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DIVISION: 06—WOOD AND PLASTICS

Section: 06160—Sheathing

REPORT HOLDER:

ESR-1577

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EVALUATION SUBJECT:

THERMO-SHEATH RED LABEL STRUCTURAL SHEATHING; THERMO-SHEATH BLACK LABEL STRUCTURAL SHEATHING; THERMO-SHEATH BLUE LABEL STRUCTURAL SHEATHING; AND THERMO-SHEATH GREEN LABEL STANDARD SHEATHING

1 **1.0 EVALUATION SCOPE**

2 **Compliance with the following codes:**

- 3 ■ 2006 *International Building Code*® (IBC)
- 4 ■ 2006 *International Residential Code*® (IRC)

5 **Properties evaluated:**

- 6 ■ Physical properties
- 7 ■ Structural

8 **2.0 USES**

9 Thermo-Sheath Red Label Structural Sheathing, Thermo-Sheath Black Label Structural
10 Sheathing and Thermo-Sheath Blue Label Structural Sheathing are used as structural
11 wall sheathing for conventional light-frame wood construction of braced wall panels in
12 braced wall lines for buildings of Type V construction under the IBC and for braced wall

13 panels and continuous sheathed braced walls for structures complying with the IRC. The
14 sheathing may also be used as a component of engineered shear walls when installed as
15 described in Section 4.4.

16
17 Thermo-Sheath Green Label Standard Sheathing is used for nonstructural wall sheathing
18 on wood studs on buildings of Type V construction (IBC) and structures complying with
19 the IRC. The sheathing may also be used as a component of engineered shear walls
20 when installed as described in Section 4.4.

21 **3.0 DESCRIPTION**

22 All Thermo-Sheath sheathing products described in this report are fibrous boards
23 laminated with water-resistant adhesive to aluminum foil, pigmented polyolefin film,
24 unpigmented polyolefin film, aluminized polyolefin film or paper overlay on one or both
25 faces of the sheathing. Thermo-Sheath Red Label Structural Sheathing has a nominal
26 thickness of 0.105 inch (2.67 mm). Thermo-Sheath Black Label Structural Sheathing has
27 a nominal thickness of 0.115 inch (2.92 mm). Thermo-Sheath Blue Label Structural
28 Sheathing has a nominal thickness of 0.137 inch (3.48 mm). Thermo-Sheath Green Label
29 Standard Sheathing has a nominal thickness of 0.078 inch (1.98 mm). Thermo-Sheath
30 sheathing is provided in two standard size sheets of 48 inches by 96 inches (1219.2 mm
31 by 2438.4 mm) and 48³/₄ inches by 96 inches (1238.25 mm by 2438.4 mm). Other sizes
32 are available by special order.

33 **4.0 DESIGN AND INSTALLATION**

34 **4.1 Thermo-Sheath Red Label Structural Sheathing, Thermo-Sheath Black Label**
35 **Structural Sheathing, and Thermo-Sheath Blue Structural Sheathing:**

36 Thermo-Sheath Red Label, Black Label and Blue Label Structural Sheathing must be
37 installed vertically over wood stud walls, with framing having a nominal thickness of not
38 less than 2 inches (51 mm) spaced a maximum of 16 inches (406 mm) on center for Red
39 Label and Black Label sheathing, and 24 inches (610mm) on center for Blue Label
40 sheathing. Fasteners must be installed a minimum of $\frac{3}{8}$ inch (9.5 mm) from sheathing
41 edges. All joints and edges must be backed by studs, plates or blocking of a size at least
42 equal to that of the studs. Sheathing joints are either butt or lapped. Lapped joints must
43 be overlapped a minimum of $\frac{3}{4}$ inch (19.1 mm) at framing members, and fastened with a
44 single row of staples at the overlaps. Butt joints must be at framing members, and a
45 single row of staples must be applied to each panel edge. The sheathing may be installed
46 horizontally on walls 4 feet (1219 mm) high or less, with all edges blocked with framing
47 members having a nominal thickness of not less than 2 inches (51 mm).

48
49 The manufacturer's published installation instructions and this report must be strictly
50 adhered to, and a copy of the instructions must be available at all times on the jobsite
51 during installation.

52 **4.2 Thermo-Sheath Green Label Standard Sheathing:**

53 Thermo-Sheath Green Label Standard Sheathing is installed on studs spaced a
54 maximum of 24 inches on center (610 mm) and fastened only as needed to hold the
55 sheathing in place until the primary wall covering is installed. Wall framing must be
56 braced in accordance with the applicable code, except when installed as engineered
57 shear walls in accordance with Section 4.4. Joints between panels are butt joints or may
58 be overlapped a minimum of $\frac{3}{4}$ inch (19.1 mm). Joints must occur over studs, plates or

59 solid blocking. When installed as engineered shear walls, fastener size, type and
60 spacing must be in accordance with Section 4.4.

61
62 The manufacturer's published installation instructions and this report must be strictly
63 adhered to, and a copy of the instructions must be available at all times on the jobsite
64 during installation.

65 **4.3 Braced Walls—Conventional Construction:**

66 **4.3.1 Thermo-Sheath Red Label Structural Sheathing, Thermo-Sheath Black Label**
67 **Structural Sheathing, Thermo-Sheath Blue Label Structural Sheathing:** Thermo-
68 Sheath Red Label, Black Label and Blue Label Structural Sheathing may be used to
69 brace exterior walls of buildings of conventional light-frame wood construction as an
70 alternative to the fiberboard wall bracing (Method 4) described in Section 2308.9.3 of the
71 IBC and Section R602.10 of the IRC. The sheathing must be installed in accordance with
72 the requirements for bracing Method 4 of Section 2308.9.3 of the IBC, with fastening as
73 described in Table 2 of this report or bracing Method 4 of Section R602.10 of the IRC,
74 and the requirements of Table 1 and 2 of this report.

75 **4.3.2 Continuous Structural Panel Sheathing—Section R602.10.5 of the IRC:**

76 Thermo-Sheath Red Label Structural Sheathing may be used as an alternative
77 continuous structural panel sheathing when installed on all sheathable areas of all
78 exterior- and interior-braced wall lines, including areas above and below openings.
79 Installation must be in accordance with this report and Section R602.10.5, Table
80 R602.10.5 and Figure R602.10.5 of the IRC. Fastener size and spacing are noted in

81 Table 2. A minimum of 2 feet (0.61 m) of sheathing material must be installed at corners,
82 in accordance with Figure R602.10.5 of the IRC.

83 **4.3.3 Seismic Provisions:** Thermo-Sheath Red Label, Black Label and Blue Label
84 Structural Sheathing is limited to use as braced walls in Seismic Design Categories A, B
85 and C in accordance with Table 1 of this report. Evaluation of Thermo-Sheath Structural
86 Sheathing grades for use in buildings for which seismic analysis is required by Section
87 2308.2 of the IBC or Section R301.2.2 of the IRC is outside the scope of this report.

88 **4.4 Engineered Shear Walls—Wind Loads:**

89 Thermo-Sheath sheathing products may be used as components of engineered shear
90 walls for resisting wind loads when installed as described in Table 3. Walls using
91 Thermo-Sheath sheathing products must be designed as engineered shear walls when
92 structural analysis for wind is required by Section 2308.2 of the IBC or Section R301.2.1
93 of the IRC or when the construction does not qualify as conventional light-frame
94 construction in accordance with Section 2308 of the IBC or Section R602 of the IRC.
95 Design wind loads are determined in accordance with Section 1609 of the IBC. The
96 design wind loads must not exceed the allowable racking shear loads shown in Table 3.
97 The bracing requirements determined by wind load analysis must not be taken as less
98 than those determined by the prescriptive bracing requirements noted in Section 4.3 of
99 this report.

00 **5.0 CONDITIONS OF USE**

01 The Thermo-Sheath sheathing products described in this report comply with, or are
02 suitable alternatives to what is specified in, those codes listed in Section 1.0 of this
03 report, subject to the following conditions.

27 **5.8** A statement of special inspection complying with Section 1705 of the IBC must be
28 provided for structures assigned to Seismic Design Category C. Special
29 inspections in Seismic Design Category C must be provided for nailing, bolting,
30 anchoring and other fastening of components within the seismic-force-resisting
31 system, including connections of the braced wall panels and braced wall lines to
32 drag struts and hold-downs, in accordance with IBC Section 1707.1.

33 **5.9** The use of braced wall panels and braced wall lines in Exposure B where
34 the basic wind speed is 120 mph or greater and in Exposures C and D
35 where the basic wind speed is 110 mph or greater, requires that a
36 statement of special inspection be provided in accordance with IBC Section
37 1705.4, except for buildings designed and constructed in accordance with
38 IBC Section 2308 or the IRC.

39 **5.10** Thermo-Sheath Structural Sheathing and Thermo-Sheath Standard Sheathing
40 panels are manufactured in Constantine, Michigan, under a quality control
41 program with inspections by RI Ogawa and Associates (AA-705).

42 **6.0 EVIDENCE SUBMITTED**

43 **6.1** Data in accordance with the ICC-ES Acceptance Criteria for Laminated Fibrous
44 Board Sheathing Material (AC295), dated May 2006.

45 **6.2** Data in accordance with the ICC-ES Acceptance Criteria for Racking Shear
46 Evaluation of Proprietary Sheathing Materials Used as Braced Wall Panels
47 (AC269), dated October 2006.

48 **7.0 IDENTIFICATION**

49 Each Thermo-Sheath panel bears a label noting the report holder's name (National
50 Shelter Products, Inc.), the address of the manufacturing facility, the product name
51 [Thermo-Sheath (Green, Red, Black or Blue Label)], the panel thickness, the name of the
52 inspection agency (RI Ogawa and Associates), and the evaluation report number (ESR-
53 1577).

54

55 This evaluation report is subject to re-examination in one year.

TABLE 1—WALL BRACING REQUIREMENTS FOR THERMO-SHEATH SHEATHING IN CONVENTIONAL LIGHT-FRAME CONSTRUCTION FOR USE IN SEISMIC DESIGN CATEGORIES A, B AND C ^{1,2,3,4}

SEISMIC DESIGN CATEGORY OR WIND SPEED	CONDITION	LOCATIONS AND AMOUNT OF STRUCTURAL BRACING
Categories A and B ($S_s \leq 0.35$ g and $S_{ds} \leq 0.33$ g) Or 100 mph or less	One story, or Top of two or three stories	Located within 12.5 feet of each end of braced wall line and every 25 feet on center, but not less than 16% of braced wall line.
	First story of two stories, or Second story of three stories	Located within 12.5 feet of each end of braced wall line and every 25 feet on center, but not less than 25% of braced wall line.
	First story of three stories	Located within 12.5 feet of each end of braced wall line and every 25 feet on center, but not less than 35% of braced wall line.
Categories C ($S_s \leq 0.6$ g and $S_{ds} \leq 0.50$ g) Or 110 mph or less	One story, or Top of two or three stories	Located within 12.5 feet of each end of braced wall line and every 25 feet on center, but not less than 25% of braced wall line.
	First story of two stories, or Second story of three stories	Located within 12.5 feet of each end of braced wall line and every 25 feet on center, but not less than 45% of braced wall line.
	First story of three stories	Located within 12.5 feet of each end of braced wall line and every 25 feet on center, but not less than 60% of braced wall line.

SI Units Conversion: 1 foot = 0.3 m, 1 mph = 0.447 m/s.

¹Installation must be in accordance with the notes of IRC Table R602.10.1
²Fastening schedule must comply with the non-continuous sheathing requirements of Table 2 of this report.
³Continuous sheathing must be installed in accordance with IRC Section R602.10.5. Fastening schedule must comply with the continuous sheathing requirements of Table 2 of this report.
⁴Installation under the IBC must comply with IBC Section 2308.9.3.

TABLE 2—PRESCRIPTIVE FASTENING REQUIREMENTS FOR THERMO-SHEATH SHEATHING IN BUILDINGS OF CONVENTIONAL LIGHT-FRAME CONSTRUCTION¹

Thermo-Sheath Grade	Maximum Stud Spacing (inches o.c.)	Wall Bracing System	Maximum Height-to-Width Aspect Ratio	Fastener Type	Fastener Spacing ¹ (Inches o.c. Edges, Field)
Red	16	IRC & IBC non-continuous sheathing ³	2:1	⁷ / ₁₆ inch crown x 1 ¹ / ₄ inch x 16 gauge staples	3, 6
		IRC continuous sheathing ²	4:1	1 inch crown x 1 ¹ / ₄ inch x 16 gauge staples	3, 3
Black	16	IRC & IBC non-continuous sheathing	2:1	⁷ / ₁₆ inch crown x 1 ¹ / ₄ inch x 16 gauge staples	3, 6
Blue	24	IRC & IBC non-continuous sheathing ³	2:1	⁷ / ₁₆ inch crown x 1 ¹ / ₄ inch x 16 gauge staples	3, 6

SI Units Conversion: 1 inch = 25.4 mm

¹Fastener spacing shown is applicable to panels used to brace exterior walls in buildings of conventional wood framing designed in accordance with the prescriptive provisions of Section 2308 of the IBC or Section R602 of the IRC.
²Continuous sheathing must be installed in accordance with the notes of IRC Table R602.10.5.
³Non-continuous sheathing must be installed in accordance with Section 4.3.1 of this report.

TABLE 3—ALLOWABLE SHEAR LOADS (PLF) FOR THERMO-SHEATH SHEATHING IN ENGINEERED WOOD CONSTRUCTION^{1, 2, 3, 4, 7}

Thermo-Sheath Grade	Maximum Stud Spacing (inches o.c.)	Maximum Height-to-Width Aspect Ratio	Fastener Type	Fastener Spacing (inches o.c. Edges, Field)	Allowable Racking Load (PLF)
Red	16 ⁴	2:1	1/16 inch crown x 1 1/4 inch x 16 gauge staples	3, 6	130
Black	16 ⁴	2:1	1/16 inch crown x 1 1/4 inch x 16 gauge staples	3, 6	155
Black	16 ⁴	2:1	1 inch crown x 1 1/4 inch x 16 gauge staples	2, 6	180
Blue	24 ⁴	2:1	1/16 inch crown x 1 1/4 inch x 16 gauge staples	3, 3	185
Green and 1/2" gypsum wallboard ⁸	16 ⁵	2:1	1 inch crown x 1 1/4 inch x 16 gauge staples for Thermo-Sheath	3, 6	159
			#6 x 1 1/4 inches coarse thread drywall screws for gypsum wallboard	7, 7	
Red and 1/2" gypsum wallboard ⁸	16 ⁵	2:1	1 inch crown x 1 1/4 inch x 16 gauge staples for Thermo-Sheath	3, 6	206
			#6 x 1 1/4 inches coarse thread drywall screws for gypsum wallboard	7, 7	
Blue and 1/2" gypsum wallboard ⁸	16 ⁵	2:1	1 inch crown x 1 1/4 inch x 16 gauge staples for Thermo-Sheath	3, 6	218
			#6 x 1 1/4 inches coarse thread drywall screws for gypsum wallboard	7, 7	

SI Units Conversion: 1 inch = 25.4 mm, 1 pound per lineal foot (plf) = 14.6 N/m

¹Panel joints must occur over studs, plates or solid blocking.

²Staples must be installed with the crown parallel to the framing member.

³The staple crown must be installed so that the staple crown does not puncture the sheathing.

⁴Wall studs are nominal 2 x 4 Hem-Fir (G=0.43) stud grade. Allowable shear values shown above are for installation over lumber framing having a specific gravity equal to or greater than G = 0.43.

⁵Wall studs are nominal 2 x 4 Spruce-Pine-Fir (G=0.42) No. 2 grade. Allowable shear values shown above are for installation over lumber framing having a specific gravity equal to or greater than G = 0.42.

⁶Allowable shear values are for short-term wind loads.

⁷Wood stud shear walls sheathed with Thermo-Sheath must not be used to resist horizontal loads from concrete or masonry walls.

⁸The interior of a braced wall panel must be sheathed with 1/2-inch-thick (12.7 mm) regular gypsum board oriented parallel to the studs. The gypsum board must be fastened to each framing member with minimum #6 by 1 1/4 -inch coarse thread drywall screws spaced 7 inches (178 mm) on center at the perimeter and in the field of the board.