

# ICC-ES Evaluation Report

**ESR-1667**

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**DIVISION: 06 00 00—WOOD, PLASTICS, AND  
COMPOSITES**
**Section: 06 53 00—Plastic Decking**
**REPORT HOLDER:**
**AZEK BUILDING PRODUCTS, INC.**  
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 SCRANTON, PENNSYLVANIA 18505  
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**EVALUATION SUBJECT:**
**AZEK DECKING SYSTEM**
**1.0 EVALUATION SCOPE**
**Compliance with the following codes:**

- 2012, 2009 and 2006 *International Building Code*® (IBC)
- 2012, 2009 and 2006 *International Residential Code*® (IRC)

**Properties evaluated:**

- Structural
- Durability
- Surface-burning Characteristics

**2.0 USES**

The AZEK Decking Systems, with the exception of the nominally  $\frac{5}{4}$ -inch-thick-by- $3\frac{1}{2}$ -wide decking, are used as deck boards for exterior balconies, porches, stair treads and decks of buildings of Type V-B (IBC) construction or buildings constructed in accordance with the IRC.

The nominally  $\frac{5}{4}$ -inch-thick-by- $3\frac{1}{2}$ -inch-wide AZEK deck boards are limited to exterior use as exterior balconies, porches and deck boards of buildings of Type V-B (IBC) construction or buildings constructed in accordance with the IRC.

**3.0 DESCRIPTION**
**3.1 General:**

The AZEK Decking Systems are available in uncapped, semi-capped and fully capped boards. The uncapped board is produced in a mono extruded process from a solid composite material consisting of cellular vinyl and agrifibre and is available under the Harvest Collection. The uncapped boards are manufactured in profiles of nominally  $\frac{5}{4}$ -inch-thick-by- $3\frac{1}{2}$ -inch-wide [actually 1 inch by  $3\frac{1}{2}$  inches (25.4 mm by 89 mm)],  $\frac{5}{4}$ -inch-thick-by- $3\frac{1}{2}$ -inch-wide tongue-and-groove porch board [actually 1 inch-by-

$3\frac{1}{8}$  inches (25.4 mm by 80 mm)] and  $\frac{5}{4}$ -inch-thick-by-6-inch-wide [actually 1 inch by  $5\frac{1}{2}$  inches (25.4 mm by 140 mm)]. The uncapped deck boards are available in 12-, 16-, or 20-foot (3.7, 4.9 and 6.1 m) lengths except for the porch boards which are available in 10-, 12- or 16-foot (3.0, 3.7 or 4.9 m) lengths. The uncapped decking is manufactured in five colors: white, slate, brownstone, clay and ivory. See Figure 1.

The semi-capped and fully capped deck boards are produced in a coextruded process from cellular vinyl and a mineral additive and are available in the Arbor Collection, Terra Collection and Harvest Collection. The capped boards are manufactured in 1-inch-thick-by- $5\frac{1}{2}$ -inch-wide (25.4 mm by 140 mm) boards with a 0.02-inch-thick-cap (0.5 mm) covering the top and a 0.01-inch-thick-cap (0.25 mm) covering the sides of the semi-cap board and additionally covering the bottom with a 0.01-inch-thick-cap (0.25 mm) on the fully capped deck board. The semi-capped and fully capped deck boards are available in 12-, 16-, or 20-foot (3.7, 4.9 and 6.1 m) lengths. The Arbor Collection is manufactured in five colors: Acacia, Cobre, Morado, Redland Rose and Silver Oak. The Terra Collection is manufactured in four colors: Fawn, Kona, Sedona and Tahoe. The Modena colored semi-capped board is available in the Harvest Collection. See Figure 1.

**3.2 Durability:**

When subjected to weathering, insect attack and other decaying elements, the material used to manufacture the AZEK Decking Systems are equivalent in durability to preservative-treated or naturally durable lumber when used in locations described in Section 2.0 of this report. The AZEK Decking Systems have been evaluated for structural capacity when exposed to temperatures between -20°F (-29°C) and 125°F (52°C).

**3.3 Surface-burning Characteristics:**

When tested in accordance with ASTM E84, the AZEK Decking Systems have a flame-spread index of no greater than 200.

**4.0 DESIGN AND INSTALLATION**
**4.1 General:**

Installation of AZEK decking must comply with this report and the manufacturer's published installation instructions. The manufacturer's published installation instructions must be available at the jobsite at all times during installation. When instructions contained in the manufacturer's published installation instructions differ from this report, this report governs.

**4.2 Deck Boards:**

**4.2.1 Structural:** The AZEK deck boards have allowable capacity when installed at a maximum center-to-center spacing of the supporting construction as prescribed in Table 1.

**4.2.2 Installation:** The AZEK deck boards must be installed perpendicular to the supporting construction. The AZEK deck boards that are installed end-to-end must be tight-fitted together when installed at temperatures above 32°F (0°C), and have a 1/16-inch gap (1.6 mm) when installed below 32°F (0°C). The end of each deck board must be supported by a joist. Where decking butt joints occur, double joists must be provided, and/or two screws must be installed a minimum of 1/4 inch (6.3 mm) and a maximum of 1/2 inch (12.7 mm) from ends of each abutted board.

**4.2.3 Deck Boards Used as Stair Treads:** The AZEK deck boards, when used as stair treads, are satisfactory to resist the code-prescribed concentrated load of 300 lb (1.33 kN) when installed at a maximum, perpendicular, center-to-center spacing of the supporting construction as given in Table 2. See footnotes to Table 2 and Figure 2 for additional supports required under the deck boards.

**4.2.4 Fasteners:** The AZEK deck boards must be fastened with two No. 7 by 2 1/4-inch-long (57.2 mm) stainless steel screws at each supporting wood member having a minimum specific gravity of 0.50; as an alternate, the fastening systems listed in Table 3 may be used. The minimum edge and end distance for fasteners is 1/4 inch (6.3 mm) to 1/2 inch (12.7 mm) from any end of deck board.

**5.0 CONDITIONS OF USE**

The AZEK 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 This product is limited to exterior use as deck boards for balconies, porches, decks, stair treads and similar appendages of buildings of Type V-B (IBC) construction and buildings constructed in accordance with the IRC.
- 5.2 Installation must comply with this report, the manufacturer's published instructions and the applicable code. Only those fasteners and fastener configurations described in this report have been evaluated for the installation of the AZEK deck boards.

- 5.3 The use of the deck boards as components of a fire-resistance-rated assembly is outside the scope of this report.
- 5.4 The compatibility of the fasteners with the supporting construction, including chemically treated wood, is outside the scope of this report.
- 5.5 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 described 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.
- 5.6 Adjustment factors outlined in the AF&PA National Design Standard (NDS) and applicable codes do not apply to the allowable capacity and maximum spans for the AZEK Decking System.
- 5.7 The AZEK uncapped deck boards have not been evaluated for use in areas subject to Formosan termite attack.
- 5.8 The AZEK Decking System is produced in Foley, Alabama, and Scranton, Pennsylvania, under a quality control program with inspections by Architectural Testing, Inc. (AA-676).

**6.0 EVIDENCE SUBMITTED**

Data in accordance with applicable portions of the ICC-ES Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems (Guards and Handrails) (AC174), dated January 2012.

**7.0 IDENTIFICATION**

The deck boards described in this report are identified by a label, on each individual piece or on the packaging, bearing the AZEK Building Products name, the AZEK Decking System name, the span rating of the deck board, the allowable span of the deck board when used as a stair tread, the name of the inspection agency (Architectural Testing, Inc.) and the evaluation report number (ESR-1667).

**TABLE 1—DECK BOARD SPAN RATINGS**

DECK BOARD	BRAND NAMES	MAXIMUM SPAN <sup>1</sup> (inches)	ALLOWABLE CAPACITY <sup>2</sup> (lb/ft <sup>2</sup> )
5/4-inch-by-6 inch uncapped deck board	Harvest Collection	16	100
5/4-inch-by-3 1/2-inch uncapped deck board	Harvest Collection	16	100
5/4-inch-by-3 1/2-inch tongue-and-groove uncapped porch board	Harvest Collection	16	100
1-inch-by- 5 1/2 inch semi-capped and fully capped deck board	Harvest Collection, Arbor Collection and Terra Collection	16	100

For SI: 1 inch = 25.4 mm; 1 lbf/ft<sup>2</sup> = 47.9 Pa.

<sup>1</sup>Maximum span is measured center-to-center of the supporting construction.

<sup>2</sup>Maximum allowable capacity is adjusted for durability. No further increases are permitted.

TABLE 2—MAXIMUM STAIR TREAD SPANS<sup>1</sup>

DECK BOARDS USED AS STAIR TREADS	MAXIMUM SPAN (inches)
<sup>5</sup> / <sub>4</sub> -inch-by-6 inch uncapped deck board <sup>2</sup>	17.25
<sup>5</sup> / <sub>4</sub> -inch-by-6 inch uncapped deck board <sup>3</sup>	9
<sup>5</sup> / <sub>4</sub> -inch-by-6 inch uncapped deck board <sup>4</sup>	24
<sup>5</sup> / <sub>4</sub> -inch-by-3 <sup>1</sup> / <sub>2</sub> -inch tongue-and-groove uncapped porch board <sup>5</sup>	11
1-inch-by-5 <sup>1</sup> / <sub>2</sub> inch semi-capped and fully capped deck boards <sup>3</sup>	9
1-inch-by-5 <sup>1</sup> / <sub>2</sub> inch semi-capped and fully capped deck boards <sup>4</sup>	24

For SI: 1 inch = 25.4 mm; 1 lbf/ft<sup>2</sup> = 47.9 Pa.

<sup>1</sup>Based on a minimum 2-span installation.

<sup>2</sup>Maximum span is measured center-to-center of the supporting construction. A treated Southern pine 2-by-6 installed flatwise between the stringers and directly beneath the deck board using Simpson A23 connectors attached with hot dipped galvanized 10d by 1<sup>1</sup>/<sub>2</sub>-inch joist hanger nails.

<sup>3</sup>Maximum span measured center-to-center of the supporting construction with no additional support.

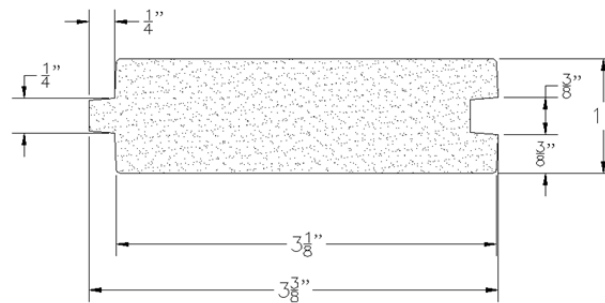
<sup>4</sup>Maximum span measured center-to-center of the supporting construction with a treated 2-by-4 support installed edgewise and centered under each deck board used as a tread attached with two 0.131-inch-diameter-by-3<sup>1</sup>/<sub>4</sub>-inch-long round drive framing nails.

<sup>5</sup>Maximum span measured center-to-center of the supporting construction with no additional support.

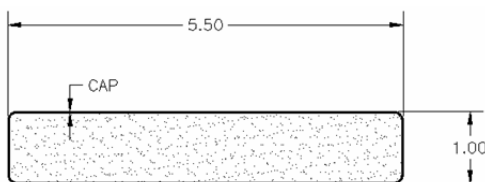
TABLE 3—MAXIMUM UPLIFT LOADS FOR ALTERNATE FASTENING SYSTEMS

DECK BOARD	FASTENER	ALLOWABLE UPLIFT (lb/ft <sup>2</sup> )
1-inch-by-5 <sup>1</sup> / <sub>2</sub> inch semi-capped and fully capped deck boards	#8-by-2 <sup>1</sup> / <sub>2</sub> inch Stainless Steel Trim-Head Headcote <sup>®</sup> Screw	100
1-inch-by-5 <sup>1</sup> / <sub>2</sub> inch semi-capped and fully capped deck boards	#10-by-2 <sup>1</sup> / <sub>2</sub> inch Stainless Steel Flat-Head Screw	100
1-inch-by-5 <sup>1</sup> / <sub>2</sub> inch semi-capped and fully capped deck boards	OMG FastenMaster <sup>®</sup> Cortex Hidden Fastener System	100
1-inch-by-5 <sup>1</sup> / <sub>2</sub> inch semi-capped and fully capped deck boards	HIDfast Hidden Fastener System	100
1-inch-by-5 <sup>1</sup> / <sub>2</sub> inch semi-capped and fully capped deck boards	TigerClaw <sup>®</sup> Proclip Hidden Fastener System	100
<sup>5</sup> / <sub>4</sub> -inch-by-6 inch uncapped deck board	OMG FastenMaster <sup>®</sup> Cortex Hidden Fastener System	100
<sup>5</sup> / <sub>4</sub> -inch-by-6 inch uncapped deck board	HIDfast Hidden Fastener System	100
<sup>5</sup> / <sub>4</sub> -inch-by-6 inch uncapped deck board	TigerClaw <sup>®</sup> Proclip Hidden Fastener System	100

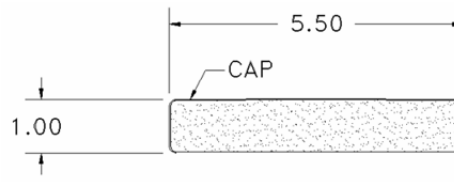
For SI: 1 inch = 25.4 mm; 1 lbf/ft<sup>2</sup> = 47.9 Pa.



HARVEST COLLECTION UNCAPPED DECK BOARDS



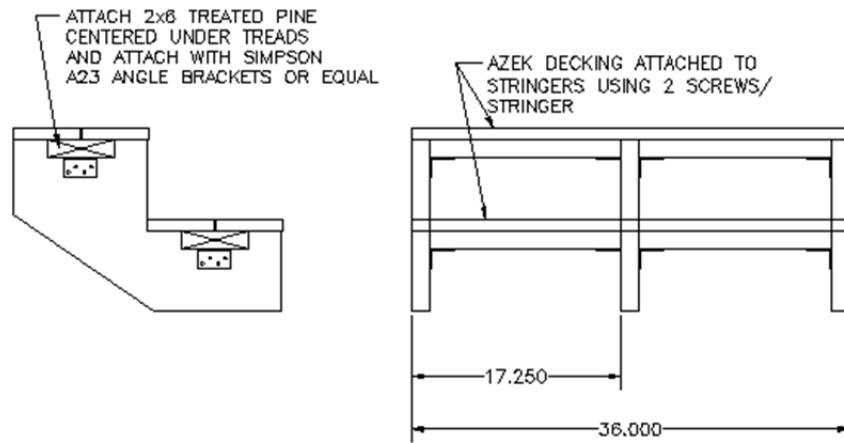
ARBOR COLLECTION™ AND TERRA COLLECTION™ FULLY CAPPED DECK PROFILE



CAPPED DECK BOARDS

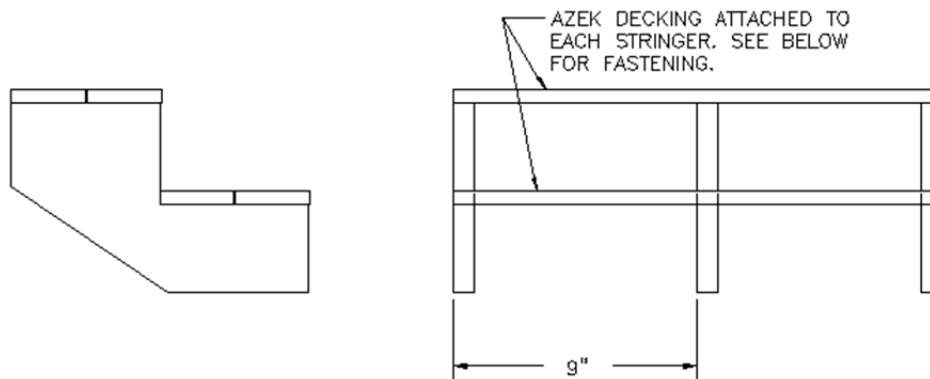
ARBOR, TERRA COLLECTION, AND HARVEST MODENA SEMI-CAPPED BOARD

FIGURE 1—AZEK DECK BOARD PROFILES



BOARD TYPE	MAX. SPAN	FASTENING
1x5-1/2 DECK BOARD	17.25 INCHES	ATTACH SUPPORT USING SIMPSON A23 (OR EQUAL) BRACKET W/10d x 1-1/2" JOIST HANGER NAILS.

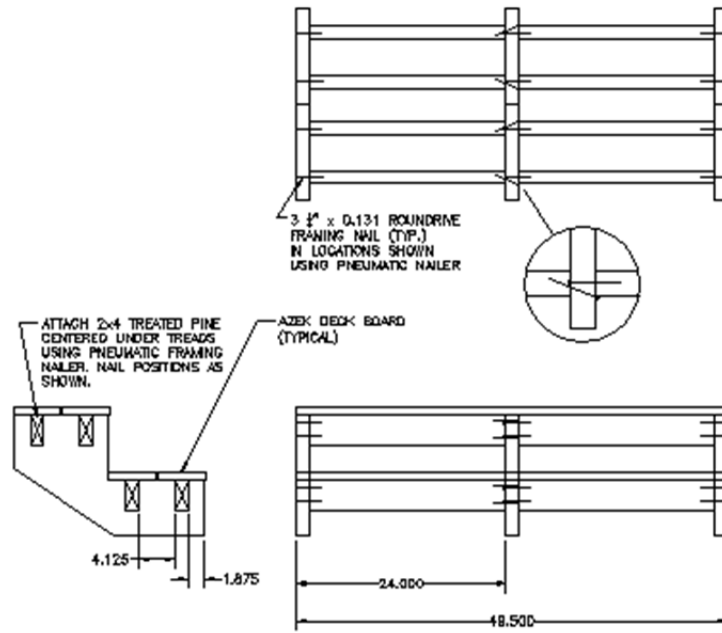
STAIR TREAD INSTALLATION WITH ADDITIONAL SUPPORT (MINIMUM TREAD LENGTH IS 36")



BOARD TYPE	MAX. SPAN	FASTENING
1x5-1/2 DECK BOARD	9 INCHES	TWO #7 x 2 1/4" DECK SCREWS EACH STRINGER

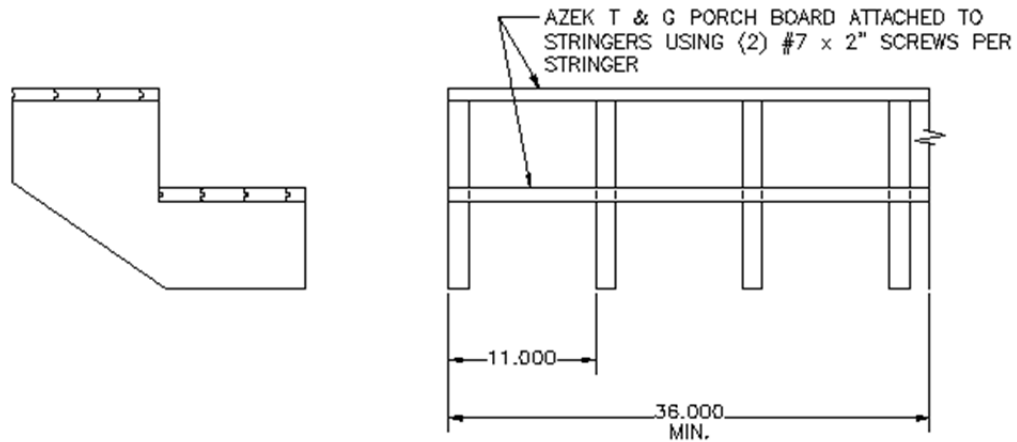
STAIR TREAD INSTALLATION WITH NO ADDITIONAL SUPPORT (MINIMUM TREAD LENGTH IS 36")

FIGURE 2—STAIR CONSTRUCTION DETAILS



BOARD TYPE	MAX. SPAN	FASTENING
1x5-1/2 DECK BOARD	24 INCHES	ATTACH SUPPORTS W/ 3-1/4" x 0.131 ROUNDRIE FRAMING NAILS.

STAIR TREAD INSTALLATION WITH NO ADDITIONAL SUPPORT  
(MINIMUM TREAD LENGTH IS 36")



BOARD TYPE	MAX. SPAN	FASTENING
1x3-1/2 PORCH BOARD	11 INCHES	ONE #7 x 2" TRIM HEAD SCREW THRU TONGUE. END BOARDS RECEIVE AN EXTRA SCREW THRU FACE.

STAIR TREAD INSTALLATION WITH NO ADDITIONAL SUPPORT  
(MINIMUM TREAD LENGTH IS 36")

FIGURE 2—STAIR CONSTRUCTION DETAILS (Continued)