



**CERTIFICATION**



Approved. Sealed. Code Compliant.

## **Technical Evaluation Report**

**TER 1709-07**

Thermo-Brace® Green Structural  
Insulated Board (SIB)

## **Barricade® Building Products**

### **Product:**

**Thermo-Brace® Green SIB**

Issue Date:

March 30, 2018

Revision Date:

June 8, 2020

Subject to Renewal:

July 1, 2021





COMPANY  
INFORMATION:

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Barricade® Building Products

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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

DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION

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

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## 1 PRODUCT EVALUATED<sup>1</sup>

1.1 Thermo-Brace® Green SIB

## 2 APPLICABLE CODES AND STANDARDS<sup>2,3</sup>

### 2.1 Codes

2.1.1 *IBC—12, 15, 18: International Building Code®*

2.1.2 *IRC—12, 15, 18: International Residential Code®*

2.1.3 *IECC—12, 15, 18: International Energy Conservation Code®*

### 2.2 Standards and Referenced Documents

2.2.1 *ANSI/AWC SDPWS: Special Design Provisions for Wind and Seismic*

2.2.2 *ASCE/SEI 7: Minimum Design Loads and Associated Criteria for Buildings and Other Structures*

2.2.3 *ASTM E2178: Standard Test Method for Air Permeance of Building Materials*

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<sup>1</sup> Building codes require data from valid [research reports](#) be obtained from [approved sources](#). Agencies who are accredited through ISO/IEC 17065 have met the [code requirements](#) for approval by the [building official](#). DrJ is an ISO/IEC 17065 ANSI-Accredited Product Certification Body – Accreditation #1131.

Through ANSI accreditation and the [IAF MLA](#), DrJ certification can be used to obtain product approval in any [jurisdiction](#) or country that has [IAF MLA Members & Signatories](#) to meet the Purpose of the MLA – “certified once, accepted everywhere.”

Building official approval of a licensed [registered design professional](#) (RDP) is performed by verifying the RDP and/or their business entity complies with all professional engineering laws of the relevant [jurisdiction](#). Therefore, the work of licensed RDPs is accepted by [building officials](#), except when plan (i.e. peer) review finds an error with respect to a specific section of the code. Where this TER is not approved, the [building official](#) responds in writing stating the reasons for [disapproval](#).

For more information on any of these topics or our mission, product evaluation policies, product approval process, and engineering law, visit [drjcertification.org](http://drjcertification.org) or call us at 608-310-6748.

<sup>2</sup> Unless otherwise noted, all references in this TER are from the 2018 version of the codes and the standards referenced therein (e.g., *ASCE 7*, *NDS*, *ASTM*). This material, design, or method of construction also complies with the 2000-2015 versions of the referenced codes and the standards referenced therein.

<sup>3</sup> All terms defined in the applicable building codes are italicized.

- 2.2.4 *ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference*
- 2.2.5 *ASTM E564: Standard Practice for Static Load Test for Shear Resistance of Framed Walls for Buildings*

### 3 PERFORMANCE EVALUATION

- 3.1 Thermo-Brace® Green SIB has been evaluated to determine:
  - 3.1.1 Structural performance under lateral load conditions (wind) for use as an alternative to the intermittent wall bracing provisions of *IBC Section R602.10* Method WSP (wood structural panel) and the continuous wall bracing provisions of *IBC Section R602.10.4* Methods CS-WSP (continuously sheathed wood structural panel) and CS-PF (continuously sheathed portal frame).
  - 3.1.2 Structural performance under lateral load conditions (wind) for use as an alternative to the conventional wall bracing provisions of *IBC Section 2308.6*,<sup>4</sup> Method WSP for Type V construction.
  - 3.1.3 Structural performance under lateral load conditions (wind) for use under the performance-based provisions of *IBC Section 2306.1* and *Section 2306.3* for light-frame wood wall assemblies.
  - 3.1.4 Structural performance under lateral load conditions (wind) for use as an alternative to *SDPWS Section 4.3* Wood-Frame Shear Walls.
  - 3.1.5 Performance for use as foam plastic insulation in accordance with *IBC Section 2603* and *IRC Section R316*.
  - 3.1.6 Performance for use as a water-resistive barrier (WRB) in accordance with *IBC Section 1404.2*<sup>5</sup> and *IRC Section R703.2*.
  - 3.1.7 Performance as an air barrier material in accordance with *IRC Section N1102.4.1.1* and *IECC Section R402.4.1.1* and *Section C402.5.1*.<sup>6</sup>
- 3.2 The use of Thermo-Brace® Red SIB on steel studs is outside the scope of this TER.
- 3.3 Performance with regard to thermal resistance (R-value) is outside the scope of this TER.
- 3.4 The use of Thermo-Brace® Red SIB in a fire resistance rated assembly is outside the scope of this TER.
- 3.5 Any code compliance issues not specifically addressed in this section are outside the scope of this TER.
- 3.6 Any engineering evaluation conducted for this TER was performed on the dates provided in this TER and within DrJ's professional scope of work.

### 4 PRODUCT DESCRIPTION AND MATERIALS

- 4.1 The product evaluated in this TER is shown in Figure 1.



FIGURE 1. THERMO-BRACE® GREEN SIB

<sup>4</sup> [2012 IBC Section 2308.9.3](#)

<sup>5</sup> [2015 IBC Section 1403.2](#)

<sup>6</sup> [2012 IECC Section C402.4.1](#)

- 4.2 Thermo-Brace® Green SIB is a structural, rigid insulation sheathing product consisting of a proprietary cellulosic fiber sheathing board laminated to one side of a proprietary rigid foam plastic insulation.
- 4.2.1 The proprietary cellulosic fiber sheathing board is composed of pressure-laminated plies consisting of high strength cellulosic fibers with a protective polymer WRB layer on both sides.
- 4.2.2 The rigid foam plastic insulation is a proprietary graphite polystyrene (GPS) foam plastic insulated sheathing (FPIS). Polyolefin facings are applied to the exterior face or both faces of the GPS prior to lamination to the cellulosic fiber sheathing board.
- 4.3 *Material Availability*
- 4.3.1 Thickness: ¾" (19mm) and 1 1/8" (29 mm)
- 4.3.2 Standard product width: 48" (1219 mm)
- 4.3.3 Standard lengths: 96" (2438 mm), 108" (2743 mm), and 120" (3048 mm)
- 4.3.4 Other custom widths and lengths can be manufactured.

## 5 APPLICATIONS

- 5.1 Thermo-Brace® Green SIB panels are used in the following applications:
- 5.1.1 Wall sheathing in buildings constructed in accordance with *IBC* and *IRC* provisions for light frame wood construction.
- 5.1.2 Structural wall sheathing to provide lateral load resistance (wind) for braced wall panels used in light-frame wood construction.
- 5.1.3 Wall sheathing in buildings constructed in accordance with *IBC* requirements for Type V light frame construction.
- 5.2 When Thermo-Brace® Green SIB panels are installed with an approved construction tape on sheathing seams, they are an approved WRB in accordance with *IBC Section 1404.2*<sup>7</sup> and *IRC Section R703.2*. See the manufacturer's product information for further details.
- 5.2.1 Where Thermo-Brace® Green SIB joints are not taped, a separate WRB shall be installed in accordance with the WRB manufacturer's installation instructions.
- 5.3 *Structural Applications*
- 5.3.1 *General Structural Provisions:*
- 5.3.1.1 Except as otherwise described in this TER, Thermo-Brace® Green SIB shall be installed in accordance with the applicable building codes listed in Section 2 of this TER using the provisions set forth therein for the design and installation of wood structural panels (WSP).
- 5.3.1.1.1 Thermo-Brace® Green SIB is permitted to be used for the design of shear walls in accordance with *SDPWS* and using the methods set forth therein.
- 5.3.1.2 Anchorage for in-plane shear force resistance shall be provided to transfer the induced shear force into and out of each shear wall. Shear wall anchorage shall be in accordance with the applicable code referenced in Section 2 of this TER.
- 5.3.1.3 Except as noted in Section 5.3.2, the maximum aspect ratio for Thermo-Brace® Green SIB shall be 4:1.
- 5.3.1.4 Except as noted in Section 5.3.2, the minimum full height panel width shall be 24" (610 mm).
- 5.3.1.5 Installation is permitted for single top plate or double top plate applications.
- 5.3.1.6 Where the application exceeds the limitations set forth herein, design shall be permitted in accordance with accepted engineering procedures, experience, and technical judgment.

<sup>7</sup> [2015 IBC Section 1403.2](#)



5.3.2 *Prescriptive IRC Bracing Applications:*

- 5.3.2.1 Thermo-Brace® Green SIB may be used on braced wall lines as equivalent to the WSP method when installed in accordance with [IRC Section R602.10](#) and this TER.
- 5.3.2.2 When Thermo-Brace® Green SIB satisfies the required bracing lengths on braced wall lines, the use of NEOPOR® only on the remaining wall line is permitted provided cladding is installed directly in contact with NEOPOR® and is capable of resisting the full design wind load. Use in this manner also meets the requirements of a water-resistive barrier (WRB) when installed in accordance with Section 5.4 of this TER.
- 5.3.2.3 For wind design, required braced wall panel lengths for Thermo-Brace® Green SIB shall be designed as indicated in Table 1 and Table 2 of this TER and shall be used in conjunction with [IRC Table R602.10.3\(2\)](#), which provides the required adjustments.
- 5.3.2.4 Thermo-Brace® Green SIB may be used to brace the walls of buildings as an alternative to the continuous wall bracing provisions of the CS-WSP method described in [IRC Section R602.10.4](#). Bracing shall be designed in accordance with the bracing amounts shown in Table 1 and Table 2 of this TER, as adjusted in accordance with [IRC Table R602.10.3\(2\)](#).
- 5.3.2.5 Where a building, or portion thereof, does not comply with one or more of the bracing requirements within the prescriptive sections of the *IRC*, those portions shall be designed and constructed in accordance with [IRC Section R301.1](#).



TABLE 1. REQUIRED BRACING LENGTHS FOR THERMO-BRACE® GREEN SIB (R3 OR R5; FPIS OUTWARD; STUDS 16" O.C.) – WIND

Condition	Braced Wall Line Spacing (ft)	Minimum Total Length (ft) of Braced Wall Panels Required Along Each Braced Wall Line									
		Intermittent Sheathing <sup>2</sup>					Continuous Sheathing <sup>2</sup>				
		Ultimate Design Wind Speed, $V_{ult}$ (mph)									
		≤ 110	≤ 115	≤ 120	≤ 130	≤ 140	≤ 110	≤ 115	≤ 120	≤ 130	≤ 140
One Story or the Top of Two or Three Stories	10	1.9	1.9	2.4	2.4	2.9	1.4	1.9	1.9	2.4	2.4
	20	3.4	3.4	3.8	4.8	5.3	2.9	3.4	3.4	3.8	4.8
	30	4.8	5.3	5.8	6.7	7.7	4.3	4.3	4.8	5.8	6.7
	40	6.2	6.7	7.7	8.6	10.1	5.3	5.8	6.2	7.2	8.6
	50	7.8	8.6	9.1	10.6	12.5	6.7	7.2	7.7	9.1	10.6
	60	9.1	10.1	11.0	12.5	14.4	7.7	8.3	9.1	10.6	12.5
First Story of Two Stories or Second Story of Three Stories	10	3.4	3.8	4.3	4.8	5.8	2.9	3.4	3.4	4.3	4.8
	20	6.2	7.2	7.7	9.1	10.6	5.3	6.2	6.7	7.7	8.6
	30	9.1	10.1	11.0	13.0	14.9	7.7	8.6	9.1	11.0	12.5
	40	12.0	13.0	14.4	16.8	19.2	10.1	11.0	12.0	14.4	16.3
	50	14.9	15.8	17.3	20.6	23.5	12.5	13.4	14.9	17.3	20.2
	60	17.3	19.2	20.6	24.0	27.8	14.9	16.3	17.8	20.6	24.0
First Story of Three Stories	10	5.3	5.8	6.2	7.2	8.2	4.3	4.8	5.3	6.2	7.2
	20	9.6	10.6	11.0	13.0	15.4	8.2	8.6	9.6	11.0	13.0
	30	13.4	14.9	16.3	18.7	22.1	11.5	12.5	13.9	16.3	18.7
	40	17.8	19.2	21.1	24.5	28.3	14.9	16.3	17.8	21.1	24.0
	50	21.6	23.5	25.9	30.2	35.0	18.2	20.2	22.1	25.4	29.8
	60	25.4	27.8	30.7	36.0	41.3	22.1	24.0	25.9	30.2	35.0

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

1. Minimum 3/4"-thick Thermo-Brace® Green SIB to be installed on 2x4 or 2x6 studs spaced 16" o.c. and fastened with staples spaced 3"-3" (edge:field) per Section 5.4 of this TER.
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 1/2" gypsum sheathing shall be applied to the interior side of the wall assembly and fastened with a minimum of 5d cooler nails or 1 1/4" #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 1/2" 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 1.7.
4. 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 of this TER 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 belongs to the manufacturer of those products or the members of the associations that publish those design values.
5. Bracing lengths are based on the worst-case condition for the product thickness/orientation described.
6. Linear interpolation is permitted.
7. Wind speeds shown are  $V_{ult}$  in accordance with [ASCE 7-16](#). Use the following equation to convert to equivalent  $V_{asd}$  wind speed for use with the [2012 IBC](#) in accordance with [IBC Section 1609.3.1](#):  $V_{asd} = V_{ult}\sqrt{0.6}$

TABLE 2. REQUIRED BRACING LENGTHS FOR THERMO-BRACE® GREEN SIB (R3 OR R5; FPIS INWARD; STUDS 16" O.C.) – WIND

Condition	Braced Wall Line Spacing (ft)	Minimum Total Length (ft) of Braced Wall Panels Required Along Each Braced Wall Line									
		Intermittent Sheathing <sup>2</sup>					Continuous Sheathing <sup>2</sup>				
		Ultimate Design Wind Speed, $V_{ult}$ (mph)									
		≤ 110	≤ 115	≤ 120	≤ 130	≤ 140	≤ 110	≤ 115	≤ 120	≤ 130	≤ 140
One Story or the Top of Two or Three Stories	10	2.3	2.3	2.8	2.8	3.4	1.7	2.3	2.3	2.8	2.8
	20	4.0	4.0	4.5	5.7	6.2	3.4	4.0	4.0	4.5	5.7
	30	5.7	6.2	6.8	7.9	9.0	5.1	5.1	5.7	6.8	7.9
	40	7.3	7.9	9.0	10.2	11.9	6.2	6.8	7.3	8.5	10.2
	50	9.0	10.2	10.7	12.4	14.7	7.9	8.5	9.0	10.7	12.4
	60	10.7	11.9	13.0	14.7	17.0	9.0	10.2	10.7	12.4	14.7
First Story of Two Stories or Second Story of Three Stories	10	4.0	4.5	5.1	5.7	6.8	3.4	4.0	4.0	5.1	5.7
	20	7.3	8.5	9.0	10.7	12.4	6.2	7.3	7.9	9.0	10.2
	30	10.7	11.9	13.0	15.3	17.5	9.0	10.2	10.7	13.0	14.7
	40	14.1	15.3	17.0	19.8	22.6	11.9	13.0	14.1	17.0	19.2
	50	17.5	18.6	20.3	24.3	27.7	14.7	15.8	17.5	20.3	23.7
	60	20.3	22.6	24.3	28.3	32.8	17.5	19.2	20.9	24.3	28.3
First Story of Three Stories	10	6.2	6.8	7.3	8.5	9.6	5.1	5.7	6.2	7.3	8.5
	20	11.3	12.4	13.0	15.3	18.1	9.6	10.2	11.3	13.0	15.3
	30	15.8	17.5	19.2	22.0	26.0	13.6	14.7	16.4	19.2	22.0
	40	20.9	22.6	24.9	28.8	33.3	17.5	19.2	20.9	24.9	28.3
	50	25.4	27.7	30.5	35.6	41.2	21.5	23.7	26.0	29.9	35.0
	60	29.9	32.8	36.2	42.4	48.6	26.0	28.3	30.5	35.6	41.2

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

- Minimum 3/8"-thick Thermo-Brace® Green SIB to be installed on 2x4 or 2x6 studs spaced 16" o.c. and fastened with staples spaced 3":3" (edge:field) per Section 5.4 of this TER.
- 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 1/2" gypsum sheathing shall be applied to the interior side of the wall assembly and fastened with a minimum of 5d cooler nails or 1 1/4" #6 types W or S screws spaced 8" o.c. at panel edges and 8" o.c. in the field of the panels.
- Minimum 1/2" 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 1.7.
- 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 of this TER 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 belongs to the manufacturer of those products or the members of the associations that publish those design values.
- Bracing lengths are based on the worst-case condition for the product thickness/orientation described.
- Linear interpolation is permitted.
- Wind speeds shown are  $V_{ult}$  in accordance with [ASCE 7-16](#). Use the following equation to convert to equivalent  $V_{asd}$  wind speed for use with the [2012 IBC](#) in accordance with [IBC Section 1609.3.1](#):  $V_{asd} = V_{ult}\sqrt{0.6}$

### 5.3.3 Alternative to Prescriptive IRC Bracing Applications:

5.3.3.1 As an alternative to the requirements of Section 5.3.2 of this TER, the following provisions are permitted:

5.3.3.1.1 Thermo-Brace® Green SIB may be used on braced wall lines as an equivalent alternative to the WSP method when installed in accordance with [IRC Section R602.10](#) and this TER.



- 5.3.3.1.2 Thermo-Brace® Green SIB may be used to brace the walls of buildings as an alternative to the continuous wall bracing provisions of the CS-WSP method described in IRC Section R602.10.4.
- 5.3.3.1.3 Required braced wall panel lengths for Thermo-Brace® Green SIB shall be as determined by the equivalency factors shown in Table 3 of this TER and IRC Table R602.10.3(1) and Table R602.10.3(2), including all footnotes.
- 5.3.3.1.3.1 Bracing lengths in the *IRC* tables for the WSP or CS-WSP methods shall be multiplied by the equivalency factors listed in Table 3 below.

TABLE 3. BRACED WALL LINE LENGTH EQUIVALENCY FACTORS

Product	Sheathing Direction	Fastener	Fastener Spacing (edge:field) (in)	Stud Spacing (in)	Equivalency Factors <sup>8</sup> to <i>IRC</i> WSP or CS-WSP
Thermo-Brace® Green SIB R3	FPIS Outward	1 <sup>5</sup> / <sub>16</sub> " Crown x 1 <sup>3</sup> / <sub>4</sub> " Leg 16 ga Staples	3:3	16 o.c.	0.92
Thermo-Brace® Green SIB R5		1 <sup>5</sup> / <sub>16</sub> " Crown x 2" Leg 16 ga Staples			0.96
Thermo-Brace® Green SIB R3	FPIS Inward	1 <sup>3</sup> / <sub>4</sub> " x 11 ga Smooth Shank Roofing Nail	3:3	16 o.c.	1.09
Thermo-Brace® Green SIB R5		1 <sup>3</sup> / <sub>4</sub> " x 11 ga Ring Shank Roofing Nail			1.13

SI: 1 in = 25.4 mm

1. Thermo-Brace® Red SIB to be a minimum 3/4" thickness installed with staples or nails per Section 5.4.
2. Where the FPIS faces outward, fasteners may be countersunk beneath the surface of Thermo-Brace®.
3. Where the FPIS faces inward, fasteners shall be driven flush with the face of Thermo-Brace®.
4. Factors based on SPF framing materials.
5. 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 602.10.3(2) and Table R602.10.3(4) by the factors shown here to establish the required bracing length.
6. Where gypsum wallboard is not applied to the interior side of the wall assembly, bracing lengths shall be multiplied by a factor of 1.9.
7. These equivalency factors are valid for single top plate (advanced framing method) wall installations or double top plate wall installations.
8. 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 of this TER 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 belongs to the manufacturer of those products or the members of the associations that publish those design values.

- 5.3.3.1.3.2 These braced wall line length equivalency factors are based on equivalency testing and are used to comply with the *IRC* WSP and CS-WSP methods.
- 5.3.3.1.3.3 The length of bracing required shall be determined by multiplying the Thermo-Brace® Green SIB tested equivalency factors in Table 4 of this TER by the length indicated for the WSP or CS-WSP methods in IRC Table R602.10.3(1) and as modified by all applicable factors in IRC Table R602.10.3(2).
- 5.3.3.1.4 All *IRC* prescriptive bracing minimums, spacing requirements, and rules must still be met.



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

5.3.4.1 Thermo-Brace® Green SIB may be used to brace exterior walls of buildings as an equivalent alternative to Method WSP of the *IBC* when installed with ½" gypsum in accordance with the conventional light-frame construction method of *IBC Section 2308.6*<sup>8</sup> and this TER.

5.3.5 *Performance-Based Wood-Framed Construction:*

5.3.5.1 Thermo-Brace® Green SIB 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 4 of this TER.

5.3.5.2 Thermo-Brace® Green SIB shear walls are permitted to resist horizontal wind load forces using the allowable shear loads (in pounds per linear foot) set forth in Table 4 of this TER.

TABLE 4. ALLOWABLE STRESS DESIGN (ASD) CAPACITY – WIND

Product	Sheathing Direction	Fastener	Fastener Spacing (edge:field) (in)	Maximum Stud Spacing (in)	Gypsum Wallboard (GWB)	Gypsum Wallboard Fastener Spacing (edge:field) <sup>2</sup> (in)	Allowable Unit Shear Capacity (plf)
Thermo-Brace® Green SIB R3	FPIS Outward	15/16" Crown x 1¾" Leg 16 ga Staple	3:3	16 o.c.	None	-	290
					½"	8:8	450
Thermo-Brace® Green SIB R5		15/16" Crown x 2" Leg 16 ga Staple			None	-	285
					½"	8:8	470
Thermo-Brace® Green R3	FPIS Inward	1¾" x 11 ga (0.120" dia.) Smooth Shank Roofing Nail	3:3	16 o.c.	None	-	235
½"					8:8	415	
Thermo-Brace® Green SIB R5		1¾" x 11 ga (0.120" dia.) Ring Shank Roofing Nail			None	-	225
					½"	8:8	405

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

- Fasteners are to be installed with the crown parallel to the framing and spaced a maximum of 3" o.c. at the panel edges and 3" o.c. in the field. Fastener edge distance shall be a minimum of ¾". Set fastener depth on driving tools to the maximum depth.
- Gypsum attached with minimum #6 type W or S screws 1¼" long.

5.4 *Water-Resistive Barrier*

5.4.1 Thermo-Brace® Green SIB may be used as a WRB in accordance with *ASTM E331* and as prescribed in *IBC Section 1404.2*<sup>9</sup> and *IRC Section R703.2* when installed on exterior walls as described in this section.

5.4.2 Thermo-Brace® Green SIB installed with the NEOPOR® FPIS facing inward or outward is approved as a WRB provided the following conditions are met:

5.4.2.1 All board joints are placed directly over exterior framing spaced a maximum of 16" o.c. (406 mm). The fasteners used to attach the board shall be installed in accordance with Section 6.

5.4.2.2 All seams and joints between boards shall be covered by Barricade® Seam Tape or equivalent after fasteners are installed.

5.4.2.3 Flashing must be installed at all sheathing penetrations and shall comply with all applicable code sections.

<sup>8</sup> 2012 *IBC Section 2308.3*

<sup>9</sup> 2015 *IBC Section 1403.2*

5.4.3 When Thermo-Brace® Green SIB is used as intermittent bracing, NEOPOR® FPIS alone, which has been properly qualified as a WRB, is permitted to be used on the remaining portions of the braced wall line with all joints taped in accordance with the NEOPOR® FPIS manufacturer's installation instructions.

5.4.3.1 Where the NEOPOR® has not been qualified as a WRB, a separate WRB shall be installed.

#### 5.5 Air Barrier

5.5.1 Thermo-Brace® Green SIB may be used as an air barrier material as prescribed in IRC Section N1102.4.1.1, and IECC Section R402.4.1.1 and Section C402.5.1<sup>10</sup> in accordance with *ASTM E2178*.

#### 5.6 Minimum Fastening Requirements for Non-Structural Applications

5.6.1 Where other means of wall bracing are provided, or are not required, any grade of Thermo-Brace® SIB may be used to provide other wall functions when installed in accordance with this section.

5.6.1.1 The sheathing panels shall be applied to wall framing with 16 gauge, galvanized staples having a <sup>15</sup>/<sub>16</sub>" crown. Staples for the R3 panels shall be minimum 1<sup>3</sup>/<sub>4</sub>" leg length. Staples for R5 panels shall be minimum 2" in length.

5.6.1.2 Fastener spacing shall be a maximum of 3" o.c. in the field and 3" o.c. around the perimeter.

5.6.1.3 Stud spacing shall be a maximum of 16" o.c. (406 mm).

5.6.1.4 Minimum fastener penetration into the framing members shall be 1" for the R3 product and <sup>3</sup>/<sub>4</sub>" for the R5 product.

5.6.1.5 All staples shall be fastened parallel to the framing member with a minimum edge spacing of <sup>3</sup>/<sub>8</sub>" (9.5 mm).

5.6.1.6 All panels are vertically or horizontally installed with all joints backed by studs, plates, or blocks when water or air barrier functionality is desired.

## 6 INSTALLATION

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

#### 6.2 Orientation

6.2.1 Thermo-Brace® Green SIB shall be installed in either the vertical or horizontal orientation. To be recognized for the structural values listed in this TER, all joints must be fastened and backed by studs, plates, or blocks.

#### 6.3 Fastener Type

##### 6.3.1 Staples for Installation with FPIS Facing Outward:

6.3.1.1 For R3 Thermo-Brace® Green SIB, minimum <sup>15</sup>/<sub>16</sub>" crown by 1<sup>3</sup>/<sub>4</sub>" leg, 16 gauge galvanized staples shall be installed per the staple manufacturer's instructions.

6.3.1.2 For R5 Thermo-Brace® Green SIB, minimum <sup>15</sup>/<sub>16</sub>" crown by 2" leg, 16 gauge galvanized staples shall be installed per the staple manufacturer's instructions.

6.3.1.3 Fasteners shall be driven such that the head of the fasteners slightly overdriven beneath the surface of the Thermo-Brace® Green SIB.

##### 6.3.2 Nails for Installation with FPIS Facing Inward:

6.3.2.1 For R3 Thermo-Brace® Green SIB, minimum 1<sup>3</sup>/<sub>4</sub>" x 11 ga smooth shank roofing nails shall be installed per the nail manufacturer's instructions.

6.3.2.2 For R5 Thermo-Brace® Green SIB, minimum 1<sup>3</sup>/<sub>4</sub>" x 11 ga ring shank roofing nails shall be installed per the nail manufacturer's instructions.

<sup>10</sup> 2012 IECC Section C402.4.1



- 6.3.2.3 Fasteners shall be driven such that the head of the fasteners are flush with the surface of the Thermo-Brace® Green SIB. Do not overdrive fasteners.
- 6.3.3 *Gypsum Wallboard:*
  - 6.3.3.1 Where required, interior gypsum wallboard shall be a minimum ½" thickness and shall be attached with one of the following.
    - 6.3.3.1.1 #6 x 1¼" type W or S screws
    - 6.3.3.1.2 5d cooler nails
- 6.4 *Fastener Edge Distance*
  - 6.4.1 Fasteners shall be installed with a nominal edge distance of ¾" (9.5 mm) for Thermo-Brace® Green SIB and gypsum.
- 6.5 *Treatment of Joints*
  - 6.5.1 Thermo-Brace® Green SIB joints must be butted.
    - 6.5.1.1 Butt joints shall be placed over framing members and fastened with a single row of fasteners at each panel edge.
    - 6.5.1.2 When used as a WRB with the NEOPOR® FPIS installed facing inward, seal all seams with Barricade® Seam Tape or equivalent after all fasteners have been installed.
    - 6.5.1.3 When installed with the NEOPOR® FPIS facing outward, the NEOPOR® FPIS shall be qualified as a WRB and all seams shall be sealed with an approved tape in accordance with the NEOPOR® FPIS manufacturer's installation instructions for use as a WRB. Alternately, a separate WRB may be installed.
  - 6.5.2 Thermo-Brace® Green SIB must 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's installation instructions.

## 7 TEST ENGINEERING SUBSTANTIATING DATA

- 7.1 Lateral load testing in accordance with *ASTM E564* conducted by SBCRI
- 7.2 WRB testing in accordance with *ASTM E331* conducted by Intertek
- 7.3 Test reports and data compiled by SBCRI for determining comparative equivalency for use as an alternative material in accordance with *IBC Section 104.11* and *IRC Section R104.11*.
- 7.4 Some information contained herein is the result of testing and/or data analysis by other sources which conform to *IBC Section 1703* and relevant professional engineering law. DrJ relies on accurate data from these sources to perform engineering analysis. DrJ has reviewed and found the data provided by other professional sources to be credible.
- 7.5 Where appropriate, DrJ's analysis is based on design values that have been codified into law through codes and standards (e.g., *IBC*, *IRC*, *NDS®*, and *SDPWS*). This includes review of code provisions and any related test data that aids in comparative analysis or provides support for equivalency to an intended end-use application. Where the accuracy of design values provided herein is reliant upon the published properties of commodity materials (e.g., lumber, steel, and concrete), DrJ relies upon the grade mark, stamp, and/or design values provided by raw material suppliers to be accurate and conforming to the mechanical properties defined in the relevant material standard.





## 8 FINDINGS

- 8.1 When used and installed in accordance with this TER and the manufacturer's installation instructions, the product(s) listed in Section 1.1 are approved for the following:
- 8.1.1 Lateral load resistance due to wind loads carried by shear walls
  - 8.1.2 Performance of foam plastics in accordance with IBC Section 2603 and IRC Section R316
  - 8.1.3 Performance for use as a WRB in accordance with IBC Section 1404.2 and IRC Section R703.2
  - 8.1.4 Performance for use as an air barrier material as prescribed in IRC Section N1102.4.1.1, and IECC Section R402.4.1.1 and Section C402.5.1<sup>11</sup> in accordance with ASTM E2178
- 8.2 IBC Section 104.11 (IRC Section R104.11 and IFC Section 104.9 are similar) states:
- 104.11 **Alternative materials, design and methods of construction and equipment.** The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *building official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code...Where the alternative material, design or method of construction is not *approved*, the *building official* shall respond in writing, stating the reasons the alternative was not *approved*.
- 8.3 This product has been evaluated in the context of the codes listed in Section 2 and is compliant with all known state and local building codes. Where there are known variations in state or local codes applicable to this TER, they are listed here.
- 8.3.1 No known variations

## 9 CONDITIONS OF USE

- 9.1 Thermo-Brace® Green SIB shall not be used as a nailing base for claddings, trim, windows, or doors. Fastening through the Thermo-Brace® Green SIB into the framing is acceptable.
- 9.2 Walls sheathed with Thermo-Brace® Green SIB shall not be used to resist horizontal loads from concrete and masonry walls.
- 9.3 When used as part of a continuous air barrier assembly, all sheathing panel edges at the top and bottom of the wall assemblies and all joints between sheathing panels shall be sealed with an approved construction tape.
- 9.4 When Thermo-Brace® Green SIB is installed as a wall sheathing but is not installed per structural requirements, light-framed walls shall be braced by other means. When used as a WRB, installation shall be in accordance with Section 5.4 of this TER.
  - 9.4.1 When Thermo-Brace® Green SIB is not installed as a WRB, other means of providing a WRB are code required.
- 9.5 When used in accordance with the *IBC* in high wind areas, special inspections shall comply with IBC Section 1705.11.<sup>12</sup>
- 9.6 Where required by the *building official*, also known as the authority having jurisdiction (AHJ) in which the project is to be constructed, this TER and the installation instructions shall be submitted at the time of *permit* application.
- 9.7 Any generally accepted engineering calculations needed to show compliance with this TER shall be submitted to the AHJ for review and approval.

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<sup>11</sup> 2012 IECC Section C402.4.1

<sup>12</sup> 2012 IBC Section 1705.10



- 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 (e.g., owner or registered design professional).
- 9.8.1 Allowable shear loads shall not exceed the values in Table 4 of this TER for under lateral load conditions (wind).
- 9.9 At a minimum, this product shall be installed per Section 6 of this TER.
- 9.10 This product is manufactured under a third-party quality control program in accordance with IBC Section 104.4 and 110.4 and IRC Section R104.4 and R109.2.
- 9.11 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. Therefore, the TER shall be reviewed for code compliance by the building official for acceptance.
- 9.12 The use of this TER is dependent on the manufacturer's in-plant QC, the ISO/IEC 17020 third-party quality assurance program and procedures, proper installation per the manufacturer's instructions, the building official's inspection, and any other code requirements that may apply to demonstrate and verify compliance with the applicable building code.

## 10 IDENTIFICATION

- 10.1 The product(s) listed in Section 1.1 are identified by a label on the board or packaging material bearing the manufacturer's name, product name, TER number, and other information to confirm code compliance.
- 10.2 Additional technical information can be found at barricadebp.com.

## 11 REVIEW SCHEDULE

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