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**DIVISION: 06—WOOD AND PLASTIC**  
**Section: 06500—Structural Plastic**  
**Section: 06610—Plastic Railings and Guards**

**REPORT HOLDER:**

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**EVALUATION SUBJECT:**

**KODIAK COMPOSITE DECK AND RAIL SYSTEM**

**1.0 EVALUATION SCOPE**

**Compliance with the following codes:**

- 2003 *International Building Code*® (IBC)
- 2003 *International Residential Code*® (IRC)
- 1997 *Uniform Building Code*™ (UBC)

**Properties evaluated:**

- Structural
- Durability
- Surface-burning characteristics

**2.0 USES**

The Kodiak Composite Deck described in this report is limited to exterior decks or nonstructural trim components for exterior balconies, porches, decks and stair treads. The Kodiak Composite Rail described in this report is limited to guards for exterior balconies, porches, and decks. The Kodiak Composite Deck and Rail System products described in this report are used in applications in Group R Occupancy (residential) buildings of Type V-B construction (IBC), Type V-N construction (UBC), and buildings constructed in accordance with the IRC.

**3.0 DESCRIPTION**

**3.1 General:**

The Kodiak Composite Deck and Rail System is made from 55 percent wood flour and 45 percent virgin high-density polyethylene plastic. The deck boards and railing are manufactured by an extrusion process in accordance with the approved quality control manual, in sizes that are comparable to lumber-sized members and railing components. The Kodiak Composite Deck and Rail System is available in four colors: Pacific Redwood, New England Grey, Teak and Carolina Pine.

**3.2 Deck Board:**

**3.2.1 General:** Kodiak Composite Deck boards are solid boards and are manufactured in a nominally  $\frac{5}{4}$ -inch-thick-by-6-inch wide cross section [actually  $\frac{7}{8}$  inch thick by  $5\frac{1}{2}$  inches wide (22.2 mm by 140 mm)] in lengths of 12, 16 and 20 feet (3.66 m, 4.88 m and 6.10 m). See Figure 1 for a typical cross section.

**3.2.2 Durability:** When subjected to weathering, insect attack, and other decaying elements, the materials used to manufacture the Kodiak Composite Deck boards described in this report are equivalent in durability to code-complying preservative-treated or naturally durable lumber when used in locations described in Section 2.0 of this report. Kodiak Composite Deck boards have been evaluated for structural performance when exposed to temperatures from -20°F (-29°C) to 125°F (52°C).

**3.2.3 Surface-burning Characteristics:** When tested in accordance with ASTM E 84, the Kodiak Composite Deck boards described in this report have a flame-spread index not exceeding 200.

**3.3 Guards:**

**3.3.1 General:** The Kodiak Composite Railing System consists of post sleeves and caps, top and bottom rails, and balusters, which are made from the same material as indicated in Section 3.1, above.

The rail system comes in one configuration: nominally 2-inch-by-4-inch composite top and bottom rails in the vertical/edgewise position; solid nominally 2-inch-by-2-inch balusters attached to the inside of the top and bottom rails, flush with the top of the top rail and the bottom of the bottom rail; post sleeves over treated nominally 4-inch-by-4-inch wood posts; and top plate made from a nominally  $\frac{5}{4}$ -inch-by-6-inch deck board that attaches to the top rail and top of the post. The maximum height of the railing assembly shall be 42 inches (1067 mm) above the walking surface. The Kodiak Composite Rail is available in 6-foot (1.83 m) center-to-center lengths (see Figure 2). The Kodiak Composite Railing balusters are solid composite members that are nominally 2 inches square [actually  $1\frac{3}{8}$  inches square (34.92 mm)], and shall be spaced 4 inches (102 mm) on center between balusters (see Figure 4). The Post Sleeves are nominally 4 inches (102 mm) square and have a wall thickness of 0.375 inch (9.52 mm). Refer to Figures 2, 3 and 4 for dimensioned profiles of the post sleeves, top and bottom rails and balusters.

**3.3.2 Durability:** When subjected to weathering, insect attack, and other decaying elements, the material used to manufacture the Kodiak Composite Railing system components are equivalent in durability to code-complying, preservative-treated or naturally durable lumber when used in

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locations described in Section 2.0 of this report. Kodiak Composite Railing system components have been evaluated for structural performance when exposed to temperatures from -20°F (-29°C) to 125°F (52°C).

**3.3.3 Surface-burning Characteristics:** When tested in accordance with ASTM E 84, Kodiak Composite Railing system components have a flame-spread index of no greater than 200.

## 4.0 DESIGN AND INSTALLATION

### 4.1 General:

Installation of the Kodiak Composite Deck and Railing System described in this report shall comply with this report and the manufacturer's published installation instructions. The manufacturer's published installation instructions shall be available at the jobsite at all times during installation. When the manufacturer's published installation instructions differ from this report, this report shall govern.

### 4.2 Deck Boards:

**4.2.1 General:** The Kodiak Composite Deck boards shall be installed with a minimum board edge spacing (gap between the sides of the boards) of  $\frac{1}{8}$  inch (3.18 mm), and a minimum deck board end spacing of  $\frac{1}{16}$  inch (1.59 mm) for every 16-foot (4.88 m) length of board for every 20°F (11.1°C) temperature difference between the temperature at time of installation and the maximum temperature that can be expected.

### 4.2.2 Structural:

**4.2.2.1 Deck Boards:** Kodiak Composite Deck boards, when used as deck boards, shall have an allowable capacity when installed perpendicular to the supporting construction as prescribed in Table 1 of this report. Each board shall be fully supported along its width at each supporting structural member. The maximum allowable cantilever shall not exceed 2 inches (51 mm).

**4.2.2.2 Deck Boards Used as Stair Treads:** Kodiak Composite Deck boards, when used as stair treads, are satisfactory to resist the code-prescribed concentrated load of 300 lbf (1.33 kN) when installed perpendicular to framing at a maximum center-to-center spacing of the supporting construction as shown in Table 2.

### 4.3 Guards:

**4.3.1 General:** Refer to Table 3 for installation details concerning the Kodiak Composite Railing System. Refer to Figure 5 for typical post base installation requirements and to Figure 6 for a typical Oasis Composite Railing installation.

**4.3.2 Structural: Kodiak Composite Railing:** Kodiak Composite Railing is satisfactory to resist the loads specified in Section 1607.7.1 of the IBC, Table R301.5 of the IRC and Table 16-B of the UBC when installed at maximum distances as shown in Table 3. When the railing is supported on one or both ends by the supporting construction, the maximum distance shall be measured from center-of-post to edge-of-structure or edge-of-structure to edge-of-structure, respectively.

## 5.0 CONDITIONS OF USE

The Kodiak Composite Deck and Railing System described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1** Kodiak Composite Deck boards shall be used for exterior decks or nonstructural trim components for exterior balconies, porches, decks, and other exterior walking surfaces. The Kodiak Composite Rail described in this report is limited to guards for exterior balconies, porches, and decks. Interior use of the material is beyond the scope of this report.
- 5.2** The Kodiak Composite Deck and Rail System shall be directly fastened to supporting construction. Where required by the code official, engineering calculations and construction documents consistent with this report shall be submitted for approval. The calculations shall 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 shall contain details of the attachment to the supporting structure consistent with the requirements of this report. The documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.3** The use of Kodiak Composite Deck boards as a fire-resistance-rated assembly is outside the scope of this report.
- 5.4** The compatibility of the fasteners and other metal hardware with the supporting construction, including chemically treated wood, is outside the scope of this report.
- 5.5** Kodiak Composite Deck boards shall be spaced to permit adequate drainage in accordance with the manufacturer's instructions. (See Section 4.2.1 of this report.)
- 5.6** Kodiak Composite Deck boards shall not be attached to any solid surface or watertight flooring system, such as sheathing, waterproof membranes, concrete, roof decks, or patios.
- 5.7** The products are produced by Deceuninck—North America at their facility located in Monroe, Ohio, for Alcoa Home Exteriors, Inc.; under a quality control program with inspections by PFS Corporation (AA-652).

## 6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems (Guards and Handrails) (AC174), dated April 2002 (editorially revised July 2004; corrected December 2004).

## 7.0 IDENTIFICATION

Each deck board and each railing package shall be identified by a stamp or nonremovable label noting the company name (Deceuninck North America); the trademarked name of the product (Kodiak™); the evaluation report number (ESR-1425); and the name of the inspection agency (PFS).

TABLE 1—KODIAK COMPOSITE DECK BOARD SPAN CHART<sup>1,2</sup>

DECK BOARD	MAXIMUM SPAN (in) <sup>1</sup>	ALLOWABLE CAPACITY (lbf/ft <sup>2</sup> ) <sup>2</sup>
<sup>5</sup> / <sub>4</sub> -by-6 Kodiak Composite Deck Board	16	100

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

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

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

TABLE 2—MAXIMUM STAIR TREAD SPANS FOR KODIAK COMPOSITE DECK BOARD

PRODUCT NAME	MAXIMUM SPAN (in) <sup>1,2</sup>
<sup>5</sup> / <sub>4</sub> -by-6 Kodiak Composite Deck Board	12

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

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

<sup>2</sup>Allowable span is based on a minimum 2-span installation.

TABLE 3—KODIAK COMPOSITE RAILING SYSTEM INSTALLATION REQUIREMENTS<sup>1,2,3,4,5</sup>

COMPONENT		INSTALLATION REQUIREMENTS
Posts		Railing posts shall consist of preservative-treated 4-by-4 solid-sawn wood, having a minimum specific gravity of 0.50. Maximum post spacing shall be 6 feet on center. The Kodiak Composite Railing Post Sleeve slides over the wood post. The post shall be connected to the supporting structure with two <sup>1</sup> / <sub>2</sub> -inch-diameter carriage bolts. See Figure 6 for a typical railing post connection detail.
Standard railing assembly	Top rail	The top rail is a 1 <sup>1</sup> / <sub>2</sub> -by-3 <sup>1</sup> / <sub>2</sub> -inch rectangular member Standard Top rail installed vertically (edgewise), with a <sup>5</sup> / <sub>4</sub> -inch deck board installed horizontally over the vertical member and over the post at both ends. The maximum span of the top rail shall be 6 feet center-of-post-to-center-of-post. Each end of the top rail shall be attached to a vertical baluster that is attached to the post with three No. 8 by 2 <sup>1</sup> / <sub>2</sub> -inch-long wood screws.
	Bottom rail	The bottom rail is a 1 <sup>1</sup> / <sub>2</sub> -by-3 <sup>1</sup> / <sub>2</sub> -inch rectangular member and shall be installed vertically (edgewise). The maximum span of the bottom rail shall be 6 feet center-of-post-to-center-of-post. Each end of the bottom rail shall be attached to a vertical baluster that is attached to the post with three No. 8 by 2 <sup>1</sup> / <sub>2</sub> -inch-long wood screws.
	Balusters	The balusters are 1 <sup>3</sup> / <sub>8</sub> square solid members which are fastened to the top and bottom rail with two No. 8 by 2 <sup>1</sup> / <sub>2</sub> -inch-long wood screws at top and bottom.

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

<sup>1</sup>Evaluation of the framing members supporting the guardrail assembly is beyond the scope of this evaluation report.

<sup>2</sup>All fasteners shall be installed in predrilled <sup>1</sup>/<sub>8</sub>-inch-diameter holes, and shall be countersunk.

<sup>3</sup>Screws used to attach the railing to the supporting structural wood posts shall comply with ANSI/ASME Standard B18.6.1, and shall be hot-dipped galvanized steel or stainless steel in accordance with IRC Section R319.3 when the wood posts are required to be preservative-treated.

<sup>4</sup>The maximum height of the guardrail assembly shall be 42 inches above the deck surface.

<sup>5</sup>Refer to Figure 6 for a detail of typical post connection to the supporting framing members, and to Figure 6 for a detail of a typical railing installation.

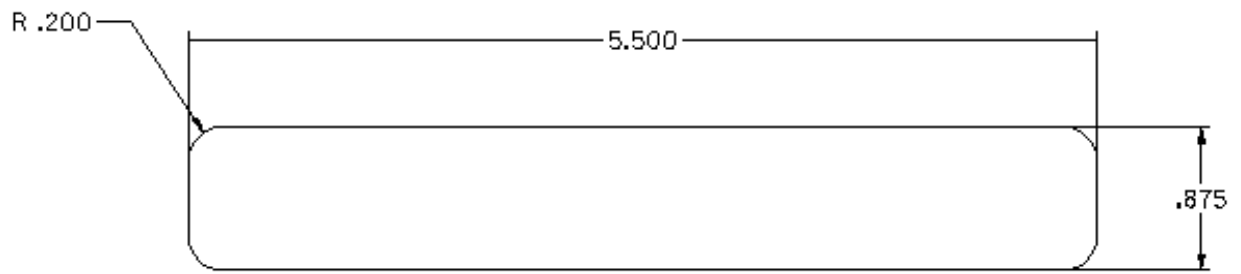


FIGURE 1

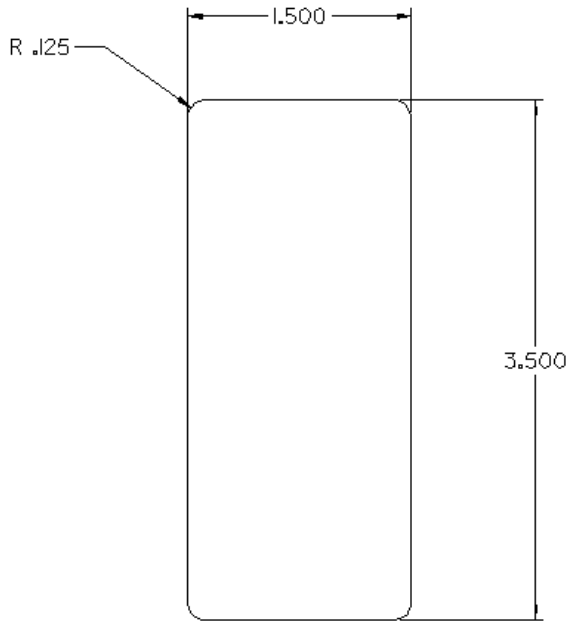


FIGURE 2

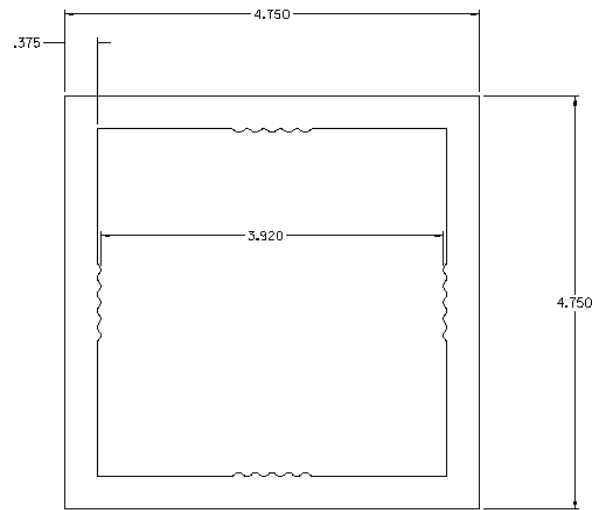


FIGURE 3

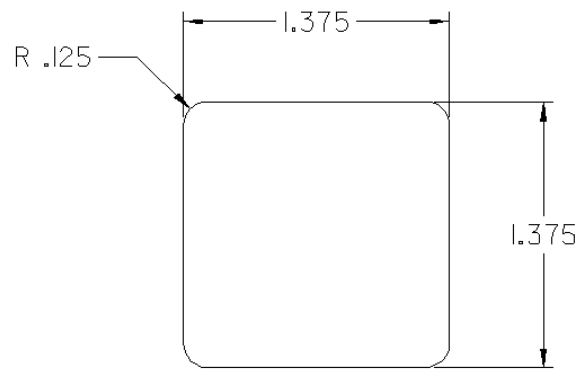
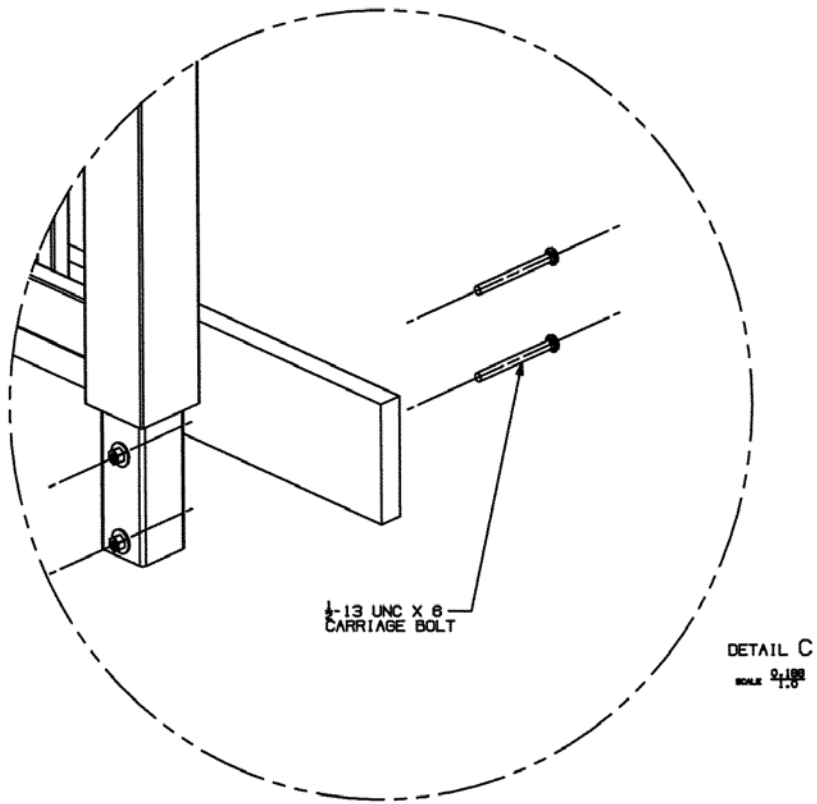


FIGURE 4



DETAIL C  
SCALE  $\frac{3}{16}$   
1/8"

FIGURE 5

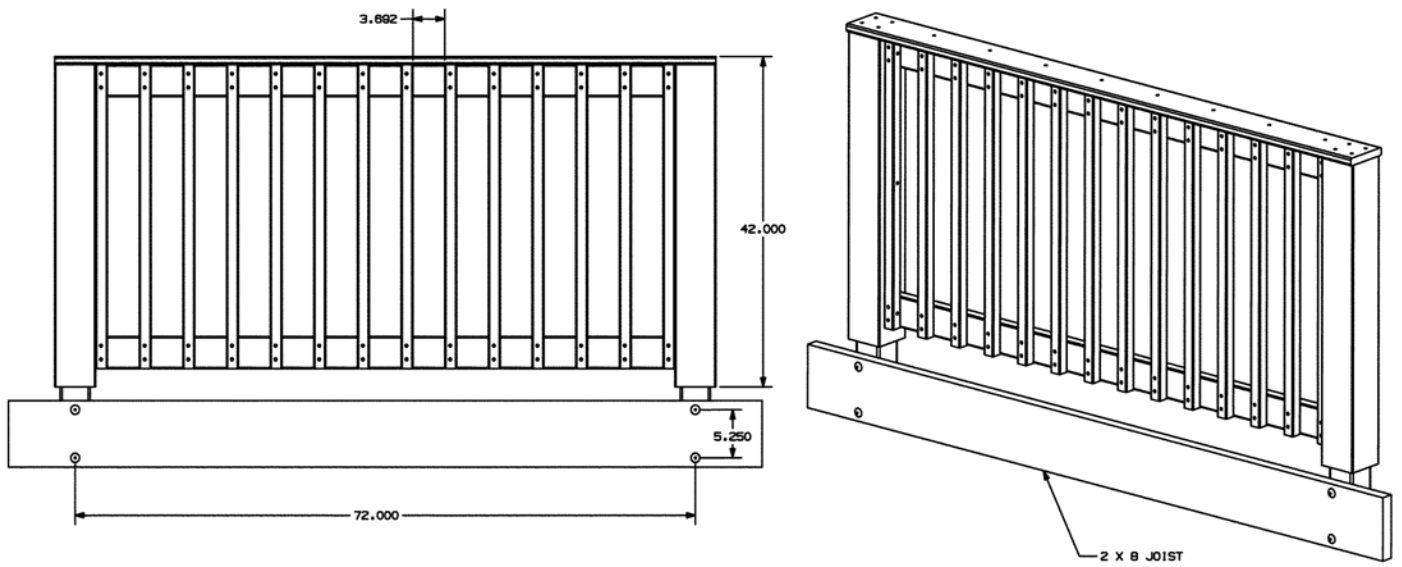


FIGURE 6