



Technical Evaluation Report

TO ASSIST WITH CODE COMPLIANCE

Rmax ECOMAXci™ Wall Solution and EVOMAXci™

TER No. 1212-03

Issue Date: July 2, 2013

Updated: July 21, 2016

Subject to Renewal: October 1, 2017

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DIVISION: 06 00 00 – WOOD, PLASTICS AND COMPOSITES

Section: 06 16 00 – Sheathing
Section: 06 16 13 – Insulating 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. Product Evaluated:

- 1.1. Rmax ECOMAXci™ Wall Solution
- 1.2. Rmax EVOMAXci™
- 1.3. For the most recent version of this Technical Evaluation Report (TER), visit drjengineering.org. For more detailed state professional engineering and code compliance legal requirements and references, visit drjengineering.org/statelaw. DrJ is fully compliant with all state professional engineering and code compliance laws.

DrJ is a Professional Engineering Approved Source

 **Learn more about DrJ's Accreditation**

- DrJ is an ISO/IEC 17065 accredited product certification body through ANSI Accreditation Services.
- DrJ provides certified evaluations that are signed and sealed by a P.E.
- DrJ's work is backed up by professional liability insurance.
- DrJ is fully compliant with *IBC* Section 1703.



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Technical Evaluation Report (TER)

2. Applicable Codes and Standards:¹

- 2.1. 2009, 2012 and 2015 International Building Code (IBC)
- 2.2. 2009, 2012 and 2015 International Residential Code (IRC)
- 2.3. 2009, 2012 and 2015 International Energy Conservation Code (IECC)
- 2.4. 2010 and 2013 California Building Code Title 24 Part 2
- 2.5. 2010 and 2013 California Residential Code Title 24 Part 2.5
- 2.6. 2010 and 2014 Florida Building Code – Building
- 2.7. 2010 and 2014 Florida Building Code – Residential
- 2.8. AATCC 127 – Water Resistance: Hydrostatic Pressure Test
- 2.9. ASTM C209 – Standard Test Methods for Cellulosic Fiber Insulating Board
- 2.10. ASTM C518 – Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
- 2.11. ASTM C1289 – Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
- 2.12. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials
- 2.13. ASTM E96 – Standard Test Methods for Water Vapor Transmission of Materials
- 2.14. ASTM E331 – Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
- 2.15. ASTM E1354 – Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter
- 2.16. ASTM E2178 – Standard Test Method for Air Permeance of Building Materials
- 2.17. ASTM E2357 – Standard Test Method for Determining Air Leakage of Air Barrier Assemblies
- 2.18. CAN/ULC-S742 – Standard for Air Barrier Assemblies – Specification
- 2.19. NFPA 285 – Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components
- 2.20. UL 263 – Standard for Fire Tests of Building Construction and Materials

3. Performance Evaluation:

- 3.1. ECOMAXci™ Wall Solution 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 1404.2](#).
 - 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 [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 evaluation.

¹ Unless otherwise noted, all references in this code compliant technical evaluation report (TER) are from the 2012 version of the codes and the standards referenced therein, including, but not limited to, ASCE 7, SDPWS and WFCM. This product also complies with the 2000-2009 and 2015 versions of the *IBC* and *IRC* and the standards referenced therein. As required by law, where this TER is not approved, the building official shall respond in writing, stating the reasons this TER was not approved. For variations in state and local codes, if any, see [Section 8](#).

Technical Evaluation Report (TER)

4. Product Description and Materials:

- 4.1. ECOMAXci™ Wall Solution and EVOMAXci™ are proprietary foam plastic insulating sheathing (FPIS) systems.
 - 4.1.1. ECOMAXci™ Wall Solution and EVOMAXci™ are proprietary polyisocyanurate insulation boards that include a glass fiber reinforced aluminum foil facer material on both sides.
 - 4.1.2. R-SEAL 3000 is a joint sealing tape with a nominal 2 mil aluminum foil backing and acrylic pressure-sensitive adhesive.
 - 4.1.3. R-SEAL 6000 is self-sealing, through-wall flashing tape with a nominal 35 mil black woven polyethylene membrane backing and butyl rubber adhesive.



Figure 1: ECOMAXci™ Wall Solution and EVOMAXci™ / R-SEAL 3000 and R-SEAL 6000

4.2. Material Availability

- 4.2.1. Thickness: ¾" (19 mm) through 4 ½" (76 mm)
- 4.2.2. Standard product width: 48" (1219 mm)
- 4.2.3. Standard lengths: 96" (2438 mm) and 144" (3658 mm)

5. Applications:

5.1. General

- 5.1.1. ECOMAXci™ Wall Solution and EVOMAXci™ are FPIS complying with [IBC Section 2603](#).
- 5.1.2. ECOMAXci™ Wall Solution and EVOMAXci™ shall not be used as a nail base for other building products.
- 5.1.3. Stud walls insulated with ECOMAXci™ Wall Solution 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™ Wall Solution and EVOMAXci™ meet the continuous insulated sheathing requirements complying with the provisions of [IECC Section C402](#).

Technical Evaluation Report (TER)

5.2.2. ECOMAXci™ Wall Solution and EVOMAXci™ have the following R-Values:

ECOMAXci™ Wall Solution and EVOMAXci™ R-Values	
Nominal Thickness	Thermal R-Value ¹
0.75"	5.0
1.0"	6.5
1.15"	7.6
1.5"	10.0
2.0"	13.1
2.5"	16.7
3.0"	20.3

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.

Table 1: ECOMAXci™ Wall Solution and EVOMAXci™ R-Values

5.3. Water-Resistive Barrier

- 5.3.1. ECOMAXci™ Wall Solution and EVOMAXci™ may be used as a WRB as prescribed in [IBC Section 1404.2](#) when installed on exterior walls as described in this section and the [manufacturer's installation instructions](#).
- 5.3.2. ECOMAXci™ Wall Solution 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 per the manufacturer's installation instructions.
- 5.3.4. All corners, ceiling and floor transitions, windows, doors and other large through-wall penetrations shall be sealed with R-SEAL 6000 flashing per the manufacturer's installation instructions.
- 5.3.5. Small through-wall penetrations shall be sealed using a one-part moisture cure sealant.
- 5.3.6. ECOMAXci™ Wall Solution and EVOMAXci™ have the following water-resistive properties:

ECOMAXci™ Wall Solution and EVOMAXci™ Water-Resistance Properties		
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](#).

Table 2: ECOMAXci™ Wall Solution and EVOMAXci™ Water-Resistance Properties

5.4. Air Barrier

- 5.4.1. ECOMAXci™ Wall Solution 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, taped.

ECOMAXci™ Wall Solution and EVOMAXci™ Air Barrier Properties	
ASTM E2178	< 0.005 L/(s.m ²) ¹

1. Liter per second per square meter

Table 3: ECOMAXci™ Wall Solution and EVOMAXci™ Air Barrier Properties

- 5.4.2. The air permeance of an air barrier material is defined by the IECC and the 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 – *Standard Test Method for Air Permeance of Building Materials*.

Technical Evaluation Report (TER)

- 5.4.3. ECOMAXci™ Wall Solution 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, taped.

ECOMAXci™ Wall Solution and EVOMAXci™ Air Barrier Properties	
ASTM E2357 and CAN/ULC-S742	< 0.05 L/(s.m²)

Table 4: ECOMAXci™ Wall Solution and EVOMAXci™ Wall Solution Air Barrier System Properties

- 5.4.3.1. 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 – Standard Test Method for Determining Air Leakage of Air Barrier Assemblies*.
- 5.4.3.2. ECOMAXci™ Wall Solution and EVOMAXci™ are classified as an A1 air barrier assembly per *CAN/ULC-S742*.
- 5.4.3.3. ECOMAXci™ Wall Solution 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](#).
- 5.4.3.4. All seams and joints between boards shall be covered by R-SEAL 3000 tape per the manufacturer’s installation instructions.
- 5.4.3.5. All corners, ceiling and floor transitions, windows, doors and other large through-wall penetrations shall be sealed with R-SEAL 6000 flashing per the manufacturer’s installation instructions.
- 5.4.3.6. Small through-wall penetrations shall be sealed using a one-part moisture cure sealant.

5.5. Fire Safety Performance

5.5.1. Thermal Barrier

- 5.5.1.1. ECOMAXci™ Wall Solution 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 4", 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

Fire Performance of ECOMAXci™ Wall Solution and EVOMAXci™ ¹		
Product	Flame Spread	Smoke Developed
ECOMAXci™ Wall Solution and EVOMAXci™ ¹	< 25	< 450
1. Tested in accordance with <i>ASTM E84</i> . Flame spread and smoke developed numbers are shown for comparison purposes only and are not intended to represent the performance of ECOMAXci™ Wall Solution and EVOMAXci™ and related components under actual fire conditions.		

Table 5: Fire Performance of ECOMAXci™ Wall Solution and EVOMAXci™

Technical Evaluation Report (TER)

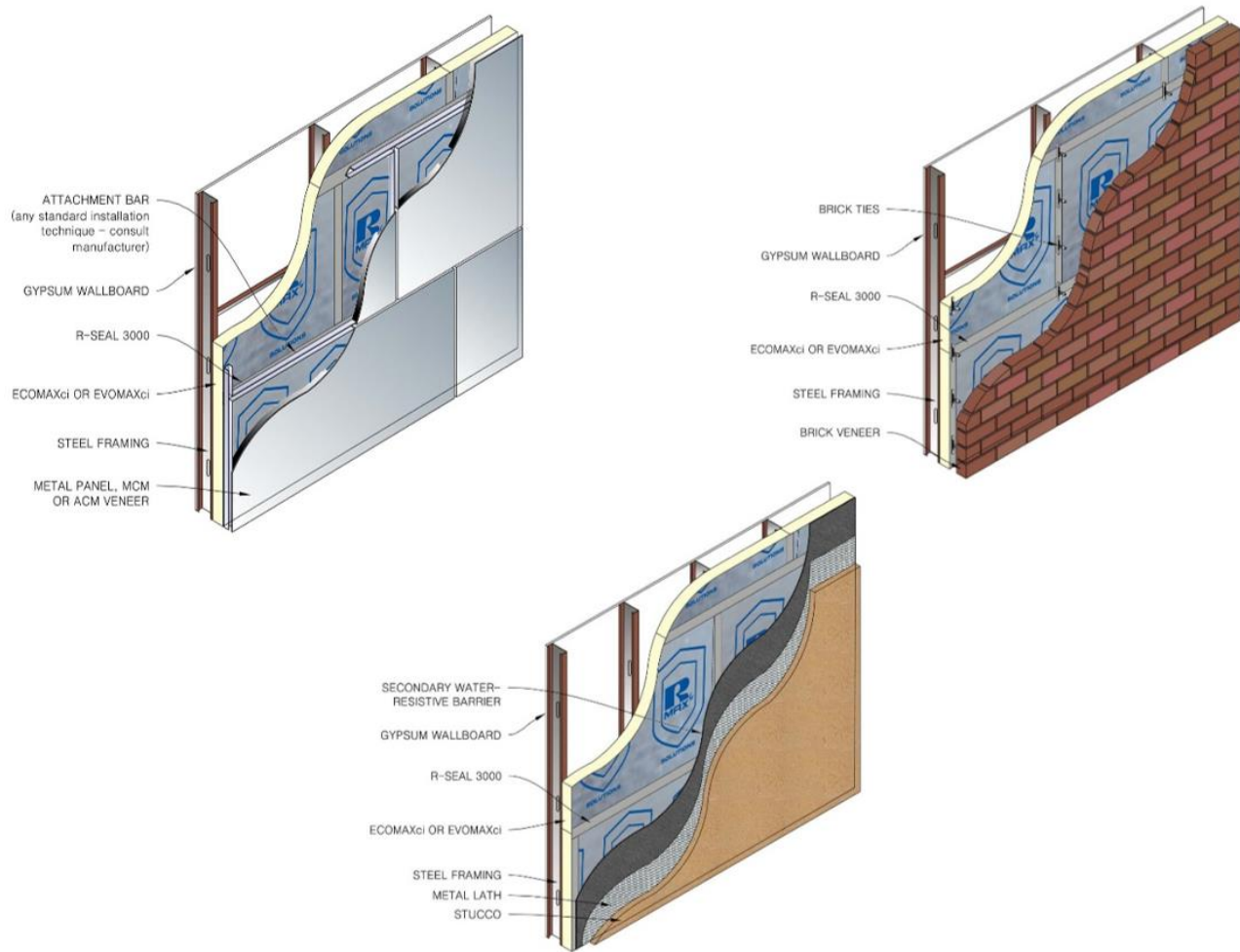


Figure 2: Three examples of Approved *NFPA 285* Tested Assemblies

5.5.3. NFPA 285 Applications

5.5.3.1. ECOMAXci™ Wall Solution 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.

Fire Performance – Vertical & Lateral Fire Propagation ¹	
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.) ½ 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 <i>IBC Section 2303.2</i> , min. nominal 2x4 dimension, spaced 24" o.c. (max.) <ul style="list-style-type: none"> 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

Continued on next page

Technical Evaluation Report (TER)

Fire Performance – Vertical & Lateral Fire Propagation ¹	
Wall Component	Materials
<p>Cavity Insulation Select option 1, 2, 3 or 4, 5, 6, 7, 8, 9, 11 12, 13, 14 or 15</p> <p>Note: Items 5-15 are SPF Foam Type</p>	<ol style="list-style-type: none"> 1. None 2. Any noncombustible insulation per <i>ASTM E136</i> 3. Any Mineral Fiber (board type Class A, <i>ASTM E84</i> faced or un-faced) 4. Any Fiberglass (batt type Class A <i>ASTM E84</i> faced or unfaced) 5. 5 ½ inch (max.) Icynene LD-C-50 spray foam in 6 inch deep studs (max.). Use with 5/8 inch exterior sheathing. 6. 5 ½ 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 ½ 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 ½ inch air gap or full fill. Use with 5/8 exterior sheathing. 9. Gaco Western 83M (3 ½ inch max). Use with 5/8 exterior sheathing. 10. Gaco Western F 1850 (3 ½ inch max.). Use with 5/8 exterior sheathing. 11. Demilec SEALECTiON 500 (3 5/8 inch max). Use with 5/8 exterior sheathing. 12. Deilec 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.
<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. ½"-thick or thicker, exterior gypsum board sheathing 2. None (for 3 in. max. exterior insulation with claddings 7-12 or 4 ½ in. max. exterior insulation with claddings 1-6) 3. ½" (min.) FRTW structural panels complying with <i>IBC</i> Section 2303.2 and installed in accordance with code allowances for Types I, II, III or IV construction.
Continued on next page	

Technical Evaluation Report (TER)

Fire Performance – Vertical & Lateral Fire Propagation ¹	
Wall Component	Materials
<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 31MR k. Henry EnviroCap l. Henry Air Bloc 33MR m. Henry Air Bloc 21 FR n. Henry VP 160 o. Henry Air Bloc 17 p. Henry BlueSkin SA q. Henry FoilSkin r. Henry MetalClad s. Henry 32MR t. Soprema Stick VP or Soprasolin HD 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. W.R. Grace PAB NPL 10 ee. W.R. Grace PAB VPL ff. W.R. Grace PAB VPL LT gg. W.R. Grace PAB VPS hh. W.R. Grace PAB AWM ii. W.R. Grace PAB VPL 50 jj. Dryvit Backstop NT
<p>Exterior Insulation Use either 1, 2, or 3</p> <p>Note: See Exterior sheathing options for thickness limitations when no exterior sheathing is used.</p>	<p>4 ½ in. (max. consisting of a single panel or multiple thinner panels) Rmax ECOMAXci™ Wall Solution or EVOMAXci™ (for Claddings 1-12)</p>
<p>FRTW Structural Panels over Exterior Insulation (Optional)</p>	<p>For use with cladding options 1-12, 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>
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Technical Evaluation Report (TER)

Fire Performance – Vertical & Lateral Fire Propagation ¹	
Wall Component	Materials
<p>Weather-Resistive Barrier Applied over Exterior Insulation (or FRTW) Use any item 1) a-ff for claddings 1-6 with non-open joint installation technique.</p> <p>Or any item 2) a-h for all approved claddings 1-12 below.</p> <p>Note: Exterior WRB items 1 b-d and 2 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 1-12.</p> <p>NLA = No longer available. Replaced with Spraywrap MVP</p>	<ol style="list-style-type: none"> 1. 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. None b. 6 in. (max.) Venture Tape CW over insulation joints c. 6 in. (max.) Rmax R-SEAL 3000 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. Soprema Stick VP or Soprasolin HD j. Carlisle (CCW) Fire Resist 705FR-A k. Carlisle (CCW) Fire Resist Barritech NP l. Carlisle (CCW) Fire Resist Barritech VP m. Henry Air Bloc 31MR n. Henry Envirocap o. Henry Air Bloc 33MR p. Henry Air Bloc 21 FR q. Henry Air Bloc 17 r. Henry FoilSkin s. Henry MetalClad t. Prosoco R-Guard Spray Wrap (NLA) u. Prosoco R-Guard MVP (NLA) v. Prosoco Spraywrap MVP w. Prosoco R-Guard VB x. Prosoco R-Guard Cat 5 y. Vaproshield Revealshield SA z. Vaproshield Wrapshield SA aa. Pecora XL-PermULTRA VP (10 mil DFT) bb. W.R. Grace PAB VPL cc. W.R. Grace PAB VPL LT dd. W.R. Grace PAB VPS ee. W.R. Grace PAB AWM ff. Dryvit Backstop NT 2. For use with all approved claddings 1-12 as listed below: <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 over insulation joints d. 6 in. (max.) asphalt or butyl based tape, or liquid flashing over insulation joints e. Henry FoilSkin f. Henry MetalClad g. Carlisle (CCW) Fire Resist 705FR-A h. W.R. Grace PAB AWM i. Soprema Soprasolin HD
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Technical Evaluation Report (TER)

Fire Performance – Vertical & Lateral Fire Propagation ¹	
Wall Component	Materials
<p>Exterior Cladding Select option 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 or 12</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 and 2) b-d are panel joint tapes allowed for all claddings. The panel joints shall be staggered.</p>	<ol style="list-style-type: none"> 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/ 1 ⅛ in. ± ½ in. 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, 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.
<p>1. All WRBs shall be installed at recommended application rates and per the manufacturer's installation instructions.</p> <p>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 or R-SEAL 6000 polyethylene tape up to 12" maximum width.</p>	

Table 6: Fire Performance – Vertical & Lateral Fire Propagation

5.5.4. Fire Resistance Ratings

5.5.4.1. ECOMAXci™ Wall Solution 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.** 1-hour: [U026](#), [U326](#), [U330](#), [U354](#), [U424](#), [U460](#), [V454](#)
- 5.5.4.1.2.** 2-hour: [U905](#), [U906](#), [V499](#)
- 5.5.4.1.3.** 3-hour: [U904](#)
- 5.5.4.1.4.** 4-hour: [U902](#), [U907](#)

Technical Evaluation Report (TER)

6. Installation:

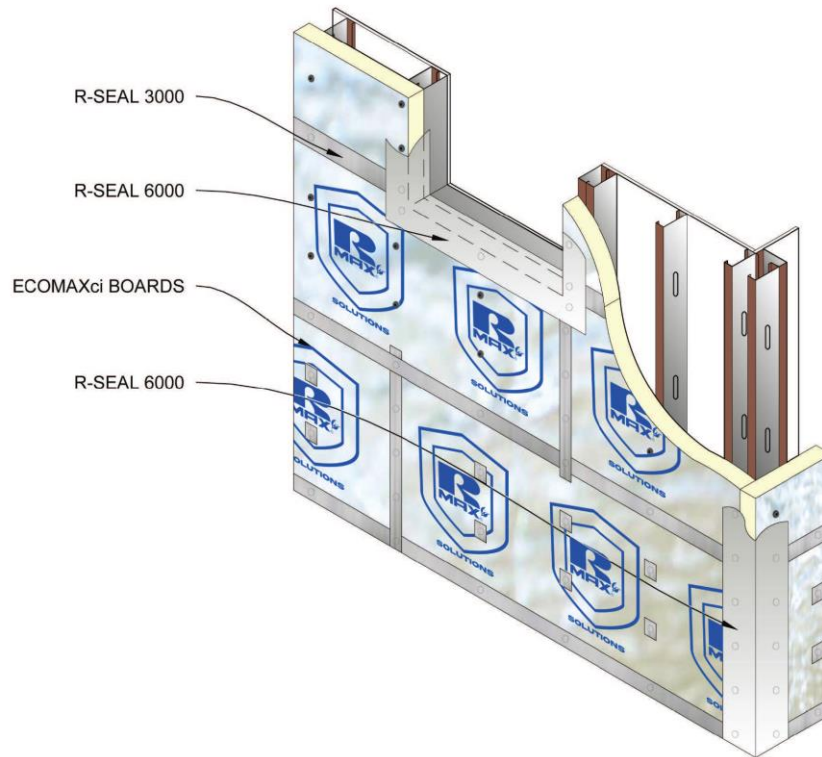


Figure 3: Installation of ECOMAXci™ Wall Solution and EVOMAXci™
Note: Install R-SEAL 3000 Tape & R-SEAL 6000 Flashing as Shown to Form Water Shedding Laps

- 6.1. Refer to the [manufacturer's installation instructions](#), in addition to this TER, for complete details and requirements.
- 6.2. ECOMAXci™ Wall Solution and EVOMAXci™ shall be applied to wall framing in accordance with [Figure 3](#) as follows:
 - 6.2.1. The insulation boards shall be oriented with the Rmax Solutions shield facing the exterior side of the building.
 - 6.2.2. Each row of insulation shall be staggered a minimum of one stud spacing to the row below. All boards must be tightly abutted together.
 - 6.2.3. At changes in wall directions (corners), the boards shall fit snugly in an overlap.

Technical Evaluation Report (TER)

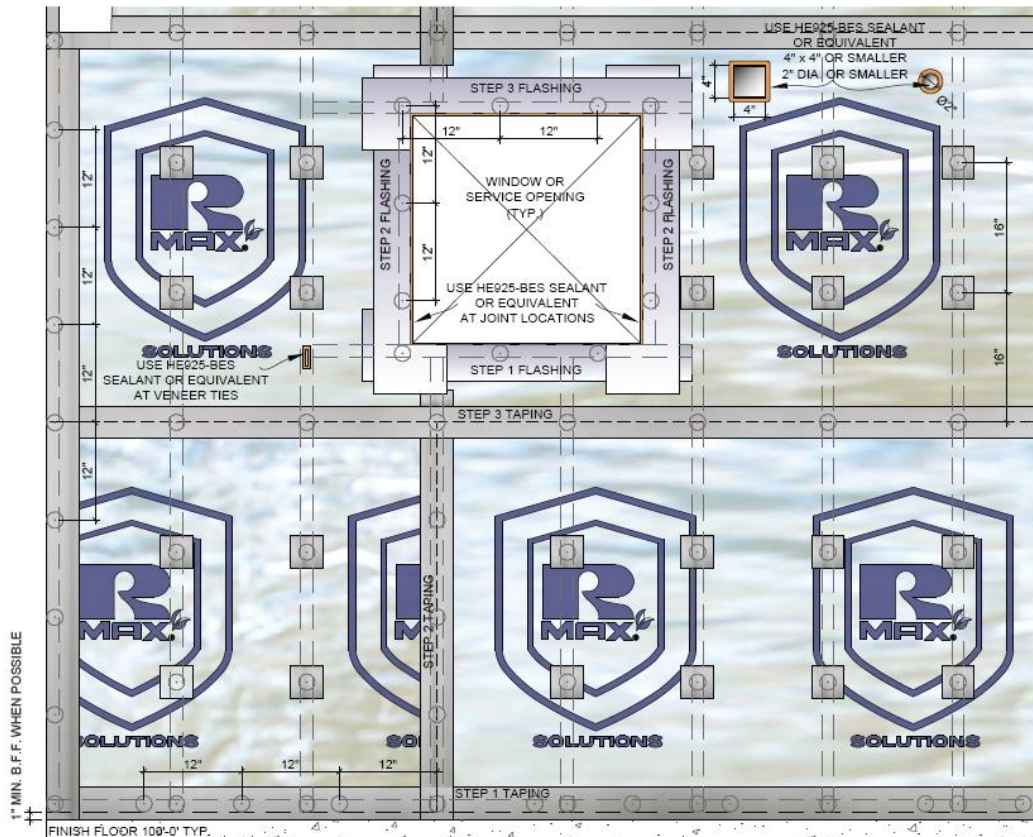


Figure 4: ECOMAXci™ Wall Solution and EVOMAXci™ Fastener & Flashing Application

- 6.3. ECOMAXci™ Wall Solution and EVOMAXci™ fastener application shall be in accordance with [Figure 4](#) as follows:
- 6.3.1. Insulation fastener components shall include a minimum 2"-diameter plastic plate/washer and self-taping steel screw.
 - 6.3.2. 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.
 - 6.3.3. Each insulation board shall be secured with a fastening pattern of 12" o.c. along the edge of each exterior wall facade and at the perimeter of each board where backed by framing. The pattern shall be 16" o.c. in the field along framing.
- 6.4. R-SEAL 3000 application shall be in accordance with [Figure 4](#) and [Figure 5](#) as follows:
- 6.4.1. 4"-wide R-SEAL 3000 shall be used to seal all joints of adjacent insulation boards, as well as cover all insulation fasteners. It can also be used to repair minor damages to the foil facer of the ECOMAXci™ Wall Solution and EVOMAXci™.
- 6.5. R-SEAL 6000 application shall be as follows:
- 6.5.1. 9"- or 12"-wide R-SEAL 6000 must 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.

Technical Evaluation Report (TER)

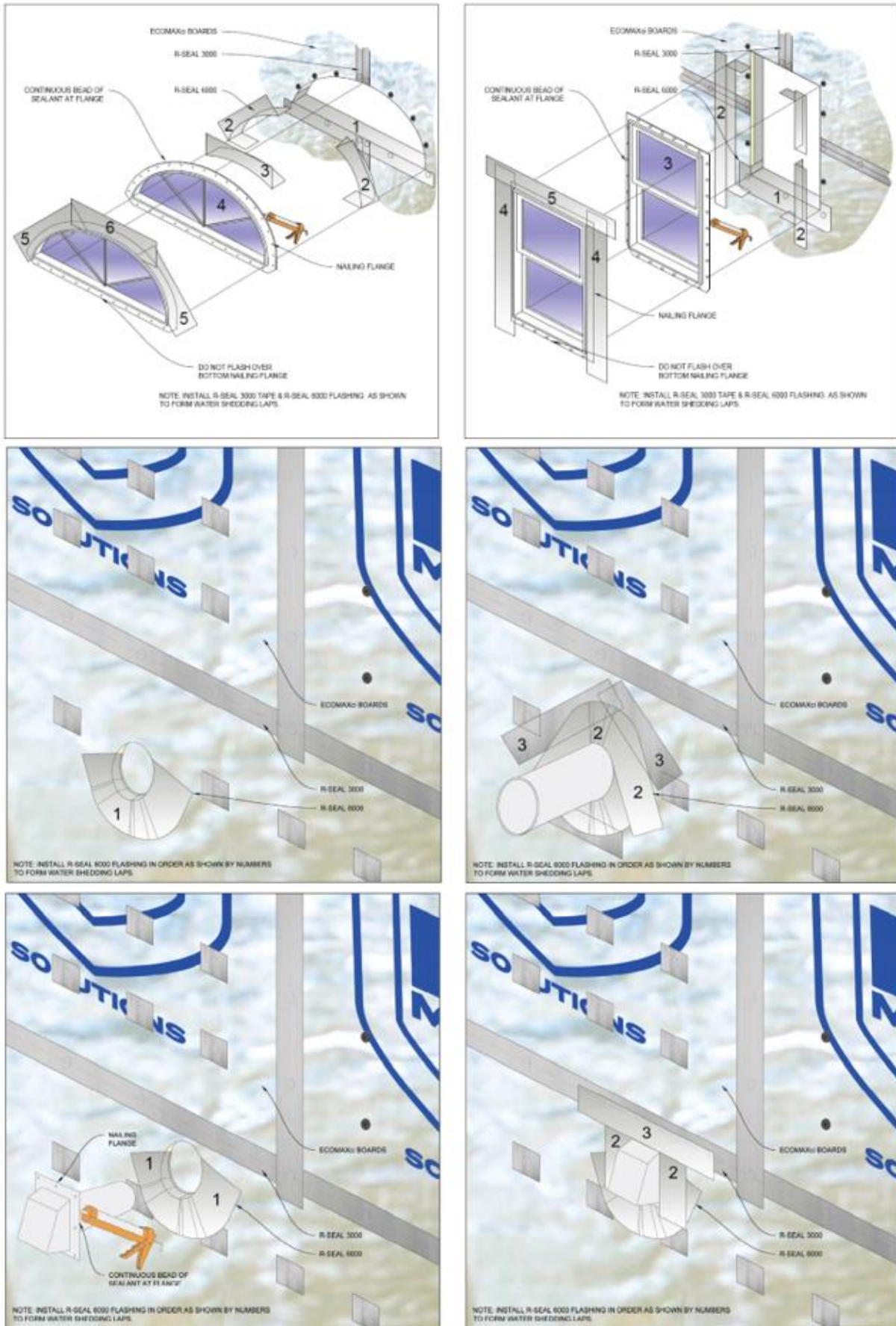


Figure 5: Application of R-SEAL 3000 & R-SEAL 6000 Wall Assembly Penetrations

Technical Evaluation Report (TER)

7. Test and 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 permeance in accordance with *ASTM E96*, performed by Exova.
 - 7.1.6. Water absorption in accordance with *ASTM C209*, performed by Radco.
 - 7.1.7. Water-resistance properties in accordance with *AATCC 127*, performed by ATI.
 - 7.1.8. Air barrier criteria for air barrier materials and air barrier assembly in accordance with ABAA.
 - 7.1.9. Air permeance in accordance with *ASTM E2178*, performed by Exova.
 - 7.1.10. Air leakage in accordance with *ASTM E2357 and CAN/ULC-S742*, performed by Exova.
 - 7.1.11. Thermal resistance properties in accordance with *ASTM C518*, performed by Exova.
 - 7.1.12. 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. The product(s) evaluated by this TER falls within the scope of one or more of the model, state or local building codes for building construction. The testing and/or substantiating data used in this TER is limited to buildings, structures, building elements, construction materials and civil engineering related specifically to buildings.
- 7.5. The provisions of model, state or local building codes for building construction do not intend to prevent the installation of any material or to prohibit any design or method of construction. Alternatives shall use consensus standards, performance-based design methods or other engineered alternative means of compliance. This TER assesses compliance with defined standards, generally accepted engineering analysis, performance-based design methods, etc. in the context of the pertinent building code requirements.
- 7.6. Some information contained herein is the result of testing and/or data analysis by other sources, which DrJ relies on to be accurate as it undertakes its engineering analysis.
- 7.7. DrJ has reviewed and found the data provided by other professional sources are credible. This information has been approved in accordance with DrJ's procedure for acceptance of data from approved sources.
- 7.8. DrJ's responsibility for data provided by approved sources is in accordance with professional engineering law.
- 7.9. Where appropriate, DrJ relies on the derivation of design values, which have been codified into law through codes and standards (e.g., *IRC, WFCM, IBC, SDPWS*, etc.). This includes review of code provisions and any related test data that helps with comparative analysis or provides support for equivalency to an intended end-use application.

8. Findings:

- 8.1. ECOMAXci™ Wall Solution and EVOMAXci™ described in this TER comply with, or is a suitable alternative to, the applicable sections of the codes listed in [Section 2](#).
- 8.2. This product has been evaluated with 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 that are applicable to this evaluation, they are listed here:
 - 8.2.1. No known variations
- 8.3. This TER uses professional engineering law, the building code, *ANSI/ASTM* consensus standards and generally accepted engineering practice as its criteria for all testing and engineering analysis. DrJ's professional engineering work falls under the jurisdiction of each state Board of Professional Engineers, when signed and sealed.

Technical Evaluation Report (TER)

- 8.4. [IBC Section 104.11](#) and [IRC Section R104.11](#) ([IFC Section 104.9](#) is similar) state:

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, at least 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*.²

9. Conditions of Use:

- 9.1. Where required by 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.
- 9.2. Any generally accepted engineering calculations needed to show compliance with this TER shall be submitted to the code official for review and approval.
- 9.3. Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed.
- 9.4. ECOMAXci™ Wall Solution and EVOMAXci™ are subject to the following conditions:
- 9.4.1. This TER and the installation instructions, when required by a code official, shall be submitted at the time of permit application.
- 9.4.2. When the insulation boards are used on exterior walls of buildings of Type I, II, III or IV, construction must be as described in [Section 5.5.3](#).
- 9.4.3. 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.
- 9.4.4. In areas where the probability of termite infestation is very heavy, in accordance with [IBC Section 2603.8](#), the product must not be placed on exterior walls located within 6" (152 mm) of the ground.
- 9.4.5. This product is not to be used as a structural nailing base for claddings.
- 9.4.6. 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.
- 9.4.7. ECOMAXci™ Wall Solution and EVOMAXci™ are manufactured in Dallas, TX; Fernley, NV; and Greer, SC, under a quality control program with quality control inspections in accordance with [IBC Section 110.3.8](#) and [110.3.9](#).
- 9.5. Design
- 9.5.1. Building Designer Responsibility
- 9.5.1.1. Unless the AHJ allows otherwise, the Construction Documents shall be prepared by a Building Designer (e.g., Owner, Registered Design Professional, etc.) for the Building and shall be in accordance with [IRC Section R106](#) and [IBC Section 107](#).
- 9.5.1.2. The Construction Documents shall be accurate and reliable and shall provide the location, direction and magnitude of all applied loads and shall be in accordance with [IRC Section R301](#) and [IBC Section 1603](#).
- 9.5.2. Construction Documents
- 9.5.2.1. Construction Documents shall be submitted to the Building Official for approval and shall contain the plans, specifications and details needed for the Building Official to approve such documents.

² The last sentence is adopted language in the 2015 codes.

Technical Evaluation Report (TER)

9.6. Responsibilities

- 9.6.1. The information contained herein is a product, engineering or building code compliance technical evaluation report performed in accordance with the referenced building codes, testing and/or analysis through the use of accepted engineering procedures, experience and technical judgment.
- 9.6.2. DrJ technical evaluation reports provide an assessment of only those attributes specifically addressed in the Products Evaluated or Code Compliance Process Evaluated section.
- 9.6.3. The engineering evaluation was performed on the dates provided in this TER, within DrJ's professional scope of work.
- 9.6.4. This product is manufactured under a third-party quality control program in accordance with [/IRC Section R104.4](#) and [R109.2](#), and [/IBC Section 104.4](#) and [110.4](#).
- 9.6.5. 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, and the TER shall be reviewed for code compliance by the Building Official.
- 9.6.6. The use of this TER is dependent on the manufacturer's in-plant QC, the ISO/IEC 17020 third-party inspection process, proper installation per the manufacturer's instructions, the Building Official's inspection and any other code requirements that may apply to assure accurate compliance with the applicable building code.

10. Identification:

- 10.1. ECOMAXci™ Wall Solution and EVOMAXci™ described in this TER are identified by a label on the board or packaging material bearing the manufacturer's name, product name, label of the third-party inspection agency, 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 drjengineering.org.
- 11.2. For information on the current status of this TER, contact [DrJ Engineering](#).



- [Mission and Professional Responsibilities](#)
- [Product Evaluation Policies](#)
- [Product Approval – Building Code, Administrative Law and P.E. Law](#)