tyvek CommercialWrap or StuccoWrap</li> <li>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)</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 or Emerald Coat (only with Xci-Ply)</li> <li>11. Dryvit Backstop NT</li> <li>12. 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>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. Dörken Systems, Inc., Delta-Vent SA, Delta-Vent S, Delta-Fassade S, Delta Maxx.</li> <li>16. Soprema Sopraseal Stick VP (with Claddings 1-6, not with Xci Foil), 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 Chemical DefendAir 200 (or LT version) or DefendAir 200C (Charcoal)</li> <li>21. Hohmann &amp; Barnard Enviro Barrier VP</li> <li>22. STS FW100A</li> <li>23. Kamak 321 K-NRG</li> <li>24. Jumpstart HWW-65A, HWW-65B, HWHP-80A, HWMP-90A, HWD2-72A, HWHPT-92A, HWMPC-105A</li> <li>25. Master Wall Rollershield</li> <li>26. Parex WeatherSeal Spray &amp; Roll-On</li> </ol>



**APPENDIX C**  
**Rmax Polyiso Table (Ref. DrJ TER 1309-03)**

**Table 6.** Fire Performance – Vertical & Lateral Fire Propagation (ECOMAXci FR and ECOMAXci FR WHITE)

Wall Component	Materials
<p><b>Base Wall System</b> Select Option 1, 2, 3 or 4</p>	<ol style="list-style-type: none"> <li>1. Cast concrete walls</li> <li>2. CMU Concrete walls</li> <li>3. 20-gauge (min.) 3.625" (min.) steel studs spaced 24" o.c. (max.)                             <ol style="list-style-type: none"> <li>a. 1/2" (min.) type X Special Fire Resistant Gypsum Wallboard Interior</li> <li>b. Bracing as required by code</li> </ol> </li> <li>4. Where allowed by code in Types I, II, III or IV construction, FRTW (Fire-Retardant Treated Wood) studs complying with <u>IBC Section 2303.2</u>, minimum nominal 2x4 dimension, spaced 24" o.c. (max.)                             <ol style="list-style-type: none"> <li>a. 0.625" type X Gypsum Wallboard Interior</li> <li>b. Bracing as required by code</li> </ol> </li> </ol>
<p><b>Floor Line Firestopping</b> Select Option 1 or 2</p>	<ol style="list-style-type: none"> <li>1. 4-pcf mineral wool installed with Z-clips</li> <li>2. FRTW fire blocking at floor line in accordance with applicable code requirements (use with FRTW framing)</li> </ol>
<p><b>Cavity Insulation</b> Select Option 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 or 15</p> <p><b>NOTE:</b> EZ FLO may be used inside the box headers and jamb studs for NFPA 285 assemblies requiring SPF in stud cavities</p>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Any noncombustible insulation per ASTM E136</li> <li>3. Any Mineral Fiber (board type Class A, ASTM E84 faced or un-faced)</li> <li>4. Any Fiberglass (batt type Class A ASTM E84 faced or unfaced)</li> <li>5. 5.5" (max.) Icynene LD-C-50 SPF in 6" deep studs (max.). Use with 0.625" exterior sheathing.</li> <li>6. 5.5" (max.) Icynene MD-C-200 2-pcf SPF in 6" deep studs (max.) full fill without an air gap. Use with 0.625" exterior sheathing.</li> <li>7. 5.5" (max.) Icynene MD-R-210 2-pcf SPF in 6" deep studs (max.) full fill without an air gap. Use with 0.625" exterior sheathing</li> <li>8. SWD Urethane QS 112 2-pcf SPF in 6" deep studs (max.) partial fill with a maximum 2.5" air gap or full fill. Use with 0.625" exterior sheathing.</li> <li>9. Gaco Western 183M SPF (3.5" max). Use with 0.625" exterior sheathing.</li> <li>10. Gaco Western F 1850 SPF (3.5" max). Use with 0.625" exterior sheathing.</li> <li>11. Demilec Sealection 500 SPF (3.625" max). Use with 0.625" exterior sheathing.</li> <li>12. Demilec HeatLok Soy 200 Plus SPF (3.4" max). Use with 0.625" exterior sheathing.</li> <li>13. Bayer Bayseal SPF (3" max). Use with 0.625" exterior sheathing.</li> <li>14. Lapolla FoamLok FL 2000 SPF (3" max). Use with 0.625" exterior sheathing.</li> <li>15. BASF SprayTite 81206 or WallTite (US &amp; US-N) SPF (3.625" max). Use with 0.625" exterior sheathing.</li> </ol>
<p><b>Exterior Sheathing</b> Select option 1, 2, 3, 4, 5, 6, 7 or 8</p> <p><b>NOTE:</b> When SPF is used, 0.625" exterior gypsum sheathing must be used.</p>	<ol style="list-style-type: none"> <li>1. None (when using Base Wall 1 or 2)</li> <li>2. None (3" max. exterior insulation with claddings 7-15)</li> <li>3. None (4.5" max. exterior insulation with claddings 1-6)</li> <li>4. 0.5" (min.) exterior gypsum board sheathing</li> <li>5. 0.5" (min.) FRTW structural panels complying with <u>IBC Section 2303.2</u> and installed in accordance with code allowances for Types I, II, III or IV construction.</li> <li>6. 0.625" DensElement with DensDefy or Prosoco FastFlash flashing at joints/fasteners</li> <li>7. Soprema Sopraseal Xpress G</li> <li>8. Tremco/USG Securock® ExoAir® 430</li> </ol>
<p><b>Weather-Resistive Barrier Applied to Exterior Sheathing</b> Select option 1 or 2 installed per <a href="#">www.fedex.com/installation-instructions</a></p>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Any WRB tested in accordance with 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 the baseline WRB or exterior insulation foam core. The following WRB products are allowed:</li> </ol>

Exterior Sheathing 4, 5, 6, 7, and 8 may be replaced by NEXGEN MAXTERRA 12 mm, 16 mm, or 20 mm.





**Table 6.** Fire Performance – Vertical & Lateral Fire Propagation (ECOMAXci FR and ECOMAXci FR WHITE)

Wall Component	Materials
<p><b>NOTE:</b> WRB over Exterior Sheathing items 6-8 may not be used since they already incorporate a pre-installed WRB.</p> <p><b>NOTE:</b> When using no exterior sheathing, sheet building wraps may be applied directly to studs.</p> <p>NLA = No Longer Available.</p>	2.01 Carlisle CCW Fire Resist 705FR-A
	2.02 Carlisle CCW Fire Resist Barritech NP™
	2.03 Carlisle CCW Fire Resist Barritech VP
	2.04 Dörken Systems Inc, Delta Stratus SA
	2.05 Dörken Systems Inc, Delta®-Fassade S
	2.06 Dörken Systems Inc, Delta®-Foxy/Plus
	2.07 Dörken Systems Inc, Delta®-Maxx/Plus
	2.08 Dörken Systems Inc, Delta®-Vent S/Plus
	2.09 Dörken Systems Inc, Delta®-Vent SA
	2.10 Dow Corning DOWSIL DefendAir 200 (or LT version)
	2.11 Dow Corning DOWSIL DefendAir 200C (Charcoal)
	2.12 Dryvit Backstop® NT™
	2.13 DuPont™ Tyvek® (Various per ESR 2375)
	2.14 DuPont™ WeatherMate™ Housewrap
	2.15 DuPont™ WeatherMate™ Plus Housewrap
	2.16 GCP PERM-A-BARRIER® Aluminum Wall Membrane
	2.17 GCP PERM-A-BARRIER® NPL 10
	2.18 GCP PERM-A-BARRIER® VPL
	2.19 GCP PERM-A-BARRIER® VPL 50 Membrane
	2.20 GCP PERM-A-BARRIER® VPL Low Temperature
	2.21 GCP PERM-A-BARRIER® VPS
	2.22 Henry Air-Bloc All Weather STPE
	2.23 Henry® Air-Bloc® 16 MR
	2.24 Henry® Air-Bloc® 17 MR
	2.25 Henry® Air-Bloc® 21 FR
	2.26 Henry® Air-Bloc® 31MR [NLA]
	2.27 Henry® Air-Bloc® 32MR [NLA]
	2.28 Henry® Air-Bloc® 33MR [NLA]
	2.29 Henry® Blueskin® Metal Clad®
2.30 Henry® Blueskin® SA	
2.31 Henry® Blueskin® VP 160	
2.32 Henry® EnviroCap	
2.33 Henry® FoilSkin	
2.34 Henry® Super Jumbo Tea 60 Minute® (Fortifiber)	
2.35 Henry® WeatherSmart® Drainable Housewrap (Fortifiber)	
2.36 Kingspan (Pactiv) GreenGuard® MAX™ Building Wrap	
2.37 MBCC MasterSeal® AWB 660 (Formerly BASF Enershield® HP)	
2.38 MBCC MasterSeal® AWB 660 I (Formerly BASF Enershield® I)	
2.39 NaturaSeal AirSeal NS A-250LP™	
2.40 NaturaSeal NS-A-250HP™	
2.41 Parex WeatherSeal Spray & Roll-On	
2.42 Pecora ProPerm VP	
2.43 Pecora XL-PermULTRA NP	
2.44 Pecora XL-PermULTRA VP (10 mil DFT)	
2.45 Prosoco R-Guard® Cat 5™	
2.46 Prosoco R-Guard® MVP (NLA)	
2.47 Prosoco R-Guard® Spray Wrap (NLA)	
2.48 Prosoco R-Guard® Spray Wrap MVP	
2.49 Prosoco R-Guard® VB	
2.50 Siga Majvest® 500 SA	



**Table 6. Fire Performance – Vertical & Lateral Fire Propagation (ECOMAXci FR and ECOMAXci FR WHITE)**

Wall Component	Materials
	2.51 Sika Sikagard®-530 2.52 Sika Sikagard®-535 2.53 Soprema Sopraseal® LM 204 VP 2.54 Soprema Sopraseal® Stick 1100T 2.55 Soprema Sopraseal® Stick VP 2.56 Soprema Soprasolin HD 2.57 Tremco ExoAir 110AT 2.58 Tremco ExoAir 230 2.59 Vaproshield RevealShield SA® 2.60 Vaproshield WrapShield SA® 2.61 W.R. Meadows® Air-Shield™ LMP (Black) 2.62 W.R. Meadows® Air-Shield™ LMP (Gray) 2.63 W.R. Meadows® Air-Shield™ LSR 2.64 W.R. Meadows® Air-Shield™ SMP 2.65 W.R. Meadows® Air-Shield™ TMP
<p><b>Exterior Insulation</b> Use either 1 or 2</p> <p><b>NOTE:</b> See Exterior sheathing options for thickness limitations when no exterior sheathing is used.</p>	1. 4.5" (max. consisting of a single panel or multiple thinner panels) Rmax ECOMAXci FR 2. 4.5" (max. consisting of a single panel or multiple thinner panels) Rmax ECOMAXci FR WHITE
<p><b>FRTW Structural Panels over Exterior Insulation (Optional)</b></p>	<p>For use with all cladding options, installed in accordance with applicable code requirements. Must be applied with joints staggered. Fasteners used for securing FRTW panels must penetrate through the foam plastic into FRTW or steel framing. The system must be designed to handle the cladding load and wind load per the applicable code.</p> <p><b>NOTE:</b> May be applied in the field or factory applied. Adhesive must not be full coverage.</p>
<p><b>Weather-Resistive Barrier Applied over Exterior Insulation (or FRTW)</b> Use any in item 1 or 2 depending on the cladding used</p> <p><b>NOTE:</b> Exterior WRB items in 1.02 are not traditional WRB products but are insulation panel joint tapes. The insulation panel joints shall be staggered.</p> <p>NLA = No longer available.</p>	1. For use with all claddings <ul style="list-style-type: none"> <li>1.01 None</li> <li>1.02 6" (max) tape or flashing over insulation joints                             <ul style="list-style-type: none"> <li>a Rmax® R-SEAL 3000</li> <li>b Rmax® R-SEAL 6000</li> <li>c Rmax® R-SEAL 2000 LF</li> <li>d Venture Tape CW</li> <li>e Asphalt or butyl based tape</li> <li>f Liquid flashing</li> </ul> </li> <li>1.03 Carlisle (CCW) Fire Resist 705FR-A</li> <li>1.04 Dupont™ Tyvek® (Various per 2375)</li> <li>1.05 Dupont™ Weathermate™ Housewrap</li> <li>1.06 Dupont™ Weathermate™ Plus Housewrap</li> <li>1.07 GCP PERM-A-BARRIER® Aluminum Wall Membrane</li> <li>1.08 Henry® Blueskin® Metal Clad®</li> <li>1.09 Henry® FoilSkin</li> <li>1.10 Kingspan (Pactiv) GreenGuard® MAX™ Building Wrap</li> <li>1.11 Prosoco R-Guard® Spray Wrap MVP</li> <li>1.12 Soprema Soprasolin® HD</li> </ul>

FRTW structural panels over exterior insulation may be replaced by NEXGEN MAXTERRA 12 mm, 16 mm, or 20 mm

Where MAXTERRA 12 mm, 16 mm, or 20 mm is applied over polyiso, it shall be mechanically attached (per wind load design) or adhered with approved construction adhesive 2 in. dabs spaced 18 in. apart or 1 ft long, ¼ in. wide ribbons spaced 1 ft apart. Use the WRBs listed for use over the exterior insulation on the MgO surface. See the tables above and below.



**Table 6. Fire Performance – Vertical & Lateral Fire Propagation (ECOMAXci FR and ECOMAXci FR WHITE)**

Wall Component	Materials
	<p>2. For use with cladding options 1-6 (heavy masonry) with non-open joint installation techniques (ex. shiplap, etc.)</p> <p>2.01 Carlisle CCW Fire Resist Barritech NP™</p> <p>2.02 Carlisle CCW Fire Resist Barritech VP</p> <p>2.03 Dörken Systems Inc. Delta®-Fassade S</p> <p>2.04 Dörken Systems Inc. Delta®-Foxy/Plus</p> <p>2.05 Dörken Systems Inc. Delta®-Maxx/Plus</p> <p>2.06 Dörken Systems Inc. Delta®-Vent S/Plus</p> <p>2.07 Dow Corning DOWSIL™ DefendAir 200</p> <p>2.08 Dow Corning DOWSIL™ DefendAir 200C</p> <p>2.09 Dryvit Backstop® NT™</p> <p>2.10 GCP PERM-A-BARRIE® VPS</p> <p>2.11 GCP PERM-A-BARRIER® VPL</p> <p>2.12 GCP PERM-A-BARRIER® VPL Low Temperature</p> <p>2.13 Henry Air-Bloc All Weather STPE</p> <p>2.14 Henry Super Jumbo Tex 60 minutes (only with 3/4" stucco cladding) (Fortifiber)</p> <p>2.15 Henry WeatherSmart Drainable (Fortifiber)</p> <p>2.16 Henry® Air-Bloc® 16 MR</p> <p>2.17 Henry® Air-Bloc® 17 MR</p> <p>2.18 Henry® Air-Bloc® 21 FR</p> <p>2.19 Henry® Air-Bloc® 31MR</p> <p>2.20 Henry® Air-Bloc® 33MR</p> <p>2.21 Henry® Blueskin® VP160</p> <p>2.22 Henry® Envirocap</p> <p>2.23 Parex WeatherSeal Spray &amp; Roll-On</p> <p>2.24 Pecora ProPerm VP</p> <p>2.25 Pecora XL-Perm<sup>ULTRA</sup> NP</p> <p>2.26 Pecora XL-Perm<sup>ULTRA</sup> VP (10 mil DFT)</p> <p>2.27 Prosoco R-Guard® Cat 5™</p> <p>2.28 Prosoco R-Guard® MVP (NLA)</p> <p>2.29 Prosoco R-Guard® Spray Wrap (NLA)</p> <p>2.30 Prosoco R-Guard® VB</p> <p>2.31 Siga Majvest® 500 SA</p> <p>2.32 Sika SikaGard® 535</p> <p>2.33 Soprema Sopraseal® Stick VP</p> <p>2.34 Vaproshield Revealshield SA®</p> <p>2.35 Vaproshield Wrapshield SA®</p> <p>2.36 W.R. Meadows® Air-Shield™ LMP (Black)</p> <p>2.37 W.R. Meadows® Air-Shield™ LMP (Gray)</p> <p>2.38 W.R. Meadows® Air-Shield™ LSR</p> <p>2.39 W.R. Meadows® Air-Shield™ SMP</p> <p>2.40 W.R. Meadows® Air-Shield™ TMP</p> <p>2.41 Henry® Air-Bloc® 31MR</p>
<p><b>Exterior Cladding</b>                      Select option 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 or 17</p> <p><b>NOTE:</b> For WRB over exterior insulation option 2 above, heavy</p>	<p><b>Heavy Masonry</b></p> <p>1. Brick - nominal 4" clay brick or veneer with a maximum 2" air gap behind brick. Brick ties/anchors –24" o.c. (max.)</p> <p>2. Stucco – Minimum 0.75" thick, exterior cement plaster and lath with an optional secondary water resistive barrier between the exterior insulation and lath.*</p> <p>3. Limestone - minimum 2" thick any using standard installation technique.</p>



<p>masonry claddings 1-6 shall incorporate non-open joints.</p>	<ol style="list-style-type: none"> <li>4. Natural Stone Veneer – Minimum 2" thick using any standard installation technique.</li> <li>5. Cast Artificial Stone, Precast Concrete Panels, or CMU – Minimum 1.5" thick, using any standard installation technique. Cast stone complying with ICC-ES AC 51.</li> <li>6. Terra Cotta Cladding – Minimum 1.25" thick using any standard installation technique.</li> </ol> <p><u>Other</u></p> <ol style="list-style-type: none"> <li>1. Any MCM or ACM (aluminum, steel, copper, zinc) (w/ 2.5" maximum air gap) that has successfully passed NFPA 285 using any standard installation technique, such as             <ol style="list-style-type: none"> <li>a. Carter Companies EVO Architectural Panel Systems for use with any FR ACM/MCM NFPA 285 material</li> </ol> </li> <li>2. Uninsulated sheet metal building panels including aluminum, zinc, steel or copper using any standard installation technique.</li> <li>3. Uninsulated fiber-cement board siding using any standard installation technique.</li> <li>4. Stone/Aluminum honeycomb composite building panels that have passed NFPA 285 or equivalent.             <ol style="list-style-type: none"> <li>a. Stone Panels Inc. Stone Lite Panel system has been analyzed using manufacturer standard installation technique</li> </ol> </li> <li>5. Autoclaved-aerated- concrete (AAC) panels that have successfully passed NFPA 285 using any standard installation technique.</li> <li>6. Thin Set Brick             <ol style="list-style-type: none"> <li>a. Glen-Gary Thin Tech™ Elite Series has been analyzed using manufacturer standard installation technique.</li> <li>b. Tabs II Panel System with 0.5" bricks using Tabs Wall Adhesive</li> </ol> </li> <li>7. Natural Stone Veneer – minimum 1.25" (adhered with mortar or concrete/cement based adhesive).</li> <li>8. FunderMax M.Look using the manufacturer standard installation technique. The air gap between cladding and insulation or WRB must not exceed 1.5".</li> <li>9. Glen-Gery Tru-Brix (only with optional non-combustible mortar)</li> <li>10. Thin brick (minimum 0.75" thick clay brick) fully adhered with cementitious mortar (standard or polymer-modified) to minimum 0.5" thick cement backer board or gypsum sheathing. A secondary water resistive barrier can be installed between the exterior sheathing and the brick.*</li> <li>11. Natural stone or artificial stone (minimum 0.75" thick) fully adhered with cementitious mortar (standard or polymer-modified) to minimum 0.5" thick cement backer board or gypsum sheathing. A secondary water resistive barrier can be installed between the exterior sheathing and the brick.*</li> </ol> <p><b>*NOTE:</b> The secondary barriers shall not be full-coverage asphalt or butyl-based self-adhered membranes.</p>
<p><b>Rough Openings</b></p> <p><b>NOTE:</b> Must cover both the air gap between the cladding and the exterior insulation and the exposed edge of the exterior insulation.</p>	<p>Rough opening perimeters shall incorporate one of the following, spanning at a minimum from the interior edge of the cladding to the interior edge of the exterior insulation at the rough opening.</p> <ol style="list-style-type: none"> <li>1. 0.08" (min.) aluminum (examples include window frame, flashing, lintel, c-channel)</li> <li>2. 20-gauge (min.) sheet steel (examples include window frame, flashing, lintel, c-channel)</li> <li>3. 0.5" (min.) 4pcf (min.) mineral wool</li> <li>4. 0.75" (min.) FRT wood buck</li> <li>5. 0.75" (min.) FRT plywood</li> <li>6. 0.625" (min.) type X GWB</li> <li>7. 0.25" (min.) fiber cement board</li> </ol>



**APPENDIX D  
Carlisle R2+-Polyiso (Ref. TER 1407-02)**

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.) a. 5 <sup>8</sup> / <sub>8</sub> " Type X gypsum wallboard interior b. Lateral bracing every 4' 4. FRTW (fire-retardant-treated wood) studs: min. nominal 2x4 dimension, spaced 24" o.c. (max.) a. 5 <sup>8</sup> / <sub>8</sub> " Type X gypsum wallboard interior b. Bracing as required by building code
<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, 11, 12, 13, 14, or 15.  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 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/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-Shield 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) 12. Carlisle® SealTite PRO High Yield, SealTite PRO Open Cell, SealTite PRO No Mix, SealTite PRO No Trim 21, or SealTite PRO OCX – up to full cavity thickness with ½" (min.) exterior gypsum sheathing 13. Gaco (Firestone) F6500R, 052N, F4500, 183M, F1850, F1880 – 3½" (max.) for use with 5 <sup>8</sup> / <sub>8</sub> " Exterior Gypsum Sheathing 14. JM Corbond III or Corbond IV – Full stud cavity depth or less for use with 5 <sup>8</sup> / <sub>8</sub> " exterior gypsum sheathing 15. Huntsman ProSeal HFO (8 in. max. thickness with no air gap, 6 inch max. thickness with air gap) for use with ½" or thicker exterior gypsum sheathing
<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>Multi-Function Sheathing and WRB Products</b> Use 1 or 2	1. USG Securock® Exoair® 430 System – See note and Table 7 2. 5 <sup>8</sup> / <sub>8</sub> " Georgia Pacific DensElement, flashed with Prosoco R-Guard FastFlash on sheathing joints  4. 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 7

Exterior Sheathing 2, 3, and Multi-function Sheathing/WRB Items 1 or 2 may be replaced by NEXGEN MAXTERRA 12 mm, 16 mm, or 20 mm.



<b>WRB Over Base Wall Surface</b>	See Table 7
<b>Exterior Insulation</b>	<ol style="list-style-type: none"> <li>3½"-thick (max.) R2+ SHEATHE for all claddings</li> <li>4" thick R2+ SHEATHE for claddings 1-6</li> </ol>
<b>WRB Over Exterior Insulation</b>	<p>See Table 7</p> <p>The exterior insulation may be used with or without CavClear® Masonry Mat over the insulation with a maximum 1" air gap between the CavClear® and the cladding. When CavClear® is used, this may only be used with Cladding 1, 2, 3, 4, 5, or 6 or with thin brick/thin stone adhered to stucco as long as the total thickness is ¾" min.</p>

Where MAXTERRA 12 mm, 16 mm, or 20 mm is applied over polyiso, it shall be mechanically attached (per wind load design) or adhered with approved construction adhesive 2 in. dabs spaced 18 in. apart or 1 ft long, ¼ in. wide ribbons spaced 1 ft apart. Use the WRBs listed for use over the exterior insulation on the MgO surface. See Table 7 below.

<p><b>Exterior Cladding</b></p> <p>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>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>Stucco – Minimum ¾"-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 (Table 7) can be used as a slip sheet between the WRB/ exterior insulation and the lath.</li> <li>Limestone – Minimum 2" thick using any standard non-open joint installation technique such as shiplap.</li> <li>Natural stone veneer – Minimum 2" thick using any standard non-open joint installation technique such as grouted/mortared stone.</li> <li>Cast Artificial Stone – Minimum 1½" thick complying with ICC-ES AC 51 using any standard non-open joint installation technique such as shiplap.</li> <li>Terra Cotta Cladding – Minimum 1¼" thick (solid or equivalent by weight) using any standard non-open joint installation technique such as shiplap.</li> <li>Any MCM that has passed <i>NFPA 285</i>.</li> <li>Uninsulated sheet metal building panels including steel, copper and aluminum.</li> <li>Uninsulated fiber-cement siding.</li> <li>Stone/Aluminum honeycomb composite building panels that have successfully passed <i>NFPA 285</i> criteria.</li> <li>Autoclaved-aerated-concrete (AAC) panels that have successfully passed <i>NFPA 285</i> criteria.</li> <li>Terra Cotta Cladding – Any Rain-screen Terra Cotta (min. ½" thick) with ventilated shiplap.</li> <li>½" stucco – any one coat stucco (½" 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>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 ¾". 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 (Table 7) can be used as a slip sheet between the WRB/AVP and the lath.</li> <li>Glen Gery Thin Tech Elite Series Masonry Veneer or TABS II Panel System with ½"-thick bricks using TABS Wall Adhesive.</li> <li>Natural Stone Veneer – minimum 1¼" thick using any standard installation technique.</li> <li>FunderMax m.look Grey Core – minimum ¼" thick using any standard installation technique</li> </ol>
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Table 7 – WRBs listed below.

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, 26, 27, 28, 29, 30, 31, 32, 33, or None.</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. Hunter Xci VP-SA WRB</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> <li>27. Hohmann &amp; Barnard Enviro Barrier and Enviro Barrier VP</li> <li>28. STS FW100 or FW100A</li> <li>29. Karnak 321 K-NRG</li> <li>30. NaturaSeal AirSeal NS-A-250LP, AirSeal NS-A-250HP</li> <li>31. Jumpstart HWW-65A, HWW-65B, HWHP-80A, HWMP-90A, HWD2-72A, HWHPT-92A, HWMPC-105A</li> <li>32. Master Wall Rollershield</li> <li>33. Parex WeatherSeal Spray &amp; Roll-On</li> </ol>



<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, 20, 21, 22, 23, 24, 25, 26, or None.</p> <p>Note: Some WRB's are only allowed with specific systems.</p>	<ol style="list-style-type: none"> <li>1. Hunter Xci VP-SA WRB</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> <li>21. Hohmann &amp; Barnard Enviro Barrier VP</li> <li>22. STS FW100A</li> <li>23. Karnak 321 K-NRG</li> <li>24. Jumpstart HWW-65A, HWW-65B, HWHP-80A, HWMP-90A, HWD2-72A, HWHPT-92A, HWMPC-105A</li> <li>25. Master Wall Rollershield</li> <li>26. Parex WeatherSeal Spray &amp; Roll-On</li> </ol>
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**APPENDIX E  
Kingspan Kooltherm (TER 1601-06)**

<b>NFPA 285 Approved Wall Assemblies Containing Maximum 4¾-inch Thick Kooltherm® Insulation<sup>1</sup></b>	
<b>Wall Component</b>	<b>Materials</b>
<b>Base Wall System</b> Use 1, 2 or 3	<ol style="list-style-type: none"> <li>1. Cast concrete Wall</li> <li>2. Concrete Masonry Wall</li> <li>3. 1 layer 5/8"-thick Type X gypsum wallboard on interior installed over steel studs: minimum 35/8" depth, minimum 20-gauge, spaced at a maximum of 24" o.c. with lateral bracing every 4' vertically.</li> </ol>
<b>Floorline Firestopping</b>	<ol style="list-style-type: none"> <li>1. 4 lb./cu ft. mineral wool in each stud cavity at each floor line, attached with Z-clips or equivalent</li> </ol>
<b>Cavity Insulation</b> Use either 1, 2 or 3	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Fiberglass batt or mineral wool insulation (faced or unfaced)</li> <li>3. Any noncombustible insulation (faced or unfaced)</li> </ol>
<b>Exterior Gypsum Sheathing</b> Use either 1 or 2	<ol style="list-style-type: none"> <li>1. None; when base wall systems #1 or #2 are used, sheathing is optional</li> <li>2. Minimum 5/8"-thick, Type X, exterior type gypsum sheathing</li> </ol>
<b>Weather-Resistive Barrier Applied Over Gypsum Sheathing</b> Use either 1 or 2	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Any weather-resistive barrier materials as indicated in <a href="#">Table 6</a>.</li> </ol>

Exterior Sheathing 2 may be replaced by NEXGEN MAXTERRA 12 mm, 16 mm, or 20 mm.

<b>Exterior Insulation</b>	Kingspan Kooltherm® K15, K8, K10, K12 or K20 insulation – minimum 1" (25 mm) thick to a maximum of 4¾" (120 mm) thick. Standard silver aluminum, black coated aluminum, white coted aluminum, or glass tissue facers are all acceptable facing materials.
<b>Sealing of exterior insulation</b>	Optional; all exterior insulation joints and veneer tie penetrations sealed with acrylic, asphalt or butyl-based sealing tape – max. 4-inch width
<b>Exterior Veneer</b> Use any of these options	<ol style="list-style-type: none"> <li>1. Brick                             <ul style="list-style-type: none"> <li>• Standard nominal 4"-thick, clay brick</li> <li>• Brick veneer anchors – standard types – installed maximum 24" o.c. vertically on each stud</li> <li>• Maximum 2" air gap between exterior insulation and brick</li> </ul> </li> <li>2. Concrete                             <ul style="list-style-type: none"> <li>• Minimum 2" thick</li> <li>• Maximum 2" air gap between exterior insulation and concrete.</li> <li>• Any standard non-open joint technique may be used.</li> </ul> </li> <li>3. CMU-concrete Masonry Units                             <ul style="list-style-type: none"> <li>• Minimum 4" thick</li> <li>• Maximum 2" air gap between exterior insulation and CMU</li> </ul> </li> <li>4. Stone Veneer                             <ul style="list-style-type: none"> <li>• Minimum 2"-thick limestone or natural stone veneer</li> <li>• Minimum 1½"-thick cast artificial stone veneer</li> <li>• Any standard non-open joint technique may be used (such as shiplap, etc.)</li> </ul> </li> <li>5. Stucco                             <ul style="list-style-type: none"> <li>• Minimum ¾"-thick 2- or 3-coat stucco installed over lath</li> </ul> </li> </ol>
<b>Flashing of window, door and other exterior wall penetrations</b>	As an option, flash window, door and other exterior penetrations with limited amounts of acrylic, asphalt or butyl-based sealing tape, max. 12-inch width. As an option, Kooltherm® Cavity Closure can be used to close wall cavities at openings.
For More information regarding window detailing for NFPA 285 assemblies, please contact the manufacturer.	

**Table 4:** Approved NFPA 285 Wall Assemblies Containing Maximum 4¾-inch Thick Kooltherm® Insulation

Where MAXTERRA 12 mm, 16 mm, or 20 mm is applied over polyiso, it shall be mechanically attached (per wind load design) or adhered with approved construction adhesive 2 in. dabs spaced 18 in. apart or 1 ft long, ¼ in. wide ribbons spaced 1 ft apart.

The table above is for max. 4¾ in. Kooltherm Insulation



The table below is for max. 3 in. Kooltherm Insulation

NFPA 285 Approved Wall Assemblies Containing Maximum 3-inch Thick Kooltherm® Insulation <sup>1</sup>	
Wall Component	Materials
<b>Base Wall System</b> Use 1, 2 or 3	<ol style="list-style-type: none"> <li>1. Cast concrete Wall</li> <li>2. Concrete Masonry Wall</li> <li>3. 1 layer 5/8"-thick Type X gypsum wallboard on interior installed over steel studs: minimum 35/8" depth, minimum 20-gauge, spaced at a maximum of 24" o.c. with lateral bracing every 4' vertically.</li> </ol>
<b>Floorline Firestopping</b>	<ol style="list-style-type: none"> <li>1. 4 lb/cu ft. mineral wool in each stud cavity at each floor line, attached with Z-clips or equivalent</li> </ol>
<b>Cavity Insulation</b> Use either 1, 2 or 3	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Fiberglass batt or mineral wool insulation (faced or unfaced)</li> <li>3. Any noncombustible insulation (faced or unfaced)</li> </ol>
<b>Exterior Gypsum Sheathing</b> Use either 1 or 2	<ol style="list-style-type: none"> <li>1. None (only allowed when base wall systems #1 or #2 are used)</li> <li>2. 1/2" or 5/8"-thick, Type X, exterior type gypsum sheathing</li> </ol>
<b>Weather-Resistive Barrier Applied Over Gypsum Sheathing</b> Use either 1 or 2	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Any weather-resistive barrier materials as indicated in <a href="#">Table 6</a>.</li> </ol>

Exterior Sheathing 2 may be replaced by NEXGEN MAXTERRA 12, 16, or 20 mm.

<b>Exterior Insulation</b>	Kingspan Kooltherm® K15, K8, K10, K12 or K20 insulation – minimum 1" (25 mm) thick to a maximum of 3" (75 mm) thick. Standard silver aluminum, black coated aluminum, white coted aluminum, or glass tissue facers are all acceptable facing materials.
<b>Sealing of exterior insulation</b>	Optional; all exterior insulation joints and veneer tie penetrations sealed with acrylic, asphalt or butyl-based sealing tape – max. 4-inch width
<b>Exterior Veneer</b> Use any of these options	<ol style="list-style-type: none"> <li>1. MCM Panel System <ul style="list-style-type: none"> <li>• Any metal composite material system that has been successfully tested by the panel manufacturer via the NFPA 285 test method.</li> <li>• Acceptable NFPA 285 testing shall consist of successful NFPA 285 test results on wall assembly incorporating a comparable thickness of combustible foam insulation behind the MCM.</li> <li>• MCM panels shall be maximum 4-mm thick</li> </ul> </li> <li>2. Steel, Aluminum or Copper Metal Exterior Wall Cladding <ul style="list-style-type: none"> <li>• Aluminum cladding shall be minimum 0.080-inch thick;</li> <li>• Steel cladding shall be minimum 0.0149-inch thick; Copper cladding shall be minimum 0.0216-inch thick.</li> <li>• Any standard installation technique may be used.</li> <li>• Also acceptable to install cladding using Knight Wall Rainscreen Attachment System.</li> </ul> </li> <li>3. Fiber-Cement Siding (Noncombustible) <ul style="list-style-type: none"> <li>• Minimum 1/4-inch thick.</li> <li>• Any standard installation technique with noncombustible furring can be used.</li> <li>• A maximum 1-1/2-inch air gap allowed behind the fiber-cement siding.</li> </ul> </li> <li>4. Swisspearl Carat Panels <ul style="list-style-type: none"> <li>• Minimum 0.315-inch (8 mm) thick with closed or open joints (maximum 1/2 inch joints when open).</li> <li>• Any standard installation technique using noncombustible furring can be used.</li> <li>• A maximum 1 1/2-inch air gap allowed behind panels.</li> </ul> </li> <li>5. Brick <ul style="list-style-type: none"> <li>• Standard nominal 4"-thick, clay brick</li> <li>• Brick veneer anchors – standard types – installed maximum 24" o.c. vertically on each stud</li> <li>• Maximum 2" air gap between exterior insulation and brick</li> </ul> </li> <li>6. Concrete <ul style="list-style-type: none"> <li>• Minimum 2" thick</li> <li>• Maximum 2" air gap between exterior insulation and concrete.</li> <li>• Any standard non-open joint technique may be used.</li> </ul> </li> <li>7. CMU-concrete Masonry Units <ul style="list-style-type: none"> <li>• Minimum 4" thick</li> </ul> </li> </ol>



	<ul style="list-style-type: none"> <li>Maximum 2" air gap between exterior insulation and CMU</li> </ul> <p>8. Stone Veneer</p> <ul style="list-style-type: none"> <li>Minimum 2"-thick limestone or natural stone veneer</li> <li>Minimum 1½"-thick cast artificial stone veneer</li> <li>Any standard non-open joint technique may be used (such as shiplap, etc.)</li> </ul> <p>9. Stucco</p> <ul style="list-style-type: none"> <li>Minimum ¾"-thick</li> <li>2- or 3-coat stucco installed over lath</li> </ul> <p>10. Terracotta Cladding</p> <ul style="list-style-type: none"> <li>Use any terracotta cladding system in which terracotta is minimum 1¼-inch thick.</li> <li>Any standard joint installation technique such as ship-lap, etc. may be used.</li> </ul> <p>11. EIFS</p> <ul style="list-style-type: none"> <li>Henkel Polybit Industries Limited Ceresit EIFS – EIFS system consisting of Ceresit-CT 85 adhesive mortar and basecoat, Ceresit-CT 16 primer, and Ceresit-CT 60 finish coat.</li> </ul> <p>12. Thin Brick</p> <ul style="list-style-type: none"> <li>Minimum ¾-inch thick clay brick fully adhered with cementitious mortar (standard or polymer modified) to minimum ½-inch thick cement backer board or gypsum sheathing.</li> <li>A secondary water-resistive barrier can be installed between the board/sheathing and the brick.</li> <li>The secondary water-resistive barrier shall not be full-coverage asphalt or butyl-based self-adhered membranes.</li> </ul>
<b>Flashing of window, door and other exterior wall penetrations</b>	As an option, flash window, door and other exterior penetrations with limited amounts of acrylic, asphalt or butyl-based sealing tape, max. 12-inch width. As an option, Kooltherm® Cavity Closure can be used to close wall cavities at openings.
For More information regarding window detailing for NFPA 285 assemblies, please contact the manufacturer.	

Table 5: Approved NFPA 285 Wall Assemblies Containing Maximum 3-inch Thick Kooltherm® Insulation

Where MAXTERRA 12, 16, or 20 mm is applied over polyiso, it shall be mechanically attached (per wind load design) or adhered with approved construction adhesive 2 in. dabs spaced 18 in. apart or 1 ft long, ¼ wide ribbons spaced 1 ft apart. Use a WRB on the MgO surface that is approved for the specific cladding.

Table 6 for WRBs is listed below.

Table 6. Approved WRB Materials for NFPA 285 Wall Assemblies

Manufacturer	Material <sup>1</sup>	For Use with Table 4	For Use with Table 5
3M™	3M™ Self-Adhered Air and Vapor Barrier 3015	X	X
BASF	MasterSeal AWB 660	X	X
	MasterSeal AWB 660I	X	X
Carlisle	CCW-705FR w/ Primers	X	X
	Barritech™ VP	X	X
	Barritech™ NP	X	X
Cosella-Dörken	DeltaR-Foxx	X	X
	DeltaR-Foxx Plus	X	X
	DeltaR-Fassade S	X	X
	DeltaR-Vent S/Plus	X	X
	DeltaR-Maxx Plus	X	X
Dow Chemical	WeatherMate™	X	X
	WeatherMate™ Plus	X	X
Dow Corning®	DefendAir 200	X	X
Dryvit	BackstopR NT	X	X
DuPont	DuPont™ TyvekR CommercialWrap®	X	X
	DuPont™ TyvekR CommercialWrap® D	X	X
	DuPont™ TyvekR ThernaWrap™	X	X
	DuPont™ TyvekR Fluid Applied WB+ – nominal 25 wet mil thickness	X	X
Henry Company	Air-Bloc® 32MR	X	X
	Air-Bloc® 31MR	X	X
	Air-Bloc® 33MR	X	X
	Blueskin VP™ 160	X	X



Hohmann & Barnard	Air-Bloc® 21 FR	X	X
	Metal Clad™	X	X
	Foilskin®	X	X
	Enviro-Barrier™	X	X
	Enviro-Barrier™ VP	X	X
Grace Construction Products	Perm-A-BarrierR Aluminum Wall Membrane	X	X
	Perm-A-BarrierR VPL	X	X
	Perm-A-BarrierR VPL LT	X	X
	Perm-A-BarrierR VPS	X	X
	Perm-A-BarrierR NPL 10	X	X
JX Nippon ANCI, Inc.	JX ALTATM Commercial Wrap	X	X
	JX ALTATM HP Wrap	X	X
	JX ALTATM LP Wrap	X	X
Kingspan®	Kingspan® GreenGuard® Max™ Building Wrap	X	X
	Kingspan® GreenGuard® Classic Building Wrap	X	X
	Kingspan® GreenGuard® C2000 Building Wrap	X	X
	Kingspan® GreenGuard® Raindrop® 3D Building Wrap	X	X
	Kingspan® GreenGuard® HPW™ Building Wrap	X	X
	Everbilt™ Premium Non-woven Housewrap	X	X
	Momentive Performance Materials	GE SEC2500 SilShield* AWB	X
GE SEC2600 SilShield* AWB		X	X
GE SEC2600-r SilShield* AWB		X	X
Polyguard Products	Airlok Flex® applied at a maximum 40 mils WFT	X	

TER 1601-06 NFPA 285 Tested Wall Assemblies Using Kingspan® Kooltherm® Insulation Boards in Exterior Walls of Buildings of Type I-IV Construction  
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Manufacturer	Material <sup>1</sup>	For Use with Table 4	For Use with Table 5
	Airlok Flex® WG applied at a maximum 20 mils WFT	X	
	Airlok Flex® VP applied at a maximum 32 mils WFT	X	



	Airlok Flex® WG applied at a maximum 20 mils WFT	X	
	Airlok Flex® VP applied at a maximum 32 mils WFT	X	
Prosoco	CAT 5	X	
	CAT 5 Rainscreen	X	
Soprema	Sopresa Stick 1100 TI	X	
	Sopraseal Stick VP	X	
Sto Corp	Sto Gold Coat® with StoGuard Fabric	X	X
	Sto Emerald Coat® with StoGuard Fabric	X	X
	Sto ExtraSeal™ with StoGuard Mesh	X	X
	StoGuard® VaproShield™	X	
STS, Inc.	Wall Guardian™ FW-100A	X	X
Tremco, Inc.	ExoAir 430		
VaproShield	WallShield	X	X
	WrapShield	X	X
	WrapShield SA™	X	
	RevealShield™	X	X
	RevealShield SA™	X	X
W.R. Meadows	Air-Shield™ LMP (Gray)	X	X
	Air-Shield™ LMP (Black)	X	X
	Air-Shield™ TMP	X	X
	Air-Shield™ LSR	X	X

~ End of Report ~

