DrJ™ CERTIFICATION

Approved. Sealed. Code Compliant.

Technical Evaluation Report

TER 1309-03

Rmax® Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE

Rmax®

Products:

Rmax® Thermasheath®
Rmax® Thermasheath®-XP
Rmax® TSX-8500
Rmax® TSX-8510
Rmax® ECOMAXci® FR and
Rmax® ECOMAXci® FR WHITE

Issue Date:

May 19, 2014

Revision Date:

July 11, 2022

Subject to Renewal:

July 1, 2023

COMPANY
INFORMATION:

Rmax®

13524 Welch Rd
Dallas, TX 75244

972-850-3604

technical@rmax.com

rmax.com

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 21 13 - Foam Board Insulation

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

SECTION: 07 27 00 - Air Barriers

SECTION: 07 27 23 - Board Product Air Barriers

1 PRODUCTS EVALUATED[1]

1.1 Rmax® Thermasheath®
Rmax® Thermasheath®-XP
Rmax® TSX-8500
Rmax® TSX-8510
Rmax® ECOMAXci® FR and
Rmax® ECOMAXci® FR WHITE

2 APPLICABLE CODES AND STANDARDS[2,3]

2.1 *Codes*

2.1.1 *IBC—15, 18, 21: International Building Code®*

2.1.2 *IRC—15, 18, 21: International Residential Code®*

[1] For more information, 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. 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.

2.1.3 *IECC—15, 18, 21: International Energy Conservation Code®*

2.1.4 *CBC—16, 19: California Building Code (Title 24, Part 2)*[4]

2.1.5 *CRC—16, 19: California Residential Code (Title 24, Part 2.5)*[4]

2.1.6 *CEC —16, 19: California Energy Code (Title 24, Part 6)*[5]

2.1.7 *FBC-B—17, 20: Florida Building Code – Building*[6]

2.1.8 *FBC-R—17, 20: Florida Building Code – Residential*[6]

2.2 *Standards and Referenced Documents*

2.2.1 *AATCC Test Method 27: Water Resistance: Hydrostatic Pressure Test*

2.2.2 *ASTM C209: Standard Test Methods for Cellulosic Fiber Insulating Board*

2.2.3 *ASTM C272: Standard Test Method for Water Absorption of Core Materials for Sandwich Constructions*

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 C1289: Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board*

2.2.6 *ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials*

2.2.7 *ASTM E96: Standard Test Methods for Water Vapor Transmission of Materials*

2.2.8 *ASTM E119: Standard Test Methods for Fire Tests of Building Construction and Materials*

2.2.9 *ASTM E136: Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C*

2.2.10 *ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference*

2.2.11 *ASTM E1354: Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter*

2.2.12 *ASTM E2178: Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials*

2.2.13 *NFPA 259: Standard Test Method for Potential Heat of Building Materials*

2.2.14 *NFPA 285: Standard Fire Test Method for the Evaluation of Fire Propagation Characteristics of Exterior Nonload-bearing Wall Assemblies Containing Combustible Components*

2.2.15 *NFPA 286: Standard Methods of Fire Test for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*

2.2.16 *UL 263: Standard for Fire Tests of Building Construction and Materials*

2.2.17 *UL 1715: Fire Test of Interior Finish Material*

3 PERFORMANCE EVALUATION

3.1 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE were evaluated to determine the following:

3.1.1 Performance in accordance with foam plastic requirements of *IBC* Section 2603 and *IRC* Section R316.

3.1.2 Performance for use as insulating sheathing (R-value) in accordance with *IRC* Section N1102 and *IECC* Section C402.

[4] All references to the *CBC* and *CRC* are the same as the 2018 *IBC* and 2018 *IRC* unless otherwise noted in the California Supplement at the end of this TER.

[5] All references to the *CBC, CRC,* and *CEC* are the same as the 2018 *IBC* and 2018 *IRC* unless otherwise noted in the Florida Supplement at the end of this TER.

[6] All references to the *FBC-B* and *FBC-R* are the same as the 2018 *IBC* and 2018 *IRC* unless otherwise noted in the Florida Supplement at the end of this TER.

3.1.3 Performance for use as a water-resistive barrier (WRB) in accordance with *IBC* Section 1403.2[7] and *IRC* Section R703.2.

3.1.4 Performance for use as a vapor retarder in accordance with *IBC* Section 202 and Section 1404.3[8] and *IRC* Section R202 and Section R702.7.

3.1.5 Performance for use as a continuous air barrier in accordance with *IECC* Section C402.

3.1.6 Surface burning characteristics in accordance with *IBC* Section 2603.3 and *IRC* Section R316.3.

3.1.7 Special approval for use without a thermal barrier or ignition barrier in accordance with *IBC* Section 2603.4 and Section 2603.5.2 and *IRC* Section R316.4.

3.1.8 Fire resistance rated assembly in accordance with *IBC* Section 703.2.1

3.2 Thermasheath® ECOMAXci® FR, and ECOMAXci® FR WHITE were evaluated to determine the following:

3.2.1 Performance for use in exterior walls of buildings of Type I-IV construction in accordance with *IBC* Section 2603.5

3.2.1.1 Fire resistance rated assembly in accordance with *IBC* Section 703.2.1

3.2.1.2 Potential heat in accordance with *IBC* Section 2603.5.3

3.2.1.3 Flame spread and smoke development ratings in accordance with *IBC* Section 2603.5.4

3.2.1.4 Vertical and lateral fire propagation in accordance with *IBC* Section 2603.5.5

3.2.1.5 Ignition characteristics in accordance with *IBC* Section 2603.5.7

3.3 Use of TSX-8500 and TSX-8510 in exterior walls of buildings of Type I-IV construction in accordance with *IBC* Section 2603.5 is outside the scope of this TER.

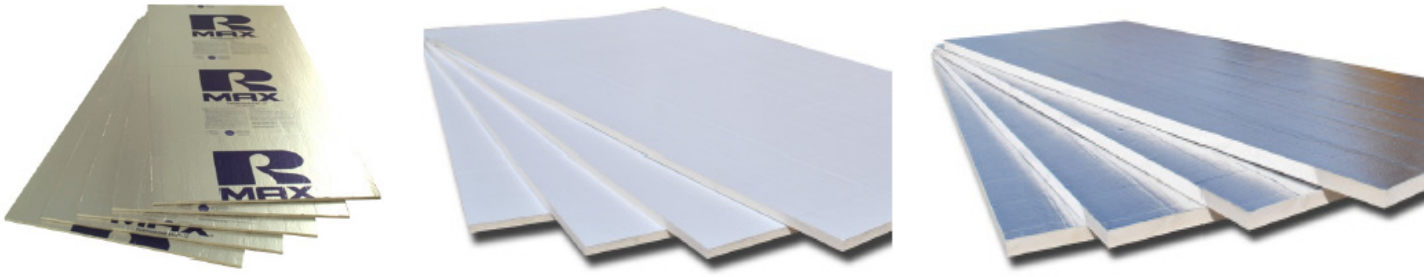
3.4 Use of Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE in structures where the exterior wall covering is unable to resist 100% of the transverse wind load is outside the scope of this TER.

3.5 Any code compliance issues not specifically addressed in this section are outside the scope of this TER.

3.6 Any engineering evaluation conducted for this TER was performed within DrJ's ANAB accredited ICS code scope and/or the defined professional engineering scope of work on the dates provided herein.

4 Product Description and Materials

4.1 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE, pictured in Figure 1, are non-structural foam plastic insulating sheathing (FPIS) panels consisting of a closed-cell rigid polyisocyanurate (polyiso) foam core bonded to various facers (*ASTM C1289* Type I, Class 1 and Class 2).



Thermasheath® TSX-8510 ECOMAXci® FR

Figure 1. Thermasheath®, TSX-8510, and ECOMAXci® FR

[7] 2015 *IBC* Section 1404.2

[8] 2015 *IBC* Section 1405.3

4.1.1 Thermasheath® consists of a polyiso core bonded to reinforced aluminum facers on each side. Both sides have a reflective surface.

4.1.2 Thermasheath®-XP consists of a polyiso core bonded to aluminum facers on each side. Both sides may be left exposed; one side has a white modified acrylic coating, and the other side has a reflective surface with a clear coating.

4.1.3 TSX-8500 consists of a polyiso core bonded to glass fiber reinforced aluminum facers on each side. Both sides have a reflective surface.

4.1.4 TSX-8510 consists of a polyiso core bonded to glass fiber reinforced aluminum facers on each side. One side has a white modified acrylic coating. The other side has a reflective surface.

4.1.5 ECOMAXci® FR consists of a polyiso core bonded to glass fiber reinforced aluminum facers on each side. Both sides have a reflective surface. The exposed side has a clear modified acrylic coating. Each board is marked on the non-exposed side.

4.1.6 ECOMAXci® FR WHITE consists of a polyiso core bonded to glass fiber reinforced aluminum facers on each side. The exposed side has a white modified acrylic coating. The non-exposed side has a reflective surface.

4.2 *Material Availability*

4.2.1 Thickness: 0.5 inch (12.7 mm) through 4.5 inches (114.3 mm)

4.2.2 Standard product width: 48 inches (1219 mm)

4.2.3 Standard product length: 96, 108, 120, and 144 inches (2438, 2743, 3048, and 3658 mm)

4.2.4 Custom lengths, widths and thicknesses available upon request.

5 APPLICATIONS

5.1 *General*

5.1.1 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE are used as wall sheathing and continuous insulation in buildings constructed in accordance with the *IBC* and *IRC*.

5.1.2 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE are non-structural FPIS panels used as thermal insulation within the building envelope, including, but not limited to, attic, crawlspace, wall, roof, ceiling, floor, and foundation assemblies.

5.1.3 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE may be installed horizontally under floor slabs and vertically on the interior side of footings and exterior side of foundation walls.

5.1.4 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE shall not be used as a nail base for other building products.

5.1.5 Stud walls insulated with Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE must be properly braced for lateral loads according to the requirements of local building codes.

5.1.6 The wall system shall be designed to handle cladding load and wind load per the applicable code.

5.1.7 The Environmental Product Declarations (EPD) for Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE are available at polyiso.org.

5.1.8 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 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE meet the continuous insulating sheathing requirements complying with the provisions of *IRC* Section N1102 and *IECC* Section C402 and Section R402.

5.2.2 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE have the thermal properties shown in Table 1.

TABLE 1. THERMAL PROPERTIES

Nominal Thickness (in)	Thermal R-Value[1] (°F-ft²-hr/Btu)
0.5	3.2
1.0	6.0
1.5	9.6
1.55	10.0
2.0	13.1
2.5	16.7
3.0	20.3
3.5	23.9
4.0	27.4
4.5	31.0

SI: 1 in = 25.4 mm; 1 F-ft²-h/Btu = 0.1761 K-m²/W

1. Thermal values are determined by using *ASTM C518* test method at 75°F mean temperature on material conditioned according to PIMA Technical Bulletin No. 101.

5.3 *Water-Resistive Barrier (WRB)*

5.3.1 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE may be used as a WRB as prescribed in *IBC* Section 1403.2[9] and *IRC* Section R703.2, when installed on exterior walls as described in this section and the manufacturer's installation instructions.

5.3.2 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE shall be installed horizontally or vertically with vertical board joints centered directly over exterior framing spaced a maximum of 24 inches (610 mm) o.c. The fasteners used to attach the board shall be installed in accordance with Section 6.

5.3.3 All joints between boards shall be sealed by R-SEAL 3000, R-SEAL Construction Tape, or R-SEAL 2000 LF per the manufacturer's installation instructions.

5.3.4 A separate WRB may also be provided. If a separate WRB method is used, taping of the sheathing joints is not required.

5.3.5 Flashing of corners, windows, doors, and other through-wall penetrations is required and shall comply with the applicable code.

[9] 2015 *IBC* Section 1404.2

5.3.6 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE have the water-resistance properties shown in Table 2.

TABLE 2. WATER-RESISTANCE PROPERTIES

Property	Test Method	Results
Water Vapor Transmission	ASTM E96	< 0.03 U.S. Perm
Water Absorption	ASTM C209	< 0.2% by Volume
	ASTM C272	≤ 0.3% by Volume
SI: 1 U.S. Perm [gr(hr-ft²-inHg)] = 57.2135 ng/(Pa-s-m²)		

5.3.7 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE are Class I Vapor Retarders in accordance with *IBC* Table 1404.3(1)[10].

5.4 *Air Barrier*

5.4.1 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE meet the requirements of *IRC* Section N1102 and *IECC* Section C402 and Section R402 for use as a component of the continuous air barrier, when installed in accordance with the manufacturer's installation instructions and this TER .

5.4.2 The air barrier material properties of Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE are shown in Table 3.

TABLE 3. AIR BARRIER MATERIALPROPERTIES[1]

Air Permeance
< 0.005 L/(s-m²)
IP: 1 L/(s*m²) = 0.2 cfm/ft²

1. Tested in accordance with *ASTM E2178*

5.4.3 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 L/(s.m²) at 75 Pa pressure difference when tested in accordance with *ASTM E2178*.

5.4.4 When used as part of a continuous air barrier, all sheathing panel joints shall be sealed with R-SEAL 3000, R-SEAL Construction Tape, or R-SEAL 2000 LF. The transitions, including top and bottom of walls, and all penetrations shall also be sealed in accordance with the manufacturer's installation instructions and this TER.

5.5 *Draftstop*

5.5.1 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE may be used as a draftstop material in accordance with *IBC* Section 708.4.2, Section 718.3, and Section 718.4 and *IRC* Section R302.12.

5.5.2 When installed as a draftstop, Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE shall be installed in accordance with Section 6.

5.6 *Fire Safety Performance*

5.6.1 *Surface Burning Characteristics:*

5.6.1.1 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE have the flame spread and smoke developed ratings shown in Table 4, when tested in accordance with *ASTM E84* per *IBC* Section 2603.3 and *IRC* Section R316.3

[10] 2018 *IBC* Section 1404.3.3

TABLE 4. SURFACE BURNING CHARACTERISTICS[1]

Product	Flame Spread Index	Smoke Developed Index
Thermasheath®[2]	≤ 75	≤ 450
Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, & ECOMAXci® FR WHITE	≤ 25	≤ 250

SI: 1 in = 25.4 mm

1. Tested in accordance with *ASTM E84*
2. Foam core only

5.6.2 *Thermal Barrier and Ignition Barrier (IBC and IRC Buildings):*

5.6.2.1 Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR and ECOMAXci® FR WHITE, up to 4.5 inches in walls only or up to 12 inches in ceilings only, are approved for use without a thermal barrier or ignition barrier, based on large-scale testing conducted in accordance with *UL 1715 per IBC* Section 2603.9 *and IRC* Section R316.6.

5.6.2.2 Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR and ECOMAXci® FR WHITE, up to 4.5 inches in walls and ceilings, are approved for use in attics, crawls spaces, or other uninhabited spaces without a thermal barrier or ignition barrier, based on large-scale testing in accordance with *NFPA 286 per IBC* Section 2603.9 *and IRC* Section R316.6.

5.6.2.3 Thermasheath®, up to 4.5 inches in walls only or ceilings only, is approved for use in attics, crawls spaces, or other uninhabited spaces without a thermal barrier or ignition barrier, based on large-scale testing in accordance with NFPA 286 *per IBC* Section 2603.9 *and IRC* Section R316.6.

5.6.2.4 Thermasheath®, up to 1 inch in walls and/or ceilings, is approved for use in attics, crawls spaces, or other uninhabited spaces without a thermal barrier or ignition barrier, based on large-scale testing in accordance with NFPA 286 *per IBC* Section 2603.9 *and IRC* Section R316.6.

5.6.2.5 All products, up to 12 inches (304.8 mm) in thickness, may be installed within the building envelope (including, but not limited to, attics, crawlspaces, wall, roof, floor and ceiling assemblies) of all building types when separated from the interior with a thermal barrier consisting of a minimum 0.5 inch gypsum wallboard or an approved equivalent in accordance with *IBC* Section 2603.4 and *IRC* Section R316.4.

5.6.2.6 In applications where panels are used in both walls and ceilings, but only one is allowed to be left exposed per 5.6.2.1 or 5.6.2.3, the other must meet the requirements of 5.6.2.5.

5.6.2.7 For *IRC* applications in attics, crawls spaces or other uninhabited spaces of 5.6.2.2, 5.6.2.3, or 5.6.2.4, approval is limited to areas where access to the space is required by *IRC* Section R807.1 or Section R408.4.

5.6.2.8 For *IRC* and *IBC* applications in attics, crawls spaces or other uninhabited spaces of 5.6.2.2, 5.6.2.3, or 5.6.2.4, approval is limited to areas where entry is made only for the purposes of repairs or maintenance.

5.6.2.9 Panels may be installed in single or multiple layers.

5.6.3 *Fire Resistance Ratings (Fire-Rated Assemblies):*

5.6.3.1 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE have been tested and meet the requirements of *UL 263* (*ASTM E119*) in accordance *IBC* Section 703.2.1 for use in the following assembly designs when installed in accordance with the manufacturer's installation instructions and this TER:

5.6.3.1.1 45 Minutes: U424, U425, V321, V499, W456

5.6.3.1.2 1-hour: U026, U326, U330, U349, U354, U355, U364, U424, U425, U460, V454, W417, W429, W448, W451, W452, W456

5.6.3.1.3 1.5 hours: U424, U425, W456

5.6.3.1.4 2-hour: U905, U906, U939, V332, V499, W449, W456

5.6.3.1.5 3-hour: U904, U912, U939, W429, W451

5.6.3.1.6 4-hour: U904, U912, U939, W429, W451

5.6.4 *Potential Heat:*

5.6.4.1 Thermasheath®, ECOMAXci® FR, and ECOMAXci® FR WHITE have been tested to assess their performance as shown in Table 5 with regard to potential heat in accordance with *NFPA 259* and *IBC* Section 2603.5.4.

TABLE 5. POTENTIAL HEAT

Product	Potential Heat (Btu/lb)
Thermasheath®	11,467
ECOMAXci® FR and ECOMAXci® FR WHITE	11,054

SI: 1 Btu/lb = 2.326 kJ/kg

1. Tested in accordance with *NFPA 259*

5.6.5 *Vertical and Lateral Fire Propagation (NFPA 285 Applications):*

5.6.5.1 Thermasheath®, ECOMAXci® FR, and ECOMAXci® FR WHITE have been tested to assess performance with regard to vertical and lateral fire propagation in accordance with *NFPA 285* and *IBC* Section 2603.5.5.

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

5.6.5.3 The wall assemblies listed in Table 6 are approved for use in buildings of Type I-IV construction with ECOMAXci® FR and ECOMAXci® FR WHITE.

TABLE 6. FIRE PERFORMANCE – VERTICAL & LATERAL FIRE PROPAGATION (ECOMAXCI® FR AND ECOMAXCI® FR WHITE)

Wall Component	Materials
Base Wall System Select option 1, 2, 3 or 4	1. Cast concrete walls 2. CMU Concrete walls 3. 20 GA. (min.) 3.625" (min.) steel studs spaced 24" o.c. (max.) a. ½ in. (min.) type X Special Fire Resistant Gypsum Wallboard Interior b. Bracing as required by code 4. Where allowed by code in Types I, II, III or IV construction, FRTW (fire-retardant-treated wood) studs complying with *IBC* Section 2303.2, minimum nominal 2x4 dimension, spaced 24" o.c. (max.) a. 0.625" type X Gypsum Wallboard Interior b. Bracing as required by code
Floorline Firestopping	1. 4 pcf mineral wool installed with Z-clips

Wall Component	Materials
Select option 1 or 2	2. FRTW fire blocking at floor line in accordance with applicable code requirements (use with FRTW framing)
Cavity Insulation Select option 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 or 15 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. 5.5" (max.) Icynene LD-C-50 SPF in 6" deep studs (max.). Use with 0.625" exterior sheathing. 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. 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 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. 9. Gaco Western 183M SPF (3.5" max). Use with 0.625" exterior sheathing. 10. Gaco Western F 1850 SPF (3.5" max.). Use with 0.625" exterior sheathing. 11. Demilec Sealection 500 SPF (3.625" max). Use with 0.625" exterior sheathing. 12. Demilec HeatLok Soy 200 Plus SPF (3.4" max). Use with 0.625" exterior sheathing. 13. Bayer Bayseal SPF (3" max). Use with 0.625" exterior sheathing. 14. Lapolla FoamLok FL 2000 SPF (3" max). Use with 0.625" exterior sheathing. 15. BASF SprayTite 81206 or WallTite (US & US-N) SPF (3.625" max). Use with 0.625" exterior sheathing.
Exterior Sheathing Select option 1, 2, 3, 4, 5, 6, 7 or 8 Note: When SPF is used, 0.625" exterior gypsum sheathing must be used.	1. None (when using Base Wall 1 or 2) 2. None (3" max. exterior insulation with claddings 7-15) 3. None (4..5" max. exterior insulation with claddings 1-6) 4. 0.5" (min.) exterior gypsum board sheathing 5. 0.5" (min.) FRTW structural panels complying with *IBC* Section 2303.2 and installed in accordance with code allowances for Types I, II, III or IV construction. 6. 0.625" DensElement with DensDefy or Prosoco FastFlash flashing at joints/fasteners 7. Soprema Sopraseal Xpress G 8. Tremco/USG Securock® ExoAir® 430
Weather-Resistive Barrier Applied to Exterior Sheathing Select option 1 or 2 installed per manufacturer's installation instructions. Note: WRB over Exterior Sheathing items 6-8 may not be used since they already incorporate a pre-installed WRB. Note: When using no exterior sheathing, sheet building wraps may be applied directly to studs. NLA = No Longer Available.	1. None 2. Any WRB tested in accordance with *ASTM E1354* (at a minimum of 20 kW/m^2 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: 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®-Foxx/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

Wall Component	Materials
	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 Tex 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 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 2.63 .R. Meadows® Air-Shield™ LMP (Gray) 2.64 W.R. Meadows® Air-Shield™ LSR 2.65 W.R. Meadows® Air-Shield™ SMP 2.66 W.R. Meadows® Air-Shield™ TMP
Exterior Insulation Use either 1 or 2	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

Wall Component	Materials
Note: See Exterior sheathing options for thickness limitations when no exterior sheathing is used.	
FRTW Structural Panels over Exterior Insulation (Optional)	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. Note: May be applied in the field or factory applied. Adhesive must not be full coverage.
Weather-Resistive Barrier Applied over Exterior Insulation (or FRTW) Use any in item 1 or 2 depending on the cladding used Note: Exterior WRB items in 1.02 are not traditional WRB products but are insulation panel joint tapes. The insulation panel joints shall be staggered. NLA = No longer available.	1. For use with all claddings 1.01 None 1.02 6" (max) tape or flashing over insulation joints a Rmax® R-SEAL 3000 b Rmax® R-SEAL 6000 c Rmax® R-SEAL 2000 LF d Venture Tape CW e Asphalt or butyl based tape f Liquid flashing 1.03 Carlisle (CCW) Fire Resist 705FR-A 1.04 Dupont™ Tyvek® (Various per 2375) 1.05 Dupont™ Weathermate™ Housewrap 1.06 Dupont™ Weathermate™ Plus Housewrap 1.07 GCP PERM-A-BARRIER® Aluminum Wall Membrane 1.08 Henry® Blueskin® Metal Clad® 1.09 Henry® FoilSkin 1.10 Kingspan (Pactiv) GreenGuard® MAX™ Building Wrap 1.11 Prosoco R-Guard® Spray Wrap MVP 1.12 Soprema Soprasolin® HD 2. For use with cladding options 1-6 (heavy masonry) with non-open joint installation techniques (ex. shiplap, etc.) 2.01 Carlisle CCW Fire Resist Barritech NP™ 2.02 Carlisle CCW Fire Resist Barritech VP 2.03 Dörken Systems Inc. Delta®-Fassade S 2.04 Dörken Systems Inc. Delta®-Foxx/Plus 2.05 Dörken Systems Inc. Delta®-Maxx/Plus 2.06 Dörken Systems Inc. Delta®-Vent S/Plus 2.07 Dow Corning DOWSIL™ DefendAir 200 2.08 Dow Corning DOWSIL™ DefendAir 200C 2.09 Dryvit Backstop® NT™ 2.10 GCP PERM-A-BARRIE® VPS 2.11 GCP PERM-A-BARRIER® VPL 2.12 GCP PERM-A-BARRIER® VPL Low Temperature 2.13 Henry Air-Bloc All Weather STPE 2.14 Henry Super Jumbo Tex 60 minutes (only with ¾" stucco cladding) (Fortifiber) 2.15 Henry WeatherSmart Drainable (Fortifiber) 2.16 Henry® Air-Bloc® 16 MR 2.17 Henry® Air-Bloc® 17 MR 2.18 Henry® Air-Bloc® 21 FR 2.19 Henry® Air-Bloc® 31MR 2.20 Henry® Air-Bloc® 33MR

Wall Component	Materials
	2.21 Henry® Blueskin® VP160 2.22 Henry® Envirocap 2.23 Parex WeatherSeal Spray & Roll-On 2.24 Pecora ProPerm VP 2.25 Pecora XL-Perm^{ULTRA} NP 2.26 Pecora XL-Perm^{ULTRA} VP (10 mil DFT) 2.27 Prosoco R-Guard® Cat 5™ 2.28 Prosoco R-Guard® MVP (NLA) 2.29 Prosoco R-Guard® Spray Wrap (NLA) 2.30 Prosoco R-Guard® VB 2.31 Siga Majvest® 500 SA 2.32 Sika SikaGard® 535 2.33 Soprema Sopraseal® Stick VP 2.34 Vaproshield Revealshield SA® 2.35 Vaproshield Wrapshield SA® 2.36 W.R. Meadows® Air-Shield™ LMP (Black) 2.37 W.R. Meadows® Air-Shield™ LMP (Gray) 2.38 W.R. Meadows® Air-Shield™ LSR 2.39 W.R. Meadows® Air-Shield™ SMP 2.40 W.R. Meadows® Air-Shield™ TMPHenry® Air-Bloc® 31MR
Exterior Cladding Select option 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 or 17 Note: For WRB over exterior insulation option 2 above, heavy masonry claddings 1-6 shall incorporate non-open joints.	<u>Heavy Masonry</u> 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 0.75" thick, exterior cement plaster and lath with an optional secondary water resistive barrier between the exterior insulation and lath.* 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, Precast Concrete Panels, or CMU -- Minimum 1.5" thick, using any standard installation technique. Cast stone complying with ICC-ES AC 51. 6. Terra Cotta Cladding – Minimum 1.25" thick using any standard installation technique. <u>Other</u> 7. 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 a. Carter Companies EVO Architectural Panel Systems for use with any FR ACM/MCM *NFPA 285* 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 *NFPA 285* or equivalent. a. 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 *NFPA 285* using any standard installation technique. 12. Thin Set Brick a. Glen-Gary Thin Tech™ Elite Series has been analyzed using manufacturer's standard installation technique. b. Tabs II Panel System with 0.5" bricks using Tabs Wall Adhesive 13. Natural Stone Veneer – minimum 1.25" (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 1.5". 15. Glen-Gery Tru-Brix (only with optional non-combustible mortor)

Wall Component	Materials
	16. 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.* 17. 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.* *NOTE: The secondary barriers shall not be full-coverage asphalt or butyl-based self-adhered membranes.
Rough openings Note: Must cover both the air gap between the cladding and the exterior insulation and the exposed edge of the exterior insulation.	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. 1. 0.08" (min.) aluminum (examples include window frame, flashing, lintel, c-channel) 2. 20 GA. (min.) sheet steel (examples include window frame, flashing, lintel, c-channel) 3. 0.5" (min.) 4pcf (min.) mineral wool 4. 0.75" (min.) FRT wood buck 5. 0.75" (min.) FRT plywood 6. 0.625" (min.) type X GWB 7. 0.25" (min.) fiber cement board All fenestrations and penetrations shall be flashed in accordance with the applicable code using asphalt, acrylic or butyl flashing tape, liquid flashing, R-SEAL 6000, or R-SEAL 2000 LF up to 12" maximum width.

SI: 1 in = 25.4 mm

1. All WRBs shall be installed at recommended application rates and per the manufacturer's installation instructions.

5.6.5.4 The wall assemblies listed in Table 7 are approved for use in buildings of Type I-IV construction with Thermasheath®.

TABLE 7. FIRE PERFORMANCE – VERTICAL & LATERAL FIRE PROPAGATION (THERMASHEATH®)

Wall Component	Materials
Base Wall System Use either 1, 2, 3, or 4	1. Cast Concrete Walls 2. CMU Concrete Walls 3. 20 GA (min.) 3.625" (min.) steel studs spaced 24" OC (max.) a. 0.625" (min.) type X Gypsum Wallboard Interior b. Bracing as required by code 4. Where allowed by code 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" OC (max.) a. 0.625" type X Gypsum Wallboard Interior b. Bracing as required by code
Floorline Firestopping Select option 1 or 2	1. 4 pcf mineral fiber insulation installed with z-clips 2. FRTW fire blocking at floor line in accordance with applicable code requirements (use with FRTW framing)
Cavity Insulation Use either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 or 15 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, faced or un-faced meeting *ASTM E84*) 4. Any Fiberglass (batt type Class A, faced or un-faced meeting *ASTM E84*) 5. 5.5" (max.) Icynene LD-C-50 SPF in 6" deep studs (max.). Use with 0.625" exterior sheathing 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

Wall Component	Materials
	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 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 9. Gaco Western 183M SPF (3.5" max.). Use with 0.625" exterior sheathing 10. Gaco Western F1850 SPF (3.5" max.). Use with 0.625" exterior sheathing 11. Demilec SEALECTiON 500 SPF (3.625" max.). Use with 0.625" exterior sheathing 12. Demilec HeatLok Soy 200 Plus SPF (3.4" max.). Use with 0.625" exterior sheathing 13. Bayer Bayseal SPF (3" max.) Use with 0.625" exterior sheathing 14. Lapolla FoamLok FL 2000 SPF (3" max.) Use with 0.625" exterior sheathing 15. BASF SprayTite 81206 or WallTite (US & US-N) SPF (3.625" max.). Use with 0.625" exterior sheathing
Exterior Sheathing Use either 1, 2, 3, 4, 5, 6, 7 or 8 Note – When SPF is used, 0.625" exterior gypsum sheathing must be used	1. None (when using Base Wall 1 or 2) 2. 0.5" thick or thicker, exterior type gypsum board sheathing 3. 0.5" (min.) FRTW structural panels complying with *IBC* Section 2303.2 and installed in accordance with code allowances for Types I. II. III or IV construction 4. 0.625" DensElement with DensDefy or Prosoco FastFlash flashing at joints/fasteners 5. Soprema Sopraseal Xpress G 6. Tremco/USG Securock® ExoAir® 430
Weather-Resistive Barrier Applied to Exterior Sheathing Use either option 1 or 2 installed per the manufacturer's installation instructions Note: WRB over Exterior Sheathing Items 6-8 may not be used since they already incorporate a pre-installed WRB. Note: When using no exterior sheathing, sheet building wraps may be applied directly to studs. NLA = No Longer Available.	1. None 2. Any WRB tested in accordance with *ASTM E1354* (at a minimum of 20 kW/m^2 heat flux) and shown by analysis to be less flammable (improved T_{ign}, Pk. HRR) than the tested WRB. The following WRB products are allowed: 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®Foxx/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 DefendAir 200C (Charcoal) 2.11 Dow Corning DOWSIL™ DefendAir 200 (or LT version) 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]

Wall Component	Materials
	2.29 Henry® Blueskin® Metal Clad® 2.30 Henry® Blueskin® SA 2.31 Henry® Blueskin® VP160 2.32 Henry® EnviroCap 2.33 Henry® FoilSkin 2.34 Henry® Super Jumbo Tex 60 Minute® (Fortifiber) 2.35 Henry® WeatherSmart® Drainable Housewrap (Fortifiber) 2.36 Kingspan (Pactiv) Green Guard® 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-A250-HP™ 2.40 NaturaSeal AIRSEAL NS-A250-LP™ 2.41 Parex WeatherSeal Spray & Roll-On 2.42 Pecora ProPerm VP 2.43 Pecora XL-Perm^{ULTRA} NP 2.44 Pecora XL-Perm^{ULTRA} 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 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
Exterior Insulation Use either 1, 2, or 3	1. 4.5" (max. consisting of a single panel or multiple thinner panels) Rmax® Thermasheath® 2. 4.5" (max. consisting of a single panel or multiple thinner panels) Rmax® TSX-8500 3. 4.5" (max. consisting of a single panel or multiple thinner panels) Rmax® TSX-8510
FRTW Structural Panels over Exterior Insulation (Optional)	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. Note: May be applied in the field or factory applied. Adhesive must not be full coverage.
Weather-Resistive Barrier Applied over Exterior Insulation (or FRTW) Use any item 1 or 2 Note: Exterior WRB items in 1.02 are not traditional WRB products but are	1. For use with all cladding options 1.01 None 1.02 6” (max) tape or flashing over insulation joints a Rmax® R-SEAL 3000 b Rmax® R-SEAL 6000 c Rmax® R-SEAL 2000 LF

Wall Component	Materials
insulation panel joint tapes. The insulation panel joints shall be staggered.	d Venture Tape CW e Asphalt or butyl based tape f Liquid flashing 1.03 Carlisle (CCW) Fire Resist 705FR-A 1.04 DuPont™ Tyvek® (Various per ESR 2375) 1.05 DuPont™ WeatherMate™ Housewrap 1.06 DuPont™ WeatherMate™ Plus Housewrap 1.07 GCP PERM-A-BARRIER® Aluminum Wall Membrane 1.08 Henry® Blueskin® Metal Clad® 1.09 Henry® FoilSkin 1.10 Kingspan (Pactiv) GreenGuard® Max Building Wrap 1.11 Prosoco R-Guard® Spray Wrap MVP 1.12 Soprema Soprasolin® HD 2. For use with cladding options 1-6 (heavy masonry) with non-open joint installation techniques (ex. shiplap, etc.) 2.01 Carlisle CCW Fire Resist Barritech NP™ 2.02 Carlisle CCW Fire Resist Barritech VP 2.03 Dörken Systems Inc. Delta®-Fassade S 2.04 Dörken Systems Inc. Delta®-Foxx/Plus 2.05 Dörken Systems Inc. Delta®-Maxx/Plus 2.06 Dörken Systems Inc. Delta®-Vent S/Plus 2.07 Dow Corning DefendAir 200C (Charcoal) 2.08 Dow Corning DOWSIL DefendAir 200 (or LT version) 2.09 Dryvit Backstop® NT™ 2.10 GCP PERM-A-BARRIER® VPL 2.11 GCP PERM-A-BARRIER® VPL Low Temperature 2.12 GCP PERM-A-BARRIER® VPS 2.13 Henry Air-Bloc All Weather STPE 2.14 Henry® Air-Bloc® 16MR 2.15 Henry® Air-Bloc® 17MR 2.16 Henry® Air-Bloc® 21 FR 2.17 Henry® Air-Bloc® 31MR 2.18 Henry® Air-Bloc® 33MR 2.19 Henry® Blueskin® VP160 2.20 Henry® Envirocap 2.21 Henry Super Jumbo Tex 60 minutes (only with ¾" stucco cladding) (Fortifiber) 2.22 Henry WeatherSmart Drainable (Fortifiber) 2.23 Parex WeatherSeal Spray & Roll-On 2.24 Pecora ProPerm VP 2.25 Pecora XL-Perm^{ULTRA} NP 2.26 Pecora XL-Perm^{ULTRA} VP (10 mil DFT) 2.27 Prosoco R-Guard® Cat 5™ 2.28 Prosoco R-Guard® MVP (NLA) 2.29 Prosoco R-Guard® Spray Wrap (NLA) 2.30 Prosoco R-Guard® VB 2.31 Siga Majvest® 500 SA 2.32 Sika SikaGard®-535 2.33 Soprema Sopraseal® Stick VP 2.34 Vaproshield Revealshield SA® 2.35 Vaproshield Wrapshield SA® 2.36 W.R. Meadows® Air-Shield™ LMP (Black) 2.37 W.R. Meadows® Air-Shield™ LMP (Gray) 2.38 W.R. Meadows® Air-Shield™ LSR

Wall Component	Materials
	2.39 W.R. Meadows® Air-Shield™ SMP 2.40 W.R. Meadows® Air-Shield™ TMP
Exterior Cladding Use either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 or 17 Note: For WRB over exterior insulation option 2 above, heavy masonry claddings 1-6 shall incorporate non-open joints.	Heavy Masonry 1. Brick – Nominal 4" thick clay brick or veneer with maximum 2" air gap behind the brick. Brick Ties/Anchors 24" OC (max.) 2. Stucco – Minimum 0.75" thick, exterior cement plaster and lath. A secondary WRB shall be installed between the exterior insulation and the lath to provide a bond break.* 3. Limestone – Minimum 2" thick using any standard installation technique 4. Natural Stone Veneer – Minimum 2" thick using any standard installation technique 5. Cast Artificial Stone – Minimum 1.5" thick complying with ICC-ES AC 51 using any standard installation technique 6. Terracotta cladding – Minimum 1.5" thick using any standard installation technique Other 7. Uninsulated fiber-cement panel siding using any standard installation technique *NOTE: The secondary barriers shall not be full-coverage asphalt or butyl-based self-adhered membranes.
Rough openings Note: Must cover both the air gap between the cladding and the exterior insulation and the exposed edge of the exterior insulation.	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. 1. 20 GA. (min.) sheet steel (examples include window frame, flashing, lintel, C-channel) 2. 1" (min.) 4pcf (min.) mineral wool 3. 1.5" (min.) FRT wood buck 4. Two layers 0.75" (min.) FRT plywood 5. Two layers 0.625" (min.) type X GWB 6. 0.5" (min.) fiber cement board (or two layers minimum 0.75") All fenestrations and penetrations shall be flashed in accordance with the applicable code using asphalt, acrylic or butyl flashing tape, liquid flashing, R-SEAL 6000, or R-SEAL 2000 LF up to 12" maximum width.

SI: 1 in = 25.4 mm

1. All WRBs shall be installed at recommended application rates and per the manufacturer's installation instructions.

5.6.6 *Ignition Properties:*

5.6.6.1 Thermasheath®, ECOMAXci® FR, and ECOMAXci® FR WHITE were evaluated to assess performance with regard to ignition in accordance with *IBC* Section 2603.5.7.

5.6.6.1.1 The insulation boards comply with this section when the exterior side of the sheathing is protected with one of the following materials:

5.6.6.1.1.1 A thermal barrier in accordance with *IBC* Section 2603.4

5.6.6.1.1.2 Masonry or concrete – minimum 1 inch (25 mm) thick

5.6.6.1.1.3 Glass-fiber-reinforced concrete panels – minimum 0.375 inch (9.5 mm) thick

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

5.6.6.1.1.5 Stucco – minimum 0.875 inch (22 mm) thick complying with *IBC* Section 2510

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

6 INSTALLATION

6.1 Installation shall comply with the manufacturer's published 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 Fasteners include, but are not limited to, roofing nails, bugle head screws, cap nails or self-taping screws with washers. Fasteners should penetrate wood framing at least 1 inch and steel framing at least four (4) threads. All fasteners shall be corrosion resistant.

6.3 Other means of fastening may also be used, such as masonry fasteners or construction adhesives that are compatible with the insulation.

6.4 Consult the manufacturer's installation instructions for further details.

7 SUBSTANTIATING DATA

7.1 Testing has been performed under the supervision of a professional engineer and/or under the requirements of ISO/IEC 17025 as follows:

7.1.1 Material properties testing in accordance with *ASTM C1289*

7.1.2 Thermal resistance properties testing in accordance with *ASTM C518*

7.1.3 Water vapor permeance testing in accordance with *ASTM E96*

7.1.4 Water-resistive barrier testing in accordance with *ASTM E331 and AATCC TM 127*

7.1.5 Water absorption testing in accordance with *ASTM C209 and ASTM C272*

7.1.6 Air permeance testing in accordance with *ASTM E2178*

7.1.7 Flame spread and smoke developed rating tests in accordance with *ASTM E84*

7.1.8 Room corner tests in accordance with *NFPA 286*

7.1.9 Fire resistance ratings in accordance with *UL 263*

7.1.10 Heat propagation (potential heat) testing in accordance with *NFPA 259*

7.1.11 Vertical and lateral fire propagation tests in accordance with *NFPA 285,* with analysis by Priest and Associates Consulting, LLC and Hughes Associates

7.2 Information contained herein is the result of testing and/or data analysis by sources which conform to *IBC* Section 1703 and/or professional engineering regulations. DrJ relies upon accurate data to perform its ISO/IEC 17065 evaluations.

7.3 Where appropriate, DrJ's analysis is based on provisions that have been codified into law through state or local adoption of codes and standards. The providers of the codes and standards are legally responsible for their content. DrJ's analysis may use code-adopted provisions as a control sample. A control sample versus a test sample establishes a product as being equivalent to that prescribed in this code in quality, *strength*, effectiveness, *fire resistance*, durability, and safety. Where the accuracy of the provisions provided herein is reliant upon the published properties of materials, DrJ relies upon the grade mark, grade stamp, mill certificate, and/or test data provided by material suppliers to be minimum properties. DrJ's analysis relies upon these properties to be accurate.

8 FINDINGS

8.1 When used and installed in accordance with this TER and the manufacturer's installation instructions, the product(s) listed in Section 1.1 are approved for the following:

8.1.1 Buildings constructed in accordance with the *IBC* and the *IRC*.

8.1.2 Performance of foam plastics in accordance with *IBC* Section 2603 and *IRC* Section R316.

8.1.3 Use within the building envelope, including, but not limited to, attic, crawlspace, wall, roof, ceiling, floor, and foundation assemblies.

8.1.3.1 For use below grade, products may be installed horizontally under floor slabs and vertically on the exterior side of foundation walls or interior side of footings.

8.1.4 Use as insulating sheathing in accordance with *IRC* Section N1102.1 and Section N1102.2 and *IECC* Section C402.

8.1.5 Use as a WRB in accordance with *IBC* Section 1403.2[11] and *IRC* Section R703.2.

8.1.6 Use as a continuous air barrier in accordance with *IRC* Section N1102.4 and IECC Section C402.

8.1.7 Flame spread and smoke developed indices in accordance with *IBC* Section 2603.3 and *IRC* Section R316.3

8.1.8 Use without a thermal barrier in accordance with *IBC* Section 2603.4.1.6 and *IRC* Section R316.5.3 and Section R316.5.4.

8.1.9 Use without a thermal barrier or ignition barrier in accordance with *IBC* Section 2603.10 and *IRC* Section R316.6 when installed in accordance with Section 6.

8.1.10 Use in a fire resistance rated assembly in accordance with *IBC* Section 703.2.1

8.1.11 When used and installed in accordance with this TER and the manufacturer's installation instructions, Thermasheath®, ECOMAXci® FR and ECOMAXci® FR WHITE are approved for the following:

8.1.11.1 Use in exterior walls of buildings of Type I-IV construction in accordance with *IBC* Section 2603.5

8.1.11.2 Use in a fire resistance rated assembly in accordance with *IBC* Section 703.2.1

8.1.11.3 Flame spread and smoke developed indices in accordance with *IBC* Section 2603.5.4

8.1.11.4 Potential heat in accordance with *IBC* Section 2603.5.3

8.1.11.5 Vertical and lateral fire propagation in accordance with *IBC* Section 2603.5.5

8.1.11.6 Ignition characteristics in accordance with *IBC* Section 2603.5.7

8.2 Building codes require data from valid *research reports* be obtained from *approved sources* (i.e., licensed *registered design professionals* [RDPs]).

8.2.1 Building official approval of a licensed RDP is performed by verifying the RDP and/or their business entity is listed by the licensing board of the relevant *jurisdiction*.

8.3 Agencies who are accredited through ISO/IEC 17065 have met the code requirements for approval by the *building official*. DrJ is an ISO/IEC 17065 ANAB-Accredited Product Certification Body – Accreditation #1131 and employs RDPs.

8.4 Through ANAB accreditation and the IAF MLA, DrJ certification can be used to obtain product approval in any *jurisdiction* or country that has IAF MLA Members & Signatories to meet the Purpose of the MLA – "certified once, accepted everywhere."

[11] 2015 *IBC* Section 1404.2

8.5 *IBC* Section 104.11 (*IRC* Section R104.11 and *IFC* Section 104.10[12] 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…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*.

9 Conditions of Use

9.1 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE are subject to the following conditions:

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

9.1.2 These products shall not be used as a structural nailing base for claddings.

9.1.3 Exterior wall coverings capable of resisting the full design wind pressure shall be installed over these products.

9.1.4 Walls shall be fully braced with other materials in accordance with *IBC* Section 2308.6.4 or *IRC* Section R602.10.

9.1.5 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE must not be used to resist horizontal loads from concrete or masonry walls.

9.1.6 Thermasheath® must be protected from the interior of the building by a thermal barrier in accordance with *IBC* Section 2603.4 and *IRC* Section R316.4 except as allowed in Section 5.6.2.

9.1.7 Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE are specifically approved for use without a thermal barrier as prescribed by *IBC* Section 2603.4 through Section 2603.8 and *IRC* Section R316.4 through Section R316.5.13 subject to the conditions in Section 5.6.2.

9.1.8 When used as a WRB, all sheathing panel joints shall be sealed with R-SEAL 3000, R-SEAL Construction Tape, or R-SEAL 2000 LF. All penetrations shall be flashed in accordance with the manufacturer's installation instructions.

9.1.8.1 When these products are not installed as a WRB, a separate WRB shall be installed in accordance with *IBC* Section 1403.2[13] and *IRC* Section R703.2.

9.1.9 Use of these products shall be in accordance with the vapor barrier requirements of *IBC* Section 1404.3[14] and *IRC* Section R702.7.

[12] 2018 *IFC* Section 104.9

[13] 2015 *IBC* Section 1404.2

[14] 2015 *IBC* Section 1405.3

9.1.10 In areas where the probability of termite infestation is "very heavy" as indicated in *IBC* Section 2603.8 and *IRC* Figure R318.4[15], Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE shall not be installed on the exterior face of foundation walls, under interior or exterior foundation walls or under slab foundations located below grade. The clearance between the products installed above grade and exposed earth shall be at least 6 inches.

9.1.10.1 Exceptions:

9.1.10.1.1 Buildings where the structural members of the walls, floors, ceilings, and roofs are entirely of non-combustible materials or are pressure preservative treated wood.

9.1.10.1.2 When, in addition to the requirements of *IRC* Section R318.1, an approved method of protecting Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, ECOMAXci® FR WHITE and the structure from subterranean termite damage is used.

9.1.10.1.3 On the interior side of basement walls.

9.2 This product is not to be used as a structural nailing base for claddings.

9.3 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 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.

9.5 Any generally accepted engineering calculations needed to show compliance with this TER shall be submitted to the AHJ for review and approval.

9.6 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 RDP).

9.7 At a minimum, this product shall be installed per Section 6 of this TER.

9.8 This product (manufactured in Dallas, Texas; Greer, South Carolina and Fernley, Nevada) has an internal quality control program and a third-party quality assurance program in accordance with *IBC* Section 104.4 and Section 110.4 and *IRC* Section R104.4 and Section R109.2.

9.9 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.

9.10 This TER shall be reviewed for code compliance by the AHJ in concert with *IBC* Section 104.

9.11 The implementation of this TER for this product is dependent on the design, quality control, third-party quality assurance, proper implementation of installation instructions, inspections required by *IBC* Section 110.3, and any other code or regulatory requirements that may apply.

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, visit drjcertification.org.

11.2 For information on the current status of this TER, contact DrJ Certification.

[15] 2018 *IRC* Figure R301.2(7)

Issue Date: June 23, 2022

Subject to Renewal: July 1, 2023

CBC and CRC Supplement to TER 1309-03

REPORT HOLDER: Rmax®

1 Evaluation Subject

1.1 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE

2 Purpose and Scope

2.1 *Purpose*

2.1.1 The purpose of this Technical Evaluation Report (TER) supplement is to show Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE, recognized in TER 1309-03, has also been evaluated for compliance with the codes listed below.

2.2 *Applicable Code Editions*

2.2.1 *CBC—16, 19: California Building Code (Title 24, Part 2)*

2.2.2 *CRC—16, 19: California Residential Code (Title 24, Part 2.5)*

2.2.3 *CEC —16, 19: California Energy Code (Title 24, Part 6)*

3 Conclusions

3.1 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE, described in TER 1309-03, complies with the *CBC* and *CRC* and is subject to the conditions of use described in this supplement.

3.2 Where there are variations between the *IBC* and *IRC* and the *CBC* and *CRC* applicable to this TER, they are listed here.

3.2.1 *CEC, Title 24, Part 6* replaces *IRC* Section N1102.

3.2.2 *CEC, Title 24, Part 6* replaces *IECC* Sections C402 and C402.5.1

4 Conditions of Use

4.1 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE, described in TER 1309-03, must comply with all of the following conditions:

4.1.1 All applicable sections in TER 1309-03

4.1.2 The design, installation, and inspections are in accordance with additional requirements of the *CBC* and *CRC*, as applicable.

Issue Date: June 23, 2022

Subject to Renewal: July 1, 2023

FBC Supplement to TER 1309-03

REPORT HOLDER: Rmax®

1 Evaluation Subject

1.1 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE

2 Purpose and Scope

2.1 *Purpose*

2.1.1 The purpose of this Technical Evaluation Report (TER) supplement is to show Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE, recognized in TER 1309-03, has also been evaluated for compliance with the codes listed below as adopted by the Florida Building Commission.

2.2 *Applicable Code Editions*

2.2.1 *FBC-B—17, 20: Florida Building Code – Building*

2.2.2 *FBC-R—17, 20: Florida Building Code – Residential*

3 Conclusions

3.1 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE, described in TER 1309-03, complies with the *FBC-B* and *FBC-R* and is subject to the conditions of use described in this supplement.

3.2 Where there are variations between the *IBC* and *IRC* and the *FBC-B* and *FBC-R* applicable to this TER, they are listed here.

3.2.1 *FBC-B* Section 104.4, Section 110.4, and Section 2308 are reserved.

3.2.2 *FBC-R* Section R104, Section R109, Section R602.10, are reserved.

3.2.3 *FBC-B* Section 1404.2 replaces *IBC* Section 1403.2.

3.2.4 *FCB-R* Section N1101 replaces *IRC* Section N1102.

3.2.5 *FBC-R* Section R318.1 replaces *IRC* Section R318.1

3.2.6 *FBC-R* Table R301.2(6) replaces *IRC* Table R301.2(7)

4 Conditions of Use

4.1 Thermasheath®, Thermasheath®-XP, TSX-8500, TSX-8510, ECOMAXci® FR, and ECOMAXci® FR WHITE, described in TER 1309-03, must comply with all of the following conditions:

4.1.1 All applicable sections in TER 1309-03

4.1.2 The design, installation, and inspections are in accordance with additional requirements of *FBC-B* Chapter 16 and Chapter 17, as applicable.