ICC-ES Evaluation Report

ESR-1122

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 16 00—Sheathing

REPORT HOLDER:

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EVALUATION SUBJECT:

THERMO PLY® (BLUE) STRUCTURAL GRADE SHEATHING, THERMO PLY® (RED) STRUCTURAL GRADE SHEATHING

1.0 EVALUATION SCOPE

Compliance with the following codes:

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

Properties evaluated:

- Physical properties
- Structural
- Fire-resistance-rated wall assemblies

2.0 USES

Thermo Ply® (Blue) and Thermo Ply® (Red) Structural Grade Sheathings are used as structural wall sheathing for conventional light-frame wood construction of braced wall panels, braced wall lines and for continuously sheathed wall bracing on all sheathable areas of all exterior walls and interior braced walls in buildings of Type V construction (IBC) and structures complying with the IRC.

3.0 DESCRIPTION

All Thermo Ply® sheathing products described in this report are laminated boards made of fibered, specially treated plies that are pressure-laminated with a water-resistant adhesive. The surface finish consists of reflective aluminum foil, polymeric coating, or a kraft/polyethylene/kraft laminate on one or both sides.

Thermo Ply® (Blue) Structural Grade Sheathing is 0.135 inch (3.4 mm) thick, and Thermo Ply® (Red) Structural Grade Sheathing is 0.113 inch (2.9 mm) thick. Thermo Ply® sheathing is available in a standard size of 48 inches wide by 96 inches long (1219 mm by 2438 mm), and special sizes up to 60 inches wide by 120 inches long (1524 mm by 3048 mm). The average installed weight of Thermo Ply® (Blue) Structural Grade Sheathing is 0.51 pound per square foot (2.5 kg/m^2). The average installed weight of Thermo Ply® (Red) Structural Grade Sheathing is 0.414 pound per square foot (2.02 kg/m^2).

4.0 DESIGN AND INSTALLATION

4.1 General:

Thermo Ply® sheathing must be installed vertically over wood stud walls, with framing having a nominal thickness of not less than 2 inches (51 mm) spaced a maximum of 16 inches (406 mm) on center, and fasteners placed not less than $^3/_8$ inch (9.5 mm) from sheathing edges. All joints and edges in the Thermo Ply® sheathing must be backed by studs, plates or blocking of a size at least equal to that of the studs. Sheathing joints are either butted or lapped. Lapped joints must be overlapped a minimum of $^3/_4$ inch (19.1 mm) at framing members, and fastened with a single row of staples at the overlaps. Butt joints must be at framing members, and a single row of staples must be applied to each panel edge. The sheathing may be installed horizontally on walls 4 feet (1219 mm) high or less, provided all edges are blocked (blocking of a size at least equal to that of the studs). The fastener schedule is the same as for application in the vertical direction.

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

4.2 Braced Walls—Conventional Construction:

4.2.1 Thermo Ply® (Blue) and Thermo Ply® (Red) Structural Grade Sheathing: Thermo Ply® (Blue) and Thermo Ply® (Red) Structural Grade Sheathing may be used to brace exterior walls of buildings of conventional light-frame wood construction as an alternative to the fiberboard wall bracing (Method 4) described in Section 2308.9.3 of the IBC and Section R602.10 of the IRC. The sheathing must be installed in accordance with the requirements for bracing Method 4 of Section 2308.9.3 of the IBC, with fastening as described in Table 2 of this report or bracing Method 4 of Section R602.10 of the IRC, and the requirements of Table 1 and 2 of this report. The interior of the braced wall must be sheathed with $^1/_2$-inch-thick (12.7 mm) regular gypsum board oriented perpendicular to the studs. Horizontal joint may be blocked or unblocked. The gypsum board must be fastened to each framing member with minimum 0.098 inch (2.5 mm) diameter, $1^5/_8$-inch-long (41.3 mm) ring shank wallboard nails spaced 8 inches (203 mm) on center at the perimeter and in the field of the board.

4.2.2 Continuous Structural Panel Sheathing—Section R602.10.5 of the IRC: Thermo Ply®(Blue) and Thermo Ply® (Red) Structural Grade Sheathing may be used as an alternative to Method 3 continuous structural panel sheathing when installed on all sheathable areas of all exterior- and interior-braced wall lines, including areas above and below openings. Installation must be in accordance with this report and Section R602.10.5, Table R602.10.5 and Figure R602.10.5 of the IRC. Fastener size and spacing are noted in Table 2. Bracing panel location must be in accordance with IRC Section R602.10.11.2.

4.2.3 Seismic Provisions: Recognition in this evaluation report is limited to use of the Thermo Ply® (Blue) and Thermo Ply® (Red) Structural Grade Sheathing in Seismic Design Categories A, B and C of the IBC or IRC as described in Table 1 of this report. Evaluation of the sheathing for use in buildings for which seismic analysis is required by Section 2308.2 of the IBC or Section R301.2.2 of the IRC is outside the scope of this report.

4.2.4 Transverse Load Design: Thermo Ply® Blue and Thermo Ply® Red Structural Wall Sheathings have allowable negative and positive transverse (out-of-plane) loads as shown in Table 3. All transverse wind design pressures resisted by the Thermo Ply® Blue or Thermo Ply® Red sheathing materials must be based on the components and cladding provisions in accordance with Section 1609.1.1 of the IBC or, under the IRC, Table 301.2(2) of the IRC adjusted for height and exposure using coefficients in IRC Table 301.2(3).

4.3 Fire-resistance-rated Wall Assemblies—Thermo Ply® (Blue) or Thermo Ply® (Red) Structural Grade Sheathing:

4.3.1 IBC Exterior Walls: Thermo Ply® (Blue) Structural Grade Sheathing may be used as a component of an 8-foot-high (2438 mm), limited load bearing, unsymmetrical, fire-resistance-rated exterior wall assembly when installed with a fire separation distance greater than 5 feet (1524 mm). When Thermo Ply® (Blue) or Thermo Ply® (Red) Structural Grade Sheathing is installed as shown in Figure 1 of this report, with exterior siding substitutions as noted in this section, the exterior wall assembly has a one-hour fire-resistance-rating for interior exposure only.

The following materials may substitute for the $^{19}/_{32}$-inch-thick (15.1 mm) plywood panel siding on the exterior side of the base assembly shown in Figure 1:

1. Wood siding at least $^{11}/_{32}$ inch thick (8.7 mm) and composed of solid wood, plywood or hardboard.
2. Steel or aluminum sidings backed by wood-fiber sheathing boards.
3. Steel or aluminum sidings without backing.
4. Any thickness of brick veneer or stone veneer exterior finish. The stone veneer could be either natural stone or composition stone made from inorganic (noncombustible) materials.
5. Nonasbestos fiber cement board described in a current ICC-ES evaluation report.

Additionally, R-13 unfaced-glass-fiber-insulation batts may be substituted for the R-11 batts shown in Figure 1.

4.3.2 IRC Two-family Dwelling Unit Separation and IBC Fire Partition for Dwelling Units Separation: Thermo Ply® (Blue) or Thermo Ply® (Red) Structural Grade Sheathing may be used as a component of an 8-foot-high (2438 mm), limited load bearing, dual wood stud, tenant separation wall assembly. The one-hour fire-resistance-rated wall assembly must be symmetrical about its longitudinal centerline as follows: an air space; followed by Thermo Ply® (Blue) or Thermo Ply® (Red) Structural Grade Sheathing stapled to nominally 2-by-4 wood studs spaced at 16 inches (406.4 mm) on center with $3^1/_2$- inch-thick (89 mm), R-11 or R-13 unfaced-friction-fit-glass-fiber-insulation batts, with a flame-spread index of 25 or less and a smoke-developed index of 450 or less, in the stud cavity; and $^5/_8$-inch-thick Type X gypsum wallboard fastened in accordance with the code as the finish. Staples must be cement-coated, No. 16 gage, 1-inch-crown-by-$1^1/_4$-inch-long (25.4 mm by 31.75 mm) staples spaced 3 inches (76.2 mm) on center on the perimeter and 6 inches (152.4 mm) on center on the intermediate studs. This assembly has a one-hour fire-resistance rating for protection between dwelling units of two-family dwellings under Section R317.1 of the IRC and Section 708 of the IBC.

5.0 CONDITIONS OF USE

The Thermo Ply® (Blue) and Thermo Ply® (Red) Structural Grade Sheathing described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 This evaluation report and the installation instructions, when required by the code official, must be submitted at the time of permit application. In the event of conflict between the published instructions and this report, the more restrictive must govern.

5.2 The sheathing material must not be used as a nailing base.

5.3 Use of the sheathing as a water-resistive barrier is outside the scope of this evaluation report.

5.4 Thermo Ply® Blue and Thermo Ply ® Red sheathing installed and fastened in accordance with Table 2 of this report are rated for allowable transverse loading due to component and cladding wind pressures acting on the building surface (transverse wind load) as described in Section 4.2.4 of this report.

5.5 Walls sheathed with Thermo Ply® sheathing must not be used to resist horizontal loads from concrete or masonry walls.

5.6 In accordance with Section 4.2 of this report, Thermo Ply® (Blue) and Thermo Ply ® (Red) Structural Grade Sheathing may be used to brace exterior walls of buildings of conventional light-frame construction in Seismic Design Categories A, B or C of the IBC or IRC.

5.7 When the sheathing is not installed as braced wall panels as described in Section 4.2, the stud walls must be braced by other materials in accordance with the applicable code.

5.8 Thermo Ply® (Blue) or Thermo Ply® (Red) Structural Grade Sheathing may be installed as part of a fire-resistance-rated assembly when all the materials and the construction comply with Section 4.3.

5.9 One-hour fire-resistance-rated load-bearing walls must be installed as described in Section 4.3, and may be axially loaded up to the lesser of: (1) 51.2 percent of the maximum allowable design stress calculated in accordance with the *AF&PA National Design Specification For Wood Construction* (NDS); (2) allowable load of 1,800 lbs (8010 N) per nominally 2-by-4 stud when the wall height is limited to 8 feet (2438 mm); (3) 0.78 F'_c (ASD); "(4) 0.78 F'_c (ASD) at l_e/d of 33 or (5) a maximum of 54.9 percent of the load calculated in accordance with Sections 3.6 and 3.7 of the ANS/AF&PA NDS.

5.10 Special inspection complying with Section 1704 of the IBC must be provided for structures assigned to Seismic Design Category C. Special inspections in Seismic Design Categories C must be provided for nailing, bolting, anchoring and other fastening of components within the seismic-force-resisting system, including connections of the braced wall panels and braced wall lines to drag struts and hold-downs, in accordance with IBC Sections 1705.1 to 1705.3, 1707.1 and 1707.3. A statement of special inspections complying with IBC Section 1705 must be provided to the code official.

5.11 For the use of braced wall panels and braced wall lines in Exposure B where the basic wind speed is 120 mph or greater and in Exposures C and D where the basic wind speed is 110 mph or greater, special inspection must be provided in accordance with IBC Sections 1705.1, 1705.2 and 1705.4, except for buildings designed and constructed in accordance with IBC Section 2308 or the IRC. A statement of special inspections complying with IBC Section 1705 must be provided to the code official.

5.12 The Thermo Ply® (Blue) and Thermo Ply® (Red) Structural Grade Sheathing panels are manufactured by Berry Plastics Corporation in Constantine, Michigan, under a quality control program with inspections by PFS Corporation (AA-652).

6.0 EVIDENCE SUBMITTED

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Laminated Fibrous Board Sheathing Material (AC295), dated October 2007 (editorially revised April 2009).

6.2 Data in accordance with the ICC-ES Acceptance Criteria for Racking Shear Evaluation of Proprietary Sheathing Materials Used as Braced Wall Panels (AC269), dated October 2009.

6.3 Tests of fire-resistance-rated wall assemblies in accordance with ASTM E 119.

7.0 IDENTIFICATION

Each Thermo Ply® (Blue) and Thermo Ply® (Red) Structural Grade Sheathing panel bears a label noting the manufacturer's trade name (Berry Plastics Corporation) and the address of the manufacturer's facility, the product name [Thermo Ply® (Blue) or Thermo Ply® (Red)], the panel thickness, the name of the inspection agency (PFS Corporation), and the evaluation report number (ESR-1122).

TABLE 1—WALL BRACING REQUIREMENTS FOR THERMO PLY® 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	LOCATION AND AMOUNT OF STRUCTURAL BRACING
Categories A and B (S_s ≤ 0.35 g and S_{ds} ≤ 0.33 g) or 100 mph or less	One story 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 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.
Category C (S_s ≤ 0.6 g and S_{ds} ≤ 0.50 g) or 110 mph or less	One story 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 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 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

For **SI:** 1 foot = 0.3 m, 1 mph = 0.447 m/s.

[1]Installation under the IRC must be in accordance with either Section R602.10.1 and the notes of IRC Table R602.10.1 or as continuous sheathing installed in accordance with IRC Section R602.10.5. Refer to Section 4.2.2 of this report.
[2]Fastening schedule must comply with the continuous or noncontinuous sheathing requirements of Table 2 of this report as applicable.
[3]Installation under the IBC must comply with IBC Section 2308.9.3. Fasteners must be as required for noncontinuous sheathing in Table 2 of this report.
[4]The interior of a braced wall panel must be sheathed with $^1/_2$-inch-thick (12.7 mm) regular gypsum board oriented perpendicular to the studs. The gypsum board must be fastened to each framing member with minimum No. 13 gage, $1^5/_8$-inch-long (41.3 mm), ring shank nails spaced 8 inches (203 mm) on center at the perimeter and in the field of the board.

TABLE 2—PRESCRIPTIVE FASTENING REQUIREMENTS FOR THERMO PLY® SHEATHING IN BUILDINGS OF CONVENTIONAL LIGHT-FRAME CONSTRUCTION[1]

THERMO PLY® GRADE	WALL BRACING SYSTEM	MAXIMUM HEIGHT-TO- WIDTH ASPECT RATIO	MAXIMUM WOOD STUD SPACING (inches o.c.)	FASTENER TYPE	FASTENER SPACING[1] (inches o.c. Edges, Field)
Blue and Red	IRC & IBC noncontinuous sheathing3	2:1	16	1 inch × 1 1/4 inch × 16 gage staple	3,3
	IRC continuous sheathing[2]	4:1	16	1 inch × 1 1/4 inch × 16 gage staple	3,3

For **SI:** 1 in = 25.4 mm.

[1]Fastener 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. Panels used as a part of a fire-resistance-rated assembly must also meet the requirements as noted in Section 4.3 of this report.
[2]Continuous sheathing must be installed in accordance with the notes of IRC Table R602.10.5.
[3]Noncontinuous sheathing must be installed in accordance with Section 4.2.1 of this report.

TABLE 3—TRANSVERSE LOAD CAPACITIES OF THERMO PLY® SHEATHING[1]

THERMO PLY® GRADE	NEGATIVE TRANSVERSE LOAD CAPACITY (psf)	POSITIVE TRANSVERSE LOAD CAPACITY (psf)
Blue	53	49
Red	48	48

For **SI:** 1 psf = 0.0479 kPa or 47.9 Pa.

[1]The transverse wind load design must be in accordance with Section 1609.1.1 of the IBC or, for buildings regulated by the IRC, Table 301.2(2) of the IRC adjusted for height and exposure using coefficients in IRC Table 301.2(3).

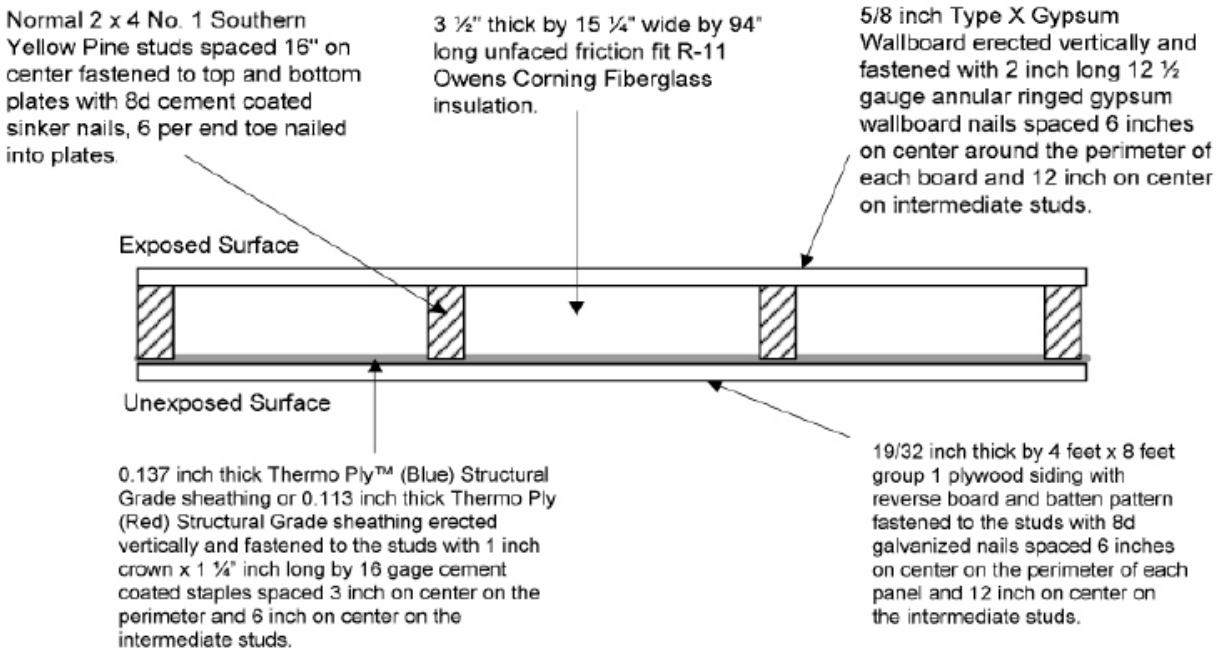

FIGURE 1—FIRE-RESISTANCE-RATED WALL ASSEMBLY