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ICC-ES Evaluation Report

ESR-3168

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 50 00—Structural Plastics
Section: 06 53 00—Plastic Decking
REPORT HOLDER:

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EVALUATION SUBJECT:
TREX® TRANSCEND™ DECKING
1.0 EVALUATION SCOPE
Compliance with the following codes:

- 2009 *International Building Code*® (2009 IBC)
- 2009 *International Residential Code*® (2009 IRC)
- 2006 *International Building Code*® (2006 IBC)
- 2006 *International Residential Code*® (2006 IRC)

Properties evaluated:

- Structural
- Durability
- Surface-burning characteristics

2.0 USES

Trex® Transcend™ Decking is for use as deck boards for exterior balconies, porches, decks, stair treads and other exterior walking surfaces of Type V-B (IBC) construction, and in structures constructed in accordance with the IRC. Trex® Transcend™ Fascia Board is for use as nonstructural trim components for exterior balconies, porches and decks of Type V-B (IBC) construction, and in structures constructed in accordance with the IRC.

3.0 DESCRIPTION
3.1 General:

Trex® Transcend™ is a wood thermoplastic composite lumber (WTCL) deck board and fascia, with an integrated shell that covers the boards on the top surface and sides. The underside of the boards and fascia is not covered by the integrated shell. The integrated shell consists of a proprietary surface formulation that produces a natural, wood-like grain pattern finish. The deck board and fascia are made from approximately 50 percent wood fiber and 50 percent polyethylene by weight, and are alternatives to

preservative-treated or naturally durable lumber. Trex® Transcend™ is manufactured by a continuous extrusion process and is available in six colors (gravel path, fire pit, vintage lantern, tree house, spiced rum and lava rock) and two textures. Trex® Transcend™ square deck boards are 5½ inches wide and 1 inch thick (140 mm by 25.4 mm). The Trex® Transcend™ grooved-edge boards are 5½ inches wide and 1 inch thick (140 mm by 25.4 mm) and have a groove in each face of the 1-inch-thick sides, running the length of the board. The Trex® Transcend™ Fascia has a square edge profile, is ¾ inch thick, and is available in nominally 1-by-8 and 1-by-12 profiles. The Trex Hideaway® Hidden Fastener System is designed specifically for the Trex® Transcend™ grooved-edge board and consists of a stainless steel clip or a plastic universal clip and No. 8 by 2-inch (51 mm) stainless steel flathead screws.

3.2 Durability:

When subjected to weathering, insect attack and other decaying elements, the deck board and fascia material are equivalent in durability to preservative-treated or naturally durable lumber. Accordingly, the material is permitted to be used as an alternative to preservative-treated or naturally durable lumber on exterior decks, porches, balconies and stair treads, as applicable. The deck board and fascia have been evaluated for use in ambient air temperatures between -20°F (-29°C) and 125°F (52°C).

3.3 Surface-burning Characteristics:

When tested in accordance with ASTM E 84, Trex® Transcend™ boards have a flame-spread index no greater than 200.

4.0 DESIGN AND INSTALLATION
4.1 Design: Allowable Stresses:

Table 1 lists allowable stress values for the Trex® Transcend™ decking recognized in this report. These values must not be adjusted.

4.2 Installation:

4.2.1 Deck Boards: The deck boards must be installed perpendicular to the supporting construction, which is limited to a maximum spacing as prescribed in Table 2. The deck boards must be spaced at edges and ends in accordance with the manufacturer's published installation instructions.

4.2.2 Deck Boards Used as Stair Treads: The deck boards, when used as stair treads, are sufficient to resist the code-prescribed concentrated load of 300 lbf (1.33 kN) when installed at a maximum center-to-center spacing as indicated in Table 3.

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4.2.3 Deck Board Fasteners: Trex® Transcend™ grooved-edge boards, when installed with the Trex Hideaway™ Stainless Steel or Universal Hidden Fastener Systems with No. 8 by 2-inch (51 mm) stainless steel flathead screws, have an uplift rating of 100 psf (4788 Pa) up to a maximum span of 16 inches (406 mm) when installed at each support. Trex® Transcend™ solid boards are to be installed on the ends of the boards with two No. 8 or No. 10 by 2½-inch (63.5 mm) wood screws at each support, at least 1 inch (25.4 mm) from the board end and sides, and at least one No. 8 or No. 10 wood screw at each support alternating each side of the board in a zigzag pattern. The allowable fastener head pull-through capacity for the screws is 349 lbf (1553 N) per fastener. Multiple joists or blocking must be used to provide adequate surface for fastener embedment of board ends.

5.0 CONDITIONS OF USE

The Trex® Transcend™ deck boards 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 The Trex® Transcend™ Decking is limited to exterior use as deck boards for balconies, porches, decks and stair treads of Type V-B (IBC) construction and structures constructed in accordance with the IRC.
- 5.2 The Trex® Transcend™ Fascia is limited to exterior use as trim for balconies, porches and decks of Type V-B (IBC) construction and structures constructed in accordance with the IRC.
- 5.3 Installation must comply with this report, the manufacturer's published instructions and the applicable code. When the manufacturer's published installation instructions differ from this report, this report governs.
- 5.4 The use of the Trex Transcend® Decking and fascia as a component of a fire-resistance-rated assembly is outside the scope of this report.

5.5 The compatibility of the fasteners with the supporting construction, including chemically treated wood, is outside the scope of this report.

5.6 The deck boards must be directly fastened to supporting construction. Where required by the code official, engineering calculations and construction documents consistent with this report must be submitted for approval. The calculations must verify that the supporting construction complies with the applicable building code requirements and is adequate to resist the loads imparted upon it from the products and systems discussed in this report. The documents must contain details of the attachment to the supporting structure consistent with the requirements of this report. The documents must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.7 The Trex® Transcend™ deck board and fascia is produced in Winchester, Virginia, and Fernley, Nevada, under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

6.1 Data in accordance with applicable portions of the ICC-ES Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems (AC174), dated July 2010.

6.2 Test data in accordance with ASTM D 7031 for bending, compressive stress parallel to longitudinal direction (F_c), compressive stress perpendicular to longitudinal direction ($F_{c\perp}$) and shear stress (F_v).

7.0 IDENTIFICATION

The deck board and fascia board described in this report must be identified by a label on the packaging bearing the Trex Company, Inc., name and address, the product name, the name of the inspection agency (ICC-ES) and the evaluation report number (ESR-3168).

TABLE 1—ALLOWABLE DESIGN STRESS VALUES FOR TREX TRANSCEND SOLID AND SLOTTED DECKING

| PROPERTY | ALLOWABLE DESIGN VALUE (psi) |
|--|------------------------------|
| Flexural stress (F_b) ¹ | 500 |
| Modulus of Elasticity (E) ¹ | 200,000 |
| Compressive stress parallel to longitudinal direction (F_c) ² | 540 |
| Compressive stress perpendicular to longitudinal direction ($F_{c\perp}$) ² | 540 |
| Shear stress (F_v) ² | 360 |

For SI: 1 psi = 6.9 kPa.

¹Values are based on testing for flatwise bending.

²Values are based on testing to ASTM D 7031.

TABLE 2—DECK BOARD SPAN RATING

| DECK BOARD | MAXIMUM SPAN (in.) ¹ | ALLOWABLE CAPACITY (lbf/ft ²) ² |
|-----------------------|---------------------------------|--|
| 1-by-5.5 solid | 24 | 100 |
| 1-by-5.5 grooved-edge | 16 | 100 |

For SI: 1 inch = 25.4 mm; 1 lbf/ft² = 47.9 Pa.

¹Maximum span is measured center-to-center of the supporting construction.

²Maximum allowable capacity is adjusted for durability. No further increases are permitted.

TABLE 3—MAXIMUM STAIR TREAD SPANS²

| DECK BOARD | MAXIMUM SPAN (inches) ¹ |
|-----------------------|------------------------------------|
| 1-by-5.5 solid | 12 |
| 1-by-5.5 grooved-edge | 12 |

For SI: 1 inch = 25.4 mm; 1 lbf/ft² = 47.9 Pa.

¹Maximum span is measured center-to-center of the supporting construction.

²Based on a minimum two-span installation.

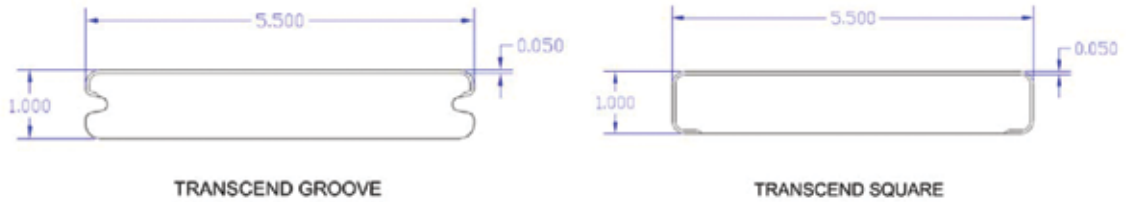


FIGURE 1—DECK BOARD PROFILES

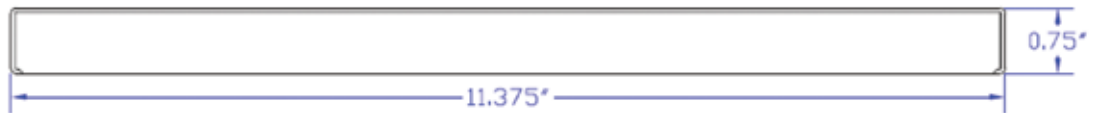


FIGURE 2—FASCIA PROFILE

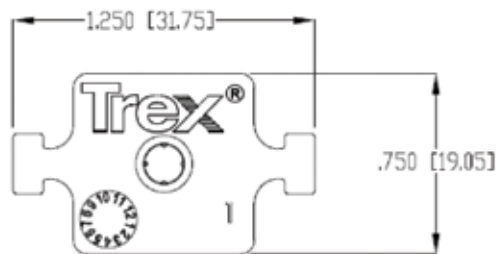


FIGURE 3—HIDDEN FASTENER PROFILE