

Technical Evaluation Report™

TER 1309-03

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

Rmax®

Product:

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

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COMPANY
INFORMATION:

ADDITIONAL
LISTEES:

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DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

SECTION: 06 16 00 - Sheathing

SECTION: 06 16 13 - Insulated Sheathing

SECTION: 06 16 53 - Moisture-Resistant Sheathing Board

DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION

SECTION: 07 20 00 - Thermal Protection

SECTION: 07 21 00 - Thermal Insulation

SECTION: 07 21 13 - Foam Board Insulation

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

SECTION: 07 27 00 - Air Barriers

SECTION: 07 27 23 - Board Product Air Barriers

¹ Innovative Products Evaluated^{1,2}

- 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

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

² **Federal Regulation Definition.** 24 CFR 3280.2 "Listed or certified" means included in a list published by a nationally recognized testing laboratory, inspection agency, or other organization concerned with product evaluation that maintains periodic inspection 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. **International Building Code (IBC) Definition of Listed.** Equipment, materials, products or services included in a list published by an organization acceptable to the building official and concerned with evaluation of products or services that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose Listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose. **IBC Definition of Labeled.** Equipment, materials or products to which has been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, approved agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

2 Applicable Codes and Standards^{3,4}

2.1 Codes

- 2.1.1 *IBC—15, 18, 21: International Building Code®*
- 2.1.2 *IRC—15, 18, 21: International Residential Code®*
- 2.1.3 *IECC—15, 18, 21: International Energy Conservation Code®*
- 2.1.4 *CBC—16, 19: California Building Code (Title 24, Part 2)⁵*
- 2.1.5 *CRC—16, 19: California Residential Code (Title 24, Part 2.5)⁵*
- 2.1.6 *CEC —16, 19: California Energy Code (Title 24, Part 6)⁵*
- 2.1.7 *FBC-B—20, 23: Florida Building Code – Building⁶*
- 2.1.8 *FBC-R—20, 23: Florida Building Code – Residential⁶*

2.2 Standards and Referenced Documents

- 2.2.1 *AATCC Test Method 27: Water Resistance: Hydrostatic Pressure Test*
- 2.2.2 *ASTM C209: Standard Test Methods for Cellulosic Fiber Insulating Board*
- 2.2.3 *ASTM C272: Standard Test Method for Water Absorption of Core Materials for Sandwich Constructions*
- 2.2.4 *ASTM C518: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus*
- 2.2.5 *ASTM C1289: Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board*
- 2.2.6 *ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials*
- 2.2.7 *ASTM E96: Standard Test Methods for Gravimetric Determination of Water Vapor Transmission of Materials*
- 2.2.8 *ASTM E119: Standard Test Methods for Fire Tests of Building Construction and Materials*
- 2.2.9 *ASTM E136: Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C*
- 2.2.10 *ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference*
- 2.2.11 *ASTM E1354: Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter*
- 2.2.12 *ASTM E2178: Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials*
- 2.2.13 *NFPA 259: Standard Test Method for Potential Heat of Building Materials*
- 2.2.14 *NFPA 285: Standard Fire Test Method for the Evaluation of Fire Propagation Characteristics of Exterior Nonload-bearing Wall Assemblies Containing Combustible Components*
- 2.2.15 *NFPA 286: Standard Methods of Fire Test for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*

³ This Listing is a code defined research report, which is also known as a duly authenticated report, provided by an approved agency (see IBC Section 1703.1) and/or an approved source (see IBC Section 1703.4.2). An approved agency is “approved” when it is ANAB accredited. DrJ Engineering, LLC (DrJ) is listed in the ANAB directory. A professional engineer is “approved” as an approved source when that professional engineer is properly licensed to transact engineering commerce. Where sealed by a professional engineer, it is also a duly authenticated report certified by an approved source: (i.e., Registered Design Professional). DrJ is an ANAB accredited product certification body.

⁴ 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.

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

⁶ All references to the FBC-B and FBC-R are the same as the 2021 IBC and 2021 IRC unless otherwise noted in the Florida Supplement at the end of this TER.

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

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

3 Performance Evaluation

- 3.1 Tests, test reports, research reports, duly authenticated reports and related engineering evaluations are defined as intellectual property and/or trade secrets and protected by Defend Trade Secrets Act 2016 (DTSA).⁷
- 3.2 Testing and/or inspections conducted for this TER were performed an ISO/IEC 17025 accredited testing laboratory,⁸ an ISO/IEC 17020 accredited inspection body,⁹ which are internationally recognized accreditations through International Accreditation Forum (IAF), and/or a licensed Registered Design Professional (RDP).
- 3.3 Rmax® Thermasheath®, Rmax® TSX-8500, Rmax® TSX-8510, Rmax® ECOMAXci® FR and Rmax® ECOMAXci® FR WHITE were evaluated to determine the following:
- 3.3.1 Performance in accordance with foam plastic requirements of IBC Section 2603 and IRC Section R316.
 - 3.3.2 Performance for use as insulating sheathing (R-value) in accordance with IRC Section N1102 and IECC Section C402.
 - 3.3.3 Performance for use as a Water-Resistive Barrier (WRB) in accordance with IBC Section 1403.2¹⁰ and IRC Section R703.2.
 - 3.3.4 Performance for use as a vapor retarder in accordance with IBC Section 202 and IBC Section 1404.3,¹¹ IRC Section R202 and IRC Section R702.7.
 - 3.3.5 Performance for use as a continuous air barrier in accordance with IECC Section C402.
 - 3.3.6 Surface burning characteristics in accordance with IBC Section 2603.3 and IRC Section R316.3.
 - 3.3.7 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.
 - 3.3.8 Fire resistance rated assembly in accordance with IBC Section 703.2.1.
- 3.4 Thermasheath® ECOMAXci® FR and ECOMAXci® FR WHITE were evaluated to determine the following:
- 3.4.1 Performance for use in exterior walls of buildings of Type I-IV construction in accordance with IBC Section 2603.5.
 - 3.4.2 Fire resistance rated assembly in accordance with IBC Section 703.2.1.
 - 3.4.3 Potential heat in accordance with IBC Section 2603.5.3.
 - 3.4.4 Flame spread and smoke development ratings in accordance with IBC Section 2603.5.4.
 - 3.4.5 Vertical and lateral fire propagation in accordance with IBC Section 2603.5.5.
 - 3.4.6 Ignition characteristics in accordance with IBC Section 2603.5.7.

⁷ <https://www.law.cornell.edu/uscode/text/18/part-11/chapter-90>. Given our professional duty to inform, please be aware that whoever, with intent to convert a trade secret (TS), that is related to a product or service used in or intended for use in interstate or foreign commerce, to the economic benefit of anyone other than the owner thereof, and intending or knowing that the offense will, injure any owner of that trade secret, knowingly without authorization copies, duplicates, sketches, draws, photographs, downloads, uploads, alters, destroys, photocopies, replicates, transmits, delivers, sends, mails, communicates, or conveys such information; shall be fined under this title or imprisoned not more than 10 years, or both. 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. As the National Society of Professional Engineers states, "Engineers shall not disclose, without consent, confidential information concerning the business affairs or technical processes of any present or former client or employer, or public body on which they serve." Therefore, to protect intellectual property (IP) and TS, and to achieve 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. For more information, please review this website: Intellectual Property and Trade Secrets.

⁸ Internationally recognized accreditations are performed by members of the International Accreditation Forum (IAF). Accreditation Body and Regional Accreditation Group Members of IAF are admitted to the IAF MLA only after a stringent evaluation of their operations by a peer evaluation team, which is charged to ensure that the applicant complies fully with both international standards and IAF requirements. Once an accreditation body is a signatory of the IAF MLA, it is required to recognise certificates and validation and verification statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA, with the appropriate scope.

⁹ Ibid.

¹⁰ 2015 IBC Section 1404.2

¹¹ 2015 IBC Section 1405.3

- 3.5 Use of TSX-8500 and TSX-8510 in exterior walls of buildings of Type I-IV construction in accordance with [IBC Section 2603.5](#) is outside the scope of this TER.
- 3.6 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 100% of the transverse wind load is outside the scope of this TER.
- 3.7 This TER covers products within the range of 0.5" to 4.5".
- 3.8 Any building code 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 RDPs / [approved sources](#). DrJ is qualified¹² to practice product and code compliance services within its scope of accreditation and engineering expertise, respectively.
- 3.9 Engineering evaluations are conducted with DrJ's ANAB [accredited ICS code scope](#), which are also its areas of professional engineering competence.
- 3.10 Any regulation specific issues not addressed in this section are outside the scope of this TER.

4 Product Description and Materials

- 4.1 Rmax® Thermasheath®, Rmax® TSX-8500, Rmax® TSX-8510, Rmax® ECOMAXci® FR and Rmax® ECOMAXci® FR WHITE (Thermasheath®, TSX-8510, and ECOMAXci® FR are picture in Figure 1) are non-structural Foam Plastic Insulating Sheathing (FPIS) panels consisting of a closed-cell rigid polyisocyanurate (polyiso) foam core bonded to various facers (ASTM C1289 Type I, Class 1 and Class 2).

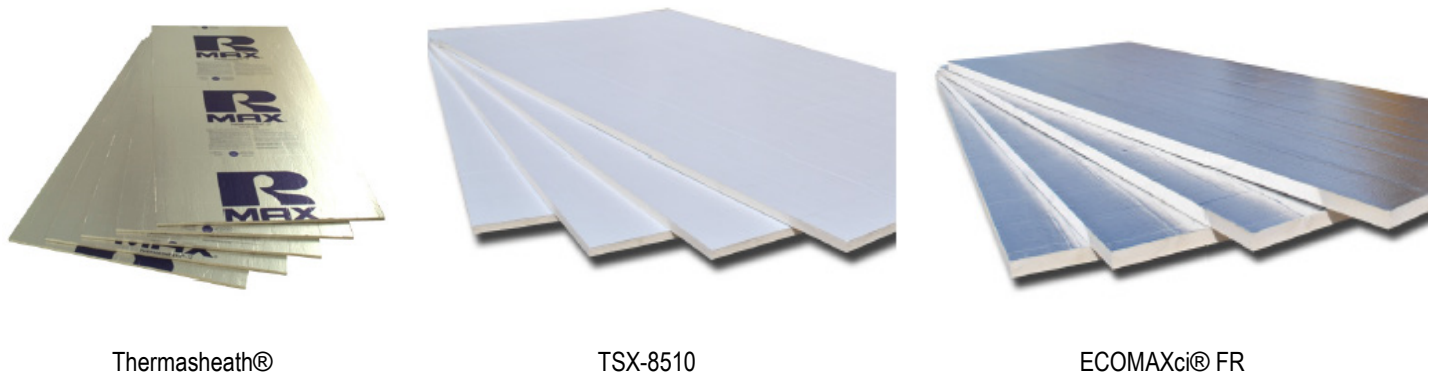


Figure 1. Thermasheath®, TSX-8510, and ECOMAXci® FR

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

¹² 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](#).

- 4.1.4 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.
- 4.1.5 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.
- 4.2 *Material Availability*
 - 4.2.1 Thickness: 0.5 inch (12.7 mm) through 4.5 inches (114.3 mm)
 - 4.2.2 Standard product width: 48 inches (1219 mm)
 - 4.2.3 Standard product length: 96, 108, 120, and 144 inches (2438, 2743, 3048, and 3658 mm)
 - 4.2.4 Custom lengths, widths and thicknesses available upon request.

5 Applications

5.1 General

- 5.1.1 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.
- 5.1.2 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.
- 5.1.3 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.
- 5.1.4 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.
- 5.1.5 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.
- 5.1.6 The wall system shall be designed to handle cladding load and wind load per the applicable code.
- 5.1.7 The Environmental Product Declarations (EPD) for Rmax® Thermasheath®, Rmax® TSX-8500, Rmax® TSX-8510, Rmax® ECOMAXci® FR and Rmax® ECOMAXci® FR WHITE are available at polyiso.org.
- 5.1.8 Where the application exceeds the limitations set forth herein, design shall be permitted in accordance with accepted engineering procedures, experience, and good technical judgment.

5.2 Thermal Resistance (R-Value)

- 5.2.1 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](#).
- 5.2.2 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-ft ² -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.

5.3 Water-Resistive Barrier (WRB)

- 5.3.1 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](#),¹³ and [IRC Section R703.2](#) when installed on exterior walls as described in this section and the [manufacturer installation instructions](#).
- 5.3.2 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 inches (610 mm) o.c. The fasteners used to attach the board shall be installed in accordance with Section 6.
- 5.3.3 All joints between boards shall be sealed by R-SEAL 3000, R-SEAL Construction Tape, or R-SEAL 2000 LF per the manufacturer installation instructions.
- 5.3.4 A separate WRB may also be provided. If a separate WRB method is used, taping of the sheathing joints is not required.

¹³ 2015 IBC Section 1404.2

- 5.3.5 Flashing of corners, windows, doors, and other through-wall penetrations is required and shall comply with the applicable code.
- 5.3.6 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)		

- 5.3.7 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\(1\)](#).¹⁴

5.4 Air Barrier

- 5.4.1 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 TER .
- 5.4.2 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 Properties¹

Air Permeance	
< 0.005 L/(s·m ²)	
IP: 1 L/(s ² ·m ²) = 0.2 cfm/ft ²	
1. Tested in accordance with ASTM E2178	

- 5.4.3 The air permeance of an air barrier material is defined by the IECC and the Air Barrier Association of America (ABAA) as being no greater than 0.02 L/(s·m²) at 75 Pa pressure difference when tested in accordance with ASTM E2178.
- 5.4.4 When used as part of a continuous air barrier, all sheathing panel joints shall be sealed with R-SEAL 3000, R-SEAL Construction Tape, or R-SEAL 2000 LF. The transitions, including top and bottom of walls, and all penetrations shall also be sealed in accordance with the manufacturer installation instructions and this TER.

5.5 Draftstop

- 5.5.1 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](#).
- 5.5.2 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 6.

¹⁴ 2018 IBC Section 1404.3.3



5.6 Fire Safety Performance

5.6.1 Surface Burning Characteristics:

- 5.6.1.1 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 Characteristics¹

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

SI: 1 in = 25.4 mm

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

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

- 5.6.2.1 TSX-8500, TSX-8510, ECOMAXci® FR and ECOMAXci® FR WHITE: up to 4.5 inches in walls only or up to 12 inches in ceilings only, are approved for use without a thermal barrier or ignition barrier, based on large-scale testing conducted in accordance with UL 1715 per [IBC Section 2603.9](#) and [IRC Section R316.6](#).
- 5.6.2.2 TSX-8500, TSX-8510, ECOMAXci® FR and ECOMAXci® FR WHITE: up to 4.5 inches in walls and ceilings, are approved for use in attics, crawls spaces, or other uninhabited spaces without a thermal barrier or ignition barrier, based on large-scale testing in accordance with NFPA 286 per [IBC Section 2603.9](#) and [IRC Section R316.6](#).
- 5.6.2.3 Thermasheath®: up to 4.5 inches in walls only or ceilings only, is approved for use in attics, crawls spaces, or other uninhabited spaces without a thermal barrier or ignition barrier, based on large-scale testing in accordance with NFPA 286 per [IBC Section 2603.9](#) and [IRC Section R316.6](#).
- 5.6.2.4 Thermasheath®: up to 1 inch in walls and/or ceilings, is approved for use in attics, crawls spaces, or other uninhabited spaces without a thermal barrier or ignition barrier, based on large-scale testing in accordance with NFPA 286 per [IBC Section 2603.9](#) and [IRC Section R316.6](#).
- 5.6.2.5 All products: up to 12 inches (304.8 mm) in thickness, may be installed within the building envelope (including, but not limited to, attics, crawlspaces, wall, roof, floor and ceiling assemblies) of all building types when separated from the interior with a thermal barrier consisting of a minimum 0.5 inch gypsum wallboard or an approved equivalent in accordance with [IBC Section 2603.4](#) and [IRC Section R316.4](#).
- 5.6.2.6 In applications where panels are used in both walls and ceilings, but only one is allowed to be left exposed per 5.6.2.1 or 5.6.2.3, the other must meet the requirements of 5.6.2.5.
- 5.6.2.7 For IRC applications in attics, crawls spaces or other uninhabited spaces of 5.6.2.2, 5.6.2.3, or 5.6.2.4, approval is limited to areas where access to the space is required by [IRC Section R807.1](#) or [IRC Section R408.4](#).
- 5.6.2.8 For IRC and IBC applications in attics, crawls spaces or other uninhabited spaces of 5.6.2.2, 5.6.2.3, or 5.6.2.4, approval is limited to areas where entry is made only for the purposes of repairs or maintenance.
- 5.6.2.9 Panels may be installed in single or multiple layers.



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

5.6.3.1 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 TER:

5.6.3.1.1 45 Minutes:

5.6.3.1.1.1 U424, U425, V321, V499, W456

5.6.3.1.2 1-Hour:

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

5.6.3.1.3 1.5-Hour:

5.6.3.1.3.1 U424, U425, W456

5.6.3.1.4 2-Hour:

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

5.6.3.1.5 3-Hour:

5.6.3.1.5.1 U904, U912, U939, W429, W451

5.6.3.1.6 4-Hour:

5.6.3.1.6.1 U904, U912, U939, W429, W451

5.6.4 *Potential Heat:*

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

Table 5. Potential Heat

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

SI: 1 Btu/lb = 2.326 kJ/kg

1. Tested in accordance with NFPA 259

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

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

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

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

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

Wall Component	Materials
Base Wall System Select option 1, 2, 3 or 4	1. Cast concrete walls 2. CMU Concrete walls 3. 20 Gauge (min.) 3.625" (min.) steel studs spaced 24" o.c. (max.) a. ½ in. (min.) type X Special Fire Resistant Gypsum Wallboard Interior b. Bracing as required by code 4. Where allowed by code in Types I, II, III or IV construction, FRTW (fire-retardant-treated wood) studs complying with IBC Section 2303.2, minimum nominal 2x4 dimension, spaced 24" o.c. (max.) a. 0.625" type X Gypsum Wallboard Interior b. Bracing as required by code
Floorline Firestopping 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 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. Note: WRB over Exterior Sheathing items 6-8 may not be used since they already incorporate a pre-installed WRB.	1. None 2. Any WRB tested in accordance with ASTM E1354 (at a minimum of 20 kW/m ² heat flux) and shown by analysis to be less flammable (improved T _{ign} , Pk. HRR) than the baseline WRB or exterior insulation foam core. The following WRB products are allowed: 2.01 Carlisle CCW Fire Resist 705FR-A 2.02 Carlisle CCW Fire Resist Barritech NP™ 2.03 Carlisle CCW Fire Resist Barritech VP 2.04 Dörken Systems Inc, Delta Stratus SA

Wall Component	Materials
<p>Note: When using no exterior sheathing, sheet building wraps may be applied directly to studs.</p> <p>NLA = No Longer Available.</p>	<ul style="list-style-type: none"> 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 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

Wall Component	Materials
	2.59 Vaproshield RevealShield SA® 2.60 Vaproshield WrapShield SA® 2.61 W.R. Meadows® Air-Shield™ LMP (Black) 2.62 W 2.63 .R. Meadows® Air-Shield™ LMP (Gray) 2.64 W.R. Meadows® Air-Shield™ LSR 2.65 W.R. Meadows® Air-Shield™ SMP 2.66 W.R. Meadows® Air-Shield™ TMP
Exterior Insulation Use either 1 or 2 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 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®-Foxy/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™

Wall Component	Materials
	<ul style="list-style-type: none"> 2.10 GCP PERM-A-BARRIE® VPS 2.11 GCP PERM-A-BARRIER® VPL 2.12 GCP PERM-A-BARRIER® VPL Low Temperature 2.13 Henry Air-Bloc All Weather STPE 2.14 Henry Super Jumbo Tex 60 minutes (only with ¾" stucco cladding) (Fortifiber) 2.15 Henry WeatherSmart Drainable (Fortifiber) 2.16 Henry® Air-Bloc® 16 MR 2.17 Henry® Air-Bloc® 17 MR 2.18 Henry® Air-Bloc® 21 FR 2.19 Henry® Air-Bloc® 31MR 2.20 Henry® Air-Bloc® 33MR 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 Sika Majvest® 500 SA 2.32 Sika SikaGard® 535 2.33 Soprema Sopraseal® Stick VP 2.34 Vaproshield Revealshield SA® 2.35 Vaproshield Wrapshield SA® 2.36 W.R. Meadows® Air-Shield™ LMP (Black) 2.37 W.R. Meadows® Air-Shield™ LMP (Gray) 2.38 W.R. Meadows® Air-Shield™ LSR 2.39 W.R. Meadows® Air-Shield™ SMP 2.40 W.R. Meadows® Air-Shield™ TMPHenry® Air-Bloc® 31MR
<p>Exterior Cladding Select option 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 or 17</p> <p>Note: For WRB over exterior insulation option 2 above, heavy masonry claddings 1-6 shall incorporate non-open joints.</p>	<p><u>Heavy Masonry</u></p> <ul style="list-style-type: none"> 1. Brick - nominal 4" clay brick or veneer with a maximum 2 in. air gap behind brick. Brick ties/anchors –24" o.c. (max.) 2. Stucco – Minimum 0.75" thick, exterior cement plaster and lath with an optional secondary water resistive barrier between the exterior insulation and lath.* 3. Limestone - minimum 2" thick any using standard installation technique. 4. Natural Stone Veneer – Minimum 2 in. thick using any standard installation technique. 5. Cast Artificial Stone, Precast Concrete Panels, or CMU -- Minimum 1.5" thick, using any standard installation technique. Cast stone complying with ICC-ES AC 51. 6. Terra Cotta Cladding – Minimum 1.25" thick using any standard installation technique. <p><u>Other</u></p> <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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. <ul style="list-style-type: none"> a. Stone Panels Inc. Stone Lite Panel system has been analyzed using manufacturer standard installation technique

Wall Component	Materials
	<p>5. Autoclaved-aerated- concrete (AAC) panels that have successfully passed NFPA 285 using any standard installation technique.</p> <p>6. Thin Set Brick</p> <p>a. Glen-Gary Thin Tech™ Elite Series has been analyzed using manufacturer standard installation technique.</p> <p>b. Tabs II Panel System with 0.5" bricks using Tabs Wall Adhesive</p> <p>7. Natural Stone Veneer – minimum 1.25" (adhered with mortar or concrete/cement based adhesive).</p> <p>8. FunderMax M.Look using the manufacturer standard installation technique. The air gap between cladding and insulation or WRB must not exceed 1.5".</p> <p>9. Glen-Gery Tru-Brix (only with optional non-combustible mortar)</p> <p>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.*</p> <p>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.*</p> <p>*NOTE: The secondary barriers shall not be full-coverage asphalt or butyl-based self-adhered membranes.</p>
<p>Rough openings</p> <p>Note: Must cover both the air gap between the cladding and the exterior insulation and the exposed edge of the exterior insulation.</p>	<p>Rough opening perimeters shall incorporate one of the following, spanning at a minimum from the interior edge of the cladding to the interior edge of the exterior insulation at the rough opening.</p> <ol style="list-style-type: none"> 1. 0.08" (min.) aluminum (examples include window frame, flashing, lintel, c-channel) 2. 20 GA. (min.) sheet steel (examples include window frame, flashing, lintel, c-channel) 3. 0.5" (min.) 4pcf (min.) mineral wool 4. 0.75" (min.) FRT wood buck 5. 0.75" (min.) FRT plywood 6. 0.625" (min.) type X GWB 7. 0.25" (min.) fiber cement board <p>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.</p>
<p style="text-align: right;">SI: 1 in = 25.4 mm</p> <p>1. All WRBs shall be installed at recommended application rates and per the manufacturer installation instructions.</p>	

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

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

Wall Component	Materials
Base Wall System Use either 1, 2, 3, or 4	1. Cast Concrete Walls 2. CMU Concrete Walls 3. 20 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
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 <u>IBC Section 2303.2</u> 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 Soprseal 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	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

Wall Component	Materials
<p>Note: WRB over Exterior Sheathing Items 6-8 may not be used since they already incorporate a pre-installed WRB.</p> <p>Note: When using no exterior sheathing, sheet building wraps may be applied directly to studs.</p> <p>NLA = No Longer Available.</p>	<ul style="list-style-type: none"> 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) 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

Wall Component	Materials
	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)	<p>For use with all cladding options, installed in accordance with applicable code requirements. Must be applied with joints staggered. Fasteners used for securing FRTW panels must penetrate through the foam plastic into FRTW or steel framing. The system must be designed to handle the cladding load and wind load per the applicable code.</p> <p>Note: May be applied in the field or factory applied. Adhesive must not be full coverage.</p>
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 <ul style="list-style-type: none"> 1.01 None 1.02 6" (max) tape or flashing over insulation joints <ul style="list-style-type: none"> 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 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.) <ul style="list-style-type: none"> 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

Wall Component	Materials
	2.13 Henry Air-Bloc All Weather STPE 2.14 Henry® Air-Bloc® 16MR 2.15 Henry® Air-Bloc® 17MR 2.16 Henry® Air-Bloc® 21 FR 2.17 Henry® Air-Bloc® 31MR 2.18 Henry® Air-Bloc® 33MR 2.19 Henry® Blueskin® VP160 2.20 Henry® Envirocap 2.21 Henry Super Jumbo Tex 60 minutes (only with ¾" stucco cladding) (Fortifiber) 2.22 Henry WeatherSmart Drainable (Fortifiber) 2.23 Parex WeatherSeal Spray & Roll-On 2.24 Pecora ProPerm VP 2.25 Pecora XL-Perm ^{ULTRA} NP 2.26 Pecora XL-Perm ^{ULTRA} VP (10 mil DFT) 2.27 Prosoco R-Guard® Cat 5™ 2.28 Prosoco R-Guard® MVP (NLA) 2.29 Prosoco R-Guard® Spray Wrap (NLA) 2.30 Prosoco R-Guard® VB 2.31 Siga Majvest® 500 SA 2.32 Sika SikaGard®-535 2.33 Soprema Sopraseal® Stick VP 2.34 Vaproshield Revealshield SA® 2.35 Vaproshield Wrapshield SA® 2.36 W.R. Meadows® Air-Shield™ LMP (Black) 2.37 W.R. Meadows® Air-Shield™ LMP (Gray) 2.38 W.R. Meadows® Air-Shield™ LSR 2.39 W.R. Meadows® Air-Shield™ SMP 2.40 W.R. Meadows® Air-Shield™ TMP
<p>Exterior Cladding Use either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 or 17</p> <p>Note: For WRB over exterior insulation option 2 above, heavy masonry claddings 1-6 shall incorporate non-open joints.</p>	<p><u>Heavy Masonry</u></p> <ol style="list-style-type: none"> 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 <p><u>Other</u></p> <ol style="list-style-type: none"> 1. Uninsulated fiber-cement panel siding using any standard installation technique <p>*NOTE: The secondary barriers shall not be full-coverage asphalt or butyl-based self-adhered membranes.</p>
<p>Rough openings</p> <p>Note: Must cover both the air gap between the cladding and the exterior insulation and the exposed edge of the exterior insulation.</p>	<p>Rough opening perimeters shall incorporate one of the following, spanning at a minimum from the interior edge of the cladding to the interior edge of the exterior insulation at the rough opening.</p> <ol style="list-style-type: none"> 1. 20 GA. (min.) sheet steel (examples include window frame, flashing, lintel, C-channel) 2. 1" (min.) 4pcf (min.) mineral wool 3. 1.5" (min.) FRT wood buck 4. Two layers 0.75" (min.) FRT plywood 5. Two layers 0.625" (min.) type X GWB

Wall Component	Materials
	<p>6. 0.5" (min.) fiber cement board (or two layers minimum 0.75")</p> <p>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.</p>
SI: 1 in = 25.4 mm	
1. All WRBs shall be installed at recommended application rates and per the manufacturer installation instructions.	

5.6.6 Ignition Properties

5.6.6.1 Thermasheath®, ECOMAXci® FR, and ECOMAXci® FR WHITE were evaluated to assess performance with regard to ignition in accordance with [IBC Section 2603.5.7](#).

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

5.6.6.1.1.1 A thermal barrier in accordance with [IBC Section 2603.4](#)

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

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

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

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

5.7 Where the application 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.

6 Installation

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

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

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

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

6.5 Consult the manufacturer installation instructions for further details.

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

7 Substantiating Data

- 7.1 Testing has been performed under the supervision of a professional engineer and/or under the requirements of ISO/IEC 17025 as follows:
- 7.1.1 Material properties testing in accordance with ASTM C1289
 - 7.1.2 Thermal resistance properties testing in accordance with ASTM C518
 - 7.1.3 Water vapor permeance testing in accordance with ASTM E96
 - 7.1.4 Water-resistive barrier testing in accordance with ASTM E331 and AATCC TM 127
 - 7.1.5 Water absorption testing in accordance with ASTM C209 and ASTM C272
 - 7.1.6 Air permeance testing in accordance with ASTM E2178
 - 7.1.7 Flame spread and smoke developed rating tests in accordance with ASTM E84
 - 7.1.8 Room corner tests in accordance with NFPA 286
 - 7.1.9 Fire resistance ratings in accordance with UL 263
 - 7.1.10 Heat propagation (potential heat) testing in accordance with NFPA 259
 - 7.1.11 Vertical and lateral fire propagation tests in accordance with NFPA 285, with analysis by Priest and Associates Consulting, LLC and Hughes Associates
- 7.2 Information contained herein may include the result of testing and/or data analysis by sources that are approved agencies (i.e., ANAB accredited agencies), approved sources (i.e., RDPs), and/or professional engineering regulations. Accuracy of external test data and resulting analysis is relied upon.
- 7.3 Where pertinent, testing and/or engineering analysis is based upon provisions that have been codified into law through state or local adoption of codes and standards. The developers of these codes and standards are responsible for the reliability of published content. DrJ's engineering practice may use a code-adopted provision as the control sample. A control sample versus a test sample establishes a product as being equivalent to the code-adopted provision in terms of quality, strength, effectiveness, fire resistance, durability, and safety.
- 7.4 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, Listings, certified reports, duly authenticated reports from approved agencies, and research reports prepared by approved agencies and/or approved sources provided by the suppliers of products, materials, designs, assemblies and/or methods of construction. These are presumed to be minimum properties and relied upon to be accurate. The reliability of DrJ's engineering practice, as contained in this TER, may be dependent upon published design properties by others.
- 7.5 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.¹⁵
- 7.6 Where additional condition of use and/or code compliance information is required, please search for Rmax® Thermasheath®, Rmax® TSX-8500, Rmax® TSX-8510, Rmax® ECOMAXci® FR and Rmax® ECOMAXci® FR WHITE on the DrJ Certification website.

¹⁵ See Code of Federal Regulations (CFR) Title 24 Subtitle B Chapter XX Part 3280 for definition.

8 Findings

- 8.1 As delineated in Section 3, 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 pertinent standards and is suitable for use pursuant to its specified purpose.
- 8.2 When used and installed in accordance with this TER 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:
 - 8.2.1 Buildings constructed in accordance with the IBC and the IRC.
 - 8.2.2 Performance of foam plastics in accordance with IBC Section 2603 and IRC Section R316.
 - 8.2.3 Use within the building envelope, including, but not limited to, attic, crawlspace, wall, roof, ceiling, floor, and foundation assemblies.
 - 8.2.3.1 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.
 - 8.2.4 Use as insulating sheathing in accordance with IRC Section N1102.1, IRC Section N1102.2 and IECC Section C402.
 - 8.2.5 Use as a WRB in accordance with IBC Section 1403.2¹⁶ and IRC Section R703.2.
 - 8.2.6 Use as a continuous air barrier in accordance with IRC Section N1102.4 and IECC Section C402.
 - 8.2.7 Flame spread and smoke developed indices in accordance with IBC Section 2603.3 and IRC Section R316.3.
 - 8.2.8 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.
 - 8.2.9 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 6.
 - 8.2.10 Use in a fire resistance rated assembly in accordance with IBC Section 703.2.1.
 - 8.2.11 When used and installed in accordance with this TER and the manufacturer installation instructions, Thermasheath®, ECOMAXci® FR and ECOMAXci® FR WHITE are approved for the following:
 - 8.2.11.1 Use in exterior walls of buildings of Type I-IV construction in accordance with IBC Section 2603.5.
 - 8.2.11.2 Use in a fire resistance rated assembly in accordance with IBC Section 703.2.1.
 - 8.2.11.3 Flame spread and smoke developed indices in accordance with IBC Section 2603.5.4.
 - 8.2.11.4 Potential heat in accordance with IBC Section 2603.5.3.
 - 8.2.11.5 Vertical and lateral fire propagation in accordance with IBC Section 2603.5.5.
 - 8.2.11.6 Ignition characteristics in accordance with IBC Section 2603.5.7.
- 8.3 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Rmax®.
- 8.4 IBC Section 104.11 (IRC Section R104.11 and IFC Section 104.10¹⁷ 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.

¹⁶ 2015 IBC Section 1404.2

¹⁷ 2018 IFC Section 104.9

- 8.5 **Approved:**¹⁸ Building codes require that the building official shall accept duly authenticated reports¹⁹ or research reports²⁰ from approved agencies and/or approved sources (i.e., licensed RDP) with respect to the quality and manner of use of new products, materials, designs, services, assemblies, or methods of construction.
- 8.5.1 Acceptance of an approved agency, by a building official, is performed by verifying that the agency is accredited by a recognized accreditation body of the International Accreditation Forum (IAF).
- 8.5.2 Acceptance of a licensed RDP, by a building official, is performed by verifying that the RDP and/or their business entity is listed by the licensing board of the relevant jurisdiction.
- 8.5.3 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, as denial without written reason deprives a protected right to free and fair competition in the marketplace.
- 8.6 DrJ is an engineering company, employs RDPs and is an ISO/IEC 17065 ANAB-Accredited Product Certification Body – Accreditation #1131.
- 8.7 Through ANAB accreditation and the IAF Multilateral Agreements, this TER can be used to obtain product approval in any jurisdiction or country that has IAF MLA Members & Signatories to meet the Purpose of the MLA – “*certified once, accepted everywhere.*” IAF specifically says, “*Once an accreditation body is a signatory of the IAF MLA, it is required to recognise certificates and validation and verification statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA, with the appropriate scope.*”²¹

9 Conditions of Use

- 9.1 Material properties shall not fall outside the boundaries defined in Section 3.
- 9.2 As defined in Section 3, 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.
- 9.3 As listed herein, Rmax® Thermasheath®, Rmax® TSX-8500, Rmax® TSX-8510, Rmax® ECOMAXci® FR and Rmax® ECOMAXci® FR WHITE are subject to the following conditions:
- 9.3.1 Installation shall comply with this TER and the manufacturer installation instructions. In the event of a conflict between this TER and the manufacturer installation instructions, the more restrictive shall govern.
- 9.3.2 These products shall not be used as a structural nailing base for claddings.
- 9.3.3 Exterior wall coverings capable of resisting the full design wind pressure shall be installed over these products.
- 9.3.4 Walls shall be fully braced with other materials in accordance with IBC Section 2308.6.4 or IRC Section R602.10.
- 9.3.5 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.
- 9.3.6 Thermasheath® must be protected from the interior of the building by a thermal barrier in accordance with IBC Section 2603.4 and IRC Section R316.4, except as allowed in Section 5.6.2.
- 9.3.7 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 IBC Section R316.5.13, subject to the conditions in Section 5.6.2.

¹⁸ 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.

¹⁹ <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1707.1>

²⁰ <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1703.4.2>

²¹ <https://iaf.nu/en/about-iaf-mla/#:~:text=required%20to%20recognise>

- 9.3.8 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.
- 9.3.8.1 When these products are not installed as a WRB, a separate WRB shall be installed in accordance with IBC Section 1403.2²² and IRC Section R703.2.
- 9.3.9 Use of these products shall be in accordance with the vapor barrier requirements of IBC Section 1404.3²³ and IRC Section R702.7.
- 9.3.10 In areas where the probability of termite infestation is “very heavy” as indicated in IBC Section 2603.8 and IRC Figure R318.4,²⁴ 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 inches.
- 9.3.10.1 Exceptions:
- 9.3.10.1.1 Buildings where the structural members of the walls, floors, ceilings, and roofs are entirely of non-combustible materials or are pressure preservative treated wood.
- 9.3.10.1.2 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.
- 9.3.10.1.3 On the interior side of basement walls.
- 9.4 These products are not to be used as a structural nailing base for claddings.
- 9.5 Use of the insulation boards to resist structural loads is outside the scope of this TER. Walls shall be braced by other materials in accordance with the applicable code, and the exterior wall covering shall be capable of resisting the full design wind pressure.
- 9.6 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:
- 9.6.1 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.
- 9.6.2 This TER and the installation instructions shall be submitted at the time of permit application.
- 9.6.3 These innovative products have an internal quality control program and a third-party quality assurance program.
- 9.6.4 At a minimum, these innovative products shall be installed per Section 6 of this TER.
- 9.6.5 The review of this TER, by the AHJ, shall be in compliance with IBC Section 104 and IBC Section 105.4.
- 9.6.6 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.
- 9.6.7 The application of these innovative products in the context of this TER are 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.
- 9.7 The approval of this TER by the AHJ shall comply with IBC Section 1707.1, where legislation states in pertinent part, “*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 Section 104.11”*, all of IBC Section 104, and IBC Section 105.4.

²² 2015 IBC Section 1404.2

²³ 2015 IBC Section 1405.3

²⁴ 2018 IRC Figure R301.2(7)



- 9.8 Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed and/or by the building designer (i.e., owner or RDP).
- 9.9 The actual design, suitability, and use of this TER, for any particular building, is the responsibility of the owner or the owner's authorized agent.

10 Identification

- 10.1 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, TER number, and other information to confirm code compliance.
- 10.2 Additional technical information can be found at rmax.com.

11 Review Schedule

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

12 Approved for Use Pursuant to US and International Legislation Defined in Appendix A

- 12.1 Rmax® Thermasheath®, Rmax® TSX-8500, Rmax® TSX-8510, Rmax® ECOMAXci® FR and Rmax® ECOMAXci® FR WHITE are included in this TER 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, and whose TER Listing states either that the material, product, or service meets identified standards or has been tested and found suitable for a specified purpose. This TER 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, and
 - 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 Rmax® Thermasheath®, Rmax® TSX-8500, Rmax® TSX-8510, Rmax® ECOMAXci® FR and Rmax® ECOMAXci® FR WHITE 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),²⁵ where providing test reports, engineering analysis and/or other related IP/TS is subject to prison of not more than 10 years²⁶ and/or a \$5,000,000 fine or 3 times the value of²⁷ 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 materials²⁸ that are not specifically provided for in any building code, 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.²⁹
 - 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 has 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 104.11.³⁰

²⁵ <http://www.drjengineering.org/AppendixC> and <https://www.law.cornell.edu/uscode/text/18/part-11/chapter-90>

²⁶ <https://www.law.cornell.edu/uscode/text/18/1832#:~:text=imprisoned%20not%20more%20than%2010%20years>

²⁷ <https://www.law.cornell.edu/uscode/text/18/1832#:~:text=Any%20organization%20that,has%20thereby%20avoided>

²⁸ <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706.2>

²⁹ [IBC 2021, Section 1706.1 Conformance to Standards](#)

³⁰ [IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General](#)

- 1.3 **Approved³¹ 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, which 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.³² The Superintendent of Building roster of approved testing agencies 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 CBI 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 1707.1.³³
- 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 NYC Building Code 2022 (NYCBC) states in pertinent part that an approved agency shall be deemed³⁴ 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 agreement³⁵ (i.e., ANAB, International Accreditation Forum (IAF), etc.).

³¹ See Section 8 for the distilled building code definition of Approved

³² Los Angeles Municipal Code, SEC. 98.0503. TESTING AGENCIES

³³ https://up.codes/viewer/california/ca-building-code-2022/chapter/17/special-inspections-and-tests#1707.1

³⁴ New York City, The Rules of the City of New York, § 101-07 Approved Agencies

³⁵ New York City, The Rules of the City of New York, § 101-07 Approved Agencies

- 1.6 **Approved by Florida:** Statewide approval of products, methods, or systems of construction shall be approved, without further evaluation, by 1) A certification mark or listing of an approved certification agency, 2) A test report from an approved testing laboratory, 3) A product evaluation report based upon testing or comparative or rational analysis, or a combination thereof, from an approved product evaluation entity; 4) A product evaluation report based upon testing or comparative or rational analysis, or a combination thereof, developed and signed and sealed by a professional engineer or architect, licensed in Florida. 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) A certification mark, listing, or label from a commission-approved certification agency indicating that the product complies with the code; 2) A test report from a commission-approved testing laboratory indicating that the product tested complies with the code; 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; 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; 5) A statewide product approval issued by the Florida Building Commission. 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 Building Code 2018 of New Jersey in IBC Section 1707.1 General,³⁶ 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)”.³⁷ Furthermore N.J.A.C 5:23-3.7 states: Municipal approvals of alternative materials, equipment, or methods of construction. **(a) 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. 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 (a) above. 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 (a) above. 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 2 given that the listed entities are no longer in existence and/or do not provide “reports of engineering findings”.

³⁶ https://up.codes/viewer/new_jersey/ibc-2018/chapter/17/special-inspections-and-tests#1707.1

³⁷ <https://www.nj.gov/dca/divisions/codes/codereg/ucc.html>

- 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](#)³⁸ and [Part 3280](#),³⁹ the Department encourages innovation and the use of new technology in manufactured homes. The design and construction of a manufactured home shall conform with the provisions of Part 3282 and Part 3280 where key approval provisions in mandatory language follow: 1) “All construction methods shall be in conformance with accepted engineering practices”; 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.”; and 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.⁴⁰
- 1.10.2 For innovative alternative products, materials, designs, services and/or methods of construction, in the absence of approved rules or other approved standards...the building official shall accept duly authenticated reports (i.e., listing and/or research report) from approved agencies with respect to the quality and manner of use of new materials or assemblies.⁴¹ A building official approved agency is deemed to be approved via certification from an accreditation body that is listed by the International Accreditation Forum⁴² or equivalent.
- 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.⁴³ An approved source is defined as a PE subject to professional engineering laws, where a research and/or a technical evaluation report certified by a PE, shall be approved.
- 1.11 **Approval by International Jurisdictions:** The USMCA and GATT agreements provide for approval of innovative materials, products, designs, services, assemblies and/or methods of construction through the Technical Barriers to Trade agreements and the International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA), where these agreements:
- 1.11.1 Permit participation of conformity assessment bodies located in the territories of other Members (defined as GATT Countries) under conditions no less favourable than those accorded to bodies located within their territory or the territory of any other country,
- 1.11.2 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.
- 1.11.3 State that conformity assessment procedures are not prepared, adopted, or applied with a view to or with the effect of creating unnecessary obstacles to international trade. This means that conformity assessment procedures shall not be more strict or be applied more strictly than is necessary to give the importing Member adequate confidence that products conform to the applicable technical regulations or standards.

³⁸ <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3282/subpart-A/section-3282.14>

³⁹ <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280>

⁴⁰ [IBC 2021, Section 1706 Design Strengths of Materials, 1706.2 New Materials](#). Adopted law pursuant to IBC model code language 1706.2.

⁴¹ [IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General](#). Adopted law pursuant to IBC model code language 1707.1.

⁴² Please see the [ANAB directory](#) for building official approved agencies.

⁴³ [IBC 2021, Section 1706 Design Strengths of Materials, Section 1706.1 Conformance to Standards](#) Adopted law pursuant to IBC model code language 1706.1.



1.11.4 **Approved:** The purpose of the IAF 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, products, designs, services, assemblies and/or methods of construction. Accreditations granted by IAF MLA signatories are recognised worldwide based on their equivalent accreditation programs, therefore reducing costs and adding value to businesses and consumers.



Issue Date: June 23, 2022
Subject to Renewal: July 1, 2024

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

2.2 *Applicable Code Editions*

- 2.2.1 *CBC—16, 19: California Building Code (Title 24, Part 2)*
- 2.2.2 *CRC—16, 19: California Residential Code (Title 24, Part 2.5)*
- 2.2.3 *CEC —16, 19: California Energy Code (Title 24, Part 6)*

3 Conclusions

- 3.1 Rmax® Thermasheath®, Rmax® TSX-8500, Rmax® TSX-8510, Rmax® ECOMAXci® FR and Rmax® ECOMAXci® FR WHITE, described in TER 1309-03, complies with the CBC and CRC and is subject to the conditions of use described in this supplement.
- 3.2 Where there are variations between the IBC and IRC and the CBC and CRC applicable to this TER, they are listed here:
 - 3.2.1 CEC, Title 24, Part 6 replaces IRC Section N1102.
 - 3.2.2 CEC, Title 24, Part 6 replaces IECC Sections C402 and C402.5.1

4 Conditions of Use

- 4.1 Rmax® Thermasheath®, Rmax® TSX-8500, Rmax® TSX-8510, Rmax® ECOMAXci® FR and Rmax® ECOMAXci® FR WHITE, described in TER 1309-03, must comply with all of the following conditions:
 - 4.1.1 All applicable sections in TER 1309-03
- 4.2 The design, installation, and inspections are in accordance with additional requirements of the CBC and CRC, as applicable.



Issue Date: June 23, 2022
Subject to Renewal: July 1, 2024

FBC 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 Technical Evaluation Report (TER) supplement is to show Rmax® Thermasheath®, Rmax® TSX-8500, Rmax® TSX-8510, Rmax® ECOMAXci® FR and Rmax® ECOMAXci® FR WHITE, recognized in TER 1309-03, has also been evaluated for compliance with the codes listed below as adopted by the Florida Building Commission.
- 2.2 *Applicable Code Editions*
 - 2.2.1 *FBC-B—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 TER 1309-03, complies with the FBC-B and FBC-R and is subject to the conditions of use described in this supplement.
- 3.2 Where there are variations between the IBC and IRC and the FBC-B and FBC-R applicable to this TER, they are listed here:
 - 3.2.1 FBC-B Section 104.4 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 TER 1309-03, must comply with all of the following conditions:
 - 4.1.1 All applicable sections in TER 1309-03.
 - 4.1.2 The design, installation, and inspections are in accordance with additional requirements of FBC-B Chapter 16 and Chapter 17, as applicable.



Issue Date: July 21, 2023
Subject to Renewal: July 1, 2024

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 Technical Evaluation Report (TER) supplement is to show Rmax® Thermasheath®, Rmax® TSX-8500, Rmax® TSX-8510, Rmax® ECOMAXci® FR and Rmax® ECOMAXci® FR WHITE, recognized in TER 1309-03, has 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 2 of this TER 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 TER 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 TER 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 TER 1309-03, complies with the Seal and Insulate with Energy Star® program.
- 4.2 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 TER 1309-03, must comply with all of the following conditions:
 - 5.1.1 All applicable sections in TER 1309-03.
 - 5.1.2 Installation shall follow the instructions set forth in Section 5 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 6 of TER 1309-03 and the Insulation Instructions for the Seal and Insulate with ENERGY STAR® program document that follows.



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 3/4" 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 base 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.

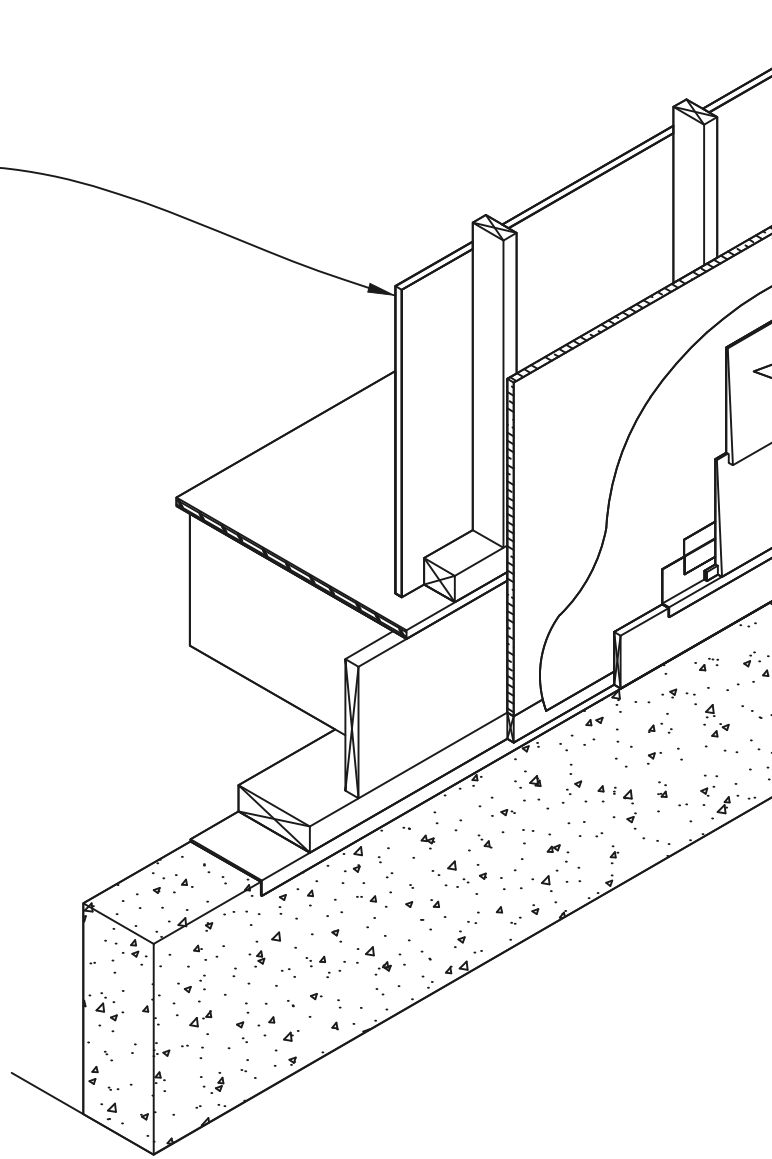
Safety:

- 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.**

15-MINUTE
THERMAL
BARRIER



THERMASHEATH

WRB
(if required)

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



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Email: Rmax@rmax.com

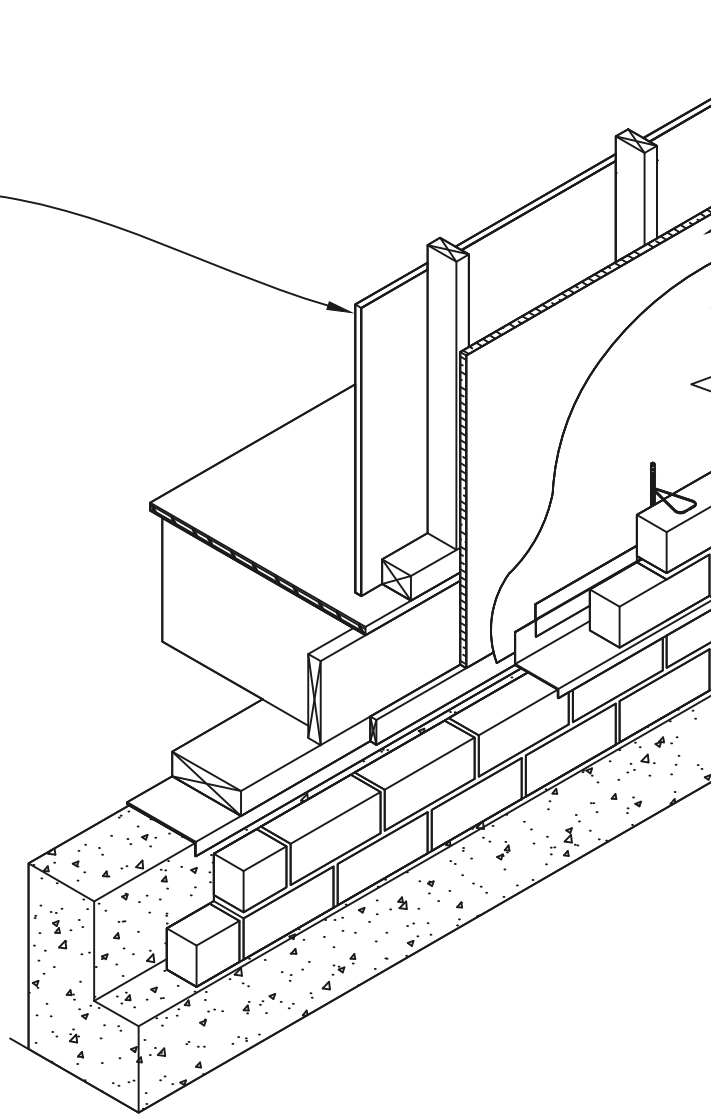
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Reference Data Sheet for Additional Information

Date:
06/28/2023

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Sheet:
01 - A1.00

15-MINUTE
THERMAL
BARRIER



THERMASHEATH

WRB
(if required)

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



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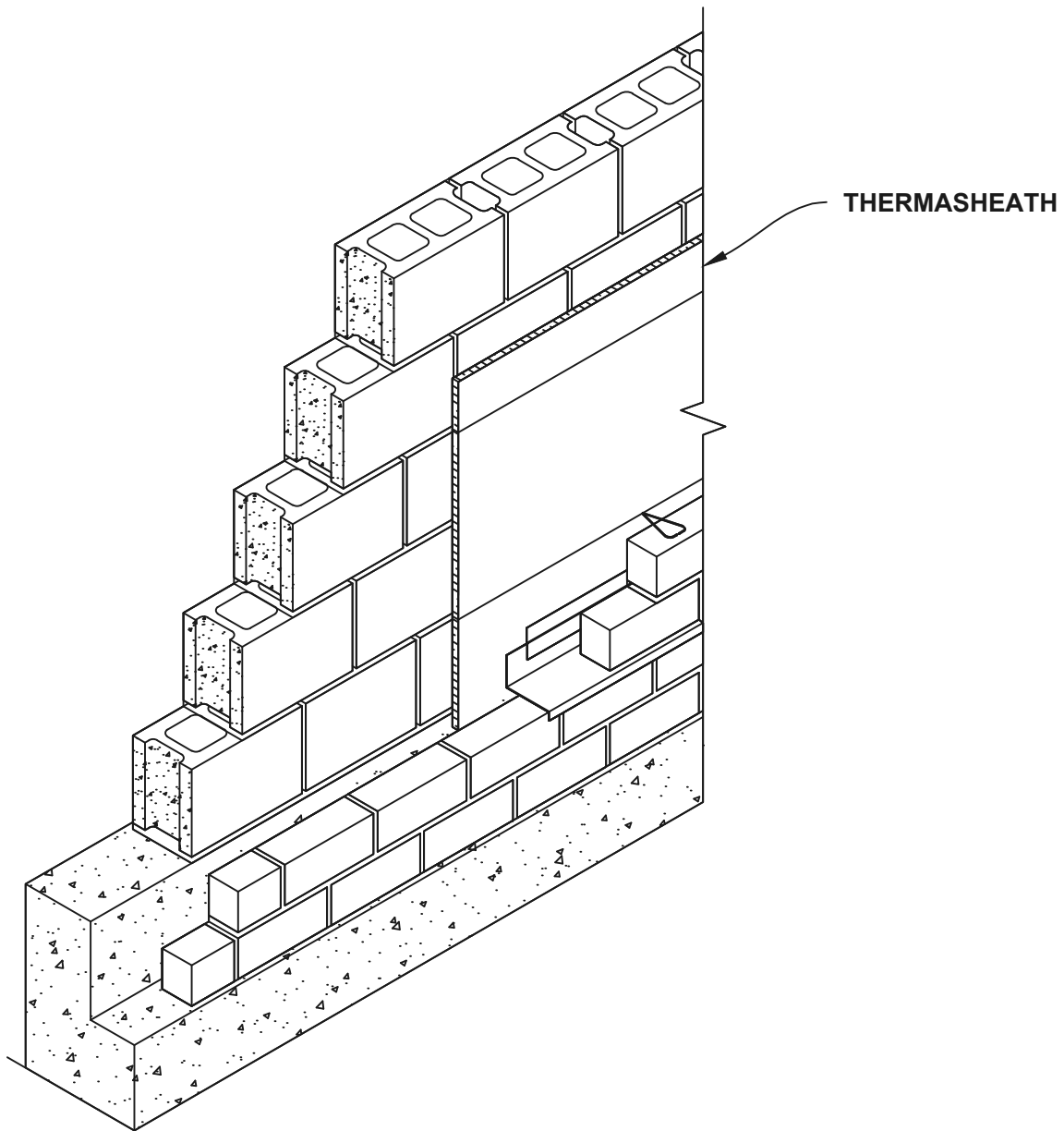
(800) 845-4455 (Eastern)
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(800) 762-9462 (Western)
Email: Rmax@rmax.com

Title: THERMASHEATH®DETAIL
Reference Data Sheet for Additional Information

Date:
06/28/2023

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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



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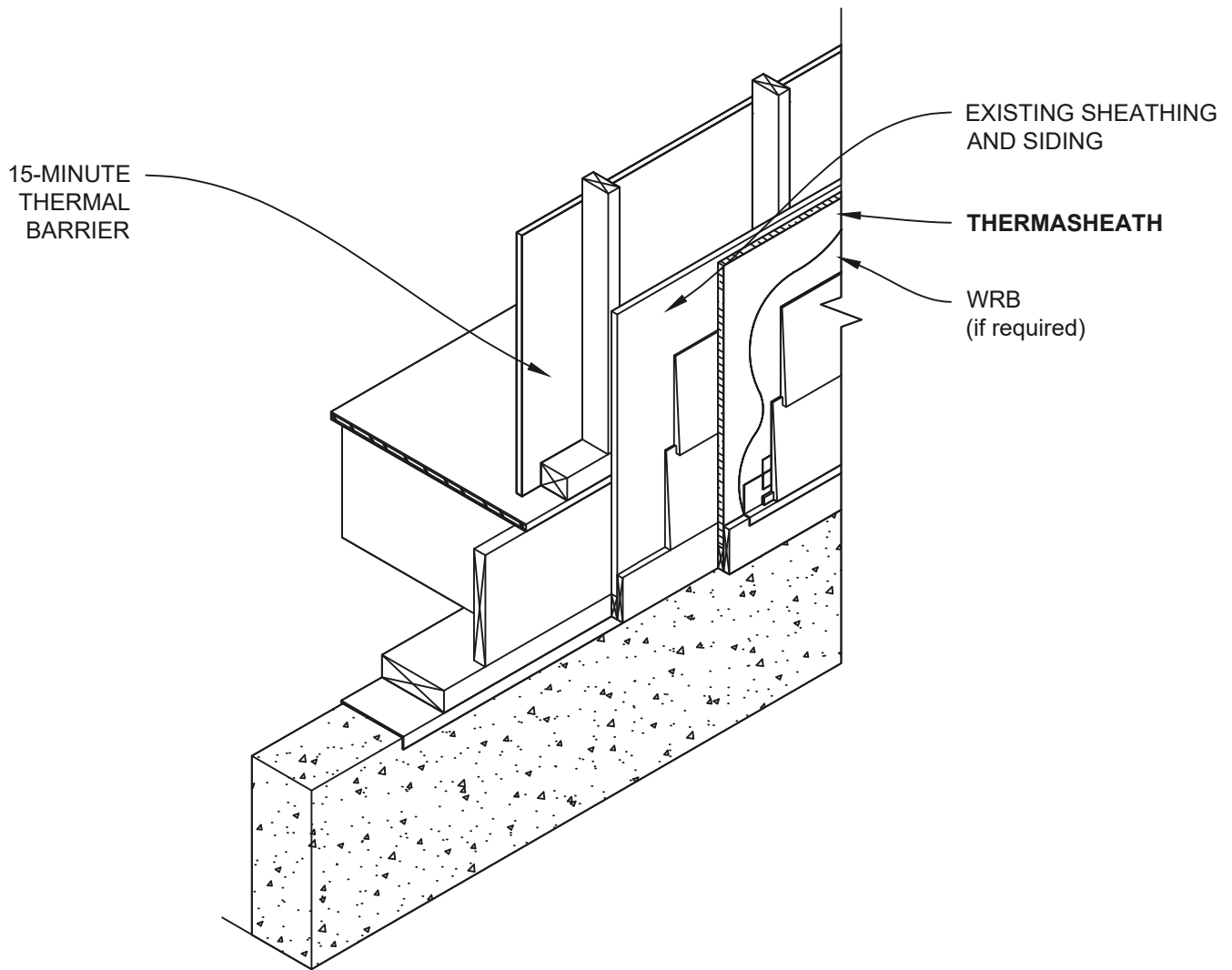
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 Email: Rmax@rmax.com

Title: THERMASHEATH®DETAIL
 Reference Data Sheet for Additional Information

Date:
 06/28/2023

Scale:
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Sheet:
 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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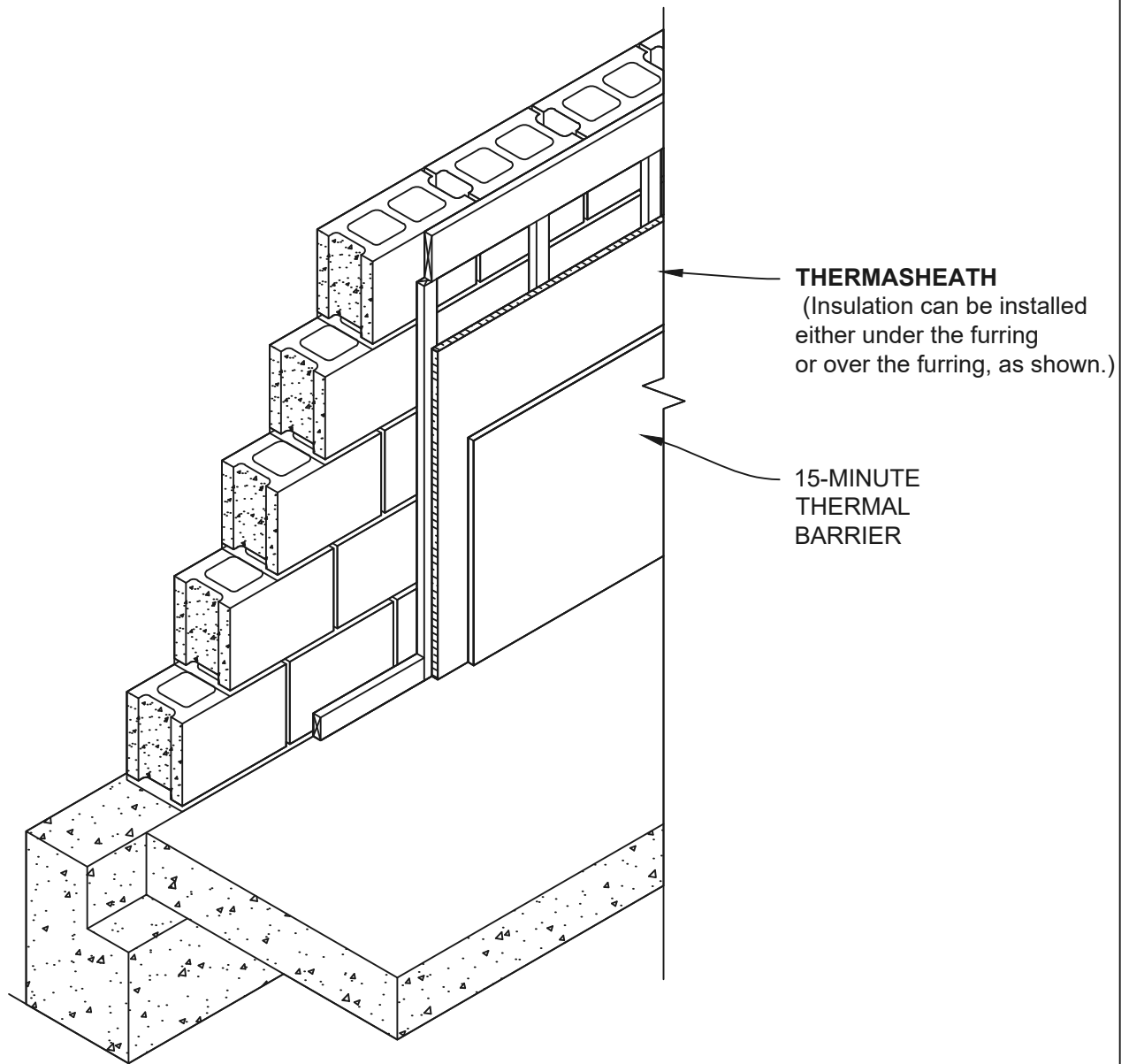
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Title: THERMASHEATH®DETAIL
 Reference Data Sheet for Additional Information

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THERMASHEATH
 (Insulation can be installed either under the furring or over the furring, as shown.)

15-MINUTE THERMAL BARRIER

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.

Masonry Wall Construction | 05

Thermasheath Interior Application | A1.00



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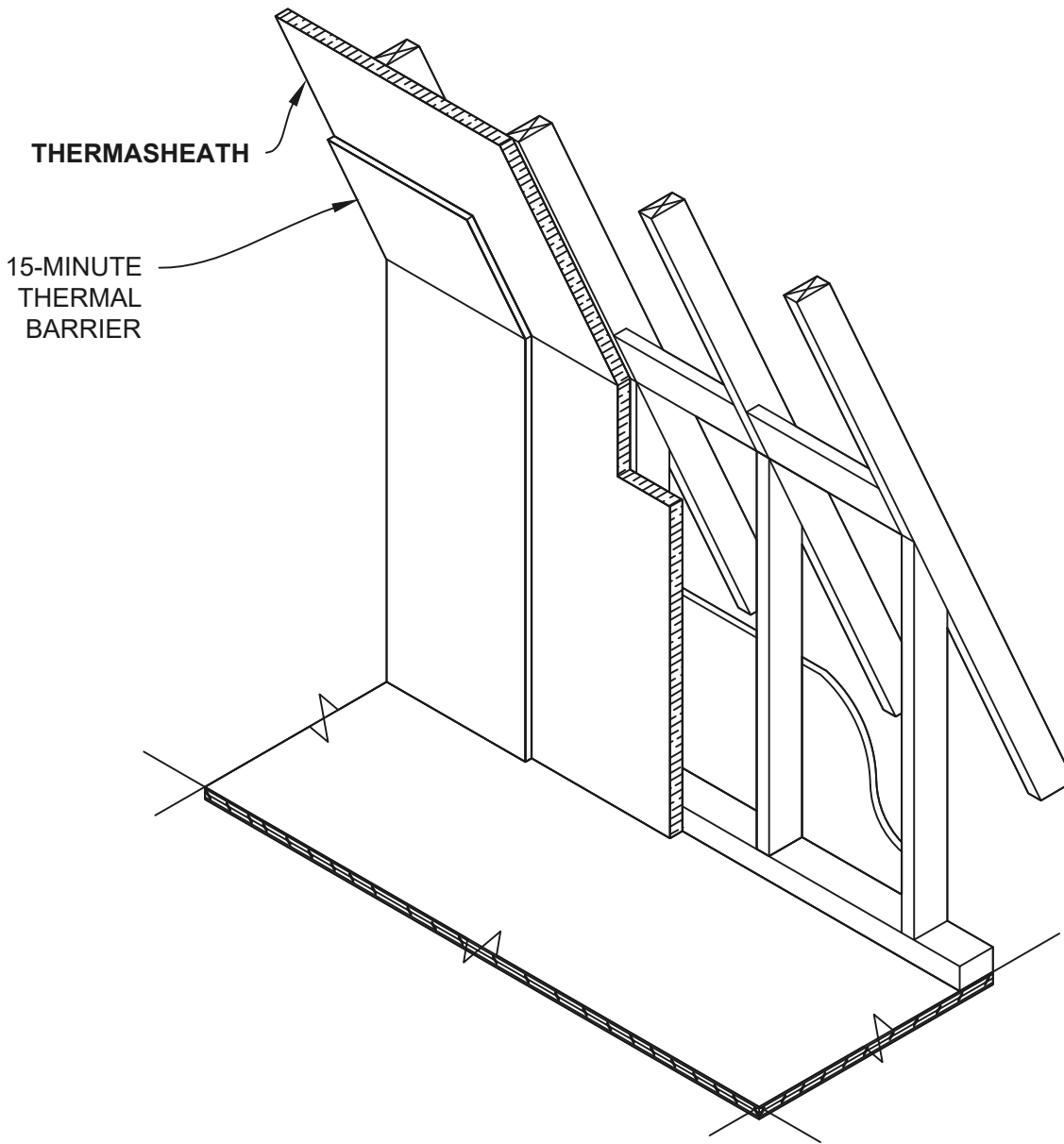
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 Email: Rmax@rmax.com

Title: THERMASHEATH®DETAIL
 Reference Data Sheet for Additional Information

Date:
 06/28/2023

Scale:
 Not To Scale

Sheet:
 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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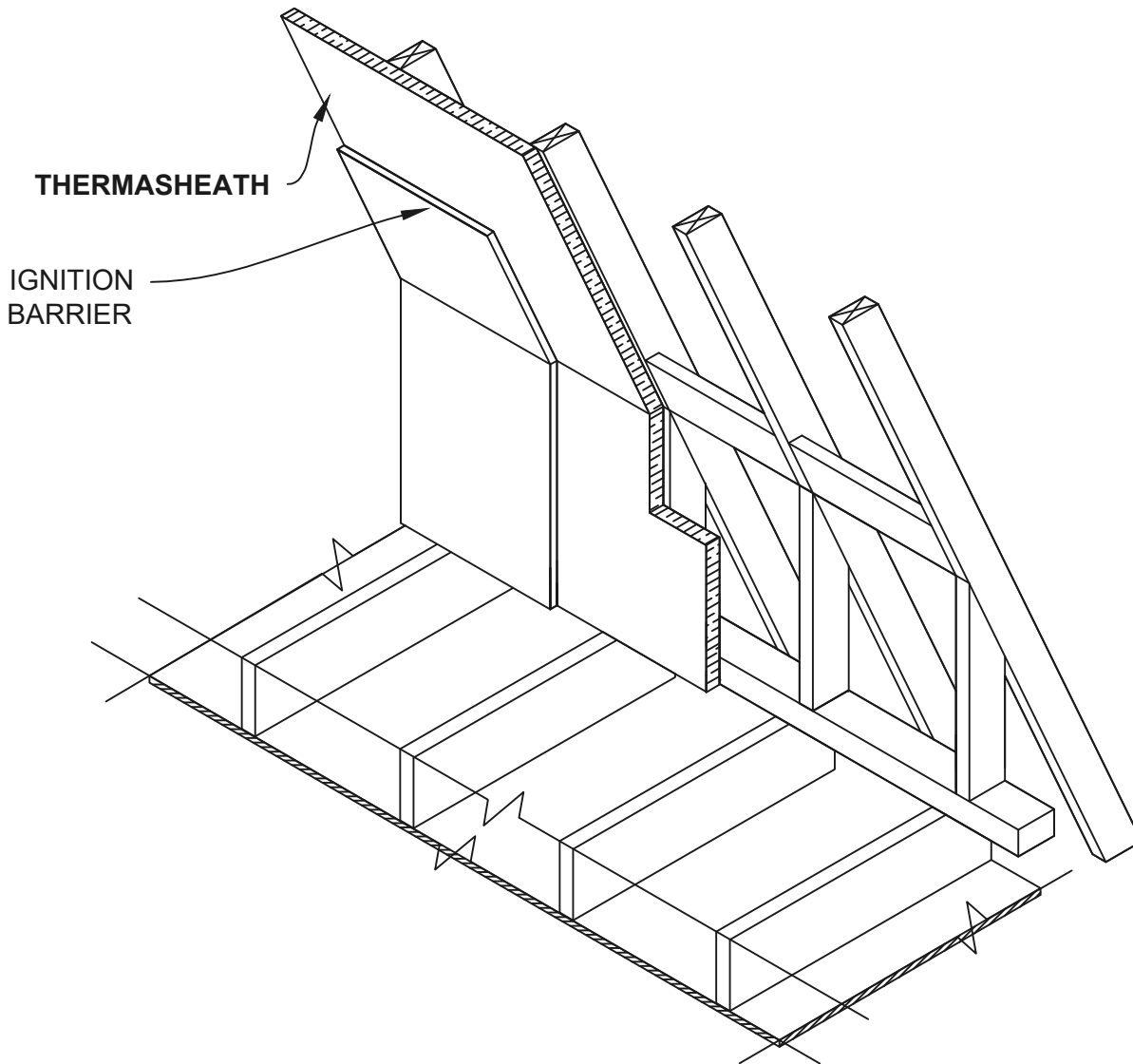
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Notes:

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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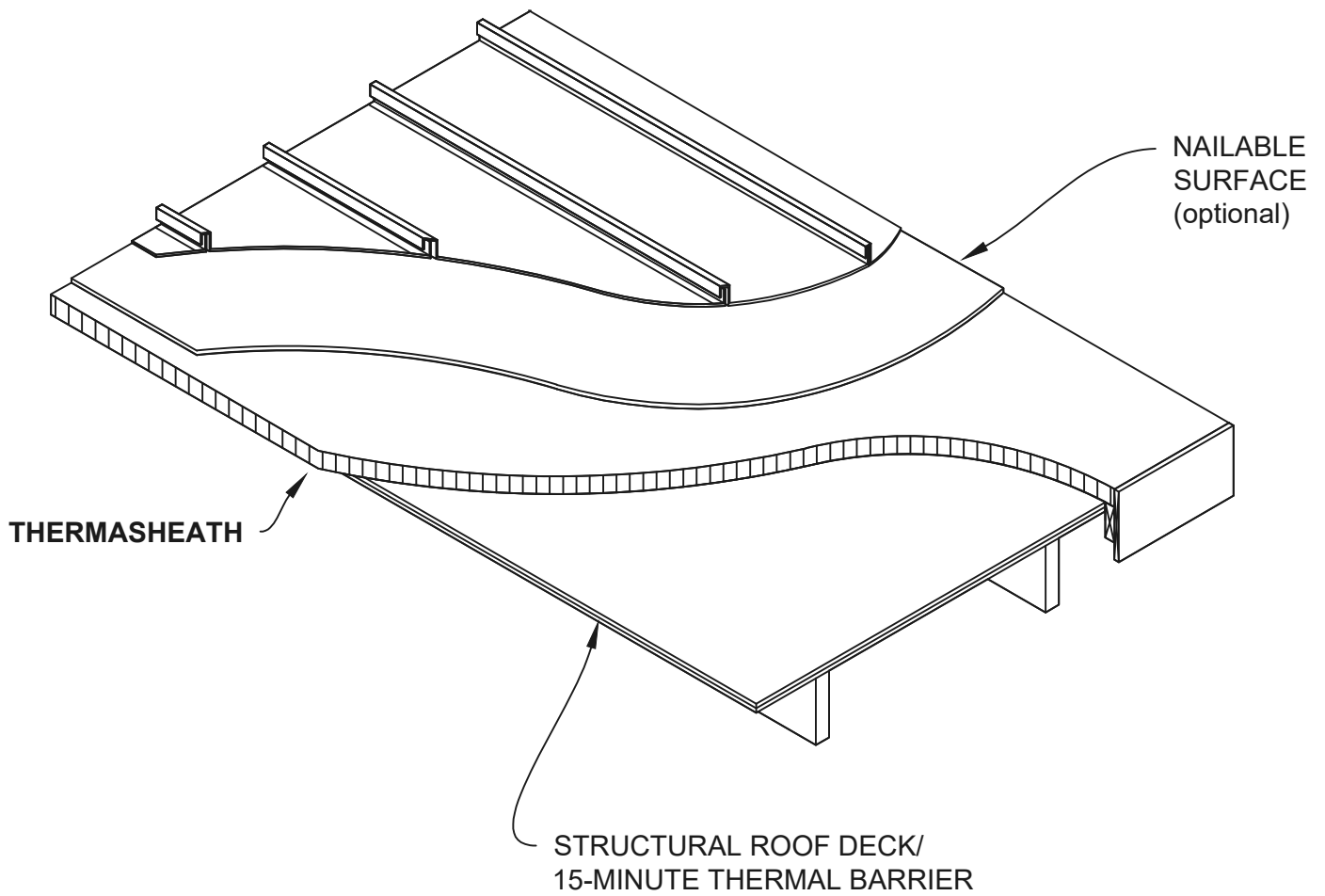
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Standing Seam Metal Roof Construction | 08
Thermasheath Exterior Application | A1.00



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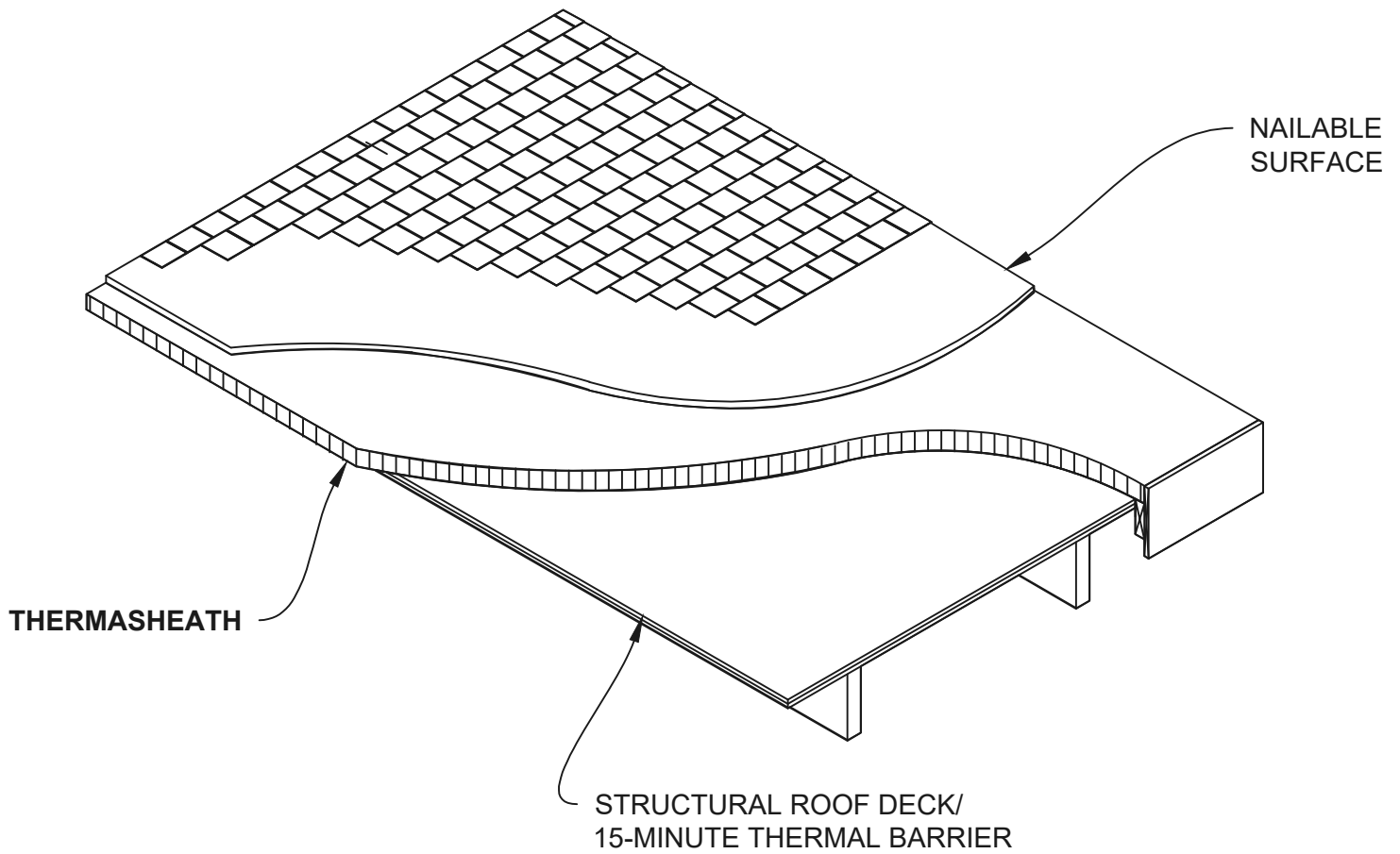
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- Notes:
1. Roof cover shown is asphalt shingles. Other covers - wood shingles and concrete or clay tiles - are also acceptable. Consult roof cover manufacturer for above deck roof ventilation requirements.

Shingle Roof Construction | 09

THERMASHEATH Exterior Application | A1.00



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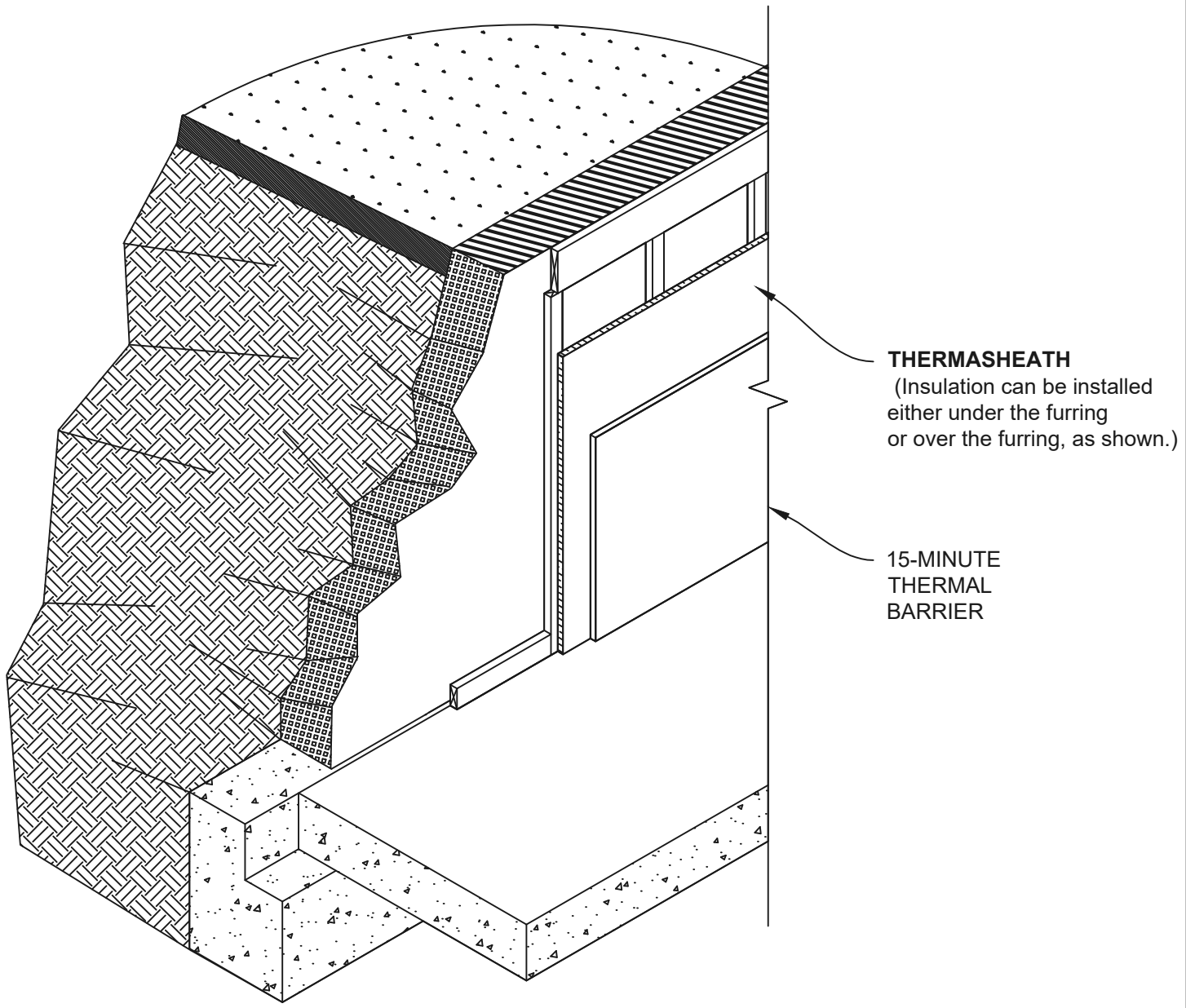
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THERMASHEATH
 (Insulation can be installed either under the furring or over the furring, as shown.)

15-MINUTE THERMAL BARRIER

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

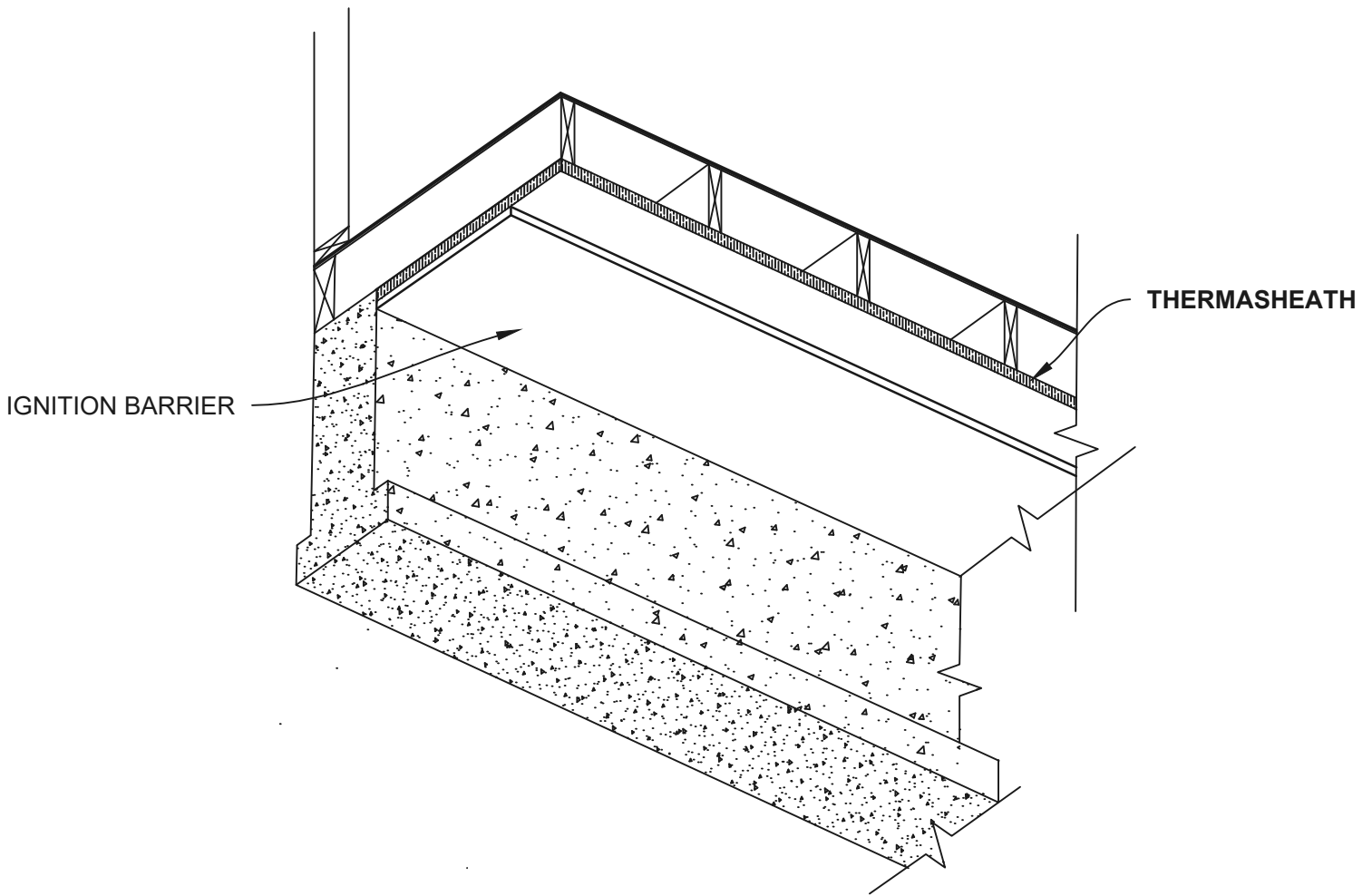


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Notes:

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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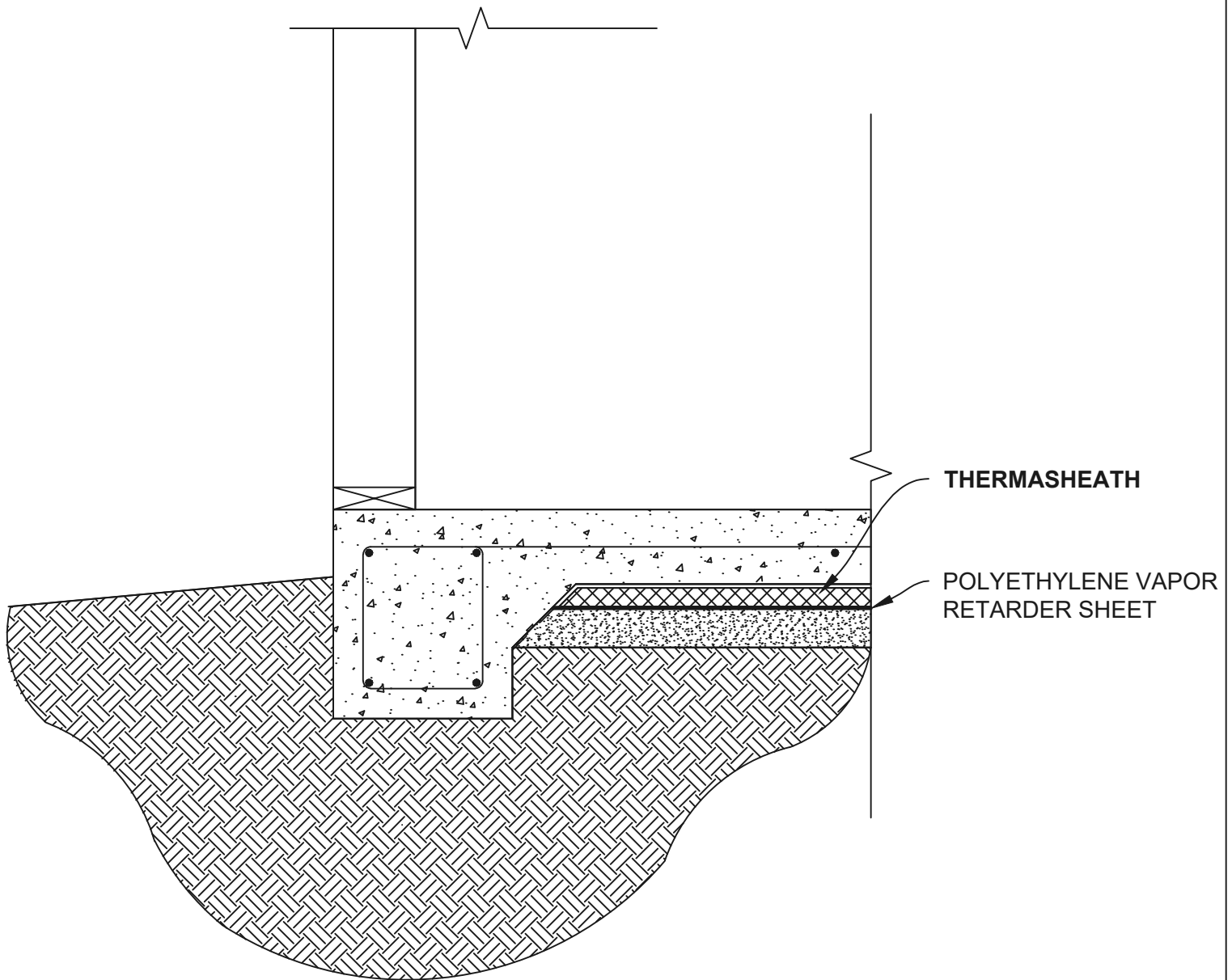
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Notes:

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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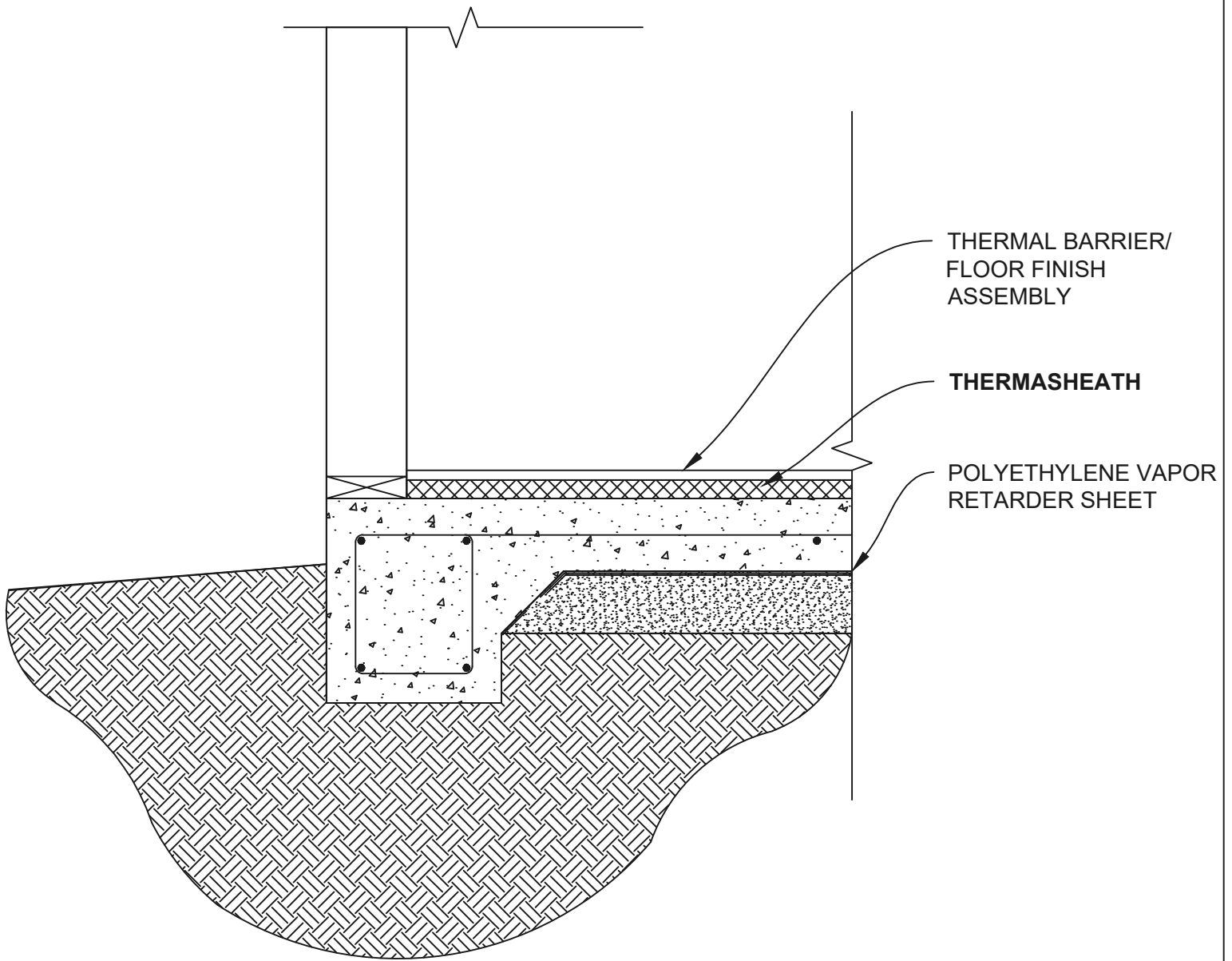
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THERMAL BARRIER/
FLOOR FINISH
ASSEMBLY

THERMASHEATH

POLYETHYLENE VAPOR
RETARDER SHEET

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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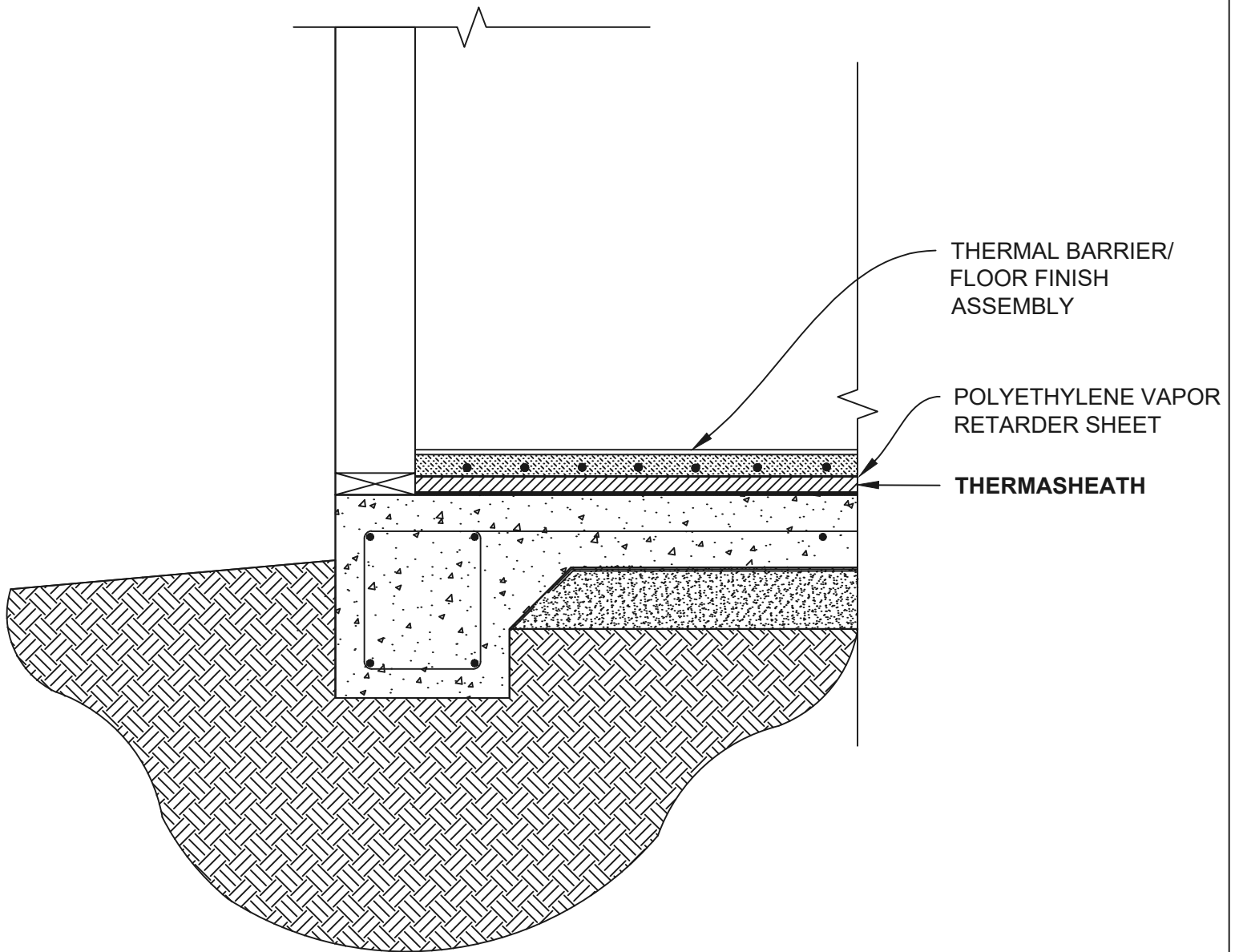
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Notes:

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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