Listing and Technical Evaluation Report™

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

Trade Secret Report Holder:

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CSI Designations:

DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES	**DIVISION**: 07 00 00 - THERMAL AND MOISTURE PROTECTION	
Section: 06 16 00 - Sheathing	Section: 07 20 00 - Thermal Protection	Section: 07 25 00 - Water-Resistive Barriers/Weather Barriers
Section: 06 16 13 - Insulated Sheathing	Section: 07 21 00 - Thermal Insulation	Section: 07 27 00 - Air Barriers
Section: 06 16 53 - Moisture-Resistant Sheathing Board	Section: 07 21 13 - Foam Board Insulation	Section: 07 27 23 - Board Product Air Barriers

1 Innovative Products Evaluated[1]

1.1 Rmax Thermasheath

1.2 Rmax TSX-8500

1.3 Rmax TSX-8510

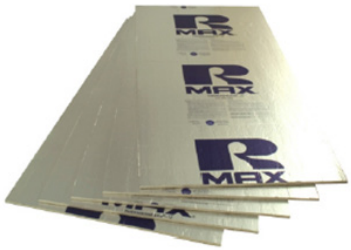
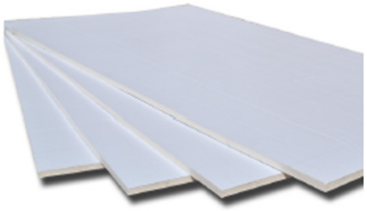
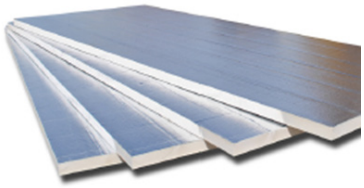
1.4 Rmax ECOMAXci FR

1.5 Rmax ECOMAXci FR WHITE

2 Product Description and Materials

2.1 The innovative products evaluated in this report are shown in **Figure 1**.

2.2 These innovative products 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

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

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

2.2.3 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.

2.2.4 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.

2.2.5 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.

2.3 *Material Availability*

2.3.1 *Thickness:*

2.3.1.1 0.5″ (12.7 mm) through 4.5″ (114.3 mm)

2.3.2 *Standard Product Width:*

2.3.2.1 48″ (1219 mm)

2.3.3 *Standard Product Length:*

2.3.3.1 96″ (2438 mm)

2.3.3.2 108″ (2743 mm)

2.3.3.3 120″ (3048 mm)

2.3.3.4 144″ (3658 mm)

2.3.4 Custom lengths, widths and thicknesses available upon request.

2.4 As needed, review material properties for design in **Section 6** and to regulatory evaluation in **Section 8**.

3 Definitions

3.1 New Materials[2] are defined as building materials, equipment, appliances, systems, or methods of construction not provided for by prescriptive and/or legislatively adopted regulations, known as alternative materials.[3] The design strengths and permissible stresses shall be established by tests[4] and/or engineering analysis.[5]

3.2 Duly Authenticated Reports[6] and Research Reports[7] are test reports and related engineering evaluations, which are written by an approved agency[8] and/or an approved source.[9]

3.2.1 These reports contain intellectual property and/or trade secrets, which are protected by the Defend Trade Secrets Act (DTSA).[10]

3.3 An approved agency is “approved” when it is ANAB ISO/IEC 17065 accredited. DrJ Engineering, LLC (DrJ) is listed in the ANAB directory.

3.4 An approved source is “approved” when a professional engineer (i.e., Registered Design Professional) is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the state legislature via its professional engineering regulations.[11]

3.5 Testing and/or inspections conducted for this Duly Authenticated Report were performed by an ISO/IEC 17025 accredited testing laboratory, an ISO/IEC 17020 accredited inspection body, and/or a licensed Registered Design Professional (RDP).

3.5.1 The Center for Building Innovation (CBI) is ANAB[12] ISO/IEC 17025 and ISO/IEC 17020 accredited.

3.6 The regulatory authority shall enforce[13] the specific provisions of each legislatively adopted regulation. If there is a non-conformance, the specific regulatory section and language of the non-conformance shall be provided in writing[14] stating the nonconformance and the path to its cure.

3.7 The regulatory authority shall accept Duly Authenticated Reports from an approved agency and/or an approved source with respect to the quality and manner of use of new materials or assemblies as provided for in regulations regarding the use of alternative materials, designs, or methods of construction.[15]

3.8 ANAB is an International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA) signatory where recognition of certificates, validation, and verification statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA with the appropriate scope, shall be approved.[16] Therefore, all ANAB ISO/IEC 17065 Duly Authenticated Reports are approval equivalent.[17]

3.9 Approval equity is a fundamental commercial and legal principle.[18]

4 Applicable Standards for the Listing; Regulations for the Regulatory Evaluation[19]

4.1 *Standards*

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

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

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

4.1.4 *ASTM C518: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus*

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

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

4.1.7 *ASTM E96: Standard Test Methods for Gravimetric Determination of Water Vapor Transmission of Materials*

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

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

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

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

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

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

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

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

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

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

4.2 *Regulations*

4.2.1 *IBC – 15, 18, 21: International Building Code®*

4.2.2 *IRC – 15, 18, 21: International Residential Code®*

4.2.3 *IECC – 15, 18, 21: International Energy Conservation Code®*

4.2.4 *CBC—16, 19: California Building Code[20] (Title 24, Part 2)*

4.2.5 *CRC—16, 19: California Residential Code[20] (Title 24, Part 2.5)*

4.2.6 *CEC —16, 19: California Energy Code[20] (Title 24, Part 6)*

4.2.7 *FBC-B—20, 23: Florida Building Code – Building[21]*

4.2.8 *FBC-R—20, 23: Florida Building Code – Residential[21]*

5 Listed[22]

5.1 Equipment, materials, products or services included in a List published by a nationally recognized testing laboratory (i.e., CBI), approved agency (i.e., CBI and DrJ), and/or approved source (i.e., DrJ) or other organization concerned with product evaluation (i.e., DrJ) that maintains periodic inspection (i.e., CBI) of production of listed equipment or materials, and whose listing states either that the equipment or material meets nationally recognized standards or has been tested and found suitable for use in a specified manner.

6 Tabulated Properties Generated from Nationally Recognized Standards

6.1 *General*

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

6.1.2 Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax 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.

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

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

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

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

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

6.2 *Thermal Resistance (R-Value)*

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

6.2.2 Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax 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
1.25	7.8
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.

6.3 *Water-Resistive Barrier (WRB)*

6.3.1 Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE may be used as a WRB as prescribed in IBC Section 1403.2,[23] and IRC Section R703.2 when installed on exterior walls as described in this section and the manufacturer installation instructions.

6.3.2 Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE shall be installed horizontally or vertically with vertical board joints centered 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 9**.

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

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

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

6.3.6 Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax 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-ft^2-inHg)] = 57.2135 ng/(Pa-s-m^2)		

6.3.7 Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE are Class I Vapor Retarders in accordance with IBC Table 1404.3(1).[24]

6.4 *Air Barrier*

6.4.1 Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE meet the requirements of IRC Section N1102, IECC Section C402 and IECC Section R402 for use as a component of the continuous air barrier when installed in accordance with the manufacturer installation instructions and this report.

6.4.2 The air barrier material properties of Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE are shown in **Table 3**.

Table 3. Air Barrier Material Properties[1]

Air Permeance
< 0.005 L/(s-m^2)
IP: 1 L/(s*m^2) = 0.2 cfm/ft^2

1. Tested in accordance with ASTM E2178

6.4.3 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 L/(s.m^2) at 75 Pa pressure difference when tested in accordance with ASTM E2178.

6.4.4 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 installation instructions and this report.

6.5 *Draftstop*

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

6.5.2 When installed as a draftstop, Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE shall be installed in accordance with Section 9.

6.6 *Fire Safety Performance*

6.6.1 *Surface Burning Characteristics:*

6.6.1.1 Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax 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.

Table 4. Surface Burning Characteristics[1]

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

SI: 1 in = 25.4 mm

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

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

6.6.2.1 ***TSX-8500, TSX-8510, ECOMAXci FR and ECOMAXci FR WHITE***: Up to 4.5″ in walls only or up to 12″ 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.

6.6.2.2 ***TSX-8500, TSX-8510, ECOMAXci FR and ECOMAXci FR WHITE***: Up to 4.5″ 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.

6.6.2.3 ***Thermasheath***: Up to 4.5″ 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.

6.6.2.4 ***Thermasheath***: Up to 1″ 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.

6.6.2.5 ***All products***: Up to 12″ (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.

6.6.2.6 In applications where panels are used in both walls and ceilings, but only one is allowed to be left exposed per **Section 6.6.2.1** or **Section 6.6.2.3**, the other must meet the requirements of Section 6.**6.2.5**.

6.6.2.7 For IRC applications in attics, crawls spaces or other uninhabited spaces of **Section 6.6.2.2**, **Section 6.6.2.3** or **Section 6.6.2.4**, approval is limited to areas where access to the space is required by IRC Section R807.1 or IRC Section R408.4.

6.6.2.8 For IRC and IBC applications in attics, crawls spaces or other uninhabited spaces of **Section 6.6.2.2**, **Section 6.6.2.3** or **Section 6.6.2.4**, approval is limited to areas where entry is made only for the purposes of repairs or maintenance.

6.6.2.9 Panels may be installed in single or multiple layers.

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

6.6.3.1 Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax 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 installation instructions and this report:

6.6.3.1.1 45 Minutes:

6.6.3.1.1.1 U424, U425, V321, V499, W456

6.6.3.1.2 *1-Hour:*

6.6.3.1.2.1 U026, U326, U330, U349, U354, U355, U364, U424, U425, U460, V454, W417, W429, W448, W451, W452, W456

6.6.3.1.3 *1.5-Hour:*

6.6.3.1.3.1 U424, U425, W456

6.6.3.1.4 *2-Hour:*

6.6.3.1.4.1 U905, U906, U939, V332, V499, W449, W456

6.6.3.1.5 *3-Hour:*

6.6.3.1.5.1 U904, U912, U939, W429, W451

6.6.3.1.6 *4-Hour:*

6.6.3.1.6.1 U904, U912, U939, W429, W451

6.6.4 *Potential Heat:*

6.6.4.1 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

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

6.6.5.1 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.

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

6.6.5.3 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-gauge (min.) 3.625" (min.) steel studs spaced 24" o.c. (max.) a. 1/2" (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
Floor Line Firestopping Select Option 1 or 2	1. 4-pcf mineral wool installed with Z-clips 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 ***NOTE***: 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 installation instructions.	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:

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

Wall Component	Materials
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.	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 2.18 GCP PERM-A-BARRIER® VPL 2.19 GCP PERM-A-BARRIER® VPL 50 Membrane 2.20 GCP PERM-A-BARRIER® VPL Low Temperature 2.21 GCP PERM-A-BARRIER® VPS 2.22 Henry Air-Bloc All Weather STPE 2.23 Henry® Air-Bloc® 16 MR 2.24 Henry® Air-Bloc® 17 MR 2.25 Henry® Air-Bloc® 21 FR 2.26 Henry® Air-Bloc® 31MR [NLA] 2.27 Henry® Air-Bloc® 32MR [NLA] 2.28 Henry® Air-Bloc® 33MR [NLA] 2.29 Henry® Blueskin® Metal Clad® 2.30 Henry® Blueskin® SA 2.31 Henry® Blueskin® VP 160 2.32 Henry® EnviroCap 2.33 Henry® FoilSkin 2.34 Henry® Super Jumbo Tea 60 Minute® (Fortifiber) 2.35 Henry® WeatherSmart® Drainable Housewrap (Fortifiber) 2.36 Kingspan (Pactiv) GreenGuard® MAX™ Building Wrap 2.37 MBCC MasterSeal® AWB 660 (Formerly BASF Enershield® HP) 2.38 MBCC MasterSeal® AWB 660 I (Formerly BASF Enershield® I) 2.39 NaturaSeal AirSeal NS A-250LP™ 2.40 NaturaSeal NS-A-250HP™ 2.41 Parex WeatherSeal Spray & Roll-On 2.42 Pecora ProPerm VP 2.43 Pecora XL-PermULTRA NP 2.44 Pecora XL-PermULTRA VP (10 mil DFT) 2.45 Prosoco R-Guard® Cat 5™ 2.46 Prosoco R-Guard® MVP (NLA) 2.47 Prosoco R-Guard® Spray Wrap (NLA) 2.48 Prosoco R-Guard® Spray Wrap MVP 2.49 Prosoco R-Guard® VB 2.50 Siga Majvest® 500 SA

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

Wall Component	Materials
	2.51 Sika Sikagard®-530 2.52 Sika Sikagard®-535 2.53 Soprema Sopraseal® LM 204 VP 2.54 Soprema Sopraseal® Stick 1100T 2.55 Soprema Sopraseal® Stick VP 2.56 Soprema Soprasolin HD 2.57 Tremco ExoAir 110AT 2.58 Tremco ExoAir 230 2.59 Vaproshield RevealShield SA® 2.60 Vaproshield WrapShield SA® 2.61 W.R. Meadows® Air-Shield™ LMP (Black) 2.62 W.R. Meadows® Air-Shield™ LMP (Gray) 2.63 W.R. Meadows® Air-Shield™ LSR 2.64 W.R. Meadows® Air-Shield™ SMP 2.65 W.R. Meadows® Air-Shield™ TMP
Exterior Insulation Use either 1 or 2 ***NOTE***: See Exterior sheathing options for thickness limitations when no exterior sheathing is used.	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
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

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

Wall Component	Materials
	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 3/4" 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 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™ TMP 2.41 Henry® 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	<u>Heavy Masonry</u> 1. Brick - nominal 4" clay brick or veneer with a maximum 2" 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.

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

Wall Component	Materials
masonry claddings 1-6 shall incorporate non-open joints.	4. Natural Stone Veneer – Minimum 2" 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> 1. Any MCM or ACM (aluminum, steel, copper, zinc) (w/ 2.5" maximum air gap) that has successfully passed NFPA 285 using any standard installation technique, such as a. Carter Companies EVO Architectural Panel Systems for use with any FR ACM/MCM NFPA 285 material 2. Uninsulated sheet metal building panels including aluminum, zinc, steel or copper using any standard installation technique. 3. Uninsulated fiber-cement board siding using any standard installation technique. 4. 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 standard installation technique 5. Autoclaved-aerated- concrete (AAC) panels that have successfully passed NFPA 285 using any standard installation technique. 6. Thin Set Brick a. Glen-Gary Thin Tech™ Elite Series has been analyzed using manufacturer standard installation technique. b. Tabs II Panel System with 0.5" bricks using Tabs Wall Adhesive 7. Natural Stone Veneer – minimum 1.25" (adhered with mortar or concrete/cement based adhesive). 8. FunderMax M.Look using the manufacturer standard installation technique. The air gap between cladding and insulation or WRB must not exceed 1.5". 9. Glen-Gery Tru-Brix (only with optional non-combustible mortar) 10. Thin brick (minimum 0.75" thick clay brick) fully adhered with cementitious mortar (standard or polymer-modified) to minimum 0.5" thick cement backer board or gypsum sheathing. A secondary water resistive barrier can be installed between the exterior sheathing and the brick.* 11. Natural stone or artificial stone (minimum 0.75" thick) fully adhered with cementitious mortar (standard or polymer-modified) to minimum 0.5" thick cement backer board or gypsum sheathing. A secondary water resistive barrier can be installed between the exterior sheathing and the brick.* ****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-gauge (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

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

Wall Component	Materials
	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 installation instructions.

6.6.5.4 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-Gauge (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 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

Table 7. Fire Performance – Vertical & Lateral Fire Propagation (Thermasheath)

Wall Component	Materials
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 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] 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)

Table 7. Fire Performance – Vertical & Lateral Fire Propagation (Thermasheath)

Wall Component	Materials
	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 insulation panel joint tapes. The insulation panel joints shall be staggered.	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 d Venture Tape CW e Asphalt or butyl based tape f Liquid flashing

Table 7. Fire Performance – Vertical & Lateral Fire Propagation (Thermasheath)

Wall Component	Materials
	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)

Table 7. Fire Performance – Vertical & Lateral Fire Propagation (Thermasheath)

Wall Component	Materials
	2.38 W.R. Meadows® Air-Shield™ LSR 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 1. 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-gauge (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 installation instructions.

6.6.6 *Ignition Properties:*

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

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

6.6.6.1.1.1 A thermal barrier in accordance with IBC Section 2603.4

6.6.6.1.1.2 Masonry or concrete – minimum 1″ (25 mm) thick

6.6.6.1.1.3 Glass-fiber reinforced concrete panels – minimum 0.375″ (9.5 mm) thick

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

6.6.6.1.1.5 Stucco – minimum 0.875″ (22 mm) thick complying with IBC Section 2510

6.7 Where the application falls outside of the performance evaluation, conditions of use and/or installation requirements set forth herein, alternative techniques shall be permitted in accordance with accepted engineering practice and experience. This includes but is not limited to the following areas of engineering: mechanics or materials, structural, building science, and fire science.

7 Certified Performance[25]

7.1 All construction methods shall conform to accepted engineering practices to ensure durable, livable, and safe construction and shall demonstrate acceptable workmanship reflecting journeyman quality of work of the various trades.[26]

7.2 The strength and rigidity of the component parts and/or the integrated structure shall be determined by engineering analysis or by suitable load tests to simulate the actual loads and conditions of application that occur.[27]

8 Regulatory Evaluation and Accepted Engineering Practice

8.1 Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE comply with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:

8.1.1 Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE were evaluated to determine the following:

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

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

8.1.1.3 Performance for use as a WRB in accordance with IBC Section 1403.2[28] and IRC Section R703.2.

8.1.1.4 Performance for use as a vapor retarder in accordance with IBC Section 202, IBC Section 1404.3,[29] IRC Section R202 and IRC Section R702.7.

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

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

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

8.1.1.8 Fire resistance rated assembly in accordance with IBC Section 703.2.1.

8.1.2 Thermasheath ECOMAXci FR and ECOMAXci FR WHITE were evaluated to determine the following:

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

8.1.2.2 Fire resistance rated assembly in accordance with IBC Section 703.2.1.

8.1.2.3 Potential heat in accordance with IBC Section 2603.5.3.

8.1.2.4 Flame spread and smoke development ratings in accordance with IBC Section 2603.5.4.

8.1.2.5 Vertical and lateral fire propagation in accordance with IBC Section 2603.5.5.

8.1.2.6 Ignition characteristics in accordance with IBC Section 2603.5.7.

8.2 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 report.

8.3 Use of Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE in structures where the exterior wall covering is unable to resist one-hundred percent (100%) of the transverse wind load is outside the scope of this report.

8.3.1 This report covers products within the range of 0.5" to 4.5".

8.4 Any building code, regulation, and/or accepted engineering evaluations (i.e., research reports, Duly Authenticated Reports, etc.) that are conducted for this Listing were performed by DrJ Engineering, LLC (DrJ), an ISO/IEC 17065 accredited certification body and a professional engineering company operated by RDP/approved sources. DrJ is qualified[30] to practice product and regulatory compliance services within its scope of accreditation and engineering expertise, respectively.

8.5 Engineering evaluations are conducted with DrJ's ANAB accredited ICS code scope of expertise, which are also its areas of professional engineering competence.

8.6 Any regulation specific issues not addressed in this section are outside the scope of this report.

9 Installation

9.1 Installation shall comply with the approved construction documents, the manufacturer installation instructions, this report and the applicable building code.

9.2 In the event of a conflict between the manufacturer installation instructions and this report, the more restrictive shall govern.

9.3 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″ and steel framing at least four (4) threads. All fasteners shall be corrosion resistant.

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

9.5 Consult the manufacturer installation instructions for further details.

9.6 For Energy Star installation instructions see the **Seal and Insulate with Energy Star® Supplement to TER 1309-03** at the end of this report.

10 Substantiating Data

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

10.1.1 Material properties testing in accordance with ASTM C1289

10.1.2 Thermal resistance properties testing in accordance with ASTM C518

10.1.3 Water vapor permeance testing in accordance with ASTM E96

10.1.4 WRB testing in accordance with ASTM E331 and AATCC TM 127

10.1.5 Water absorption testing in accordance with ASTM C209 and ASTM C272

10.1.6 Air permeance testing in accordance with ASTM E2178

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

10.1.8 Room corner tests in accordance with NFPA 286

10.1.9 Fire resistance ratings in accordance with UL 263

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

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

10.2 Information contained herein may include the result of testing and/or data analysis by sources that are approved agencies, approved sources, and/or RDPs. Accuracy of external test data and resulting analysis is relied upon.

10.3 Where pertinent, testing and/or engineering analysis are based upon provisions that have been codified into law through state or local adoption of regulations and standards. The developers of these regulations and standards are responsible for the reliability of published content. DrJ's engineering practice may use a regulation-adopted provision as the control. A regulation-endorsed control versus a simulation of the conditions of application to occur establishes a new material as being equivalent to the regulatory provision in terms of quality, strength, effectiveness, fire resistance, durability, and safety.

10.4 The accuracy of the provisions provided herein may be reliant upon the published properties of raw materials, which are defined by the grade mark, grade stamp, mill certificate, or Duly Authenticated Reports from approved agencies and/or approved sources provided by the supplier. These are presumed to be minimum properties and relied upon to be accurate. The reliability of DrJ's engineering practice, as contained in this Duly Authenticated Report, may be dependent upon published design properties by others.

10.5 Testing and engineering analysis: The strength, rigidity, and/or general performance of component parts and/or the integrated structure are determined by suitable tests that simulate the actual conditions of application that occur and/or by accepted engineering practice and experience.[31]

10.6 Where additional condition of use and/or regulatory compliance information is required, please search for Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and/or Rmax ECOMAXci FR WHITE on the DrJ Certification website.

11 Findings

11.1 As outlined in **Section 6**, Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE have performance characteristics that were tested and/or meet applicable regulations and are suitable for use pursuant to its specified purpose.

11.2 When used and installed in accordance with this Duly Authenticated Report and the manufacturer installation instructions, Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE shall be approved for the following applications:

11.2.1 Buildings constructed in accordance with the IBC and the IRC.

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

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

11.2.3.1 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.

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

11.2.5 Use as a WRB in accordance with IBC Section 1403.2[32] and IRC Section R703.2.

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

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

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

11.2.9 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 9**.

11.2.10 Use in a fire resistance rated assembly in accordance with IBC Section 703.2.1.

11.2.11 When used and installed in accordance with this report and the manufacturer installation instructions, Thermasheath, ECOMAXci FR and ECOMAXci FR WHITE are approved for the following:

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

11.2.11.2 Use in a fire resistance rated assembly in accordance with IBC Section 703.2.1.

11.2.11.3 Flame spread and smoke developed indices in accordance with IBC Section 2603.5.4.

11.2.11.4 Potential heat in accordance with IBC Section 2603.5.3.

11.2.11.5 Vertical and lateral fire propagation in accordance with IBC Section 2603.5.5.

11.2.11.6 Ignition characteristics in accordance with IBC Section 2603.5.7.

11.3 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Rmax.

11.4 IBC Section 104.11 (IRC Section R104.11 and IFC Section 104.10[33] are similar) in pertinent part 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.

11.5 **Approved**:[34] Building regulations require that the building official shall accept Duly Authenticated Reports.[35]

11.5.1 An approved agency is "approved" when it is ANAB ISO/IEC 17065 accredited.

11.5.2 An approved source is "approved" when an RDP is properly licensed to transact engineering commerce.

11.5.3 Federal law, Title 18 US Code Section 242, requires that where the alternative product, material, service, design, assembly, and/or method of construction is not approved, the building official shall respond in writing, stating the reasons why the alternative was not approved. Denial without written reason deprives a protected right to free and fair competition in the marketplace.

11.6 DrJ is a licensed engineering company, employs licensed RDPs and is an ANAB-Accredited Product Certification Body – Accreditation #1131.

11.7 Through the IAF Multilateral Agreements (MLA), this Duly Authenticated Report can be used to obtain product approval in any jurisdiction or country because all ANAB ISO/IEC 17065 Duly Authenticated Reports are equivalent.[36]

12 Conditions of Use

12.1 Material properties shall not fall outside the boundaries defined in **Section 6**.

12.2 As defined in **Section 6**, where material and/or engineering mechanics properties are created for load resisting design purposes, the resistance to the applied load shall not exceed the ability of the defined properties to resist those loads using the principles of accepted engineering practice.

12.3 As listed herein, Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE are subject to the following:

12.3.1 Installation shall comply with this report and the manufacturer installation instructions. In the event of a conflict between this report and the manufacturer installation instructions, the more restrictive shall govern.

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

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

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

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

12.3.6 Rmax 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 6.6.2**.

12.3.7 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 IBC Section 2603.8, and IRC Section R316.4 through IRC Section R316.5.13, subject to the conditions in **Section 6.6.2**.

12.3.8 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 installation instructions.

12.3.8.1 When these products are not installed as a WRB, a separate WRB shall be installed in accordance with IBC Section 1403.2[37] and IRC Section R703.2.

12.3.9 Use of these products shall be in accordance with the vapor barrier requirements of IBC Section 1404.3[38] and IRC Section R702.7.

12.3.10 In areas where the probability of termite infestation is "very heavy" as indicated in IBC Section 2603.8 and IRC Figure R318.4,[39] Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax 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″.

12.3.10.1 *Exceptions:*

12.3.10.1.1 Buildings where the structural members of the walls, floors, ceilings and roofs are entirely of noncombustible materials or are pressure preservative treated wood.

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

12.3.11 On the interior side of basement walls.

12.4 When required by adopted legislation and enforced by the building official, also known as the authority having jurisdiction (AHJ) in which the project is to be constructed:

12.4.1 Any calculations incorporated into the construction documents shall conform to accepted engineering practice and, when prepared by an approved source, shall be approved when signed and sealed.

12.4.2 This report and the installation instructions shall be submitted at the time of permit application.

12.4.3 These innovative products have an internal quality control program and a third-party quality assurance program.

12.4.4 At a minimum, these innovative products shall be installed per **Section 9** of this report.

12.4.5 The review of this report by the AHJ shall comply with IBC Section 104 and IBC Section 105.4.

12.4.6 These innovative products have an internal quality control program and a third party quality assurance program in accordance with IBC Section 104.4, IBC Section 110.4, IBC Section 1703, IRC Section R104.4, and IRC Section R109.2.

12.4.7 The application of these innovative products in the context of this report is dependent upon the accuracy of the construction documents, implementation of installation instructions, inspection as required by IBC Section 110.3, IRC Section R109.2, and any other regulatory requirements that may apply.

12.5 The approval of this report by the AHJ shall comply with IBC Section 1707.1, where legislation states in part, "*the building official shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new material or assemblies as provided for in Section 104.11*," all of IBC Section 104, and IBC Section 105.4.

12.6 Design loads shall be determined in accordance with the regulations adopted by the jurisdiction in which the project is to be constructed and/or by the building designer (i.e., owner or RDP).

12.7 The actual design, suitability, and use of this report for any particular building, is the responsibility of the owner or the authorized agent of the owner.

13 Identification

13.1 The innovative products listed in **Section 1.1** through **Section 1.5** are identified by a label on the board or packaging material bearing the manufacturer name, product name, this report number, and other information to confirm code compliance.

13.2 Additional technical information can be found at www.rmax.com.

14 Review Schedule

14.1 This report is subject to periodic review and revision. For the latest version, visit drjcertification.org.

14.2 For information on the status of this report, please contact DrJ Certification.

15 Approved for Use Pursuant to U.S. and International Legislation Defined in Appendix A

15.1 Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE are included in this report published by an approved agency that is concerned with evaluation of products or services, maintains periodic inspection of the production of listed materials or periodic evaluation of services. This report states either that the material, product, or service meets recognized standards or has been tested and found suitable for a specified purpose. This report meets the legislative intent and definition of being acceptable to the AHJ.

Appendix A

1 Legislation that Authorizes AHJ Approval

1.1 **Fair Competition**: State legislatures have adopted Federal regulations for the examination and approval of building code referenced and alternative products, materials, designs, services, assemblies and/or methods of construction that:

1.1.1 Advance innovation

1.1.2 Promote competition so all businesses have the opportunity to compete on price and quality in an open market on a level playing field unhampered by anticompetitive constraints

1.1.3 Benefit consumers through lower prices, better quality, and greater choice

1.2 **Adopted Legislation**: The following local, state, and federal regulations affirmatively authorize these innovative products to be approved by AHJs, delegates of building departments, and/or delegates of an agency of the federal government:

1.2.1 Interstate commerce is governed by the Federal Department of Justice to encourage the use of innovative products, materials, designs, services, assemblies, and/or methods of construction. The goal is to "*protect economic freedom and opportunity by promoting free and fair competition in the marketplace*."

1.2.2 Title 18 US Code Section 242 affirms and regulates the right of individuals and businesses to freely and fairly have new products, materials, designs, services, assemblies, and/or methods of construction approved for use in commerce. Disapproval of alternatives shall be based upon non-conformance with respect to specific provisions of adopted legislation and shall be provided in writing stating the reasons why the alternative was not approved, with reference to the specific legislation violated.

1.2.3 The federal government and each state have a public records act. In addition, each state also has legislation that mimics the federal Defend Trade Secrets Act 2016 (DTSA),[40] where providing test reports, engineering analysis and/or other related IP/TS is subject to prison of not more than ten years[41] and/or a $5,000,000 fine or 3 times the value of[42] the Intellectual Property (IP) and Trade Secrets (TS).

1.2.3.1 Compliance with public records and trade secret legislation requires approval through the use of Listings, certified reports, Technical Evaluation Reports, Duly Authenticated Reports, and/or research reports prepared by approved agencies and/or approved sources.

1.2.4 For new materials[43] that are not specifically provided for in any regulation, the design strengths and permissible stresses shall be established by tests, where suitable load tests simulate the actual loads and conditions of application that occur.

1.2.5 The design strengths and permissible stresses of any structural material shall conform to the specifications and methods of design using accepted engineering practice.[44]

1.2.6 The commerce of approved sources (i.e., registered PEs) is regulated by professional engineering legislation. Professional engineering commerce shall always be approved by AHJs, except where there is evidence provided in writing, that specific legislation have been violated by an individual registered PE.

1.2.7 The AHJ shall accept Duly Authenticated Reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in IBC Section 104.11.[45]

1.3 **Approved**[46] **by Los Angeles**: The Los Angeles Municipal Code (LAMC) states in pertinent part that the provisions of LAMC are not intended to prevent the use of any material, device, or method of construction not specifically prescribed by LAMC. The Department shall use Part III, Recognized Standards in addition to Part II, Uniform Building Code Standards of Division 35, Article 1, Chapter IX of the LAMC in evaluation of products for approval where such standard exists for the product or the material and may use other approved standards that apply. Whenever tests or certificates of any material or fabricated assembly are required by Chapter IX of the LAMC, such tests or certification shall be made by a testing agency approved by the Superintendent of Building to conduct such tests or provide such certifications. The testing agency shall publish the scope and limitation(s) of the listed material or fabricated assembly.[47] The Superintendent of Building Approved Testing Agency Roster is provided by the Los Angeles Department of Building and Safety (LADBS). The Center for Building Innovation (CBI) Certificate of Approval License is TA24945. Tests and certifications found in a DrJ Listing are LAMC approved. In addition, the Superintendent of Building shall accept Duly Authenticated Reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in the California Building Code (CBC) Section 1707.1.[48]

1.4 **Approved by Chicago**: The Municipal Code of Chicago (MCC) states in pertinent part that an Approved Agency is a Nationally Recognized Testing Laboratory (NRTL) acting within its recognized scope and/or a certification body accredited by the American National Standards Institute (ANSI) acting within its accredited scope. Construction materials and test procedures shall conform to the applicable standards listed in the MCC. Sufficient technical data shall be submitted to the building official to substantiate the proposed use of any product, material, service, design, assembly, and/or method of construction not specifically provided for in the MCC. This technical data shall consist of research reports from approved sources (i.e., MCC defined Approved Agencies).

1.5 **Approved by New York City**: The 2022 NYC Building Code (NYCBC) states in part that an approved agency shall be deemed[49] an approved testing agency via ISO/IEC 17025 accreditation, an approved inspection agency via ISO/IEC 17020 accreditation, and an approved product evaluation agency via ISO/IEC 17065 accreditation. Accrediting agencies, other than federal agencies, must be members of an internationally recognized cooperation of laboratory and inspection accreditation bodies subject to a mutual recognition agreement[50] (i.e., ANAB, International Accreditation Forum [IAF], etc.).

1.6 **Approved by Florida**: Statewide approval of products, methods, or systems of construction shall be approved, without further evaluation by:

1.6.1 A certification mark or listing of an approved certification agency,

1.6.2 A test report from an approved testing laboratory,

1.6.3 A product evaluation report based upon testing or comparative or rational analysis, or a combination thereof, from an approved product evaluation entity, or

1.6.4 A product evaluation report based upon testing, comparative or rational analysis, or a combination thereof, developed, signed and sealed by a professional engineer or architect, licensed in Florida.

1.6.5 For local product approval, products or systems of construction shall demonstrate compliance with the structural wind load requirements of the Florida Building Code (FBC) through one of the following methods:

1.6.5.1 A certification mark, listing or label from a commission-approved certification agency indicating that the product complies with the code,

1.6.5.2 A test report from a commission-approved testing laboratory indicating that the product tested complies with the code,

1.6.5.3 A product-evaluation report based upon testing, comparative or rational analysis, or a combination thereof, from a commission-approved product evaluation entity which indicates that the product evaluated complies with the code,

1.6.5.4 A product-evaluation report or certification based upon testing or comparative or rational analysis, or a combination thereof, developed and signed and sealed by a Florida professional engineer or Florida registered architect, which indicates that the product complies with the code, or

1.6.5.5 A statewide product approval issued by the Florida Building Commission.

1.6.6 The Florida Department of Business and Professional Regulation (DBPR) website provides a listing of companies certified as a Product Evaluation Agency (i.e., EVLMiami 13692), a Product Certification Agency (i.e., CER10642), and as a Florida Registered Engineer (i.e., ANE13741).

1.7 **Approved by Miami-Dade County (i.e., Notice of Acceptance [NOA])**: A Florida statewide approval is an NOA. An NOA is a Florida local product approval. By Florida law, Miami-Dade County shall accept the statewide and local Florida Product Approval as provided for in Florida legislation 553.842 and 553.8425.

1.8 **Approved by New Jersey**: Pursuant to the 2018 Building Code of New Jersey in IBC Section 1707.1 General,[51] it states: "*In the absence of approved rules or other approved standards, the building official shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in the administrative provisions of the Uniform Construction Code (N.J.A.C. 5:23)*".[52] Furthermore N.J.A.C 5:23-3.7 states: "*Municipal approvals of alternative materials, equipment, or methods of construction*."

1.8.1 **Approvals**: Alternative materials, equipment, or methods of construction shall be approved by the appropriate subcode official provided the proposed design is satisfactory and that the materials, equipment, or methods of construction are suitable for the intended use and are at least the equivalent in quality, strength, effectiveness, fire resistance, durability, and safety of those conforming with the requirements of the regulations.

1.8.1.1 A field evaluation label and report or letter issued by a nationally recognized testing laboratory verifying that the specific material, equipment, or method of construction meets the identified standards or has been tested and found to be suitable for the intended use, shall be accepted by the appropriate subcode official as meeting the requirements of the above.

1.8.1.2 Reports of engineering findings issued by nationally recognized evaluation service programs such as but not limited to, the Building Officials and Code Administrators (BOCA), the International Conference of Building Officials (ICBO), the Southern Building Code Congress International (SBCCI), the International Code Council (ICC), and the National Evaluation Service, Inc., shall be accepted by the appropriate subcode official as meeting the requirements of the above.

1.8.2 The New Jersey Department of Community Affairs has confirmed that technical evaluation reports, from any accredited entity listed by ANAB, meets the requirements of item the previous paragraph, given that the listed entities are no longer in existence and/or do not provide "*reports of engineering findings*."

1.9 **Approved by the Code of Federal Regulations Manufactured Home Construction and Safety Standards**: Pursuant to Title 24, Subtitle B, Chapter XX, Part 3282.14[53] and Part 3280,[54] the Department encourages innovation and the use of new technology in manufactured homes. The design and construction of a manufactured home shall conform to the provisions of Part 3282 and Part 3280 where key approval provisions in mandatory language follow:

1.9.1 "*All construction methods shall be in conformance with accepted engineering practices*."

1.9.2 "*The strength and rigidity of the component parts and/or the integrated structure shall be determined by engineering analysis or by suitable load tests to simulate the actual loads and conditions of application that occur*."

1.9.3 "*The design stresses of all materials shall conform to accepted engineering practice*."

1.10 **Approval by US, Local and State Jurisdictions in General**: In all other local and state jurisdictions, the adopted building code legislation states in pertinent part that:

1.10.1 For new materials that are not specifically provided for in this code, the design strengths and permissible stresses shall be established by tests.[55]

1.10.2 For innovative alternatives and/or methods of construction, the building official shall accept Duly Authenticated Reports from approved agencies with respect to the quality and manner of use of new materials or assemblies.[56]

1.10.2.1 An approved agency is "approved" when it is ANAB ISO/IEC 17065 accredited. DrJ Engineering, LLC (DrJ) is in the ANAB directory.

1.10.2.2 An approved source is "approved" when an RDP is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the state legislature via its professional engineering regulations.[57]

1.10.3 The design strengths and permissible stresses of any structural material…shall conform to the specifications and methods of design of accepted engineering practice performed by an approved source.[58]

1.11 **Approval by International Jurisdictions**: The USMCA and GATT agreements provide for approval of innovative materials, designs, services, and/or methods of construction through the Agreement on Technical Barriers to Trade and the IAF Multilateral Recognition Arrangement (MLA), where these agreements:

1.11.1 State that conformity assessment procedures (i.e., ISO/IEC 17020, 17025, 17065, etc.) are prepared, adopted, and applied so as to grant access for suppliers of like products originating in the territories of other Members under conditions no less favourable than those accorded to suppliers of like products of national origin or originating in any other country, in a comparable situation.

1.11.2 **Approved**: The purpose of the MLA is to ensure mutual recognition of accredited certification and validation/verification statements between signatories to the MLA and subsequently, acceptance of accredited certification and validation/verification statements in many markets based on one accreditation for the timely approval of innovative materials, designs, services, and/or methods of construction.

1.11.3 ANAB is an IAF-MLA signatory where recognition of certificates, validation, and verification statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA, with the appropriate scope, shall be approved.[59]

1.11.4 Therefore, all ANAB ISO/IEC 17065 Duly Authenticated Reports are approval equivalent.[60]

1.12 Approval equity is a fundamental commercial and legal principle.[61]

Issue Date: June 23, 2022
Subject to Renewal: July 1, 2025

CBC and CRC Supplement to Report Number 1309-03

REPORT HOLDER: Rmax

1 Evaluation Subject

1.1 Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE

2 Purpose and Scope

2.1 Purpose

2.1.1 The purpose of this Report Supplement is to show Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE, recognized in Report Number, 1309-03 have also been evaluated for compliance with the codes listed below.

2.2 *Applicable Code Editions*

2.2.1 *CBC—19, 22: California Building Code (Title 24, Part 2)*

2.2.2 *CRC—19, 22: California Residential Code (Title 24, Part 2.5)*

2.2.3 *CEC —19, 22: California Energy Code (Title 24, Part 6)*

3 Conclusions

3.1 Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE, described in Report Number 1309-03, comply with the CBC and CRC and are 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 report, 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 Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE, described in Report Number 1309-03, must comply with all of the following conditions:

4.1.1 All applicable sections in Report Number 1309-03.

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

Issue Date: June 23, 2022
Subject to Renewal: July 1, 2025

FBC Supplement to Report Number 1309-03

REPORT HOLDER: Rmax

1 Evaluation Subject

1.1 Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE

2 Purpose and Scope

2.1 Purpose

2.1.1 The purpose of this Report Supplement is to show Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE, recognized in Report Number 1309-03, have 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—20, 23: Florida Building Code – Building*

2.2.2 *FBC-R—20, 23: Florida Building Code – Residential*

3 Conclusions

3.1 Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE, described in Report Number 1309-03, comply with the FBC-B and FBC-R and are 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 report, they are listed here:

3.2.1 FBC-B Section 104.4 and Section 110.4 are reserved.

3.2.2 FBC-R Section R104 and Section R109 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 Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE, described in Report Number 1309-03, must comply with all of the following conditions:

4.1.1 All applicable sections in Report Number 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.

Issue Date: July 21, 2023
Subject to Renewal: July 1, 2025

Seal and Insulate with Energy Star® Supplement to TER 1309-03

REPORT HOLDER: Rmax

1 Evaluation Subject

1.1 Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE

2 Purpose and Scope

2.1 Purpose

2.1.1 The purpose of this Report Supplement is to show Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE, recognized in Report Number 1309-03, have also been evaluated for compliance with the program listed below.

2.1.1.1 Seal and Insulate with Energy Star®

2.1.2 This supplement also shows that DrJ has reviewed all relevant test results and has compared them to the criteria provided in the codes and standards listed in **Section 4** of this report and the EPA's Definitions and Testing Requirements for Residential Insulation V1.0.

2.1.3 For the purpose of the Energy Star program, these products are defined as "*Board Insulation*".

3 Evaluation

3.1 *R-Value*

3.1.1 The Board insulation has the thermal resistances (R-Values) as shown in **Table 1** of Report Number 1309-03.

3.2 *Flame Spread and Smoke Developed Indexes*

3.2.1 The Board insulation has the Flame spread and smoke developed indexes as shown in **Table 4** of Report Number 1309-03.

3.2.2 DrJ has verified that the test results provided have been generated by a laboratory accredited to perform these tests as required by the Conditions and Criteria for Recognition of Insulation Certification Bodies for the Energy Star® program.

3.2.3 DrJ has verified that the products provided for testing were sampled by the testing agency in accordance with their accredited sampling procedures.

4 Conclusions

4.1 Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE, described in Report Number 1309-03, complies with the Seal and Insulate with Energy Star® program and is subject to the conditions of use described in this supplement.

5 Conditions of Use

5.1 Rmax Thermasheath, Rmax TSX-8500, Rmax TSX-8510, Rmax ECOMAXci FR and Rmax ECOMAXci FR WHITE, described in Report Number 1309-03, must comply with all of the following conditions:

5.1.1 All applicable sections in Report Number 1309-03.

5.1.2 Installation shall follow the instructions set forth in **Section 9** of this supplement.

5.1.3 The design, installation and inspections are in accordance with additional requirements of the Seal and Insulate with Energy Star® program, as applicable.

6 Installation

6.1 *General*

6.1.1 Installation shall be in accordance with **Section 9** of Report Number 1309-03 and the Insulation Instructions for the Seal and Insulate with Energy Star® program document at the end of this document.

Notes

1 For more information, visit drjcertification.org or call us at 608-310-6748.

2 https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1702

3 Alternative Materials, Design and Methods of Construction and Equipment: The provisions of any regulation code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by a regulation. Please review https://www.justice.gov/atr/mission and https://up.codes/viewer/colorado/ibc-2021/chapter/1/scope-and-administration#104.11

4 https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706:~:text=the%20design%20strengths%20and%20permissible%20stresses%20shall%20be%20established%20by%20tests%20as

5 The design strengths and permissible stresses of any structural material shall conform to the specifications and methods of design of accepted engineering practice. https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706:~:text=shall%20conform%20to%20the%20specifications%20and%20methods%20of%20design%20of%20accepted%20engineering%20practice

6 https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1707.1:~:text=the%20building%20official%20shall%20accept%20duly%20authenticated%20reports%20from%20approved%20agencies

7 https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1703.4.2

8 https://up.codes/viewer/wyoming/ibc-2021/chapter/2/definitions#approved_agency

9 https://up.codes/viewer/wyoming/ibc-2021/chapter/2/definitions#approved_source

10 https://www.law.cornell.edu/uscode/text/18/1832 (b) Any organization that commits any offense described in subsection (a) shall be fined not more than the greater of $5,000,000 or 3 times the value of the stolen trade secret to the organization, including expenses for research and design and other costs of reproducing the trade secret that the organization has thereby avoided. The federal government and each state have a public records act. To follow DTSA and comply state public records and trade secret legislation requires approval through ANAB ISO/IEC 17065 accredited certification bodies or approved sources. For more information, please review this website: Intellectual Property and Trade Secrets.

11 https://www.nspe.org/resources/issues-and-advocacy/professional-policies-and-position-statements/regulation-professional AND https://apassociation.org/list-of-engineering-boards-in-each-state-archive/

12 https://www.cbitest.com/accreditation/

13 https://up.codes/viewer/colorado/ibc-2021/chapter/1/scope-and-administration#104:~:text=to%20enforce%20the%20provisions%20of%20this%20code

14 https://up.codes/viewer/colorado/ibc-2021/chapter/1/scope-and-administration#104.11:~:text=Where%20the%20alternative%20material%2C%20design%20or%20method%20of%20construction%20is%20not%20approved%2C%20the%20building%20official%20shall%20respond%20in%20writing%2C%20stating%20the%20reasons%20why%20the%20alternative%20was%20not%20approved AND https://up.codes/viewer/colorado/ibc-2021/chapter/1/scope-and-administration#105.3.1:~:text=If%20the%20application%20or%20the%20construction%20documents%20do%20not%20conform%20to%20the%20requirements%20of%20pertinent%20laws%2C%20the%20building%20official%20shall%20reject%20such%20application%20in%20writing%2C%20stating%20the%20reasons%20therefore

15 https://up.codes/viewer/colorado/ibc-2021/chapter/17/special-inspections-and-tests#1707.1:~:text=the%20building%20official%20shall%20accept%20duly%20authenticated%20reports%20from%20approved%20agencies%20in%20respect%20to%20the%20quality%20and%20manner%20of%20use%20of%20new%20materials%20or%20assemblies%20as%20provided%20for%20in%20Section%20104.11

16 https://iaf.nu/en/about-iaf-mla/#:~:text=it%20is%20required%20to%20recognise%20certificates%20and%20validation%20and%20verification%20statements%20issued%20by%20conformity%20assessment%20bodies%20accredited%20by%20all%20other%20signatories%20of%20the%20IAF%20MLA%2C%20with%20the%20appropriate%20scope

17 True for all ANAB accredited product evaluation agencies and all International Trade Agreements.

18 https://www.justice.gov/crt/deprivation-rights-under-color-law AND https://www.justice.gov/atr/mission

19 Unless otherwise noted, all references in this Listing are from the 2021 version of the codes and the standards referenced therein. This material, product, design, service and/or method of construction also complies with the 2000-2021 versions of the referenced codes and the standards referenced therein.

20 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 report.

21 All references to the FBC-B and FBC-R are the same as the 2021 IBC and 2021 IRC unless otherwise noted in the Florida Supplement at the end of this report.

22 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#p-3280.2(Listed%20or%20certified); https://up.codes/viewer/colorado/ibc-2021/chapter/2/definitions#listed AND https://up.codes/viewer/colorado/ibc-2021/chapter/2/definitions#labeled

23 2015 IBC Section 1404.2

24 2018 IBC Section 1404.3.3

25 https://up.codes/viewer/colorado/ibc-2021/chapter/17/special-inspections-and-tests#1703.4

26 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#:~:text=All%20construction%20methods%20shall%20be%20in%20conformance%20with%20accepted%20engineering%20practices%20to%20insure%20durable%2C%20livable%2C%20and%20safe%20housing%20and%20shall%20demonstrate%20acceptable%20workmanship%20reflecting%20journeyman%20quality%20of%20work%20of%20the%20various%20trades

27 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#:~:text=The%20strength%20and%20rigidity%20of%20the%20component%20parts%20and/or%20the%20integrated%20structure%20shall%20be%20determined%20by%20engineering%20analysis%20or%20by%20suitable%20load%20tests%20to%20simulate%20the%20actual%20loads%20and%20conditions%20of%20application%20that%20occur

28 2015 IBC Section 1404.2

29 2015 IBC Section 1405.3

30 Qualification is performed by a legislatively defined Accreditation Body. ANSI National Accreditation Board (ANAB) is the largest independent accreditation body in North America and provides services in more than 75 countries. DrJ is an ANAB accredited product certification body.

31 See Code of Federal Regulations (CFR) Title 24 Subtitle B Chapter XX Part 3280 for definition.

32 2015 IBC Section 1404.2

33 2018 IFC Section 104.9

34 Approved is an adjective that modifies the noun after it. For example, Approved Agency means that the Agency is accepted officially as being suitable in a particular situation. This example conforms to IBC/IRC/IFC Section 201.4 where the building code authorizes sentences to have an ordinarily accepted meaning such as the context implies.

35 https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1707.1

36 Multilateral approval is true for all ANAB accredited product evaluation agencies and all International Trade Agreements.

37 2015 IBC Section 1404.2

38 2015 IBC Section 1405.3

39 2018 IRC Figure R301.2(7)

40 http://www.drjengineering.org/AppendixC AND https://www.drjcertification.org/cornell-2016-protection-trade-secrets

41 https://www.law.cornell.edu/uscode/text/18/1832#:~:text=imprisoned%20not%20more%20than%2010%20years

42 https://www.law.cornell.edu/uscode/text/18/1832#:~:text=Any%20organization%20that,has%20thereby%20avoided

43 https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706.2

44 IBC 2021, Section 1706.1 Conformance to Standards

45 IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General

46 See Section 11 for the distilled building code definition of **Approved**

47 Los Angeles Municipal Code, SEC. 98.0503. TESTING AGENCIES

48 https://up.codes/viewer/california/ca-building-code-2022/chapter/17/special-inspections-and-tests#1707.1

49 New York City, The Rules of the City of New York, § 101-07 Approved Agencies

50 New York City, The Rules of the City of New York, § 101-07 Approved Agencies

51 https://up.codes/viewer/new_jersey/ibc-2018/chapter/17/special-inspections-and-tests#1707.1

52 https://www.nj.gov/dca/divisions/codes/codreg/ucc.html

53 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3282/subpart-A/section-3282.14

54 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280

55 IBC 2021, Section 1706 Design Strengths of Materials, 1706.2 New Materials. Adopted law pursuant to IBC model code language 1706.2.

56 IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General. Adopted law pursuant to IBC model code language 1707.1.

57 https://www.nspe.org/resources/issues-and-advocacy/professional-policies-and-position-statements/regulation-professional AND https://apassociation.org/list-of-engineering-boards-in-each-state-archive/

58 IBC 2021, Section 1706 Design Strengths of Materials, Section 1706.1 Conformance to Standards Adopted law pursuant to IBC model code language 1706.1.

59 https://iaf.nu/en/about-iaf-mla/#:~:text=it%20is%20required%20to%20recognise%20certificates%20and%20validation%20and%20verification%20statements%20issued%20by%20conformity%20assessment%20bodies%20accredited%20by%20all%20other%20signatories%20of%20the%20IAF%20MLA%2C%20with%20the%20appropriate%20scope

60 True for all ANAB accredited product evaluation agencies and all International Trade Agreements.

61 https://www.justice.gov/crt/deprivation-rights-under-color-law AND https://www.justice.gov/atr/mission

Insulation Instructions
For the
Seal and Insulate with ENERGY STAR® program

Description:
General installation instructions, warnings, limitations and warranty information for Rmax Thermasheath insulation boards are provided below. Construction diagrams within this report provide additional details based on various applications. Consult www.rmax.com for more information and complete literature, including, but not limited to, data sheets, SDS, Sales Policy, etc.

General Installation Instructions:

- Special training and/or certification is not required. This product is designed for an easy install for both DIYs and professional contractors.

- Before beginning installation, all surfaces shall be clean and free of irregularities that will affect the placement or performance of the insulation, including, but not limited to, dirt, debris, miscellaneous fasteners or warped, defective or otherwise damaged framing.

- Installations utilizing Thermasheath must be separated from the interior side of the building by a suitable thermal barrier or ignition barrier when required. Refer to the Local Building Official for general exceptions and specific governing codes and requirements. Consult Rmax for special testing and exceptions on thicknesses of 1" or less.

- All materials installed over Thermasheath (thermal barrier, ignition barrier, furring strips, interior finishes, veneers, roof systems, etc.), must be mechanically attached through the insulation to the framing/structure according to the building code.

Walls and Ceilings:

- Attach insulation boards to framing or other finished surface.
  - Starting at one corner/edge, install boards continuously and tightly abutted to cover entire surface.
  - Where insulation is cut to accommodate penetrations, voids and gapping should be minimized.
  - When using compatible adhesives to secure boards, apply the adhesive to the finished surface. Press/hold the board firmly until adhesive is set. Refer to adhesive manufacturer for application recommendations and proper installation techniques.
  - When using mechanical fasteners to secure boards, use fasteners with sufficient length to penetrate framing or other finished surface (minimum ¾" into wood or minimum 29/64" into steel). Use a minimum of 8 fasteners, spaced evenly throughout the board.
  - Where multiple rows or layers of insulation exist, stagger joints.

- When Thermasheath is being used as the vapor retarder, water-resistive barrier (WRB) and/or the air barrier, the following measures should be taken to ensure a complete barrier:
  - All insulation board joints, as well as, any breaks or other damage to the face in the insulation shall be sealed with a pressure sensitive tape, such as Rmax R-SEAL 3000 or R-SEAL Construction Tape.
  - All perimeter edges, transitions and fenestration shall be sealed to the exterior face of the Thermasheath with appropriate flashing, including, but not limited to, exposed foam edges, wall to floor and wall to roof transitions, windows, doors, etc.

Insulation Instructions
For the
Seal and Insulate with ENERGY STAR® program

- All penetrations made through the exterior plane of the WRB and/or air barrier shall be sealed using tape, flashing, caulk or other water/air sealing method.

NOTE: When Rmax Thermasheath is not the primary air barrier, ENERGY STAR requires air sealing throughout the envelope by other means.

- Refer to individual application details for more specific instructions.
  - For Exterior Applications see Details: Stud Wall Constructions Siding 01, Stud Wall Construction (Brick Veneer) 02, Masonry Wall Construction (Veneer) 03, Re-Siding Construction 04.
  - For Interior Applications see Details: Masonry Wall Construction 05, Stud Wall & Vaulted Ceilings Construction 06, Attic Knee Wall & Ceiling Construction 07, Below Grade Wall Construction 10, Ceiling Crawl Space Construction 11

Floors and Below Grade:

- Attach insulation boards to finished surface.
  - Install Thermasheath over specially prepared based of crushed stone for slab on grade constructions or on existing slab for floor and radiant floor slab constructions.
  - Starting at one corner/edge, install boards continuously and tightly abutted to cover entire surface.
  - Where insulation is cut to accommodate penetrations, voids and gapping should be minimized.

- Refer to individual application details for more specific instructions.
  - See Details: Slab on Grade Construction 12, Floor Construction 13, Radiant Floors Slab Construction 14

Roofs:

- Attach insulation boards to suitable roof deck (tongue-and-groove timber, plywood, or metal deck).
  - Secure boards to roof deck with enough fasteners to hold it in place until the nailing surface or roof cover system is attached through the insulation to the deck.
  - Starting at one corner/edge, install boards continuously and tightly abutted to cover entire surface.
  - Where multiple rows or layers of insulation exist, stagger joints.
  - Where insulation is cut to accommodate penetrations, voids and gapping should be minimized.
  - When using compatible adhesives to secure boards, apply the adhesive per the manufacturer's recommendations.
  - When using mechanical fasteners to secure boards, use screw and plate type fasteners with sufficient length to penetrate the deck (minimum 1" into wood or minimum 3/4" into steel).

- Rmax strongly recommends the decision to use or not use a vapor retarder in any insulated roofing assembly, as well as, its location within the system, be guided by the recommendations of the National Roofing Contractors Association (NRCA).

- Refer to individual application details for more specific instructions.
  - See Details : Standing Seam Metal Roof 08, Shingle Roof Construction 09

Insulation Instructions
For the
Seal and Insulate with ENERGY STAR® program

Limitations:

- Thermasheath should not be used as commercial roof insulation directly under membrane systems.

- Thermasheath is not a structural panel and must not be used as a nailing base for any other building products. The structure must be properly braced for lateral loads and uplift according to the requirements of the local building codes.

- In "very heavy" termite infestation probability areas, except where permitted by code, boards shall not be installed on the exterior face or under interior or exterior foundation walls or slab foundations located below grade, and the clearance between insulation boards installed above grade and exposed earth shall be at least 6 inches (152 mm). Consult the Local Building Official for specific governing codes and requirements.

Warnings:

- Polyisocyanurate foam is an organic material which will burn when exposed to an ignition source of sufficient heat and intensity and may contribute to flames spreading. Boards must not be in direct contact with hot objects requiring a certain amount of clearance. Refer to equipment/fixture rating for guidance.

Safety:

- Cutting Thermasheath produces a nuisance or irritant dust – use of a dust mask may be necessary.

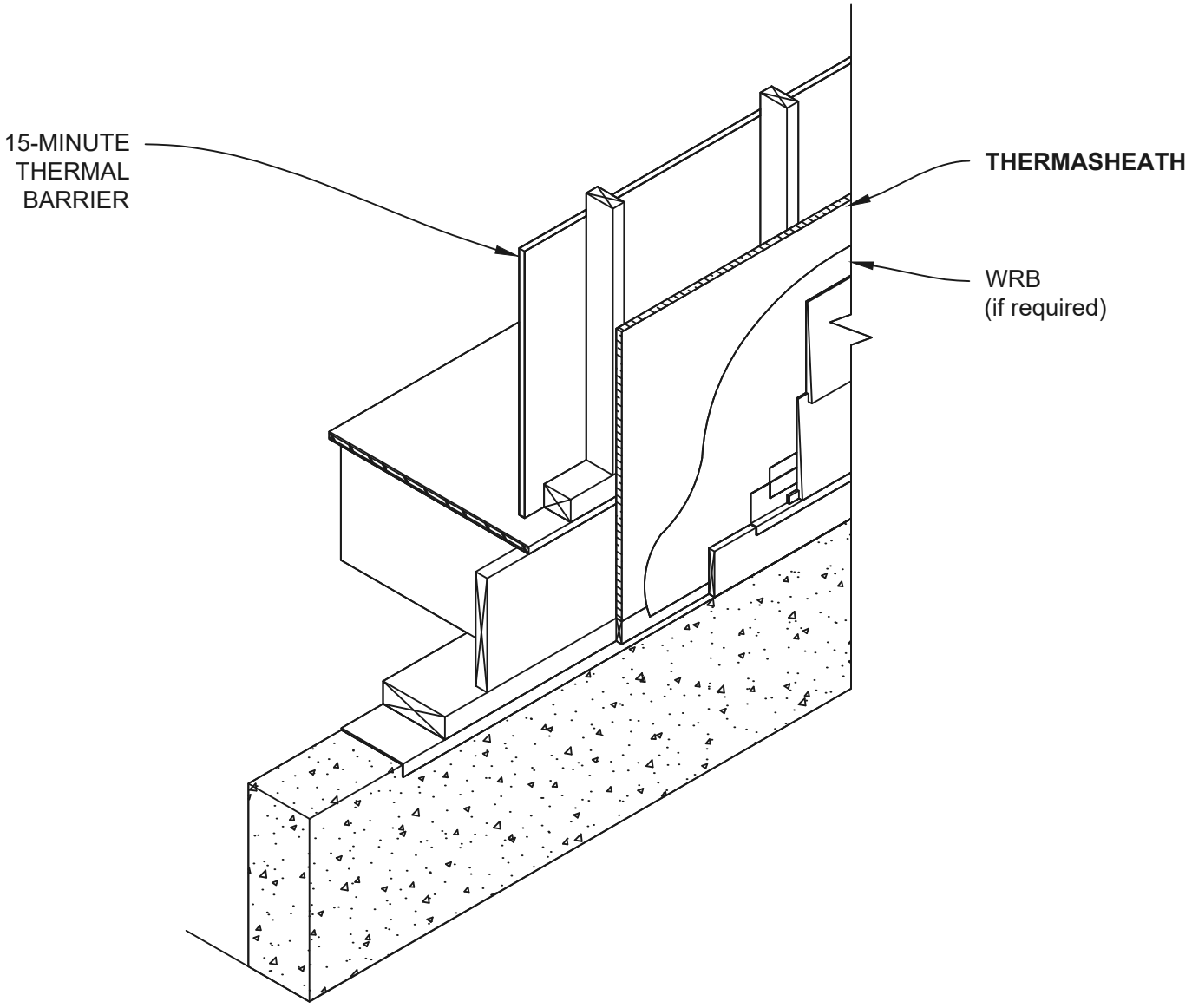
- Safety glasses are always recommended when using power tools.

- Proper ventilation should be provided to minimize airborne dust and fumes if using construction adhesives.

Warranty:

- See Rmax "Sales Policy" for warranty conditions, Rmax does not assume any responsibility or liability for the performance of any products other than those manufactured by Rmax. **NOTE: All Rmax products must be tarped, placed on skids and kept dry before and throughout construction until proper sealing techniques are employed.**

Rmax, A Business Unit of Sika Corporation
2075 Midway Road • Lewisville, TX • 75056 • (972) 850-3604 • Fax (972) 387-4673 • www.rmax.com • Email rmax@rmax.com



Notes:

1. Veneer shown is lap siding. Other veneers, such as stucco and various siding materials - aluminum, vinyl, fiber cement, wood and wood based products - are also acceptable. For stucco systems, the secondary barrier is required over the Thermasheath prior to attaching the metal lathe.
2. Thermasheath insulation panels shall be secured to the studs using bugle-head screws, galvanized roofing nails, or minimum $\frac{3}{4}$" cap nails. A quality grade construction adhesive may also be used to secure the Thermasheath. The veneer must be mechanically attached through the Thermasheath to the studs.
3. Where a separate water resistive barrier (WRB) is not included, the joints of the Thermasheath shall be sealed using a pressure sensitive aluminum tape such as Rmax R-SEAL 3000 or R-SEAL Construction Tape.

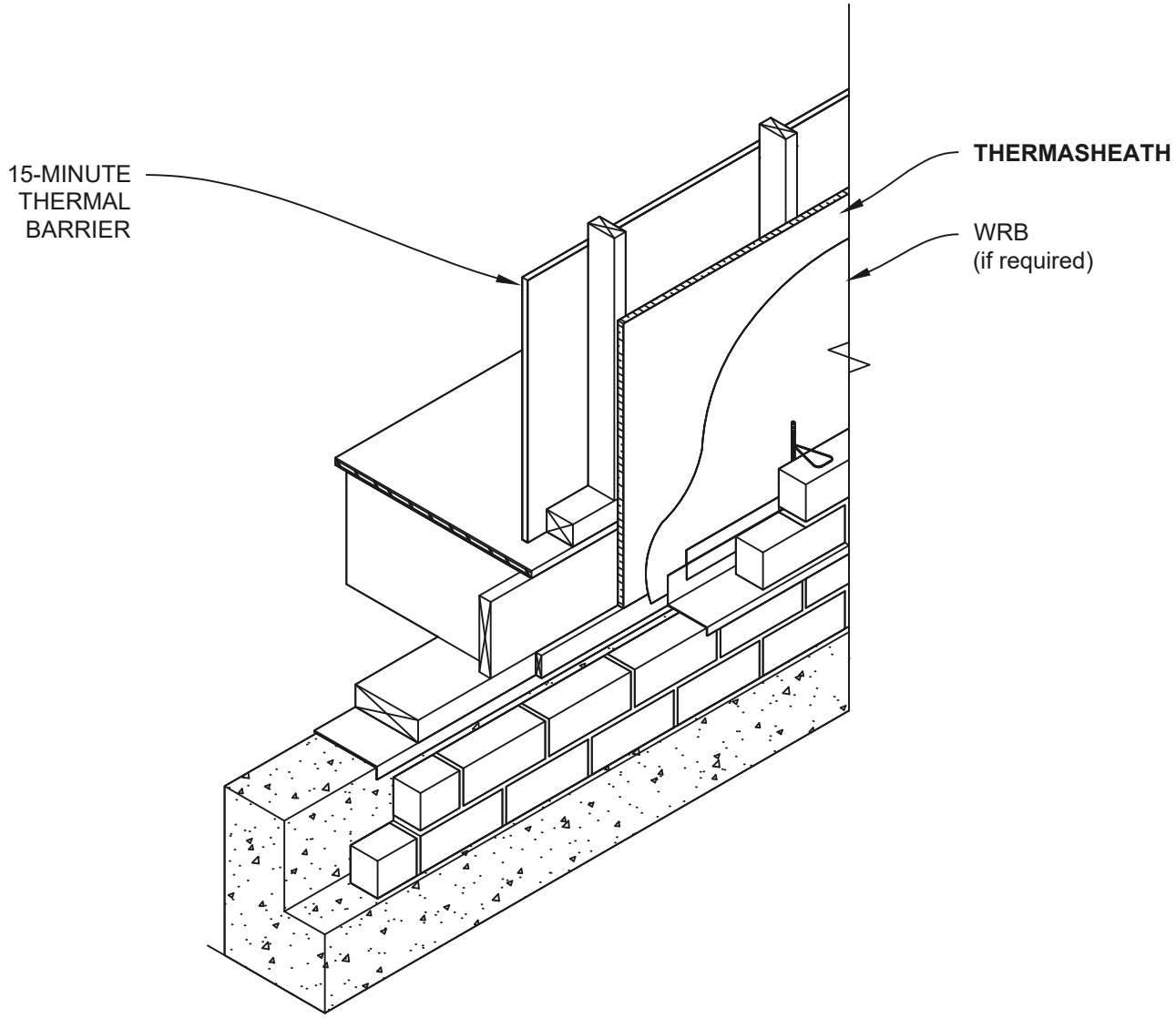
Stud Wall Construction (Siding) | 01

Thermasheath Exterior Application | A1.00

Rmax
2075 Midway Road
Lewisville, Texas 75056
Phone: (972) 850-3604
Web Site: www.rmax.com
(800) 845-4455 (Eastern)
(800) 527-0890 (Central)
(800) 762-9462 (Western)
Email: Rmax@rmax.com

Title: THERMASHEATH® DETAIL
Reference Data Sheet for Additional Information

Date:	Scale:	Sheet:
06/28/2023	Not To Scale	01 - A1.00



Notes:

1. Veneer shown is brick. Other veneers - artificial stone and natural stone - are also acceptable.
2. Thermasheath panels shall be secured to the studs using bungle-head screws, galvanized roofing nails, or minimum $\frac{3}{4}$" cap nails, or simply cut to fit tightly between existing wall ties. Proper air space must be maintained between the face of the insulation and the veneer.
3. Where a separate water resistive barrier (WRB) is not included, the joints of the Thermasheath shall be sealed using a pressure sensitive aluminum tape such as Rmax R-SEAL 3000 or R-SEAL Construction Tape.

Stud Wall Construction (Brick Veneer) | 02

Thermasheath Exterior Application | A1.00

Rmax
2075 Midway Road
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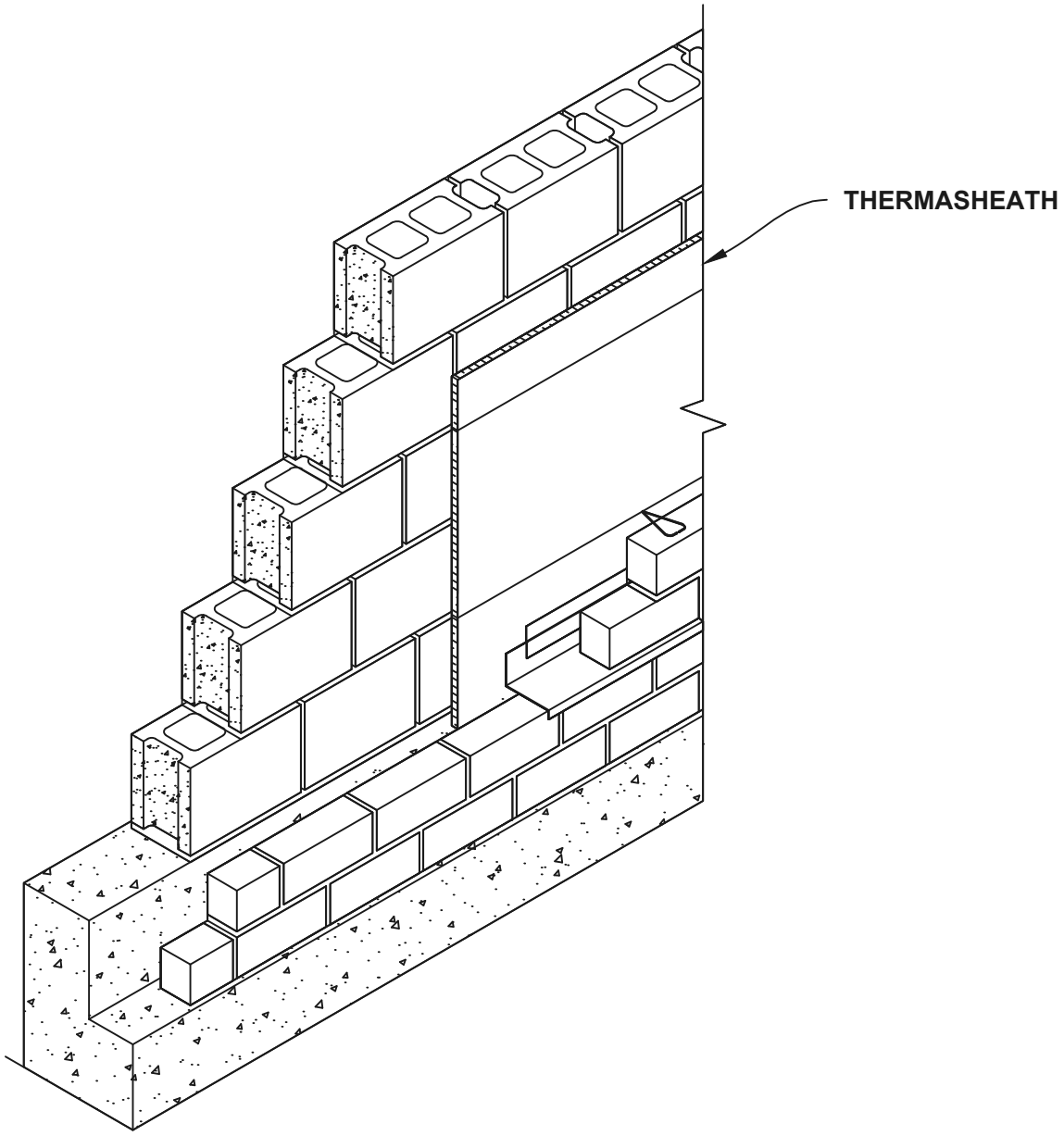
(800) 845-4455 (Eastern)
(800) 527-0890 (Central)
(800) 762-9462 (Western)
Email: Rmax@rmax.com

Title: THERMASHEATH® DETAIL Reference Data Sheet for Additional Information		
Date: 06/28/2023	Scale: Not To Scale	Sheet: 02 - A1.00



Notes:

1. Veneer shown is brick. Other veneers - artificial stone and natural stone - are also acceptable.
3. Masonry/block wall shall be adequately waterproofed according to local requirements and building design.
4. Thermasheath panels shall be secured to the dry face of concrete or CMU walls with a quality grade construction adhesive or simply cut to fit tightly between existing wall ties. Proper air space must be maintained between the face of the insulation and the veneer.

Masonry Wall Construction (Veneer) | 03

Thermasheath Exterior Application | A1.00

Rmax
2075 Midway Road
Lewisville, Texas 75056
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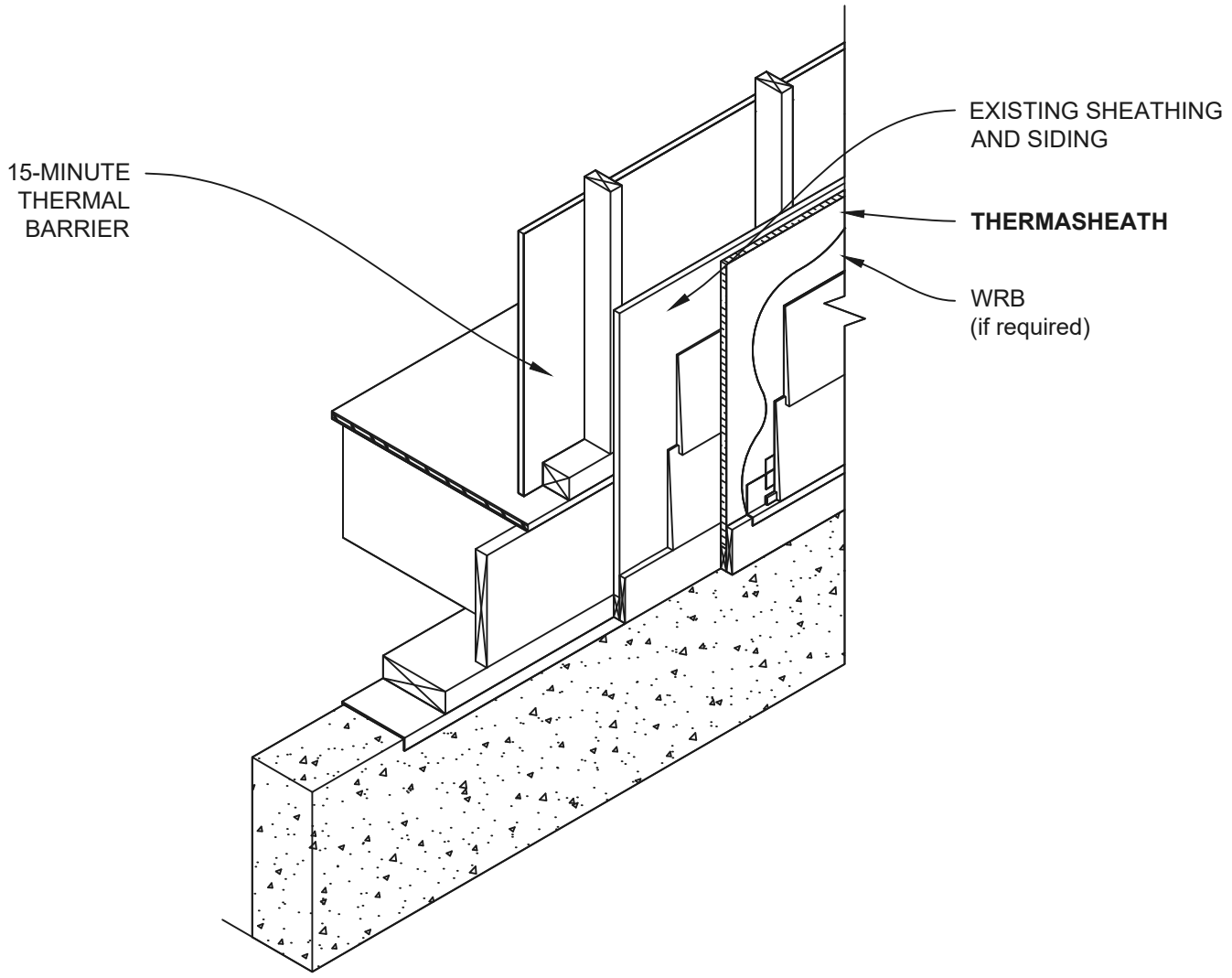
(800) 527-0890 (Central)
(800) 762-9462 (Western)
Email: Rmax@rmax.com

Title: THERMASHEATH® DETAIL
Reference Data Sheet for Additional Information

Date:	Scale:	Sheet:
06/28/2023	Not To Scale	03 - A1.00



Notes:

1. Veneer shown is lap siding. Other veneers - stucco and various siding materials, such as aluminum, vinyl, fiber cement, wood and wood based products - are also acceptable. For stucco systems, the secondary barrier is required over the Thermasheath prior to attaching the metal lathe.
2. Thermasheath insulation panels shall be secured with galvanized nails of sufficient length to penetrate the old sidings, sheathings below and at least one inch into the existing wall studs. Prior to installation, ensure that the existing siding is sound and solidly attached.
3. Where a secondary water resistive barrier (WRB) is not included, the joints of the Thermasheath shall be sealed using a pressure sensitive aluminum tape such as Rmax R-SEAL 3000 or R-SEAL Construction Tape.

Re-Siding Construction | 04

Thermasheath Exterior Application | A1.00

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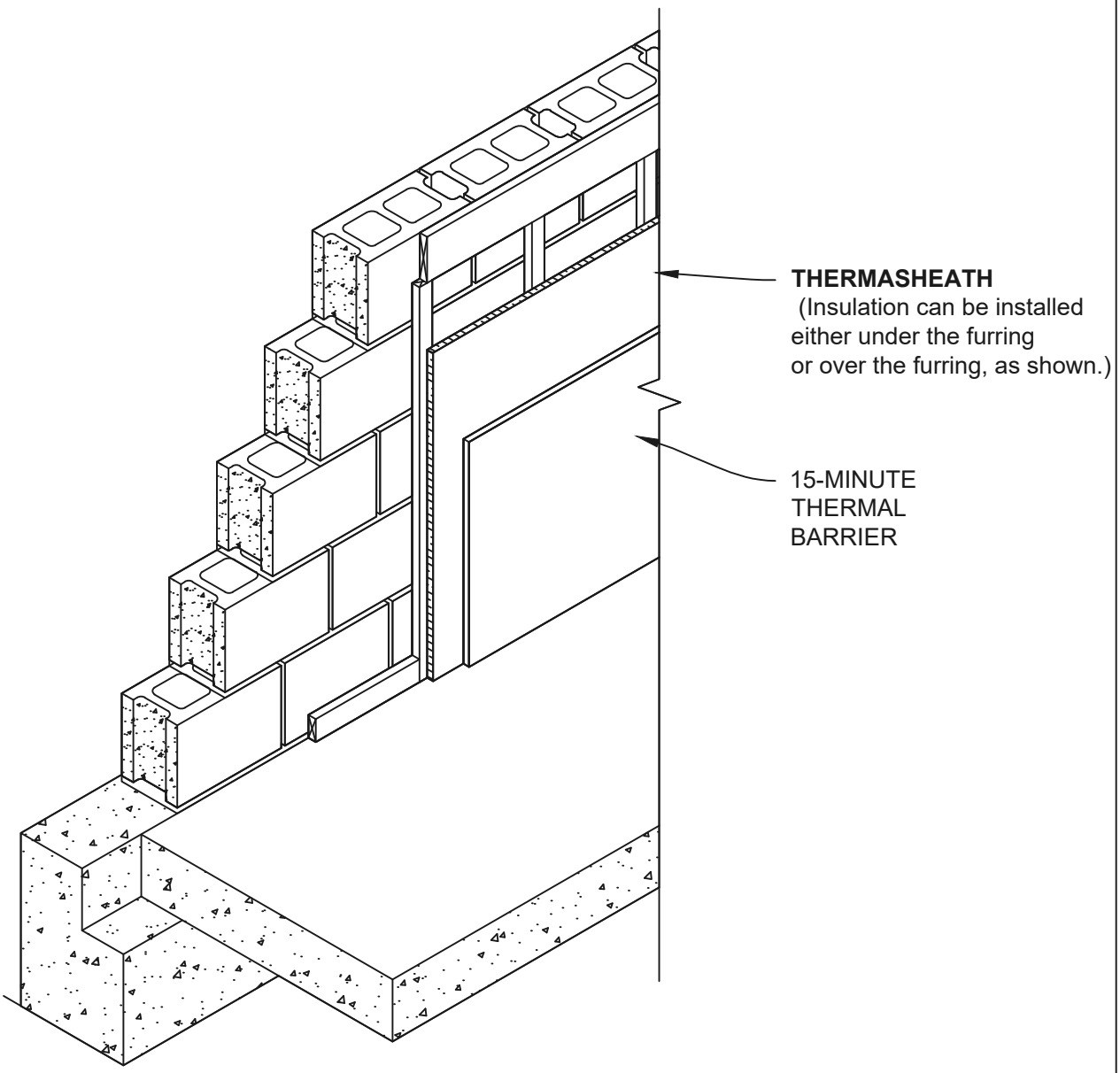
(800) 762-9462 (Western)
Email: Rmax@rmax.com

Title: THERMASHEATH® DETAIL
Reference Data Sheet for Additional Information

Date:	Scale:	Sheet:
06/28/2023	Not To Scale	04 - A1.00



Notes:

1. Thermasheath insulation panels shall be secured to the furring using bugle-head screws, galvanized roofing nails, or minimum $\frac{3}{4}$" cap nails. When Thermasheath is installed under the furring, adhere panels directly to the masonry/ brick wall.
2. Masonry/block wall shall be adequately waterproofed according to local requirements and building design.

Masonary Wall Construction | 05

Thermasheath Interior Application | A1.00

Rmax
2075 Midway Road
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(800) 762-9462 (Western)
Email: Rmax@rmax.com

Title: THERMASHEATH® DETAIL
Reference Data Sheet for Additional Information

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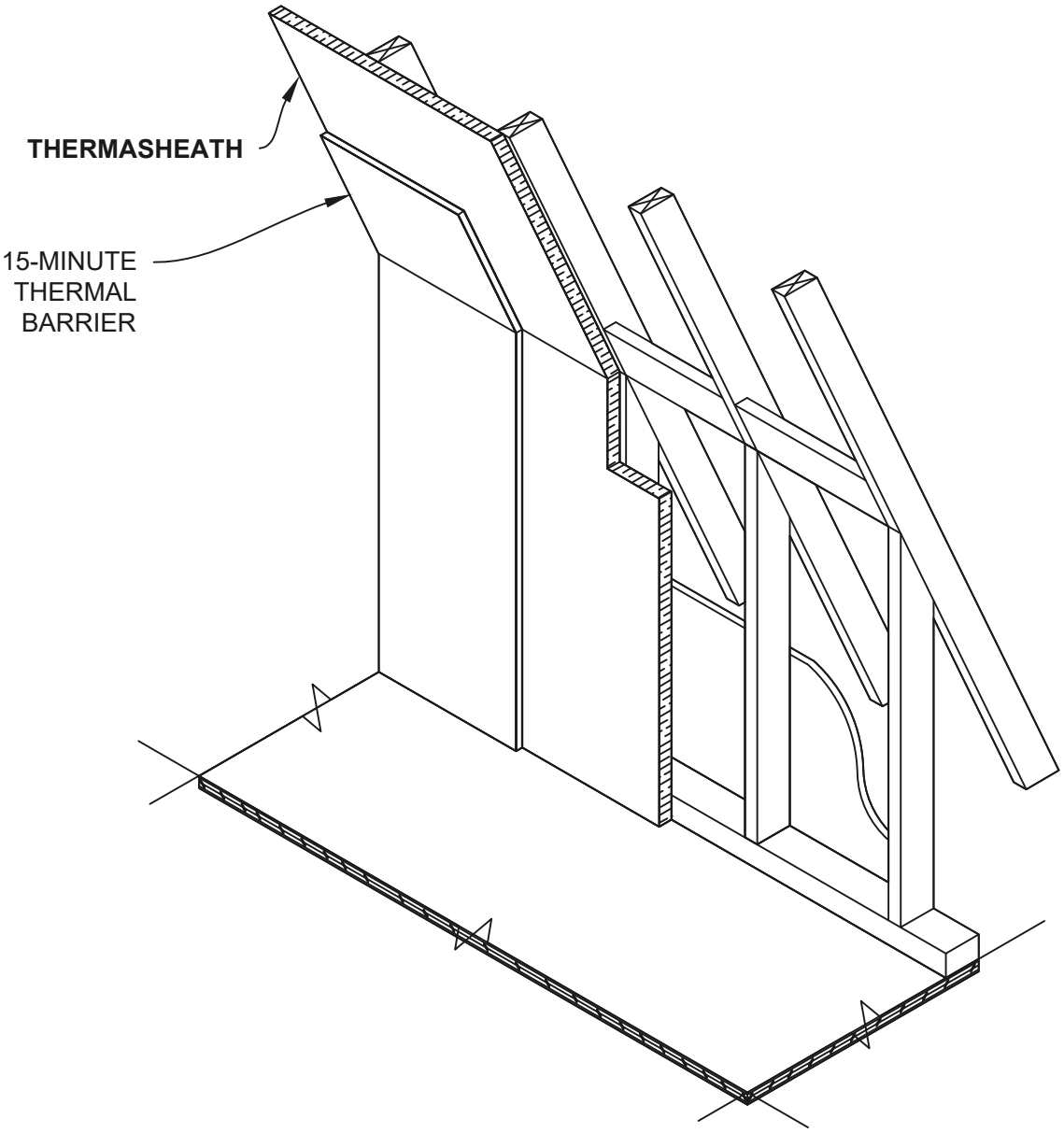
06/28/2023	Not To Scale	05 - A1.00



Notes:

1. Refer to local building codes for requirements on proper ventilation.
2. Thermasheath insulation panels shall be secured to the rafters/ studs using bugle-head screws, galvanized roofing nails, or minimum $\frac{3}{4}$" cap nails. A quality grade construction adhesive may also be used to secure the Thermasheath.

Stud Wall & Vaulted Ceiling Construction | 06

Thermasheath Interior Application | A1.00

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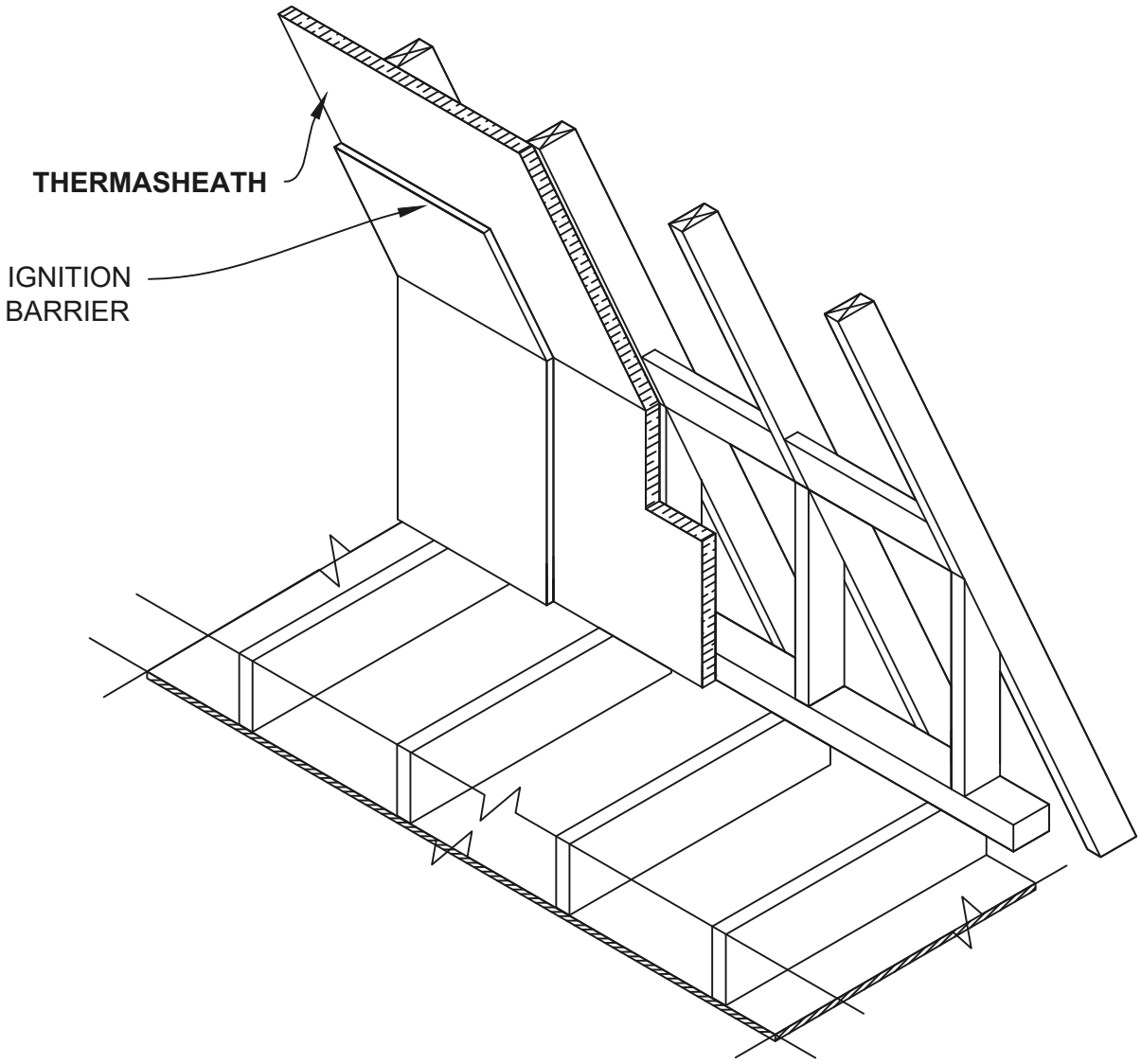
Title: THERMASHEATH® DETAIL
Reference Data Sheet for Additional Information

Date:	Scale:	Sheet:
06/28/2023	Not To Scale	06 - A1.00



Notes:

1. Refer to local building codes for requirements on proper ventilation.
2. Thermasheath insulation panels shall be secured to the studs/ rafters using bugle-head screws, galvanized roofing nails, or common nails driven through cap washers. A quality grade construction adhesive may also be used to secure the Thermasheath.
3. Where the Thermasheath is being used as a vapor retarder, the panel joints shall be sealed using a pressure sensitive tape such as Rmax R-SEAL 3000 or R-SEAL Construction Tape. Otherwise, a secondary vapor retarder may be required per local Building Codes.

Attic Knee Wall & Ceiling Construction | 07

Thermasheath Interior Application | A1.00

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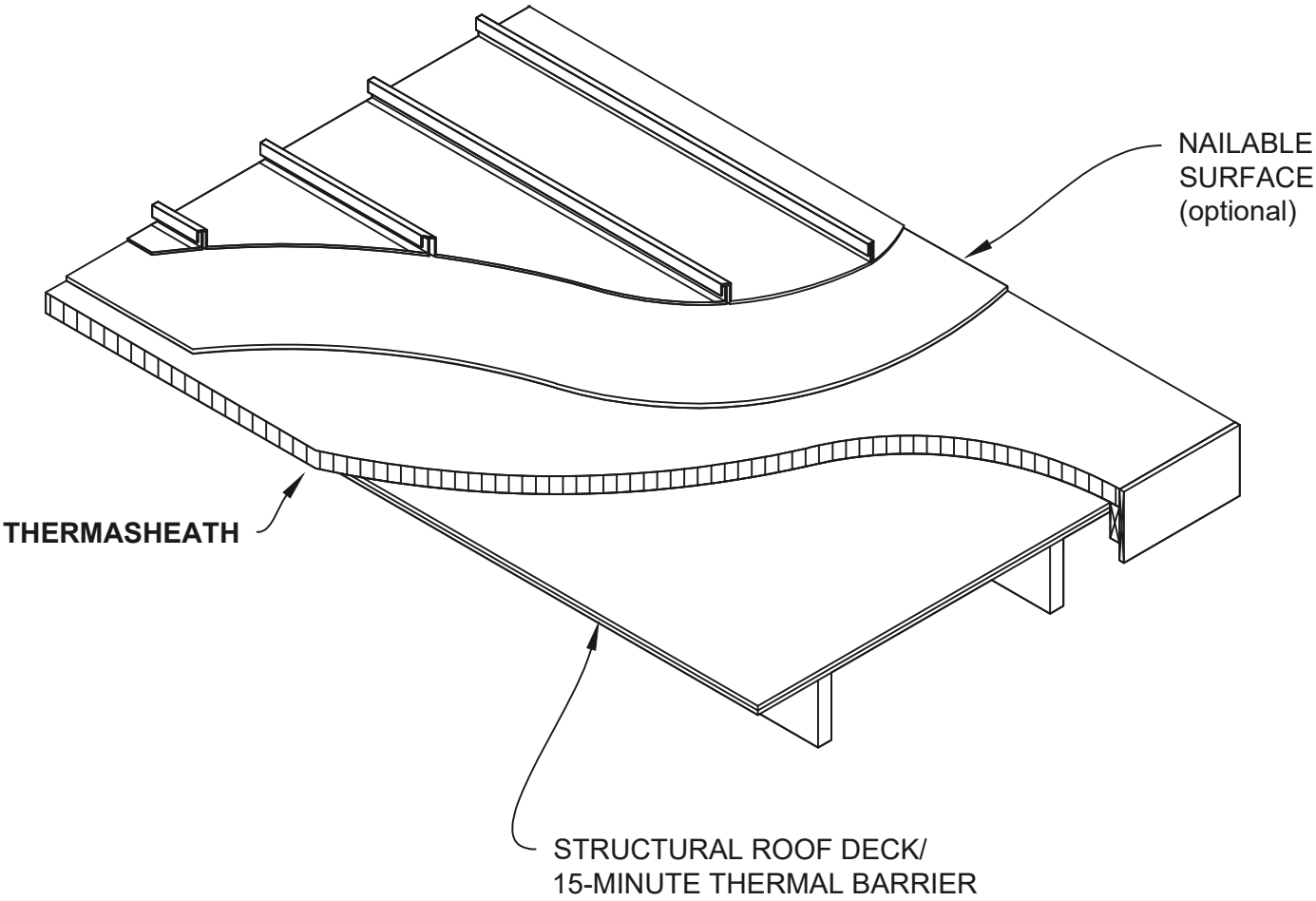

Standing Seam Metal Roof Construction | 08

Thermasheath Exterior Application | A1.00

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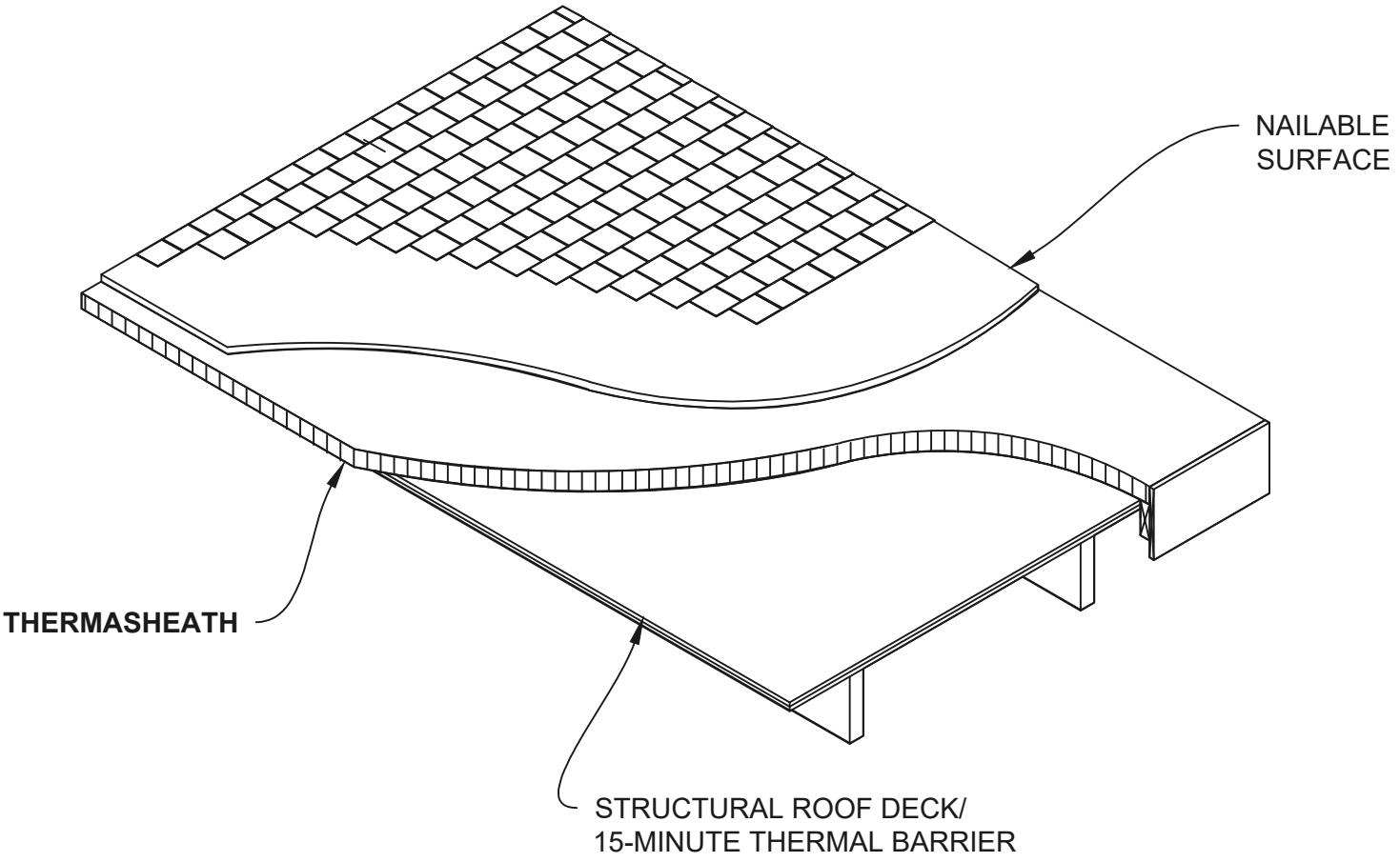

Notes:

1. Roof cover shown is asphalt shingles. Other covers - wood shingles and concrete or clay tiles - are also acceptable. Consult roof cover manufacturer for above deck roof ventilation requirements.

Shingle Roof Construction | 09

THERMASHEATH Exterior Application | A1.00

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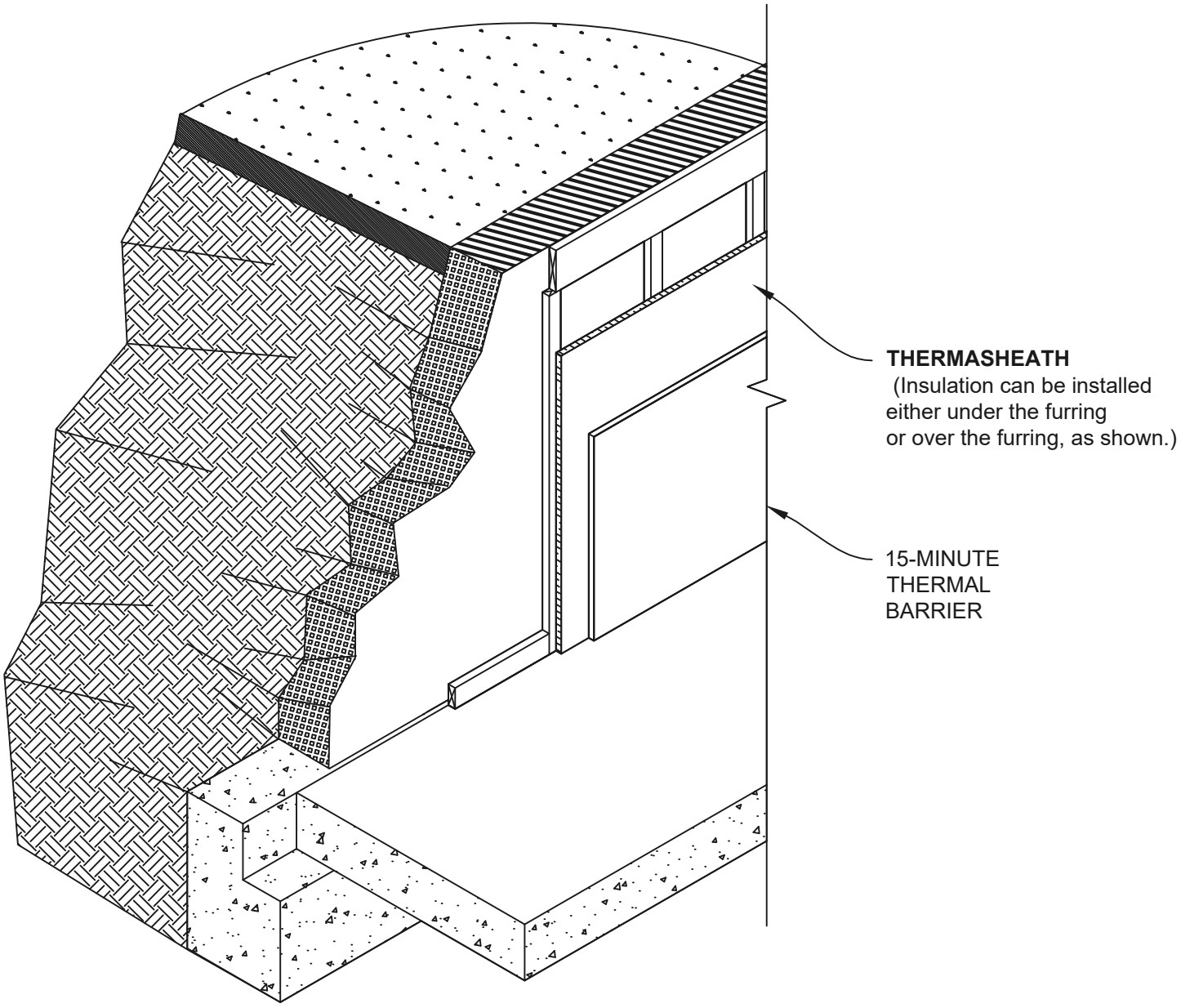

Notes:

1. Thermasheath insulation panels shall be secured to the furring using bugle-head screws, galvanized roofing nails, or minimum $\frac{3}{4}$" cap nails. A quality grade construction adhesive may also be used to secure the Thermasheath.
2. Masonry/block wall shall be adequately waterproofed according to local requirements and building design.

Below Grade Wall Construction | 10

Thermasheath Interior Application | A1.00

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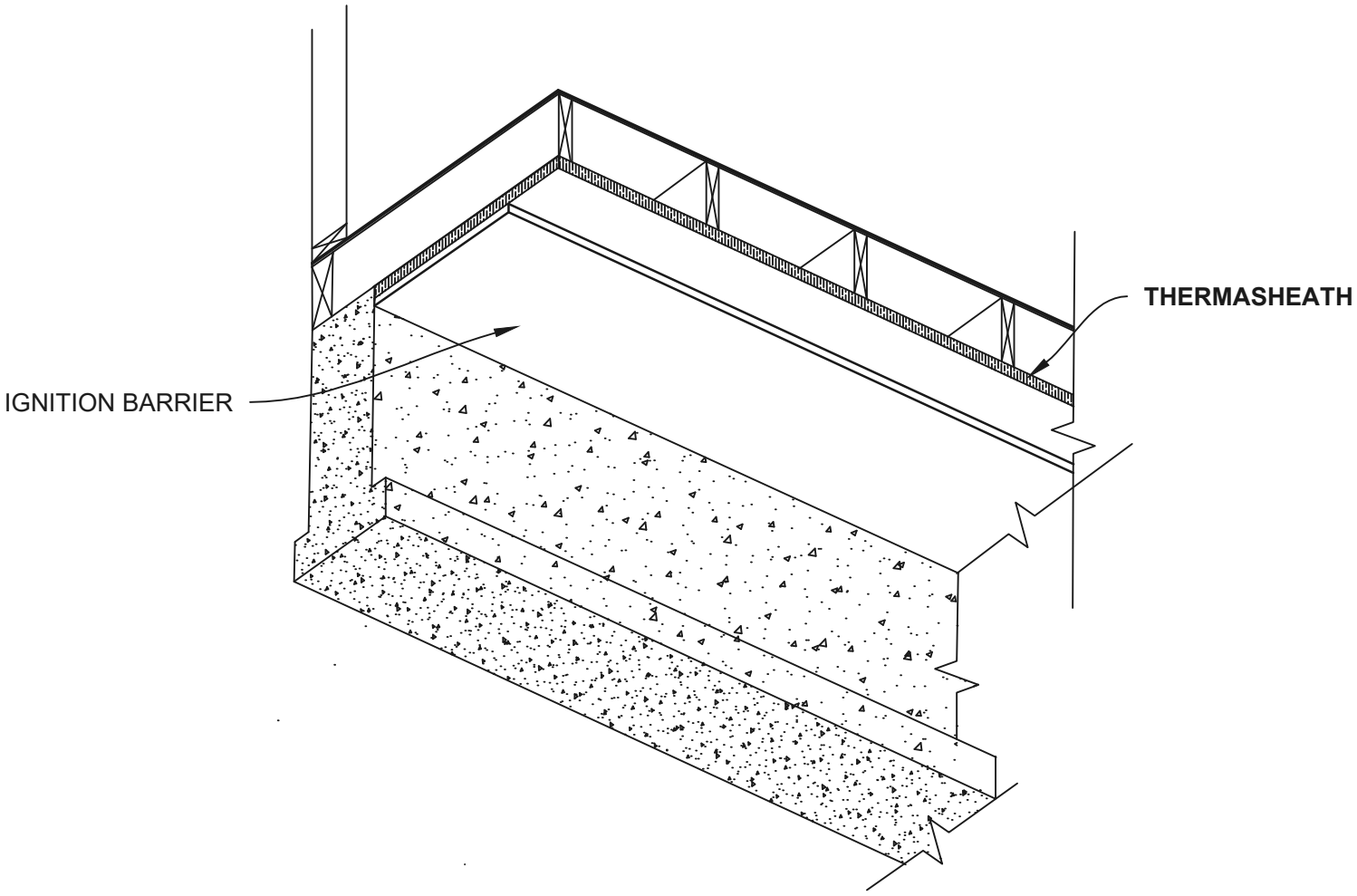

Notes:

1. Refer to local building codes for requirements on proper ventilation and bracing.
2. Thermasheath insulation panels shall be secured to the framing using bugle-head screws, galvanized roofing nails, or minimum $\frac{3}{4}$" cap nails. A quality grade construction adhesive may also be used to secure the Thermasheath.

Ceiling Crawl Space Construction | 11

Thermasheath | A1.00

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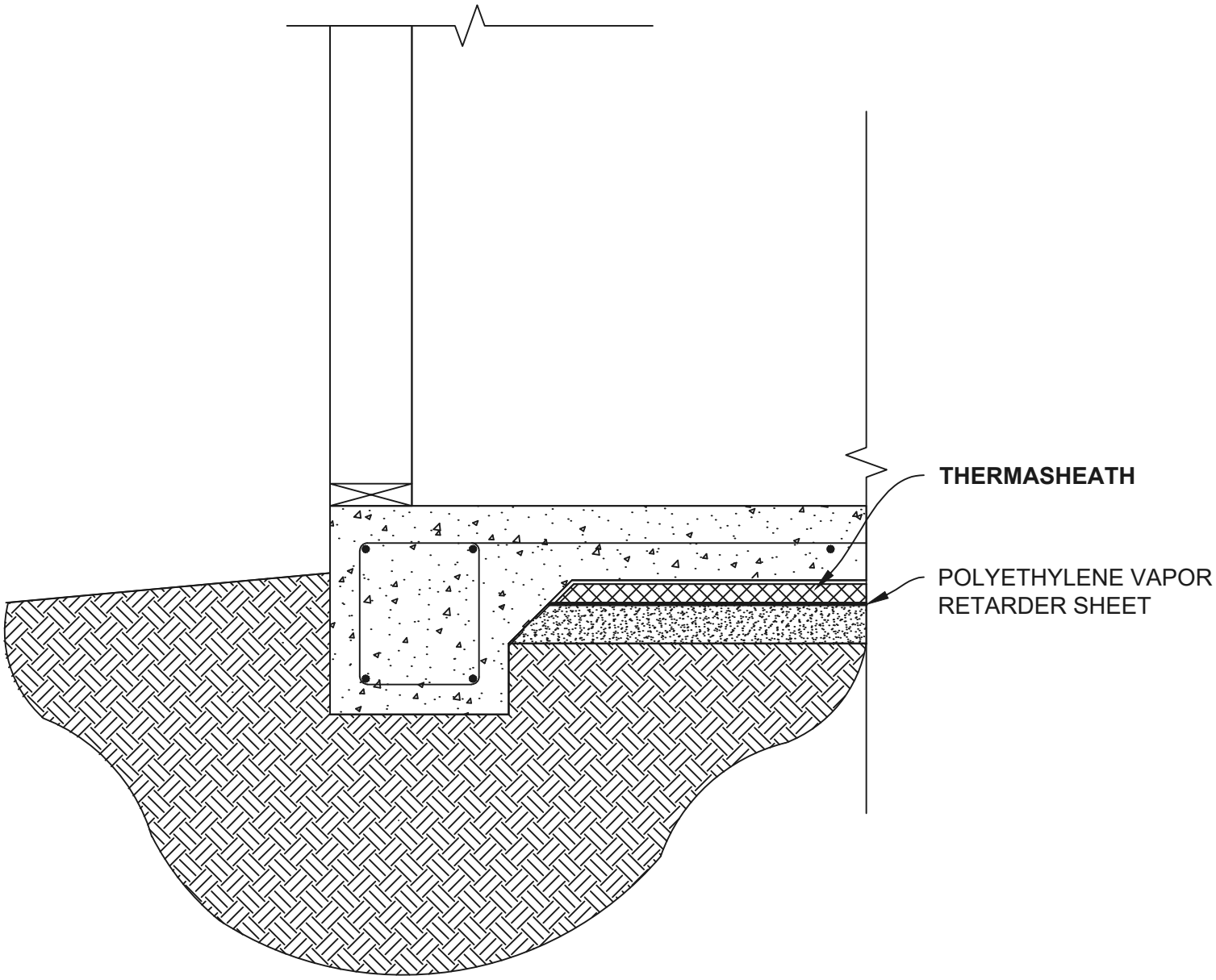

Notes:

1. Thermasheath insulation panels are simply laid over the specially prepared base of crushed stone, sand or other material that is spread for leveling.
2. Exact placement of the polyethylene vapor barrier is up the building designer and local code requirements.

Slab-on-Grade Construction | 12

Thermasheath | A1.00

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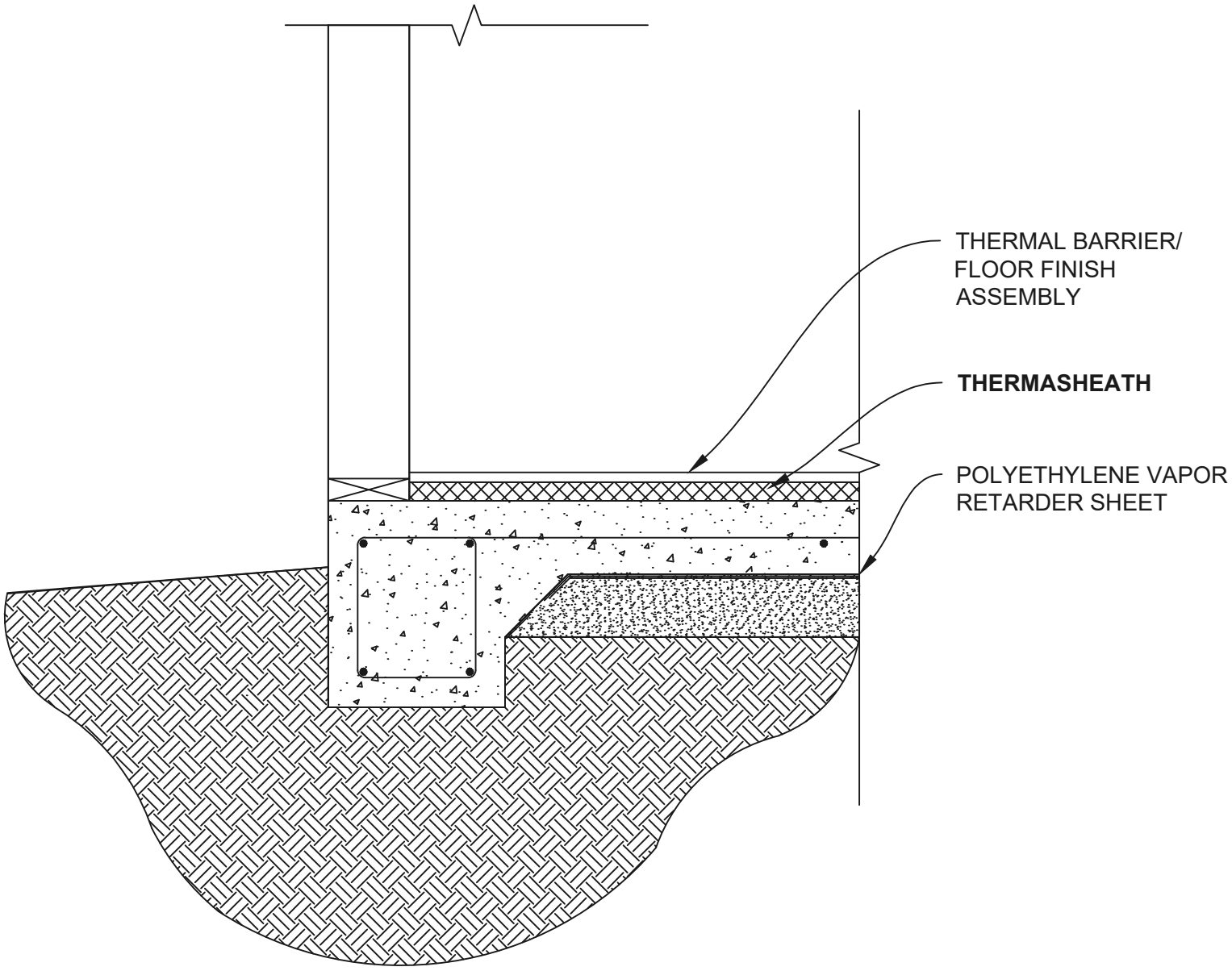

Notes:

1. Thermasheath insulation panels are simply laid over the existing slab.
2. Refer to local building codes for requirements on confined spaces with exposed foam plastic where applicable.

Floor Construction | 13

Thermasheath | A1.00

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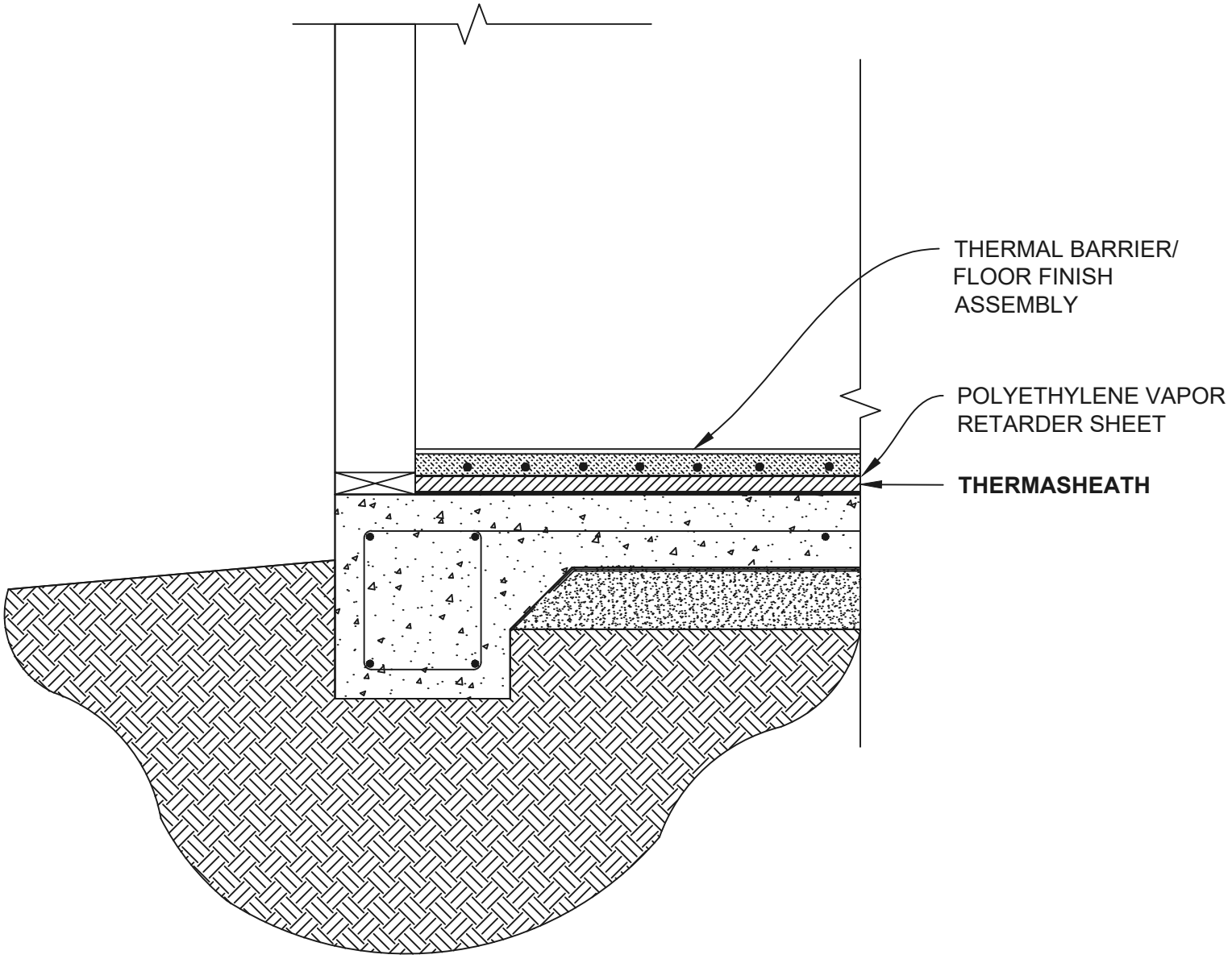

Notes:
1. Thermasheath insulation panels are simply laid over the existing slab.
2. Exact placement of the polyethylene vapor barrier is up the building designer and local code requirements.

Radiant Floor Slab Construction | 14

Thermasheath | A1.00

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