



CERTIFICATION



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Technical Evaluation Report

TER 1212-03

Rmax ECOMAXci® FR Air Barrier and
EVOMAXci™

Rmax

Product:

**Rmax ECOMAXci® FR Air
Barrier (formerly ECOMAXci®)
and Rmax EVOMAXci**

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DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

SECTION: 06 16 00 - Sheathing

SECTION: 06 16 13 - Insulated Sheathing

SECTION: 06 16 53 - Moisture-Resistant Sheathing Board

DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION

SECTION: 07 20 00 - Thermal Protection

SECTION: 07 21 00 - Thermal Insulation

SECTION: 07 25 00 - Water-Resistive Barriers/Weather Barriers

SECTION: 07 27 00 - Air Barriers

1 PRODUCTS EVALUATED¹

- 1.1 Rmax ECOMAXci® FR Air Barrier (formerly ECOMAXci®) and Rmax EVOMAXci

2 APPLICABLE CODES AND STANDARDS^{2,3}

2.1 Codes

- 2.1.1 *IBC—12, 15, 18: International Building Code®*
- 2.1.2 *IRC—12, 15, 18: International Residential Code®*
- 2.1.3 *IECC— 12, 15, 18: International Energy Conservation Code®*
- 2.1.4 *CBC—10, 13, 16: California Building Code*

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

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

Building official approval of a licensed [registered design professional](#) (RDP) is performed by verifying the RDP and/or their business entity complies with all professional engineering laws of the relevant [jurisdiction](#). Therefore, the work of licensed RDPs is accepted by [building officials](#), except when plan (i.e. peer) review finds an error with respect to a specific section of the code. Where this TER is not approved, the [building official](#) responds in writing stating the reasons for [disapproval](#).

For more information on any of these topics or our mission, product evaluation policies, product approval process, and engineering law, visit drjcertification.org or call us at 608-310-6748.

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

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

- 2.1.5 *CRC—10, 13, 16: California Residential Code*
- 2.1.6 *FBC-B—14, 17: Florida Building Code – Building*
- 2.1.7 *FBC-R—14, 17: Florida Building Code – Residential*
- 2.2 *Standards and Referenced Documents*
 - 2.2.1 *AATCC TM127: Test Method 127 Water Resistance: Hydrostatic Pressure Test*
 - 2.2.2 *ASTM C1289: Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board*
 - 2.2.3 *ASTM C209: Standard Test Methods for Cellulosic Fiber Insulating Board*
 - 2.2.4 *ASTM C518: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus*
 - 2.2.5 *ASTM E1354: Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter*
 - 2.2.6 *ASTM E136: Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C*
 - 2.2.7 *ASTM E2178: Standard Test Method for Air Permeance of Building Materials*
 - 2.2.8 *ASTM E2357: Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies*
 - 2.2.9 *ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference*
 - 2.2.10 *ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials*
 - 2.2.11 *ASTM E96: Standard Test Methods for Water Vapor Transmission of Materials*
 - 2.2.12 *CAN/ULC-S742: Standard for Air Barrier Assemblies – Specification*
 - 2.2.13 *NFPA 285: Standard Fire Test Method for the Evaluation of Fire Propagation Characteristics of Exterior Nonload-bearing Wall Assemblies Containing Combustible Components*
 - 2.2.14 *UL 263: Standard for Fire Tests of Building Construction and Materials*

3 PERFORMANCE EVALUATION

- 3.1 ECOMAXci® FR Air Barrier and EVOMAXci™ were evaluated to determine:
 - 3.1.1 Thermal resistance for use as insulating sheathing in accordance with [IECC Section C402](#)
 - 3.1.2 Performance for use as a water-resistive barrier (WRB) in accordance with [IBC Section 1403.2⁴](#)
 - 3.1.3 Performance for use as an air barrier in accordance with [IECC Section C402](#)
 - 3.1.4 Performance for use in buildings of Type I-IV construction in accordance with [IBC Section 2603.5](#)
 - 3.1.4.1 Performance in accordance with *ASTM E84* for flame spread and smoke development ratings in accordance with [IBC Section 2603.3](#) and [Section 2603.5.4](#)
 - 3.1.4.2 Performance with regard to vertical and lateral fire propagation in accordance with [IBC Section 2603.5.5](#)
 - 3.1.4.3 Performance for use in a fire resistance rated assembly in accordance with [IBC Section 2603.5.1](#)
- 3.2 Any code compliance issues not specifically addressed in this section are outside the scope of this TER.
- 3.3 Any engineering evaluation conducted for this TER was performed on the dates provided in this TER and within Dr.J's professional scope of work.

⁴ [2015 IBC Section 1404.2](#)

4 PRODUCT DESCRIPTION AND MATERIALS

4.1 The product evaluated in this TER is shown in Figure 1.

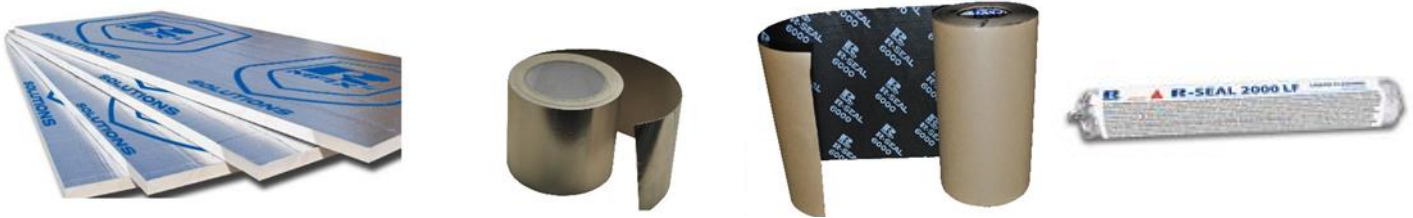


FIGURE 1. ECOMAXci® FR AIR BARRIER, R-SEAL 3000, R-SEAL 6000, AND R-SEAL 2000 LF

4.2 ECOMAXci® FR Air Barrier and EVOMAXci™ are proprietary foam plastic insulating sheathing (FPIS) systems.

- 4.2.1 ECOMAXci® FR Air Barrier and EVOMAXci™ are proprietary polyisocyanurate insulation boards that include a glass fiber reinforced aluminum foil facer material on both sides. The exposed side has a clear modified acrylic coating.
- 4.2.2 R-SEAL 3000 is a joint sealing tape with a nominal 2 mil aluminum foil backing and acrylic pressure-sensitive adhesive.
- 4.2.3 R-SEAL 6000 is a self-sealing, through-wall flashing tape with a nominal 35 mil black woven polyethylene membrane backing and butyl rubber adhesive.
- 4.2.4 R-SEAL 2000 LF is a durable one-component, hybrid technology, non-sag, flexible, flashing and water barrier sealant.

4.3 Material Availability

- 4.3.1 Thickness: ½" (19 mm) through 4½" (76 mm)
- 4.3.2 Standard product width: 48" (1219 mm)
- 4.3.3 Standard lengths: 96", 108", 120", and 144" (2438 mm, 2743 mm, 3048 mm, and 3658 mm)

5 APPLICATIONS

5.1 General

- 5.1.1 ECOMAXci® FR Air Barrier and EVOMAXci™ are FPIS complying with IBC Section 2603.
- 5.1.2 ECOMAXci® FR Air Barrier and EVOMAXci™ shall not be used as a nail base for other building products.
- 5.1.3 Stud walls insulated with ECOMAXci® FR Air Barrier and EVOMAXci™ must be properly braced for lateral loads according to the requirements of local building codes.
- 5.1.4 The wall system shall be designed to handle cladding load and wind load per the applicable code.
- 5.1.5 Where the application exceeds the limitations set forth herein, design shall be permitted in accordance with accepted engineering procedures, experience, and good technical judgment.

5.2 Thermal Resistance (R-Value)

- 5.2.1 ECOMAXci® FR Air Barrier and EVOMAXci™ meet the continuous insulated sheathing requirements complying with the provisions of IECC Section C402.
- 5.2.2 ECOMAXci® FR Air Barrier and EVOMAXci™ have the R-values recorded in Table 1.

TABLE 1. THERMAL R-VALUES

Nominal Thickness (in)	Thermal R-Value ¹
0.5	3.2
1.0	6.5
1.15	7.6
1.5	10.0
2.0	13.1
2.5	16.7
3	20.3
3.5	23.9
4.0	27.4
4.5	31.0
SI: 1 in = 25.4 mm 1. Thermal values are determined using the ASTM C518 test method at 75° mean temperature on material conditioned according to ASTM C1289 Section 11.1.	

5.3 Water-Resistive Barrier

- 5.3.1 ECOMAXci® FR Air Barrier and EVOMAXci™ may be used as a WRB as prescribed in IBC Section 1403.2⁵ when installed on exterior walls as described in this section and the manufacturer's installation instructions.
- 5.3.2 ECOMAXci® FR Air Barrier and EVOMAXci™ shall be installed with vertical board joints placed directly over exterior framing spaced a maximum of 24" (610 mm) o.c. The fasteners used to attach the board shall be installed in accordance with Section 6.
- 5.3.3 All seams and joints between boards shall be covered by R-SEAL 3000 tape or R-SEAL 2000 LF liquid flashing per the manufacturer's installation instructions. Washers in the field of the board do not need to be sealed.
- 5.3.4 All corners, windows, doors, and other large through-wall penetrations shall be sealed with R-SEAL 6000 flashing or R-SEAL 2000 LF liquid flashing per the manufacturer's installation instructions.
- 5.3.5 Small through-wall penetrations shall be sealed using R-SEAL 2000 LF liquid flashing or a one-part moisture cure sealant.
- 5.3.6 All ceiling and floor transitions shall be sealed with R-SEAL 6000 flashing per the manufacturer's installation instructions.
- 5.3.7 ECOMAXci® FR Air Barrier and EVOMAXci™ have the water-resistive properties listed in Table 2.

TABLE 2. WATER-RESISTANCE PROPERTIES

Property	Test Method	Value
Water Vapor Transmission	ASTM E96	< 0.03 Perm
Water Absorption	ASTM C209	< 0.2% Volume
1. 1 perm is defined as 1 grain of water vapor per hour, per square foot, per inch of mercury.		

⁵ 2015 IBC Section 1404.2

5.4 Air Barrier

5.4.1 ECOMAXci® FR Air Barrier and EVOMAXci™ meet the requirements of IECC Section C402 for use as a component of the air barrier, when installed in accordance with the manufacturer's installation instructions and this TER with all seams, including the top and bottom edges, sealed.

5.4.1.1 The air barrier properties are listed in Table 3.

TABLE 3. AIR BARRIER PROPERTIES

Test Method	Property
ASTM E2178	< 0.005 L/(s.m ²) ¹
1. Liter per second per square meter	

5.4.2 The air permeance of an air barrier material is defined by the *IECC* and the and Air Barrier Association of America (ABAA) as being no greater than 0.02 liter per second per square meter (L/(s.m²)) at 75 Pa pressure difference when tested in accordance with *ASTM E2178*.

5.4.3 ECOMAXci® FR Air Barrier and EVOMAXci™ meet the requirements of IECC Section C402 for use as an air barrier assembly when installed in accordance with the manufacturer's installation instructions and this TER with all seams, including the top and bottom edges, sealed.

5.4.3.1 The air barrier properties are listed in Table 4.

TABLE 4. AIR BARRIER SYSTEM PROPERTIES

Test Method	Property
ASTM E2357 and CAN/ULC-S742	< 0.05 L/(s.m ²) ¹
1. Liter per second per square meter	

5.4.3.2 The air permeance of an air barrier assembly is defined by the *IECC* and ABAA as being no greater than 0.2 L/(s.m²) at 75 Pa pressure difference when tested in accordance with *ASTM E2357*.

5.4.3.3 ECOMAXci® FR Air Barrier and EVOMAXci™ are classified as an A1 air barrier assembly per *CAN/ULC-S742*.

5.4.3.4 ECOMAXci® FR Air Barrier and EVOMAXci™ shall be installed with vertical board joints placed directly over exterior framing spaced a maximum of 24" (610 mm) o.c. The fasteners used to attach the board shall be installed in accordance with Section 6.

5.4.3.5 All seams and joints between boards shall be covered by R-SEAL 3000 tape or R-SEAL 2000 LF liquid flashing per the manufacturer's installation instructions. Washers in the field of the board do not need to be sealed.

5.4.3.6 All corners, windows, doors, and other large through-wall penetrations shall be sealed with R-SEAL 6000 flashing or R-SEAL 2000 LF liquid flashing per the manufacturer's installation instructions.

5.4.3.7 Small through-wall penetrations shall be sealed using R-SEAL 2000 LF liquid flashing or a one-part moisture cure sealant.

5.4.3.8 All ceiling and floor transitions shall be sealed with R-SEAL 6000 flashing per the manufacturer's installation instructions.

5.5 Fire Safety Performance

5.5.1 Thermal Barrier:

5.5.1.1 ECOMAXci® FR Air Barrier and EVOMAXci™ shall be separated from the building interior by a thermal barrier meeting the provisions of IBC Section 2603.4, except in one-story buildings, in a thickness of not more than 4½", when the building is equipped throughout with an automatic sprinkler system and the foam sheathing is covered by one of the following:

5.5.1.1.1 Minimum 0.032" thick aluminum

5.5.1.1.2 Minimum 0.016" thick corrosion resistance steel

5.5.2 Surface Burning Characteristics:

5.5.2.1 Fire performance characteristics of ECOMAXci® FR Air Barrier and EVOMAXci™ are shown in Table 5.

 TABLE 5. SURFACE BURNING CHARACTERISTICS¹

Product	Flame Spread	Smoke Developed
ECOMAXci® FR Air Barrier and EVOMAXci™ ¹	< 25	< 450
1. Tested in accordance with ASTM E84. Flame Spread and smoke developed numbers are shown for comparison purposes only and are not intended to represent the performance of ECOMAXci® FR Air Barrier and EVOMAXci™ and related components under actual fire conditions.		

5.5.3 NFPA 285 Applications:

5.5.3.1 ECOMAXci® FR Air Barrier and EVOMAXci™ were tested to assess their performance with regard to vertical and lateral fire propagation in accordance with NFPA 285 and IBC Section 2603.5.5.

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

5.5.3.3 The wall assemblies listed in Table 6 are approved for use in buildings of Type I-IV construction.

TABLE 6. FIRE PERFORMANCE – VERTICAL & LATERAL FIRE PROPAGATION

Wall Component	Materials
Base Wall System Select option 1, 2 3 or 4 (option) Note: May use 4 optionally when FRTW framing is allowed by code.	1. Cast concrete walls 2. CMU Concrete walls 3. 20 gauge (min) 3-5/8 in. (min.) steel studs spaced 24" o.c. (max.) 1/2 in. (min.) type X Special Fire Resistant Gypsum Wallboard Interior 4. Where allowed in Types I, II, III or IV construction, FRTW (fire-retardant-treated wood) studs complying with IBC Section 2303.2, min. nominal 2x4 dimension, spaced 24" o.c. (max.) a. 5/8 in. type X Gypsum Wallboard Interior b. Bracing as required by code
Floorline Firestopping As an option, use 2 with FRTW framing	1. 4 pcf mineral wool installed with Z-clips 2. FRTW fire blocking at floor line in accordance with applicable code requirements
Cavity Insulation Select option 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 or 15 Note: Items 5-15 are SPF Foam Type EZ FLO may be used inside the box headers and jamb studs for NFPA 285 assemblies requiring SPF in stud cavities	1. None 2. Any noncombustible insulation per ASTM E136 3. Any Mineral Fiber (board type Class A, ASTM E84 faced or un-faced) 4. Any Fiberglass (batt type Class A ASTM E84 faced or unfaced) 5. 5-1/2 inch (max.) Icynene LD-C-50 spray foam in 6-inch-deep studs (max.). Use with 5/8-inch exterior sheathing. 6. 5-1/2 inch (max.) Icynene MD-C-200 2 pcf spray foam in 6-inch-deep studs (max.) full fill without an air gap. Use with 5/8-inch exterior sheathing. 7. 5-1/2 inch (max.) Icynene MD-R-210 2 pcf spray foam in 6-inch-deep studs (max.) full fill without an air gap. Use with 5/8-inch exterior sheathing 8. SWD Urethane QS 112 2 pcf spray foam in 6-inch-deep studs (max.) partial fill with a maximum 2-1/2 inch air gap or full fill. Use with 5/8 exterior sheathing. 9. Gaco Western 83M (3-1/2 inch max). Use with 5/8 exterior sheathing. 10. Gaco Western F 1850 (3-1/2 inch max.). Use with 5/8 exterior sheathing. 11. Demilec SELECTION 500 (3-5/8 inch max). Use with 5/8 exterior sheathing. 12. Demilec HeatLok Soy 200 Plus (3.4 inch max). Use with 5/8 exterior sheathing. 13. Bayer Bayseal (3 inch max). Use with 5/8 exterior sheathing. 14. Lapolla FoamLok FL 2000 (3 inch max). Use with 5/8 exterior sheathing. 15. BASF SprayTite 81206 or WallTite (US & US-N) (3-5/8 inch max). Use with 5/8 inch exterior sheathing.

Wall Component	Materials
<p>Exterior Sheathing Select option 1, 2 or 3</p> <p>Note: exterior FRTW sheathing or gypsum board is optional for Base Walls 1 and 2. When SPF is used, 5/8 inch exterior gypsum sheathing must be used.</p>	<ol style="list-style-type: none"> 1. 1/2"-thick or thicker, exterior gypsum board sheathing 2. None (for 3 in. max. exterior insulation with claddings 7-12 or 4-1/2 in. max. exterior insulation with claddings 1-6) 3. 1/2" (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.
<p>Weather-Resistive Barrier Applied to Exterior Sheathing Select option 1 or 2 installed per manufacturer's installation instructions.</p> <p>Note 1: when using exterior sheathing, option 2 (no exterior sheathing) items 2 a-d may be applied directly to studs.</p> <p>NLA = No Longer Available. Replace with Spraywrap MVP.</p>	<ol style="list-style-type: none"> 1. None 2. Any WRB tested in accordance with <i>ASTM E1354</i> (at a minimum of 20 kW/m² heat flux) and shown by analysis to be less flammable (improved T_{ign}, Pk. HRR) than the baseline WRB or exterior insulation foam core. The following WRB products are allowed (item t. based on <i>NFPA 285</i>): <ol style="list-style-type: none"> a. Pactiv Green Guard® Max Building Wrap b. Dupont Tyvek® (Various per ESR 2375) c. DOW WeatherMate™ d. DOW WeatherMate™ Plus e. Carlisle (CCW) Fire Resist 705FR-A f. Carlisle CCW Fire Resist Barritech NP g. Carlisle CCW Fire Resist Barritech VP h. BASF Enershield HP i. BASF Enershield I j. Henry Air Bloc 32MR k. Henry Air Bloc 31MR l. Henry EnviroCap m. Henry Air Bloc 33MR n. Henry Air Bloc 21 FR o. Henry VP 160 p. Henry Air Bloc 17 q. Henry BlueSkin SA r. Henry FoilSkin s. Henry MetalClad t. Soprema Stick VP, Soprasolin HD or LM 204 VP u. Soprema 1100T or Sopraseal Xpress G v. Prosoco R-Guard Spray Wrap (NLA) w. Prosoco R-Guard MVP (NLA) x. Prosoco Spraywrap MVP y. Prosoco R-Guard VB z. Prosoco R-Guard Cat 5 aa. Vaproshield Revealshield SA bb. Vaproshield Wrapshield SA cc. Pecora XL-PermULTRA VP (10 mil DFT) dd. Dryvit Backstop NT ee. Sika SikaGard 530 or SikaGard 535 ff. W.R. Grace PAB NPL 10 gg. W.R. Grace PAB VPL hh. W.R. Grace PAB VPL LT ii. W.R. Grace PAB VPS jj. W.R. Grace PAB AWM kk. W.R. Grace PAB VPL 50 ll. WR Meadows Air-Shield LMP (Gray) mm. WR Meadows Air-Shield LMP (Black) nn. WR Meadows Air-Shield TMP oo. WR Meadows Air-Shield LSR pp. Siga Majvest 500 SA qq. Dow Corning DOWSIL DefendAir 200

Wall Component	Materials
<p>Exterior Insulation Use either 1 or 2</p> <p>Installation may use FRT plywood on exterior side (installed over exterior sheathing) or interior side (applied directly to studs). This option (plywood on interior) negates use of exterior sheathing since the FRT ply acts as the sheathing.</p>	<ol style="list-style-type: none"> 1. 4-½ in. (max. consisting of a single panel or multiple thinner panels) Rmax ECOMAXci® FR Air Barrier 2. 4-½ in. (max. consisting of a single panel or multiple thinner panels) Rmax EVOMAXci™ <p>Note: See Exterior sheathing options for thickness limitations when no exterior sheathing is used. Note: FRT Plywood may be applied in the field or factory applied. Adhesive must not be full coverage.</p>
<p>FRTW Structural Panels over Exterior Insulation (Optional)</p> <p>Note: May be applied in the field or factory applied. Adhesive must not be full coverage.</p>	<p>For use with all cladding options 1-14, 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>Weather-Resistive Barrier Applied over Exterior Insulation (or FRTW) Use any item 2) a-aa for claddings 1-6 with non-open joint installation technique, or any item 1) a-n for all approved claddings 1-14 below.</p> <p>Note: Exterior WRB items 1 b-d are not traditional WRB products but are insulation panel joint tapes. The insulation panel joints shall be staggered. These tapes are listed to allow use in both categories 1-6 OR 1-14.</p> <p>NLA = No longer available. Replaced with Spraywrap MVP</p>	<ol style="list-style-type: none"> 1. For use with all claddings <ol style="list-style-type: none"> a. None b. 6 in. (max.) Venture Tape CW over insulation joints c. 6 in. (max.) Rmax R-SEAL 3000, R-SEAL 6000 or R-SEAL 2000 LF over insulation joints d. 6 in. (max.) asphalt or butyl based tape, or liquid flashing over insulation joints e. Pactiv Green Guard® Max Building Wrap f. Dupont Tyvek® (Various per 2375) g. Dow Weathermate™ h. Dow Weathermate™ Plus i. Henry FoilSkin j. Henry MetalClad k. Prosoco Spraywrap MVP l. Soprema Soprasolin HD m. Carlisle (CCW) Fire Resist 705FR-A n. W.R. Grace PAB AWM 2. For use with cladding options 1-6 (Brick Equivalent) with non-open joint installation techniques (ex. shiplap, etc.) <ol style="list-style-type: none"> a. Henry Air Bloc 31MR b. Henry Envirocap c. Henry Air Bloc 33MR d. Henry Air Bloc 21 FR e. Henry Air Bloc 17 f. Henry Blueskin VP 160 g. Soprema Stick VP h. Carlisle (CCW) Fire Resist Barritech NP i. Carlisle (CCW) Fire Resist Barritech VP j. Prosoco R-Guard Spray Wrap (NLA) k. Prosoco R-Guard MVP (NLA) l. Prosoco R-Guard VB m. Prosoco R-Guard Cat 5 n. Vaproshield Revealshield SA o. Vaproshield Wrapshield SA p. Pecora XL-PermULTRA VP (10 mil DFT) q. W.R. Grace PAB VPL r. W.R. Grace PAB VPL LT s. W.R. Grace PAB VPS

Wall Component	Materials
	t. Dryvit Backstop NT u. WR Meadows Air-Shield LMP (Gray) v. WR Meadows Air-Shield LMP (Black) w. WR Meadows Air-Shield TMP x. WR Meadows Air-Shield LSR y. Siga Majvest 500 SA z. Sika SikaGard 535 aa. Dow Corning DOWSIL DefendAir 200
<p>Exterior Cladding Select option 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 or 14</p> <p>Note: For WRB over exterior insulation options 1) a-ee above, claddings 1-6 shall incorporate non-open joints.</p> <p>Note: WRB over exterior insulation items 1) b-d are panel joint tapes allowed for all claddings. The panel joints shall be staggered.</p>	1. Brick - nominal 4" clay brick or veneer with a maximum 2 in. air gap behind brick. Brick ties/anchors –24" o.c. (max.) 2. Stucco – Minimum ¾"-thick, exterior cement plaster and lath with an optional secondary water resistive barrier between the exterior insulation and lath. The secondary barrier shall not be full-coverage asphalt or butyl-based self-adhered membranes. 3. Limestone - minimum 2" thick any using standard installation technique. 4. Natural Stone Veneer – Minimum 2 in. thick using any standard installation technique. 5. Cast Artificial Stone -- Minimum 1-½ in. thick complying with ICC-ES AC 51 using any standard installation technique. 6. Terra Cotta Cladding – Minimum 1-¼ in. thick using any standard installation technique. 7. Any MCM or ACM (aluminum, steel, copper, zinc) (w/ 2 ½ in. max. air gap) that has successfully passed <i>NFPA 285</i> using any standard installation technique, such as <ul style="list-style-type: none"> • Carter Companies EVO Architectural Panel Systems for use with any FR ACM/MCM <i>NFPA 285</i> material 8. Uninsulated sheet metal building panels including aluminum, zinc, steel or copper using any standard installation technique. 9. Uninsulated fiber-cement board siding using any standard installation technique. 10. Stone/Aluminum honeycomb composite building panels that have passed <i>NFPA 285</i> or equivalent. <ul style="list-style-type: none"> • Stone Panels Inc. Stone Lite Panel system has been analyzed using manufacturer's standard installation technique 11. Autoclaved-aerated- concrete (AAC) panels that have successfully passed <i>NFPA 285</i> using any standard installation technique. 12. Thin Set Brick <ul style="list-style-type: none"> • Glen-Gary Thin Tech™ Elite Series has been analyzed using manufacturer's standard installation technique. 13. Natural Stone Veneer – minimum 1¼ inch (adhered with mortar or concrete/cement based adhesive). 14. FunderMax M.Look using the manufacturer standard installation technique. The air gap between cladding and insulation or WRB must not exceed 1 ½ inches.
St: 1 in = 25.4 mm	1. All WRBs shall be installed at recommended application rates and per the manufacturer's installation instructions. 2. Window headers for all wall assemblies shall incorporate minimum 0.08" aluminum flashing to cover air gaps between the exterior sheathing or exterior insulation and the exterior veneer. All fenestrations and penetrations shall be flashed in accordance with the applicable code using asphalt, acrylic or butyl based flashing tape, liquid flashing, R-SEAL 6000, or R-SEAL 2000 LF up to 12" maximum width.

5.5.4 Fire Resistance Ratings:

5.5.4.1 ECOMAXci® FR Air Barrier and EVOMAXci™ have been tested and meet the requirements of *UL 263* in accordance with *IBC Section 2603.5.1* for use in the following assembly designs when installed in accordance with the manufacturer's installation instructions and this TER:

5.5.4.1.1 45 Minutes: V321

5.5.4.1.2 1-hour: U026, U326, U330, U349, U354, U355, U364, U424, U425, U460, V454, W417, W429, W448, W451, W452, W456

5.5.4.1.3 2-hour: U905, U906, U939, V332, V499, W449, W456

5.5.4.1.4 3-hour: U904, U912, U939, W429, W451

5.5.4.1.5 4-hour: U902, U907, U939

6 INSTALLATION

6.1 Installation shall comply with the manufacturer's installation instructions and this TER. In the event of a conflict between the manufacturer's installation instructions and this TER, the more restrictive shall govern.

6.2 Installation Procedure

6.2.1 ECOMAXci® FR Air Barrier and EVOMAXci™ shall be applied to wall framing as follows:

6.2.1.1 The insulation boards shall be oriented with the Rmax Solutions shield facing the exterior side of the building.

6.2.1.2 Each row of insulation shall be staggered a minimum of one stud spacing to the row below. All boards must be tightly abutted together.

6.2.1.3 At changes in wall directions (corners), the boards shall fit snugly in an overlap.

6.2.2 ECOMAXci® FR Air Barrier and EVOMAXci™ fastener application shall be as follows:

6.2.2.1 Insulation fastener components shall include a minimum 2"-diameter plastic plate/washer and corrosion resistant self-taping steel screw, nail or concrete fastener.

6.2.2.2 Plates/washers shall be snug and flush with the board surface. Plates/washers should never break the foil facing of the boards, nor should the plate/washer crown be counter sunk.

6.2.2.3 Each insulation board shall be secured with a fastening pattern as shown in Table 7.

TABLE 7. FASTENING PATTERN OF ECOMAXci® FR AIR BARRIER AND EVOMAXci™

Nominal Thickness (in)	Wall Perimeter (in)	Wall Field (in)
≥ 1.5	24 o.c.	24 o.c.
≥ 0.5	12 o.c.	16 o.c.
SI: 1 in = 25.4 mm		

6.2.3 R-SEAL 3000 application shall be as follows:

6.2.3.1 4"-wide R-SEAL 3000 shall be used to seal all joints of adjacent insulation boards. It can also be used to repair minor damages to the foil facer of the ECOMAXci® FR Air Barrier and EVOMAXci™.

6.2.4 R-SEAL 6000 application shall be as follows:

6.2.4.1 9"- or 12"-wide R-SEAL 6000 shall be used to seal at corners, ceiling and floor transitions, windows, doors and other large through-wall penetrations. Refer to the R-SEAL 6000 data sheet for specific details on appropriate installation conditions.

6.2.5 R-SEAL 2000 LF application shall be as follows:

6.2.5.1 1"-wide at 30mil shall be used to seal all joints of adjacent insulation boards.

6.2.5.2 3"-wide at 50mil shall used to seal at corners, windows, doors and other large through-wall penetrations.

6.2.5.3 R-SEAL 2000 LF can also be used to repair minor damages to the foil facer of the ECOMAXci® FR Air Barrier and EVOMAXci™.

6.2.5.4 Refer to the R-SEAL 2000 LF data sheet for specific details on appropriate installation conditions.

7 TEST ENGINEERING SUBSTANTIATING DATA

7.1 Test reports and data supporting the following material and structural properties:

7.1.1 Material properties in accordance with *ASTM C1289*, performed by Exova

7.1.2 Flame spread and smoke developed ratings in accordance with *ASTM E84*, performed by Intertek

7.1.3 Fire performance criteria in accordance with *NFPA 285*, performed by Intertek

7.1.4 Water-resistance properties in accordance with *ASTM E331*, performed by ATI

- 7.1.5 Water-resistance properties in accordance with *ASTM E331*, performed by Intertek
- 7.1.6 Water permeance in accordance with *ASTM E96*, performed by Exova
- 7.1.7 Water absorption in accordance with *ASTM C209*, performed by Radco
- 7.1.8 Water-resistance properties in accordance with *AATCC 127*, performed by ATI
- 7.1.9 Air barrier criteria for air barrier materials and air barrier assembly in accordance with ABAA
- 7.1.10 Air permeance in accordance with *ASTM E2178*, performed by Exova
- 7.1.11 Air leakage in accordance with *ASTM E2357* and *CAN/ULC-S742*, performed by Exova
- 7.1.12 Air leakage in accordance with *ASTM E2357* and *CAN/ULC-S742*, performed by ATI
- 7.1.13 Air leakage in accordance with *ASTM E2357* and *CAN/ULC-S742*, performed by Intertek
- 7.1.14 Thermal resistance properties in accordance with *ASTM C518*, performed by Exova
- 7.1.15 Underwriters Laboratories Fire-Resistance Directory Listing
- 7.2 Manufacturer installation instructions
- 7.3 Test reports and data for determining comparative equivalency for use as an alternative material in accordance with [IBC Section 104.11](#).
- 7.4 Some information contained herein is the result of testing and/or data analysis by other sources which conform to [IBC Section 1703](#) and relevant [professional engineering law](#). DrJ relies on accurate data from these sources to perform engineering analysis. DrJ has reviewed and found the data provided by other professional sources to be credible.
- 7.5 Where appropriate, DrJ's analysis is based on design values that have been codified into law through codes and standards (e.g., *IBC*, *IRC*, *NDS®*, and *SDPWS*). This includes review of code provisions and any related test data that aids in comparative analysis or provides support for equivalency to an intended end-use application. Where the accuracy of design values provided herein is reliant upon the published properties of commodity materials (e.g., lumber, steel, and concrete), DrJ relies upon the grade mark, stamp, and/or design values provided by raw material suppliers to be accurate and conforming to the mechanical properties defined in the relevant material standard.

8 FINDINGS

- 8.1 ECOMAXci® FR Air Barrier and EVOMAXci™ described in this TER comply with the applicable sections of the codes listed in Section 2.
- 8.2 [IBC Section 104.11](#) ([IRC Section R104.11](#) and [IFC Section 104.9](#) are similar) states:
 - 104.11 Alternative materials, design and methods of construction and equipment.** The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *building official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code...Where the alternative material, design or method of construction is not *approved*, the *building official* shall respond in writing, stating the reasons the alternative was not *approved*.
- 8.3 This product has been evaluated in the context of the codes listed in Section 2 and is compliant with all known state and local building codes. Where there are known variations in state or local codes applicable to this evaluation, they are listed here.
 - 8.3.1 No known variations

9 CONDITIONS OF USE

- 9.1 This TER and the installation instructions, when required by a code official, shall be submitted at the time of permit application.
- 9.2 When the insulation boards are used on exterior walls of buildings of Type I-IV construction must be as described in Section 5.5.3.
- 9.3 The product shall be fully protected from the interior of the building by an approved thermal barrier or ignition barrier as required by the applicable code.
- 9.4 In areas where the probability of termite infestation is very heavy, in accordance with IBC Section 2603.8,⁶ the product must not be placed on exterior walls located within 6" (152 mm) of the ground.
- 9.5 This product is not to be used as a structural nailing base for claddings.
- 9.6 Use of the insulation boards to resist structural loads is outside the scope of this TER. Walls shall be braced by other materials in accordance with the applicable code, and the exterior wall covering shall be capable of resisting the full design wind pressure.
- 9.7 Where required by the building official, also known as the authority having jurisdiction (AHJ) in which the project is to be constructed, this TER and the installation instructions shall be submitted at the time of permit application.
- 9.8 Any generally accepted engineering calculations needed to show compliance with this TER shall be submitted to the AHJ for review and approval.
- 9.9 Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed and/or by the Building Designer (e.g., owner or registered design professional).
- 9.10 At a minimum, this product shall be installed per Section 6 of this TER.
- 9.11 This product is manufactured under a third-party quality control program in accordance with IBC Section 104.4 and 110.4 and IRC Section R104.4 and R109.2.
- 9.12 The actual design, suitability, and use of this TER, for any particular building, is the responsibility of the owner or the owner's authorized agent. Therefore, the TER shall be reviewed for code compliance by the building official for acceptance.
- 9.13 The use of this TER is dependent on the manufacturer's in-plant QC, the ISO/IEC 17020 third-party quality assurance program and procedures, proper installation per the manufacturer's instructions, the building official's inspection, and any other code requirements that may apply to demonstrate and verify compliance with the applicable building code.

10 IDENTIFICATION

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

11 REVIEW SCHEDULE

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

⁶ 2012 IBC Section 2306.9