

Technical Evaluation Report™

TER 1207-01

Rmax® Thermasheath®-SI and Thermasheath®

Rmax®

Products:

Thermasheath®-SI and Thermasheath®

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DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

SECTION: 06 12 00 - Structural Panels

SECTION: 06 12 19 - Shear Wall Panels

SECTION: 06 16 00 - Sheathing

SECTION: 06 16 13 - Insulated Sheathing

DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION

SECTION: 07 21 00 - Thermal Insulation

SECTION: 07 21 13 - Foam Board Insulation

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

SECTION: 07 27 00 - Air Barriers

SECTION: 07 27 23 - Board Product Air Barriers

1 Products Evaluated^{1,2}

1.1 Thermasheath®-SI and Thermasheath®

2 Applicable Codes and Standards³

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)⁴*

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

² This TER is a code defined research report provided by an approved source (see IBC Section 1703.4.2) and an approved agency (see IBC Section 1703.1). Given that this TER is for new materials, as defined in IBC Section 1702, for which there are no approved rules or standards, IBC Section 1707.1 states that, "In the absence of approved rules or other approved standards, the building official shall accept duly authenticated reports (i.e. research 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". A professional engineer is approved as an approved source when that professional engineer is properly licensed to transact engineering commerce.

³ Unless otherwise noted, all references in this TER are from the 2021 version of the codes and the standards referenced therein. This material, design, or method of construction also complies with the 2000-2018 versions of the referenced codes and the standards referenced therein.

⁴ All references to the CBC and CRC are the same as the 2018 IBC and 2018 IRC unless otherwise noted in the California Supplement

- 2.1.5 *CRC—16, 19: California Residential Code (Title 24, Part 2.5)⁴*
- 2.1.6 *CEC —16, 19: California Energy Code (Title 24, Part 6)⁴*
- 2.1.7 *FBC-B—17, 20: Florida Building Code – Building⁵*
- 2.1.8 *FBC-R—17, 20: Florida Building Code – Residential⁵*
- 2.2 *Standards and Referenced Documents*
 - 2.2.1 *AATCC Test Method 127: Water Resistance: Hydrostatic Pressure Test*
 - 2.2.2 *ANSI/AWC NDS: National Design Specification (NDS) for Wood Construction*
 - 2.2.3 *ANSI/AWC SDPWS: Special Design Provisions for Wind and Seismic*
 - 2.2.4 *ASCE/SEI 7: Minimum Design Loads and Associated Criteria for Buildings and Other Structures*
 - 2.2.5 *ASTM C209: Standard Test Methods for Cellulosic Fiber Insulating Board*
 - 2.2.6 *ASTM C272: Standard Test Method for Water Absorption of Core Materials for Sandwich Constructions*
 - 2.2.7 *ASTM C518: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus*
 - 2.2.8 *ASTM C1289: Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board*
 - 2.2.9 *ASTM D1037: Standard Test Methods for Evaluation Properties of Wood-Base Fiber and Particle Panel Materials*
 - 2.2.10 *ASTM D7989: Standard Practice for Demonstrating Equivalent In-Plane Lateral Seismic Performance to Wood-Frame Shear Walls Sheathed with Wood Structural Panels*
 - 2.2.11 *ASTM E72: Standard Test Methods for Conducting Strength Tests of Panels for Building Construction*
 - 2.2.12 *ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials*
 - 2.2.13 *ASTM E96: Standard Test Methods for Water Vapor Transmission of Materials*
 - 2.2.14 *ASTM E119: Standard Test Methods for Fire Tests of Building Construction and Materials*
 - 2.2.15 *ASTM E283: Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specific Pressure Differences Across the Specimen*
 - 2.2.16 *ASTM E330: Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference*
 - 2.2.17 *ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference*
 - 2.2.18 *ASTM E564: Standard Practice for Static Load Test for Shear Resistance of Framed Walls for Buildings*
 - 2.2.19 *ASTM E2126: Standard Test Methods for Cyclic (Reversed) Load Test for Shear Resistance of Vertical Elements of the Lateral Force Resisting Systems for Buildings*
 - 2.2.20 *ASTM E2178: Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials*
 - 2.2.21 *NFPA 286: Standard Methods of Fire Test for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*
 - 2.2.22 *UL 263: Standard for Fire Test of Building Construction and Materials*

⁵ All references to the FBC-B and FBC-R are the same as the 2018 IBC and 2018 IRC unless otherwise noted in the Florida Supplement.

3 Performance Evaluation

3.1 Testing and related engineering evaluations are defined as intellectual property and/or trade secrets.

3.2 Thermasheath®-SI was evaluated to determine:

3.2.1 Structural performance under lateral load conditions (wind and seismic) for use as an alternative to the IRC Intermittent Wall Bracing provisions of [IRC Section R602.10](#), method WSP (wood structural panel), and the IRC Continuous Wall Bracing provisions of [IRC Section R602.10.4](#), methods CS-WSP (Continuous Sheathed Wood Structural Panel) and CS-PF (Continuous Sheathed Portal Frame).

3.2.2 Structural performance under lateral load conditions for use as an alternative to the IRC simplified bracing provisions of [IRC Section R602.12](#).

3.2.3 Structural performance under lateral load conditions for use as an alternative to the IBC Conventional Wall Bracing provisions, [IBC Section 2308.6](#), WSP Wood Structural Panel (Method 3), for Type V construction.

3.2.4 Structural performance under lateral load conditions for wind loading for use with the IBC performance-based provisions, [IBC Section 2211.1](#) for light-frame steel wall assemblies.

3.2.5 Structural performance under lateral load conditions for both wind and seismic loading for use with the IBC performance-based provisions, [IBC Section 2306.1](#) and [IBC Section 2306.3](#) for light-frame wood wall assemblies.

3.2.5.1 Table 7 provides seismic design coefficients (SDC) that conform to the requirements in ASCE 7 Section 12.2.1 and Table 12.2-1 for design of wall assemblies in buildings that require seismic design in accordance with ASCE 7 (i.e., all Seismic Design Categories).

3.2.5.2 The basis for equivalency testing is outlined in Section 12.2.1.1 of ASCE 7:

Alternative Structural Systems. Use of seismic force-resisting systems not contains in Table 12.2-1 shall be permitted contingent on submittal to and approved by the Authority Having Jurisdiction and independent structural design review of an accompanying set of design criteria and substantiating analytical and test data. The design criteria shall specify any limitations on system use, including Seismic Design Category and height; required procedures for designing the system's components and connections; required detailing; and the values of the response modification coefficient, R ; overstrength factor, Ω_o ; and deflection amplification factor, C_d .

3.2.5.2.1 The basis of the seismic evaluation performed as part of this TER is based on ASTM D7989 and testing per ASTM E2126 to establish SDCs that conform to the requirements of ASCE 7 Section 12.2.1.1.

3.2.6 Resistance to uplift loads for wall assemblies used in light-frame steel and wood construction in accordance with [IBC Section 1604.8.1](#), [IBC Section 2304.10.8](#)⁶, [IBC Section 2308.7.5](#), and [IRC Section R602.3.5](#).

3.2.7 Resistance to transverse loads for wall assemblies used in light-frame steel and wood construction in accordance with [IBC Section 1609.1.1](#) and [IRC Section R301.2.1](#).

3.2.8 Structural performance under lateral load conditions for use as an alternative to SDPWS Section 4.3 Wood-Frame Shear Walls.

3.3 Thermasheath®-SI and Thermasheath® were evaluated to determine:

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 N1102.1](#), [IRC Section N1102.2](#) and [IECC Section R402](#).

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

⁶ [2018 IBC Section 2304.10.7](#)

⁷ [2015 IBC Section 1404.2](#)

- 3.3.4 Performance for use as a vapor retarder in accordance with [IBC Section 202](#), [IBC Section 1404.3](#),⁸ [IRC Section R202](#) and [IRC Section R702.7](#).
- 3.3.5 Performance for use as an air barrier material in accordance with [IRC Section N1102.4](#) and [IECC Section R402](#).
- 3.3.6 Performance for use as a draftstop in accordance with [IBC Section 708.4.2](#),⁹ [IBC Section 718.3](#), [IBC Section 718.4](#) and [IRC Section R302.12](#).
- 3.3.7 Performance for use in buildings of Type V construction in accordance with [IBC Section 2603](#) and [IRC Section R316](#).
 - 3.3.7.1 Surface burning characteristics in accordance with [IBC Section 2603.3](#) and [IRC Section R316.3](#).
 - 3.3.7.2 Special approval for use without a thermal barrier or ignition barrier in accordance with [IBC Section 2603.4.1.6](#), [IRC Section R316.5.3](#) and [IRC Section R316.5.4](#).
- 3.3.8 Performance for use in a fire resistance rated assembly in accordance with [IBC Section 703.2.1](#).
- 3.4 Thermasheath® was evaluated to determine its performance for use as non-structural in-fill on those portions of a wall assembly not otherwise designed as part of a braced wall panel or shear wall.
- 3.5 Use of Thermasheath®-SI in a Portal Frame with Hold-Down (PFH) is outside the scope of this TER.
- 3.6 Use of Thermasheath® in applications where the exterior wall covering is unable to resist 100% of the transverse wind load is outside the scope of this TER.
- 3.7 Performance of Thermasheath®-SI used in light-frame steel construction to resist seismic loading is outside the scope of this TER.
- 3.8 Engineering evaluations are conducted with DrJ's ANAB [accredited ICS code scope](#), which are also its areas of professional engineering competence.
- 3.9 Any regulation specific issues not addressed in this section are outside the scope of this TER.

4 Product Description and Materials

- 4.1 Thermasheath®-SI and Thermasheath® are shown in Figure 1 and Figure 2.

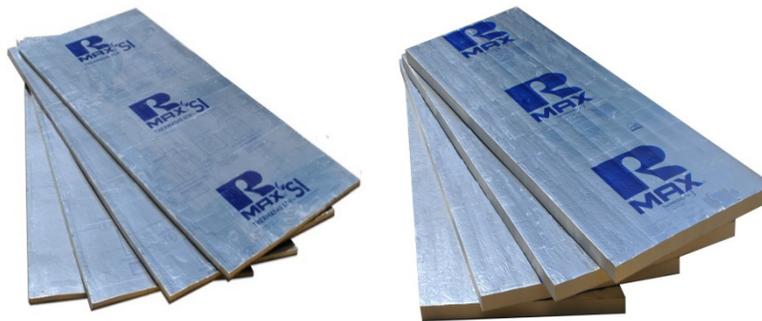


Figure 1. Thermasheath®-SI (left) and Thermasheath® (right)

⁸ [2015 IBC Section 1405.3](#)

⁹ [2015 IBC Section 708.4](#)

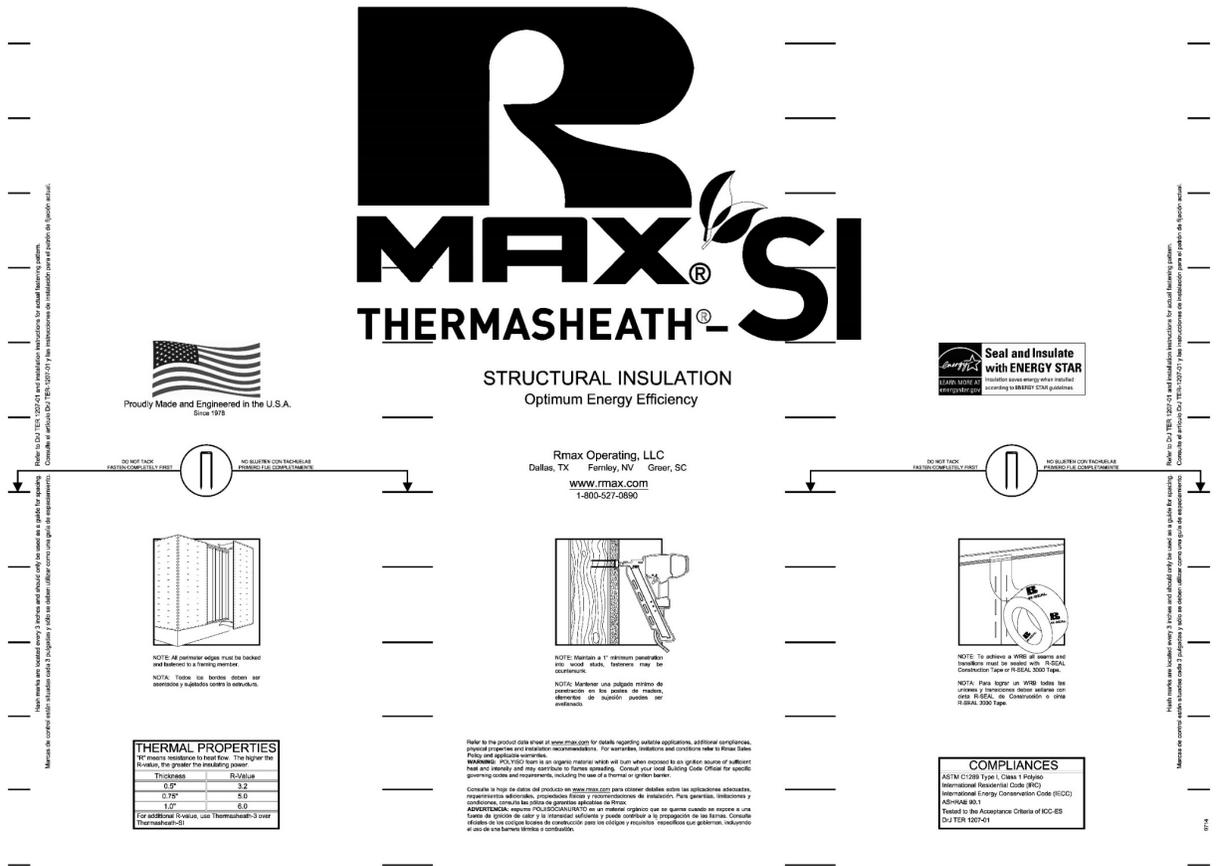


Figure 2. Thermasheath®-SI Instructions as Displayed on Board

- 4.1.1 Thermasheath®-SI is a structural wall sheathing consisting of a fibrous sheathing board layer adhered to a proprietary foam plastic insulating sheathing (FPIS). The proprietary fibrous sheathing board is a laminated board made of fibered, specially treated plies that are pressure-laminated with a water-resistant adhesive. The surface finish consists of a facer on one or both sides. The FPIS layer consists of a proprietary insulation board with a closed-cell rigid polyisocyanurate foam core and kraft reinforced aluminum facers on both sides. Both sides have a reflective surface. The FPIS layer complies with ASTM C1289 Type I, Class 1 and Class 2.
- 4.1.2 Thermasheath® is a non-structural foam plastic insulating sheathing (FPIS) panel consisting of a closed-cell rigid polyisocyanurate (polyiso) foam core bonded to reinforced aluminum facers on each side. Both sides have a reflective surface. Thermasheath® complies with ASTM C1289 Type I, Class 1 and Class 2.
 - 4.1.2.1 For a more comprehensive evaluation of Thermasheath®, see [TER 1309-03](#).
- 4.1.3 **Material Availability:**
 - 4.1.3.1 **Thickness:**
 - 4.1.3.1.1 Thermasheath®-SI: 0.5" (12 mm) through 1.25" (25 mm).
 - 4.1.3.1.2 Thermasheath®: 0.5" (12.7 mm) through 4.5" (114.3 mm).
 - 4.1.3.2 Standard product width: 48" (1219 mm).
 - 4.1.3.3 Standard lengths: 96", 108", and 120" (2438 mm, 2743 mm, and 3048 mm).

5 Applications

5.1 General

- 5.1.1 Thermasheath®-SI and Thermasheath® are used as wall sheathing and continuous insulation in buildings constructed in accordance with the IBC and IRC.
- 5.1.2 Thermasheath®-SI and Thermasheath® contain foam plastics complying with IBC Section 2603 and IRC Section R316.
- 5.1.3 Thermasheath®-SI is used as insulating structural wall sheathing to provide lateral load resistance (wind and seismic) for braced wall panels and shear walls used in wood and light-frame steel construction.
- 5.1.4 Thermasheath®-SI is used as structural wall sheathing to provide resistance to transverse loads for wall assemblies used in wood and light-frame steel construction.
- 5.1.5 Thermasheath®-SI is used as structural wall sheathing to provide resistance to uplift loads for wall assemblies used in wood and light-frame steel construction.
- 5.1.6 Thermasheath® is a non-structural FPIS panel used as thermal insulation within the building envelope, including, but not limited to, attic, crawlspace, wall, roof, ceiling, floor, and foundation assemblies.
- 5.1.7 Thermasheath® is used as insulating sheathing applied as in-fill to portions of walls that are not designed as braced wall panels or shear walls.
- 5.1.8 Thermasheath® is used as second layer of insulating sheathing over Thermasheath®-SI.
- 5.1.9 Thermasheath®-SI and Thermasheath® shall not be used as a nail base for other building products.
- 5.1.10 An approved draftstop material when installed in accordance with Section 5.6.
- 5.1.11 The Environmental Product Declarations (EPD) for Thermasheath®-SI and Thermasheath® are available at polyiso.org.
- 5.1.12 Where the application exceeds the limitations set forth herein, design shall be permitted in accordance with accepted engineering procedures, experience, and technical judgment.

5.2 Structural Applications

5.2.1 General Provisions:

- 5.2.1.1 Except as otherwise described in this TER, Thermasheath®-SI shall be installed in accordance with the applicable building codes listed in Section 2 using the provisions set forth therein for the design and installation of wood structural panels (WSP).
 - 5.2.1.1.1 Thermasheath®-SI is permitted to be designed in accordance with SDPWS for the design of shear walls using the methods set forth therein, including the perforated shear wall methodology, and subject to the SDPWS boundary conditions, except as specifically allowed in this TER.
- 5.2.1.2 Anchorage for in-plane shear shall be provided to transfer the induced shear force into and out of each shear wall.
 - 5.2.1.2.1 For wind design, anchor bolt spacing shall not exceed 6' o.c.
 - 5.2.1.2.2 For seismic design, anchor bolt spacing shall not exceed 4' o.c.
- 5.2.1.3 The maximum aspect ratio for Thermasheath®-SI shall be 4:1 (height:width).
- 5.2.1.4 The minimum full height panel width shall be 24".
- 5.2.1.5 When used in light-frame wood construction, all panel edges shall be blocked with a minimum 2" nominal lumber.
- 5.2.1.6 Thermasheath®-SI on wood studs shall be installed with one of the following:
 - 5.2.1.6.1 Staples shall be a minimum 16 gauge, $7/16$ " crown and penetrate a minimum of 1" into the stud.
 - 5.2.1.6.2 Nails shall be minimum 0.113" x $2\frac{3}{8}$ " and penetrate a minimum of $1\frac{1}{4}$ " into the stud.
- 5.2.1.7 Thermasheath®-SI on steel studs shall be installed with #8 pan head screw with three thread lengths extending beyond the stud.



- 5.2.1.8 Staples must be countersunk beneath the surface of the foam plastic sheathing. Nails and screws may be countersunk beneath the surface of the foam plastic sheathing.
- 5.2.1.9 Installation is permitted for single top plate (advanced framing method) or double top plate applications.
- 5.2.1.10 Where Thermasheath®-SI is installed with ½" gypsum wallboard on the interior side of the wall, the gypsum sheathing shall be applied to the interior side of the wall assembly and fastened with a minimum 5d cooler nails or 1¼" #6 types W or S screws.



5.2.2 Simplified IRC Bracing Provisions:

5.2.2.1 Thermasheath®-SI is permitted to be used in accordance with the IRC simplified bracing method of IRC Section R602.12 as modified by Table 1. All other provisions of the IRC simplified bracing method shall be met.

Table 1. Thermasheath®-SI IRC Simplified Bracing Table, Wood Framing^{1,2,3,4,5,6,7,8}

Structural Sheathing Product	Ultimate Design Wind Speed, V_{ult} (mph)	Story Level	Eave to Ridge Height (ft)	Minimum Number of Bracing Units Required (Long Side)						Minimum Number of Bracing Units Required (Short Side)					
				Length of Short Side (ft)						Length of Long Side (ft)					
				10	20	30	40	50	60	10	20	30	40	50	60
Thermasheath®-SI	115	One Story or Top of Two or Three Stories	10	1	1	2	2	3	3	1	1	2	2	3	3
		First of Two Story or Second of Three Stories		1	2	3	4	4	5	1	2	3	4	4	5
		First of Three Stories		2	3	4	5	6	7	2	3	4	5	6	7
		One Story or Top of Two or Three Stories	15	1	1	3	3	4	4	1	1	3	3	4	4
		First of Two Story or Second of Three Stories		1	2	3	5	5	6	1	2	3	5	5	6
		First of Three Stories		2	3	4	6	7	8	2	3	4	6	7	8
	130	One Story or Top of Two or Three Stories	10	1	2	2	3	3	3	1	2	2	3	3	3
		First of Two Story or Second of Three Stories		2	3	4	4	5	6	2	3	4	4	5	6
		First of Three Stories		2	4	5	6	8	9	2	4	5	6	8	9
		One Story or Top of Two or Three Stories	15	1	3	3	4	4	4	1	3	3	4	4	4
		First of Two Story or Second of Three Stories		2	3	5	5	6	7	2	3	5	5	6	7
		First of Three Stories		2	4	6	7	9	10	2	4	6	7	9	10

SI: 1 in = 25.4 mm

- This simplified bracing table is based on the provisions of IRC Section R602.12. All provisions therein shall be observed, except that this table shall replace IRC Table R602.12.4, and Thermasheath®-SI shall replace the sheathing material.
- Thermasheath®-SI shall be installed on 2x4 or 2x6 studs spaced 16" o.c. and fastened with minimum 1/2" crown staples spaced 3" x 6" (edge:field) per Section 6. Fastener edge distance shall be a minimum of 3/8". Nails with a head diameter and length greater than the 1-3/4" x 0.120" nails are also permissible. Increase the required units by 1 where 7/16" crown staples are used.
- Minimum 1/2" gypsum wallboard attached to the interior side of the wall in accordance with IRC Section R702.3.5 and IRC Table R702.3.5.
- Interpolation shall not be permitted.
- Cripple walls or wood-framed basement walls in a walk-out condition shall be designated as the first story and the stories above shall be re-designated as the second and third stories, respectively, and shall be prohibited in a three-story structure.
- Actual lengths of the sides of the circumscribed rectangle shall be rounded to the next highest unit of 10 when using this table.
- For Exposure Category C, multiply bracing units by a factor of 1.20 for a one-story building, 1.30 for a two-story building, and 1.40 for a three-story building.
- Maximum stud spacing is 16" o.c.



5.2.3 *Prescriptive IRC Bracing Applications:*

- 5.2.3.1 Thermasheath®-SI may be used on braced wall lines as an equivalent alternative to Method WSP of the IRC, when installed in accordance with [IRC Section R602.10](#) and this TER.
- 5.2.3.2 For wind design, required braced wall panel lengths for Thermasheath®-SI shall be as shown in Table 2 and shall be used in conjunction with [IRC Table R602.10.3\(2\)](#), which provides the required adjustments.
- 5.2.3.3 For seismic design, required braced wall panel lengths for Thermasheath®-SI shall be as shown in Table 3 and shall be used in conjunction with [IRC Table R602.10.3\(4\)](#), which provides the required adjustments.
- 5.2.3.4 Thermasheath®-SI may be used to brace walls of buildings as an alternative to the IRC Continuous Wall Bracing provisions, [IRC Section R602.10.4](#) (CS-WSP), in accordance with the bracing amounts shown in Table 2 of this TER, as adjusted in accordance with [IRC Table R602.10.3\(2\)](#).
- 5.2.3.5 Use of Thermasheath®-SI with Method CS-PF is also permitted, in lieu of WSP specified in accordance with [IRC Section R602.10.6.4](#).
- 5.2.3.6 Where a building, or portion thereof, does not comply with one or more of the bracing requirements within the prescriptive section of the IRC, those portions shall be designed and constructed in accordance with [IRC Section R301.1](#).



Table 2. Required Bracing Lengths for Thermasheath®-SI – Wood Framing, Wind^{1,2,3,4,5,6}

Condition	Braced Wall Line Spacing (ft)	Minimum Total Length (ft) of Braced Wall Panels Required Along Each Braced Wall Line											
		Intermittent Sheathing						Continuous Sheathing					
		Ultimate Design Wind Speed, Vult (mph)											
		< 95	≤ 110	≤ 115	≤ 120	≤ 130	≤ 140	< 95	≤ 110	≤ 115	≤ 120	≤ 130	≤ 140
One Story OR the Top of Two or Three Stories	10	1.3	1.8	1.8	2.2	2.2	2.7	1.3	1.3	1.8	1.8	2.2	2.2
	20	2.2	3.1	3.1	3.6	4.5	4.9	2.2	2.7	3.1	3.1	3.6	4.5
	30	3.6	4.5	4.9	5.3	6.2	7.1	3.1	4.0	4.0	4.5	5.3	6.2
	40	4.5	5.8	6.2	7.1	8.0	9.3	3.6	4.9	5.3	5.8	6.7	8.0
	50	5.3	7.1	8.0	8.5	9.8	11.6	4.5	6.2	6.7	7.1	8.5	9.8
	60	6.2	8.5	9.3	10.2	11.6	13.4	5.3	7.1	8.0	8.5	9.8	11.6
First Story of Two Stories OR Second Story of Three Stories	10	2.7	3.1	3.6	4.0	4.5	5.3	2.2	2.7	3.1	3.1	4.0	4.5
	20	4.5	5.8	6.7	7.1	8.5	9.8	4.0	4.9	5.8	6.2	7.1	8.0
	30	6.2	8.5	9.3	10.2	12.0	13.8	5.3	7.1	8.0	8.5	10.2	11.6
	40	8.5	11.1	12.0	13.4	15.6	17.8	7.1	9.3	10.2	11.1	13.4	15.1
	50	10.2	13.8	14.7	16.0	19.1	21.8	8.9	11.6	12.5	13.8	16.0	18.7
	60	12.0	16.0	17.8	19.1	22.3	25.8	10.2	13.8	15.1	16.5	19.1	22.3
First Story of Three Stories	10	3.6	4.9	5.3	5.8	6.7	7.6	3.1	4.0	4.5	4.9	5.8	6.7
	20	6.7	8.9	9.8	10.2	12.0	14.2	5.8	7.6	8.0	8.9	10.2	12.0
	30	9.3	12.5	13.8	15.1	17.4	20.5	8.0	10.7	11.6	12.9	15.1	17.4
	40	12.0	16.5	17.8	19.6	22.7	26.3	10.2	13.8	15.1	16.5	19.6	22.3
	50	15.1	20.0	21.8	24.0	28.0	32.5	12.9	16.9	18.7	20.5	23.6	27.6
	60	17.8	23.6	25.8	28.5	33.4	38.3	15.1	20.5	22.3	24.0	28.0	32.5

SI: 1 ft = 0.3048 m, 1 mph = 1.61 km/h

1. Thermasheath®-SI shall be installed on 2x4 or 2x6 studs spaced 16" o.c. and fastened with minimum ½" staples spaced 3":6" (edge:field) per Section 6. If 7/16" staples are used, increase length of bracing by a factor of 1.08.
2. Demonstrates equivalency to [IRC Table R602.10.3\(1\)](#). All adjustment factors from [IRC Table R602.10.3\(2\)](#) shall be applied. Except when used with method CS-PF, a minimum of ½" gypsum sheathing shall be applied to the interior side of the wall assembly and fastened with a minimum 5d cooler nails or 1¼" #6 types W or S screws spaced 8" o.c. at panel edges and 8" o.c. in the field of the panels
3. Minimum ½" gypsum wallboard must be installed as part of the wall assembly. Where gypsum wallboard is not applied to the interior side of the wall assembly, bracing lengths shall be multiplied by a factor of 1.8.
4. Where studs are spaced 24" o.c., bracing lengths shall be multiplied by a factor of 1.1.
5. The addition of gypsum wallboard to Thermasheath®-SI wall assemblies provides a benefit greater than the SDPWS additive method for wood structural panels.
6. Bracing lengths are the results of comparative equivalency testing and analysis using both tested and published design values as points of comparison. DrJ relies upon the design values published in the codes and standards listed in Section 2 that are adopted into law and that the manufacturers of those products stand behind. DrJ performs all equivalency analysis based on legally defined design values, the responsibility for which is the manufacturer of those products or the members of the associations that publish those design values.



Table 3. Required Bracing Lengths for Thermasheath®-SI – Wood Framing, Seismic^{1,2,3,4,5,6,7}

Condition	Braced Wall Line Length (ft)	Minimum Total Length (ft) of Braced Wall Panels Required Along Each Braced Wall Line							
		Intermittent Sheathing				Continuous Sheathing			
		Seismic Design Category (SDC)							
		C	D ₀	D ₁	D ₂	C	D ₀	D ₁	D ₂
One Story OR the Top of Two or Three Stories	10	1.5	1.6	1.8	2.2	1.3	1.5	1.5	1.9
	20	2.8	3.2	3.6	4.5	2.4	2.7	3.0	3.8
	30	4.3	4.8	5.3	6.7	3.7	4.1	4.5	5.7
	40	5.7	6.4	7.1	8.9	4.8	5.5	6.1	7.5
	50	7.1	8.0	8.9	11.1	6.1	6.8	7.5	9.4
First Story of Two Stories OR Second Story of Three Stories	10	2.7	3.4	4.0	4.9	2.3	2.8	3.4	4.2
	20	5.3	6.7	8.0	9.7	4.5	5.7	6.8	8.4
	30	8.0	10.1	12.0	14.7	6.8	8.5	10.2	12.5
	40	10.7	13.3	16.0	19.6	9.1	11.4	13.6	16.6
	50	13.3	16.7	20.0	24.5	11.4	14.3	17.0	20.8
First Story of Three Stories	10	4.0	4.7	5.3	NP	3.4	4.0	4.5	NP
	20	8.0	9.3	10.7	NP	6.8	8.0	9.1	NP
	30	12.0	14.0	16.0	NP	10.2	12.0	13.6	NP
	40	16.0	18.7	21.4	NP	13.6	15.9	18.1	NP
	50	20.0	23.4	26.7	NP	17.0	19.8	22.7	NP

SI: 1 ft = 0.3048 m

- Thermasheath®-SI shall be installed on 2x4 or 2x6 studs spaced 16" o.c. and fastened with minimum ½" staples spaced 3":6" (edge:field) per Section 6. If 7/16" staples are used, increase length of bracing by a factor of 1.08.
- Demonstrates equivalency to IRC Table R602.10.3(3). All adjustment factors from IRC Table R602.10.3(4) shall be applied. Except when used with method CS-PF, a minimum of ½" gypsum sheathing shall be applied to the interior side of the wall assembly and fastened with a minimum 5d cooler nails or 1¼" #6 types W or S screws spaced 8" o.c. at panel edges and 8" o.c. in the field of the panels.
- Tabulated bracing lengths are based on the following:
 - Soil Class D
 - Wall height = 10'
 - 10 psf floor dead load
 - 15 psf roof/ceiling dead load
 - Braced wall line spacing ≤ 25'
- Linear interpolation is permitted.
- Minimum ½" gypsum wallboard must be installed as part of the wall assembly. Where gypsum wallboard is not applied to the interior side of the wall assembly, bracing lengths shall be multiplied by a factor of 1.8.
- The addition of gypsum wallboard to Thermasheath®-SI wall assemblies provides a benefit greater than the SDPWS additive method for wood structural panels.
- Bracing lengths are the results of comparative equivalency testing and analysis using both tested and published design values as points of comparison. DrJ relies upon the design values published in the codes and standards listed in Section 2 that are adopted into law and that the manufacturers of those products stand behind. DrJ performs all equivalency analysis based on legally defined design values, the responsibility for which is the manufacturer of those products or the members of the associations that publish those design values.

5.2.4 Thermasheath®-SI CS-PF:

- 5.2.4.1 A “Thermasheath®-SI CS-PF” was tested and evaluated for equivalency to the IRC Method CS-PF in accordance with [IRC Section R602.10.6.4](#) and [IRC Table R602.10.5](#).
- 5.2.4.2 [IRC Table R602.10.5](#) establishes the contributing length bracing of the CS-PF as equivalent to 1.5 times its actual length and that it contributes this length of bracing to that required by method CS-WSP.
- 5.2.4.3 The capacity of the Thermasheath®-SI CS-PF exceeds the capacity of the IRC Method CS-WSP and is therefore permitted to be substituted for an equivalent length of bracing.
- 5.2.4.4 The Thermasheath®-SI CS-PF is shown in Figure 3 through Figure 6:

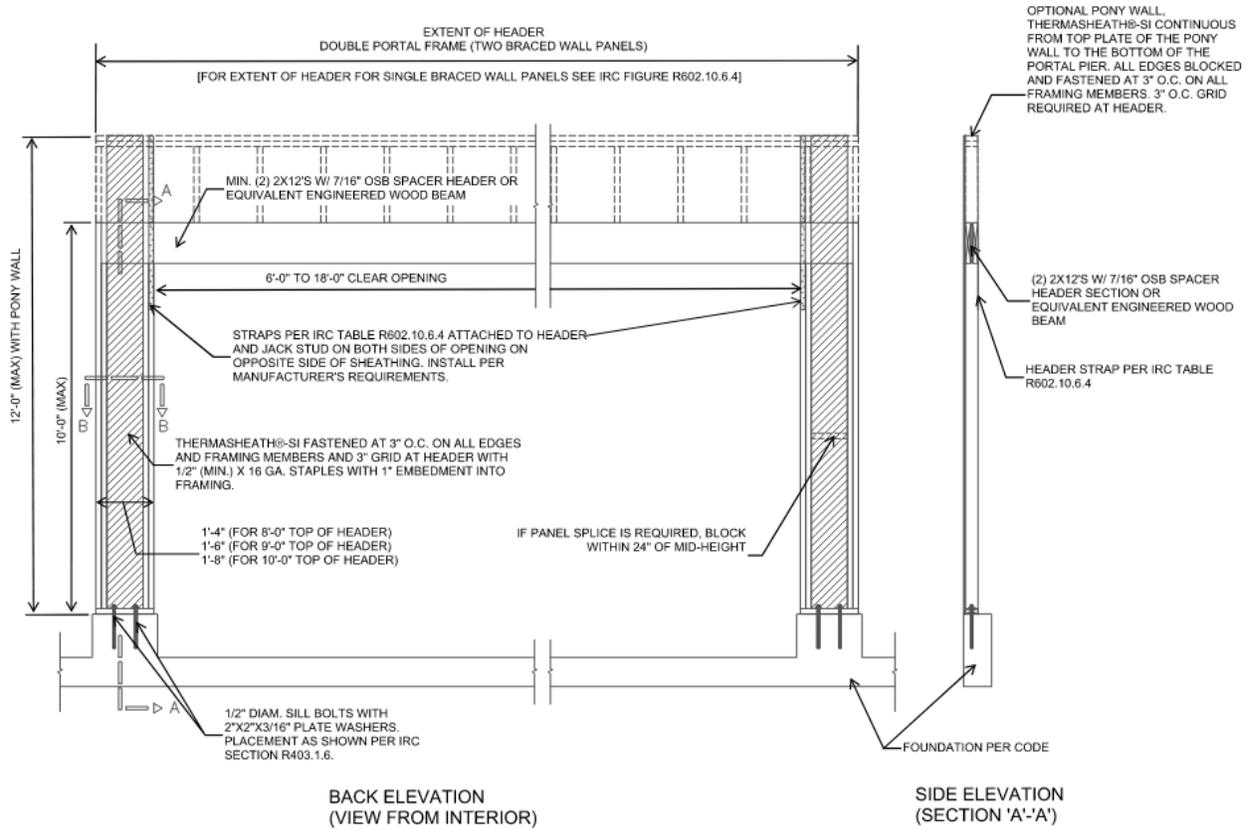


Figure 3. Thermasheath®-SI CS-PF Back Elevation

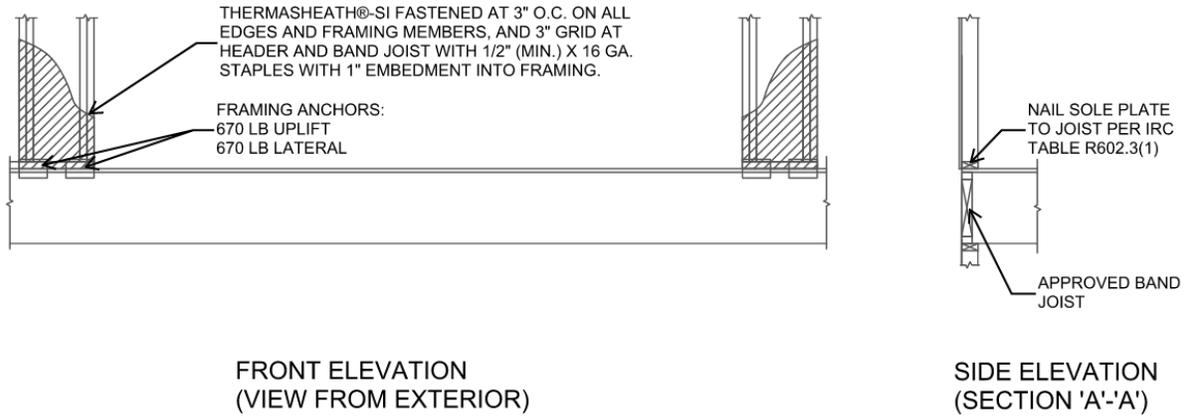


Figure 4. Thermasheath®-SI CS-PF Front Elevation 1

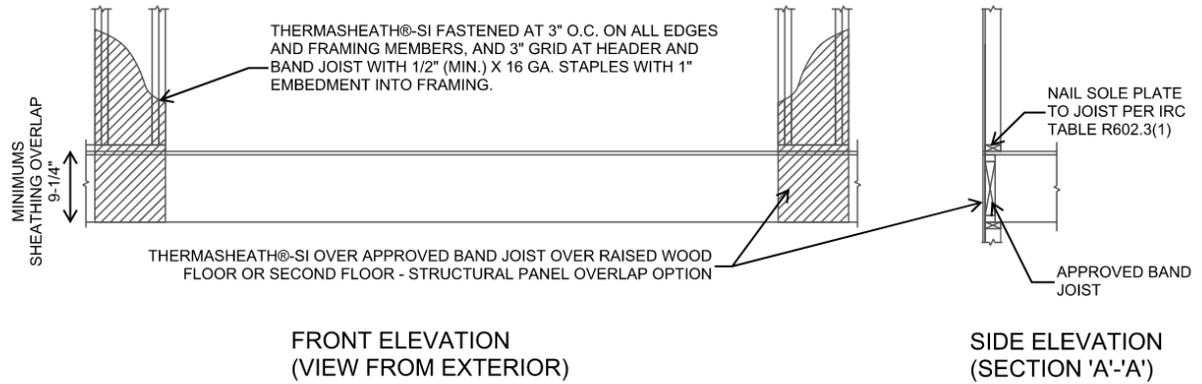
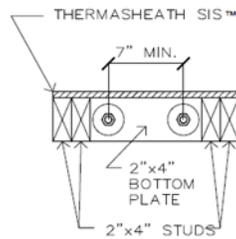


Figure 5. Thermasheath®-SI CS-PF Front Elevation 2



SECTION
'B'-'B'

Figure 6. Thermasheath®-SI CS-PF Section B-B

5.2.5 *Alternative Prescriptive IRC Bracing Applications:*

5.2.5.1 As an alternative to Section 5.2.3, the following provisions are permitted:

- 5.2.5.1.1 Thermasheath®-SI may be used on braced wall lines as an equivalent alternative to Method WSP of the IRC, when installed in accordance with [IRC Section R602.10](#) and this TER.
- 5.2.5.1.2 Thermasheath®-SI may be used to brace walls of buildings as an alternative to the Continuous Wall Bracing provisions of [IRC Section R602.10.4](#).
- 5.2.5.1.3 Required braced wall panel lengths for Thermasheath®-SI shall be as determined by the equivalency factor shown in Table 4 and [IRC Table R602.10.3\(1\)](#) and [Table R602.10.3\(3\)](#), including all footnotes.
- 5.2.5.1.3.1 Bracing lengths in these tables for Method WSP or CS-WSP shall be multiplied by the equivalency factor listed in Table 4.

Table 4. Braced Wall Line Length Equivalency Factors, Wood Framing

Product	Stud Spacing ⁶ (in)	Fastener	Fastener Spacing (edge:field) (in)	Gypsum ⁵ Wallboard (GWB)	GWB Fastener Spacing (edge:field) (in)	Equivalency Factors ^{1,4,5} to IRC WSP or CS-WSP
Thermasheath®-SI	16 o.c.	Minimum 7/16" crown x 1¼" leg staples ²	3:6	No GWB	-	1.41
				½" GWB	8:8	0.99
		Minimum ½" crown x 1¼" leg staples ²		No GWB	-	1.30
				½" GWB	8:8	0.89
		0.113" dia. Nails ³		No GWB	-	1.63
				½" GWB	8:8	1.02
	24 o.c.	Minimum 7/16" crown x 1¼" leg staples ²		No GWB	-	1.54
				½" GWB	8:8	1.09
		Minimum ½" crown x 1¼" leg staples ²		No GWB	-	1.43
				½" GWB	8:8	0.98
		0.113" dia. Nails ³		No GWB	-	1.77
				½" GWB	8:8	1.12

SI: 1 in = 25.4 mm

1. Factors based on SPF framing materials.
2. Staples shall be a minimum 16 gauge and penetrate a minimum of 1" into the stud. 1" crown x 1¼" leg staples are permitted using the equivalency factor for ½" staples. Staples must be countersunk beneath the surface of the foam plastic sheathing.
3. Nails shall penetrate a minimum of 1¼" into the stud. Nails may be countersunk beneath the surface of the foam plastic sheathing.
4. Multiply the bracing lengths indicated for the WSP or CS-WSP continuous sheathing methods in [IRC Table R602.10.3\(1\)](#) and [Table R602.10.3\(3\)](#), and as modified by all applicable factors in [IRC Table R602.10.3\(2\)](#) and [Table R602.10.3\(4\)](#), by the factors shown here to establish the required bracing length.
5. Valid for single top plate (advanced framing method) wall installations or double top plate wall installations.
6. Equivalency factors are the results of comparative equivalency testing and analysis using both tested and published design values as points of comparison. DrJ relies upon the design values published in the codes and standards listed in Section 2 that are adopted into law and that the manufacturers of those products stand behind. DrJ performs all equivalency analysis based on legally defined design values, the responsibility for which is the manufacturer of those products or the members of the associations that publish those design values.

5.2.5.1.3.2 These braced wall line length equivalency factors are based on equivalency testing and are used to comply with Method WSP and CS-WSP of the IRC.

5.2.5.1.3.3 Thermasheath®-SI tested equivalency factors in Table 4 allow the user to determine the length of bracing required, by multiplying the factor from Table 4 by the length shown in the WSP or CS-WSP columns in [IRC Table R602.10.3\(1\)](#) and [Table R602.10.3\(3\)](#) as modified by all applicable factors in [Table R602.10.3\(2\)](#) and [Table R602.10.3\(4\)](#), respectively.

5.2.5.1.4 All IRC prescriptive bracing minimums, spacing requirements, and rules must still be met.

5.2.6 *Prescriptive IBC Conventional Light-Frame Wood Construction:*

5.2.6.1 Thermasheath®-SI may be used to brace exterior walls of buildings as an equivalent alternative to the WSP method of the IBC when installed with ½" gypsum in accordance with the conventional light-frame construction method of [IBC Section 2308.6](#) and this TER.

5.2.7 *Performance-Based Construction:*

5.2.7.1 Thermasheath®-SI panels used in wall assemblies designed as shear walls are permitted to be designed in accordance with the methodology used in SDPWS for WSP using the capacities shown in Table 5, Table 6, Table 7, and Table 8.

5.2.7.2 Thermasheath®-SI panel shear walls are permitted to resist horizontal wind load forces using the allowable shear loads (in pounds per linear foot) set forth in Table 5 and Table 6.

Table 5. Allowable Stress Design (ASD) Capacity, Wood Framing – Wind

Stud Type	Maximum Stud Spacing (in)	Fastener Type & Size (minimum) ¹	Fastener Spacing (edge:field) (in)	Gypsum Wallboard (GWB)	GWB Fastener ² Spacing (edge:field) (in)	Allowable Unit Shear Capacity (plf)
Wood	16 o.c.	7/16" crown x 1 1/4" leg staples (16 gauge)	3:6	No GWB	–	260
				1/2" GWB	8:8	380
		1/2" crown x 1 1/4" leg staples (16 gauge)		No GWB	–	280
				1/2" GWB	4:16	485
					8:8	410
					8:16	385
	24 o.c.	7/16" crown x 1 1/4" leg staples (16 gauge)		No GWB	–	235
				1/2" GWB	8:8	340
	24 o.c.	1/2" crown x 1 1/4" leg staples (16 gauge)		No GWB	–	250
				1/2" GWB	8:8	365
	16 o.c.	0.113" x 2 3/8" nails		No GWB	–	225
	24 o.c.			1/2" GWB	8:8	360
			No GWB	–	200	
			1/2" GWB	8:8	315	

SI: 1 in = 25.4 mm, 1 lb/ft = 0.0146 kN/m

- Fasteners shall penetrate a minimum of 1" into wood studs. 1" crown x 1 1/4" leg 16 gauge staples are permitted using 1/2" staple capacities. Nails may be countersunk beneath the surface of the foam plastic sheathing. Staples must be countersunk beneath the surface of the foam plastic sheathing. Fasteners must have a minimum edge distance of 3/8".
- Gypsum attached with minimum #6 type W or S screws 1 1/4" long. Use Type W screws for wood stud walls and Type S screws for steel stud walls. Fasteners shall maintain a minimum edge distance of 3/8".

Table 6. Allowable Stress Design (ASD) Capacity, Steel Framing – Wind

Stud Type	Maximum Stud Spacing (in)	Fastener Type & Size (minimum) ¹	SI Fastener ² Spacing (edge:field) (in)	Gypsum Wallboard (GWB)	GWB Fastener ³ Spacing (edge:field) (in)	R-SEAL 2000 LF ⁴	Allowable Unit Shear Capacity (plf)		
							Thermasheath®-SI Thickness		
							0.5"	1"	1.25"
Steel ⁵	16 o.c.	#8 Pan Head Screw	3:6	No GWB	-	No	290	345	365
						Yes	345	405	420
				½" GWB	No	390	445	465	
			Yes		450	510	530		
			12:12	No GWB	-	Yes ⁶	345	390	420
				½" GWB	8:8	Yes ⁷	450	510	530
	24 o.c.		3:6	No GWB	-	No	230	275	290
						Yes	285	330	345
				½" GWB	8:8	No	305	350	365
			Yes		405	440	460		
			12:12	No GWB	-	Yes ⁶	285	310	345
				½" GWB	8:8	Yes ⁷	405	415	460

SI: 1 in = 25.4 mm, 1 lb/ft = 0.0146 kN/m

1. Thermasheath®-SI shall be attached with a minimum #8 pan head screw. Fasteners shall be long enough penetrate through the back of the steel stud a minimum of 3 thread lengths. Fasteners may be countersunk beneath the surface of the foam plastic sheathing.
2. Fasteners must have a minimum edge distance of ¾".
3. Gypsum attached with minimum #6 type W or S screws 1¼" long. Use Type W screws for wood stud walls and Type S screws for steel stud walls. Fasteners shall maintain a minimum edge distance of ¾".
4. 3/16" diameter bead of Rmax® R-SEAL 2000 LF placed along steel studs and top/bottom plates with 3/8" edge distance.
5. Minimum 20 gauge (33 mil) 3½" x 1½" 33 ksi yield steel studs
6. Where R-SEAL 2000 LF is not applied along the framing members the tabulated allowable unit shear capacity shall be divided by 4.2.
7. Where R-SEAL 2000 LF is not applied along the framing members the tabulated allowable unit shear capacity shall be divided by 2.9.

5.2.8 **Seismic Design:**

5.2.8.1 Thermasheath®-SI shear walls that require seismic design in accordance with IBC Section 1613 shall use the seismic allowable unit shear capacities set forth in Table 7.

5.2.8.1.1 The response modification coefficient, R, system overstrength factor, Ω_0 , and deflection amplification factor, C_d , indicated in Table 7 shall be used to determine the base shear, element design forces, and design story drift in accordance with ASCE 7 Chapter 12 and Section 14.5.

Table 7. Allowable Stress Design (ASD) Capacity and Seismic Design Coefficients, Wood Framing – Seismic^{1,2}

Seismic Force-Resisting System	Maximum Stud Spacing (in)	Gypsum Wallboard ⁷ (GWB)	Seismic Allowable Unit Shear Capacity (plf)	Apparent Shear Stiffness, G_a (kips/in)	Response Modification Factor ³ , R	System Overstrength Factor ⁴ , Ω_0	Deflection Amplification Coefficient ⁵ , C_d	Structural System Limitations and Building Height Limit ⁶ (ft)				
								Seismic Design Category				
								B	C	D	E	F
Light-Frame (Wood) Walls Sheathed with Thermasheath®-SI	16 o.c.	½" GWB	320	12.5	6.5	3	4	NL	NL	65	65	65
		No GWB	225	6.5	6.5	3	4	NL	NL	65	65	65

SI: 1 in = 25.4 mm, 1 lb/ft = 0.0146 kN/m, 1 psi = 6.895 kPa

1. Thermasheath®-SI shall be installed on 2x4 or 2x6 studs spaced 16" o.c. and fastened with minimum ½" staples spaced 3":6" (edge:field) per Section 6. If 7/16" staples are used, reduce the allowable shear capacity by a factor of 0.93.
2. All seismic design coefficients follow the equivalency procedures as defined in Section 3 of this TER.
3. Response modification coefficient, R, for use throughout ASCE 7. Note R reduces forces to a strength level, not an allowable stress level.
4. The tabulated value of the overstrength factor, Ω_0 , is permitted to be reduced by subtracting one-half (0.5) for structures with flexible diaphragms.
5. Deflection amplification factor, C_d , for use with ASCE 7 Section 12.8.6, 12.8.7 and 12.9.2.
6. NL = Not Limited. Heights are measured from the base of the structure as defined in ASCE 7 Section 11.2.
7. Gypsum attached with minimum #6 type W or S screws 1¼" long spaced 8" o.c. at panel edges and in the field. Maximum stud spacing is 16" o.c.

5.2.9 **Uplift Resistance:**

5.2.9.1 Thermasheath®-SI panels are permitted to resist uplift wind load forces using the allowable uplift loads (in pounds per linear foot) set forth in Table 8.

Table 8. Uplift Performance, Wood and Steel Framing

Product	Stud Type	Maximum Stud Spacing (in)	Fastener Schedule	Fastener Spacing (in)	Gypsum Wallboard (GWB) (in)	Allowable Uplift Capacity ^{1,2} (plf)
Thermasheath®-SI	Wood	24 o.c.	Minimum ½" crown, 1¼" leg 16 gauge galvanized staples ³	3:6	No GWB	150
					½" GWB	265
			0.113" x 2¾" nails, fastened 3" o.c. to perimeter, 6" o.c. in the field	3:6	½" GWB	240
	Steel ⁴	24 o.c.	#8 x ¾" self-tapping pan head screw ⁵	3:6	No GWB	220

SI: 1 in = 25.4 mm, 1 lb/ft = 0.0146 kN/m

1. The ASD allowable unit uplift capacity is determined by dividing the tabulated uplift capacity by the ASD reduction factor of 2.0 per SDPWS Section 4.3 for determining the ASD allowable capacity for uplift conditions.
2. The capacities shown are for the purpose of providing information on the hold-down capacity of the sheathing to the wall plate connection independent of lateral loading. Where combined shear and uplift loading is needed, consult a professional engineer.
3. Staple crowns to be installed parallel to grain. Minimum penetration of 1" into the stud
4. Minimum 20 gauge (33 mil) 3½" x 1½" 33 ksi yield steel studs
5. Fasteners shall be installed with the head in contact with the face of the board. Fastener edge distance shall be a minimum of ¾" on all sides of the board.

5.2.10 *Transverse Wind Loading:*

5.2.10.1 Thermasheath®-SI panels are permitted to resist transverse wind load forces using the allowable transverse loads (in pounds per linear foot) set forth in Table 9 and Table 10.

Table 9. Transverse (Out-Of-Plane) Wind Load Resistance, Wood and Steel Framing

Product	Stud Type	Fastener Spacing	Fastener Spacing (in)	Maximum Stud Spacing (in)	Allowable Design ^{1,2} Value (psf)
Thermasheath®-SI	Wood	½" crown, 1¼" leg 16 gauge galvanized staples ³	3:6	16 o.c.	105
				24 o.c.	75
	Steel ⁴	#8 x ¾" self-tapping pan head screw ⁵	3:6	24 o.c.	55

SI: 1 in = 25.4 mm, 1 psf = 0.0479 kN/m²

- Applies to both negative and positive wind load.
- Design wind load capacity shall be in accordance with [IBC Section 1609.1.1](#).
- Staple crowns to be installed parallel to grain.
- Minimum 20 gauge (33 mil) 3⁵/₈" x 1⁵/₈" 33 ksi yield steel studs
- Fasteners shall be installed with the head in contact with the face of the board. Fastener edge distance shall be a minimum of 3/8" on all sides of the board. The tabulated values also apply where R-SEAL 2000 LF is applied between the framing and Thermasheath®-SI.

Table 10. Basic Wind Speed for Use in Exterior Wall Covering Assemblies²

Product	Stud Type	Maximum Stud Spacing (in)	Allowable Components & Cladding Basic Wind Speed ¹ (mph)	
			ASCE 7-05 (V _{asd})	ASCE 7-10 and 7-16 (V _{ult})
Thermasheath®-SI	Wood	16 o.c.	155	200
		24 o.c.	155	200
	Steel	24 o.c.	150	195

SI: 1 in = 25.4 mm, 1 mph = 1.61 km/h

- Allowable wind speeds are based on the following: Mean roof height 30', Exposure B, Zone 5, 10 sq. ft. effective wind area. See the applicable building code for any adjustment need for specific building location and configuration.
- The tabulated wind speeds correspond to the pressures presented in Table 9. See Table 9 for framing and fastening requirements.

5.3 *Water-Resistive Barrier (WRB)*

- Thermasheath®-SI and Thermasheath® may be used as a WRB as prescribed in [IBC Section 1403.2](#)¹⁰ and [IRC Section R703.2](#) when installed on exterior walls as described in this section.
- Thermasheath®-SI and Thermasheath® shall be installed with board joints placed directly over exterior framing spaced a maximum of 24" (610 mm) o.c. The fasteners used to attach the board shall be installed in accordance with Section 6.
- 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.
- A separate WRB may also be provided. If a separate WRB method is used, taping of the sheathing joints is not required.
- Flashing of corners, windows, doors, and other through-wall penetrations is required and shall comply with the applicable code.
- Where Thermasheath®-SI is used intermittently along a braced wall line, Thermasheath® may be used as infill between the Thermasheath®-SI panels. In this application, the WRB is maintained, provided all seams and joints between boards are covered by R-SEAL 3000, R-SEAL Construction Tape, or R-SEAL 2000 LF.

¹⁰ [2015 IBC Section 1404.2](#)

5.3.7 Thermasheath®-SI and Thermasheath® have water resistance properties as shown in Table 11.

Table 11. Water Resistance Properties

Property	Test Method	Result
Water Vapor Transmission	ASTM E96	< 0.03 U.S. Perm
Water Absorption	ASTM C209	< 0.2% by Volume
	ASTM C272	< 0.3% by Volume

SI: 1 U.S. Perm [gr/(hr-ft²-inHg)] = 57.2135 ng/(Pa-s-m²)

5.4 Thermal Resistance (R-Value)

5.4.1 Thermasheath®-SI and Thermasheath® meet the continuous insulated sheathing requirements complying with the provisions of [IRC Section N1102](#), [IECC Section C402](#) and [IECC Section R402](#).

5.4.2 Thermasheath®-SI and Thermasheath® have the thermal properties as shown in Table 12.

Table 12. Thermal Resistance Properties

Product	Thickness (in)	R-Value (h*ft ² *°F/Btu)
Thermasheath®-SI and Thermasheath®	0.50	3.2
	0.75	5.0
	1.00	6.0
	1.25	7.8

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

5.5 Air Barrier

5.5.1 Thermasheath®-SI and Thermasheath® meet the requirements of [IRC Section N1102](#), [IECC Section C402](#) and [IECC Section R402](#) for use as a component of the air barrier when installed in accordance with the manufacturer installation instructions and this TER.

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

5.5.3 The air barrier properties of Thermasheath®-SI and Thermasheath® are shown in Table 13.

Table 13. Air Barrier Material Properties

Product	Air Permeance ^{1,2} (L/(s·m ²))
Thermasheath®-SI and Thermasheath®	< 0.02

IP: 1 L/(s·m²) = 0.2 cfm/ft²

1. Tested in accordance with ASTM E2178.

5.5.4 When used as part of an air barrier assembly, 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.

5.6 *Draftstop*

- 5.6.1 Thermasheath®-SI and Thermasheath® may be used as a draftstop material in accordance with [IBC Section 708.4.2](#),¹¹ [IBC Section 718.3](#), [IBC Section 718.4](#) and [IRC Section R302.12](#).
- 5.6.2 When installed as a draftstop, Thermasheath®-SI and Thermasheath® shall be installed in accordance with Section 6.

5.7 *Fire Safety Performance*

5.7.1 *Surface Burning Characteristics:*

- 5.7.1.1 Thermasheath®-SI and Thermasheath® panels have flame spread and smoke developed ratings shown in Table 14, when tested in accordance with ASTM E84 per [IBC Section 2603.3](#) and [IRC Section R316.3](#).

Table 14. Surface Burning Characteristics¹

Flame Spread Index	Smoke Developed Index
≤ 75	≤ 450
SI: 1 in = 25.4 mm	
1. Tested in accordance with ASTM E84, foam core only.	

5.7.2 *Thermal Barrier and Ignition Barrier (IBC and IRC Buildings)*

- 5.7.2.1 Product, up to 4.5" in walls only or ceilings only, where applicable, 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](#).
- 5.7.2.2 Product, up to 1" in walls only or ceilings only, where applicable, 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](#).
- 5.7.2.3 Products, up to 12" (304.8 mm) in thickness, where applicable, 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 ½" gypsum wallboard or an approved equivalent in accordance with [IBC Section 2603.4](#) and [IRC Section R316.4](#).
- 5.7.2.4 In applications where panels are used in both walls and ceilings, but only one is allowed to be left exposed per 5.7.2.1 or 5.7.2.3, the other must meet the requirements of 5.7.2.5.
- 5.7.2.5 Use without an approved thermal barrier or ignition barrier is limited to areas where:
 - 5.7.2.5.1 Access to the space is required by [IRC Section R807.1](#) or [IRC Section R408.4](#).
 - 5.7.2.5.2 Entry is made only for the purposes of repairs or maintenance.
- 5.7.2.6 Panels may be installed in single or multiple layers.

5.7.3 *Fire Resistance Ratings (Fire Rated Assemblies):*

- 5.7.3.1 Thermasheath®-SI has been tested and meets the requirements of UL 263 (ASTM E119) in accordance with [IBC Section 703.2.1](#) and [IRC Section R302.1](#) for use in the following assembly designs when installed in accordance with the manufacturer installation instructions and this TER:
 - 5.7.3.1.1 45 minutes: [U424](#), [U425](#), [V321](#), [V499](#), [W456](#)
 - 5.7.3.1.2 1 hour: [U026](#), [U326](#), [U330](#), [U354](#), [U355](#), [U364](#), [U424](#), [U425](#), [U460](#), [V302](#), [V303](#), [V454](#), [V499](#), [W307](#), [W417](#), [W456](#)
 - 5.7.3.1.3 1.5 hours: [U424](#), [U425](#), [V499](#), [W456](#)

¹¹ [2015 IBC Section 708.4](#)

5.7.3.1.4 2 hours: U349, U424, U425, U905, U906, V332, V499, W456

5.7.3.1.5 3 hours: U904, U907

5.7.3.1.6 4 hours: U902, U907

5.7.3.2 Thermasheath® has been tested and meets the requirements of UL 263 (ASTM E119) in accordance with IBC Section 703.2.1 and IRC Section R302.1 for use in the following assembly designs when installed in accordance with the manufacturer installation instructions and this TER:

5.7.3.2.1 45 minutes: U424, U425, V321, V499, W456

5.7.3.2.2 1 hour: U026, U326, U330, U354, U355, U364, U424, U425, U460, V454, V499, W417, W456

5.7.3.2.3 1.5 hours: U424, U425, V499, W456

5.7.3.2.4 2 hours: U349, U424, U425, U905, U906, V332, V499, W456

5.7.3.2.5 3 hours: U904, U907

5.7.3.2.6 4 hours: U902, U907

5.8 Non-Structural Applications

5.8.1 Where other means of wall bracing are provided, or are not required, and an approved exterior wall covering capable of separately resisting loads perpendicular to the face of the walls is installed over the sheathing, Thermasheath®-SI or Thermasheath® are permitted to be installed as follows:

5.8.1.1 Fastening shall be sufficient to hold the Thermasheath®-SI and Thermasheath® in place until the exterior wall covering is installed. Once the wall covering is installed, the wall covering fasteners penetrate through the sheathing and into the wall framing, providing the necessary resistance to transverse loads.

5.8.1.2 Fasteners include, but are not limited to, roofing nails and bugle head screws.

5.8.1.3 Other means of fastening may also be used, such as certain adhesives, which are compatible with the sheathing.

5.8.1.4 Consult the manufacturer installation instructions for further details.

5.9 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 A copy of the manufacturer published installation instructions shall be available at all times on the jobsite during installation.

6.4 Installation Procedure

6.4.1 General:

6.4.1.1 Fastener edge distance is a minimum of $\frac{3}{8}$ " (9.5 mm) for both Thermasheath®-SI and gypsum.

6.4.1.2 Where used, always fasten staples parallel to the framing member.

6.4.1.3 Where hold-down straps are used, install structural sheathing first, remove foam at strap's location, then install the strap over the face of the structural sheathing backer and attach per the manufacturer installation instructions.

6.4.1.4 Where required, gypsum wallboard shall be a minimum ½" and installed with a minimum of #6 x 1¼" Type W or S screws or 5d cooler nails. The fastener spacing shall be a maximum of 8" o.c. (76.2 mm) along the edge and in the field.

6.4.2 *Orientation:*

6.4.2.1 Thermasheath®-SI and Thermasheath® must be installed with the long dimension of the panels parallel to the framing behind and all panel edges supported by framing or blocking.

6.4.2.2 Thermasheath®-SI and Thermasheath® must be installed over studs a nominal thickness of not less than 2" (50.8 mm) and spaced a maximum of 24" (610 mm) o.c., unless otherwise limited by this TER.

6.4.3 *Fastener Type:*

6.4.3.1 Thermasheath®-SI on Wood Studs: Minimum 7/16" crown by 1¼" leg, 16 gauge staples or 0.113" x 2⅜" nails with a 1" minimum embedment into stud.

6.4.3.2 Thermasheath®-SI on Steel Studs:

6.4.3.2.1 Minimum #8 pan head screw, with three thread lengths extending beyond the stud.

6.4.3.2.2 3/16" diameter bead of Rmax® R-SEAL 2000 LF placed along steel studs and top/bottom plates with 3/8" edge distance.

6.4.3.3 Thermasheath®: Refer to the manufacturer installation instructions.

6.4.4 *Fastener Spacing:*

6.4.4.1 Thermasheath®-SI on Wood Stud: Maximum of 3" o.c. (76.2 mm) along the edge and 6" o.c. in the field.

6.4.4.2 Thermasheath®-SI on Steel Stud:

6.4.4.2.1 Maximum of 3" o.c. (76.2 mm) along the edge and 6" o.c. in the field.

6.4.4.2.2 With R-SEAL 2000LF, maximum of 12" o.c. (76.2 mm) along the edge and in the field.

6.4.4.3 Thermasheath®: Refer to manufacturer installation instructions.

6.4.5 *Treatment of Joints:*

6.4.5.1 Thermasheath®-SI sheathing joints shall be tightly butted at framing members, and a single row of fasteners must be applied to both panel edges into the framing behind.

6.4.5.2 Do not tack Thermasheath®-SI to framing, but fasten each panel completely once fastening begins.

6.4.6 *Window Treatments:*

6.4.6.1 If windows are made to accommodate traditional ½" sheathing materials, order windows with adjustable nailing fins from the supplier. Door brick moldings may be planed or routed ⅜" in order to accommodate the different sheathing thickness, either at the jobsite or by the millwork supplier.

6.4.6.2 Thermasheath®-SI shall be installed with appropriate flashing and counter flashing in conformance with accepted building standards and in compliance with local building codes and the flashing manufacturer installation instructions.

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 Lateral load testing in accordance with ASTM E72, ASTM E564, ASTM E2126, and analysis per ASTM D7989.

7.1.3 Transverse load testing in accordance with ASTM E330.

7.1.4 Uplift load testing in accordance with ASTM E72.

7.1.5 Thermal resistance property testing in accordance with ASTM C518.

- 7.1.6 Water vapor permeance testing in accordance with ASTM E96.
- 7.1.7 WRB testing in accordance with AATCC 127, ASTM E283, ASTM E331, and ASTM D1037.
- 7.1.8 Water absorption in accordance with ASTM C209 and ASTM C272.
- 7.1.9 Air permeance testing in accordance with ASTM E2178.
- 7.1.10 Flame spread and smoke developed rating tests in accordance with ASTM E84.
- 7.1.11 Room corner tests in accordance with NFPA 286.
- 7.1.12 Fire resistance ratings in accordance with UL 263.
- 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., registered design professionals [RDP]), and/or professional engineering regulations. Accuracy of external test data and resulting analysis is relied upon.
- 7.3 Where pertinent, DrJ's 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 products 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 any raw materials. 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.¹²

8 Findings

- 8.1 As delineated in Section 3, the Thermasheath®-SI and Thermasheath® 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, Thermasheath®-SI and Thermasheath® shall be approved for the following applications:
 - 8.2.1 Lateral load resistance due to wind and seismic loads carried by shear walls.
 - 8.2.2 Use as an equivalent alternative to the CS-PF as described in IRC Section R602.10.5 and Section R602.10.6.4.
 - 8.2.3 Transverse load resistance due to components and cladding pressures on building surfaces.
 - 8.2.4 Uplift load resistance due to components and cladding pressures on building surfaces.
- 8.3 When installed in accordance with the manufacturer installation instructions and this TER, Thermasheath®-SI and Thermasheath® comply with, or are a suitable alternative to, the applicable sections of the codes listed in Section 2 for the following applications:
 - 8.3.1 Performance of foam plastics in accordance with IBC Section 2603 and IRC Section R316.
 - 8.3.2 Performance for use as insulating sheathing in accordance with IRC Section N1102.1, IRC Section N1102.2 and IECC Section C402.

¹² See Code of Federal Regulations (CFR) Title 24 Subtitle B Chapter XX Part 3280 for definition.

- 8.3.3 Performance for use as a WRB in accordance with [IBC Section 1403.2](#)¹³ and [IRC Section R703.2](#).
- 8.3.4 Performance for use as an air barrier in accordance with [IRC Section N1102.4](#) and [IECC Section C402](#).
- 8.3.5 Performance for use as a draftstop in accordance with [IBC Section 708.4.2](#),¹⁴ [IBC Section 718.3](#), [IBC Section 718.4](#) and [IRC Section R302.12](#).
- 8.3.6 Performance for use in a fire resistance rated assembly in accordance with [IBC Section 703.2.1](#).
- 8.3.7 Flame spread and smoke developed indices in accordance with [IBC Section 2603.3](#) and [IRC Section R316.3](#).
- 8.3.8 Performance for 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](#).
- 8.3.9 Performance for use without a thermal barrier or ignition barrier in accordance with [IBC Section 2603.9](#) and [IRC Section R316.6](#) when installed in accordance with [Section 5.7.2](#).
- 8.4 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Rmax®.
- 8.5 [IBC Section 104.11](#) ([IRC Section R104.11](#) and [IFC Section 104.10](#))¹⁵ 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.
- 8.6 Approved:¹⁶ Building codes require that [the building official shall accept duly authenticated reports](#)¹⁷ or [research reports](#)¹⁸ 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.
 - 8.6.1 [Acceptability 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).
 - 8.6.2 [Acceptability 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](#).
 - 8.6.3 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.
- 8.7 DrJ is an engineering company, employs RDPs and is an ISO/IEC 17065 [ANAB-Accredited Product Certification Body – Accreditation #1131](#).
- 8.8 Through ANAB accreditation and the [IAF Multilateral Agreements](#), this TER can be used to obtain products approval in any [jurisdiction](#) or country that has [IAF MLA Members & Signatories](#) to meet the [Purpose of the MLA](#) - “*certified once, accepted everywhere.*”

¹³ [2015 IBC Section 1404.2](#)

¹⁴ [2015 IBC Section 708.4](#)

¹⁵ [2018 IFC Section 104.9](#)

¹⁶ 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.

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

¹⁸ <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1703.4.2>

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 Except as provided in Section 5.7.2, this product shall be fully protected from the interior of the building by an approved 15-minute thermal barrier or ignition barrier where required by the applicable code.
- 9.4 In areas where the probability of termite infestation is very heavy, in accordance with [IBC Section 2603.8](#) or [IRC Section R318.4](#), the product must not be placed on exterior walls located within 6" (152 mm) of the ground.
- 9.5 As listed herein, Thermasheath®-SI and Thermasheath® shall not be used:
 - 9.5.1 As a nailing base.
 - 9.5.2 To resist horizontal loads from concrete and masonry walls when used as wall sheathing.
- 9.6 When not installed for use as wall bracing, as described in this TER, the stud walls shall be braced by other materials, in accordance with the applicable code.
- 9.7 When used as a WRB, Thermasheath®-SI and Thermasheath® seams shall be sealed with R-SEAL 3000, R-SEAL Construction Tape, or R-SEAL 2000 LF.
- 9.8 When used in accordance with the IBC in Seismic Design Categories C, D, E, or F, special inspections shall comply with [IBC Section 1705.13](#).¹⁹
- 9.9 When used in accordance with the IBC in high wind areas, special inspections shall comply with [IBC Section 1705.12](#).²⁰
- 9.10 Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed.
- 9.11 The manufacturer installation instructions shall be shipped to the jobsite with the materials or otherwise be available on the jobsite for inspection.
- 9.12 All panel edges shall be supported by wall framing or solid blocking a minimum of 2" nominal in thickness.
- 9.13 When required by regulation and enforced by the [building official](#), also known as the authority having jurisdiction (AHJ) in which the project is to be constructed:
 - 9.13.1 Any calculations, incorporated into the construction documents that are required to show compliance with this TER, shall conform to accepted engineering practice, and shall be approved when requirements of the pertinent regulations are met.
 - 9.13.2 This TER and the installation instructions shall be submitted at the time of [permit](#) application.
 - 9.13.3 These products have an internal quality control program and a third-party quality assurance program.
 - 9.13.4 At a minimum, these products shall be installed per Section 6 of this TER.
 - 9.13.5 The review of this TER, by the AHJ, shall be in compliance with [IBC Section 104](#) and [IBC Section 105.4](#).
 - 9.13.6 These 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](#).
 - 9.13.7 The application of these products in the context of this TER is dependent upon the accuracy of the construction documents, implementation of installation instructions, inspection as required by [IBC Section 110.3](#), [IRC Section R109.2](#) and any other regulatory requirements that may apply.

¹⁹ [2018 IBC Section 1705.12](#)

²⁰ [2018 IBC Section 1705.11](#)

- 9.14 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).
- 9.15 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 products listed in Section 1.1 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 current status of this TER, contact [DrJ Certification](#).

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

- 12.1 Thermasheath®-SI and Thermasheath® 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.

1 Appendix A: 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 Thermasheath®-SI and Thermasheath® 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).
 - 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 materials²¹ 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.²²

²¹ <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706.2>

²² [IBC 2021, Section 1706.1 Conformance to Standards](#)

- 1.3 **Approved²³ 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.²⁴ 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 1707.1.²⁵
- 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 deemed²⁶ 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 agreement²⁷ (i.e., ANAB, International Accreditation Forum (IAF), etc.).

²³ See section 8.3 for the distilled building code definition of Approved.

²⁴ Los Angeles Municipal Code, SEC. 98.0503. TESTING AGENCIES

²⁵ https://up.codes/viewer/california/ca-building-code-2022/chapter/17/special-inspections-and-tests#1707.1

²⁶ New York City, The Rules of the City of New York, § 101-07 Approved Agencies

²⁷ 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,²⁸ 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)”.²⁹ 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”.

²⁸ https://up.codes/viewer/new_jersey/ibc-2018/chapter/17/special-inspections-and-tests#1707.1

²⁹ <https://www.nj.gov/dca/divisions/codes/codreg/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](#)³⁰ and [Part 3280](#),³¹ 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 **Approved by US, Local, and State Jurisdictions in General:** In all other local and state jurisdictions, the regulations require approval per Section 8 above.
- 1.11 **Approved 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.
 - 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.

³⁰ <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3282/subpart-A/section-3282.14>

³¹ <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280>



Issue Date: June 27, 2022
Subject to Renewal: April 1, 2024

CBC and CRC Supplement to TER 1207-01

REPORT HOLDER: Rmax®

1 Evaluation Subject

- 1.1 Thermasheath®-SI and Thermasheath®

2 Purpose and Scope

2.1 Purpose

- 2.1.1 The purpose of this Technical Evaluation Report (TER) supplement is to show Thermasheath®-SI and Thermasheath®, recognized in TER 1207-01, have also been evaluated for compliance with the codes listed below.

2.2 Applicable Code Editions

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

3 Conclusions

- 3.1 Thermasheath®-SI and Thermasheath®, described in TER 1207-01, 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 CRC Section N1101 and Section N1102 are reserved.

4 Conditions of Use

- 4.1 Thermasheath®-SI and Thermasheath®, described in TER 1207-01, must comply with all of the following conditions:
 - 4.1.1 All applicable sections in TER 1207-01
 - 4.1.2 The design, installation, and inspections are in accordance with additional requirements of the CBC and CRC, as applicable.



Issue Date: June 27, 2022
Subject to Renewal: April 1, 2024

FBC Supplement to TER 1207-01

REPORT HOLDER: Rmax®

1 Evaluation Subject

- 1.1 Thermasheath®-SI and Thermasheath®

2 Purpose and Scope

2.1 Purpose

- 2.1.1 The purpose of this Technical Evaluation Report (TER) supplement is to show Thermasheath®-SI and Thermasheath®, recognized in TER 1207-01, have also been evaluated for compliance with the codes listed below as adopted by the Florida Building Commission.

2.2 Applicable Code Editions

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

3 Conclusions

- 3.1 Thermasheath®-SI and Thermasheath®, described in TER 1207-01, complies with the FBC-B and FBC-R and is subject to the conditions of use described in this supplement.
- 3.2 Where there are variations between the IBC and IRC and the FBC-B and FBC-R applicable to this TER, they are listed here.
 - 3.2.1 FBC-B Section 104.4, Section 110.4, Section 1705, and Section 2308 are reserved.
 - 3.2.2 FBC-R Section R104, Section R109, Section 602.3.5, Section R602.10, Section 602.12, Table R602.10.3(1), Table R602.10.3(2), Table R602.10.3(3), Table R602.10.3(4), Table R602.10.5, and Table 602.12.4 are reserved.
 - 3.2.3 FBC-B Section 708.4 replaces IBC Section 708.4.2.
 - 3.2.4 FBC-B Section 1404.2 replaces IBC Section 1403.2.
 - 3.2.5 FCB-R Section N1101 replaces IRC Section N1102.

4 Conditions of Use

- 4.1 Thermasheath®-SI and Thermasheath®, described in TER 1207-01, must comply with all of the following conditions:
 - 4.1.1 All applicable sections in TER 1207-01
 - 4.1.2 The design, installation, and inspections are in accordance with additional requirements of FBC-B Chapter 16 and Chapter 17, as applicable.