

# ICC-ES Evaluation Report

**ESR-2497**

Issued July 1, 2009

*This report is subject to re-examination in one year.*[www.icc-es.org](http://www.icc-es.org) | (800) 423-6587 | (562) 699-0543

A Subsidiary of the International Code Council®

**DIVISION: 06—WOOD AND PLASTICS**  
**Section: 06500—Structural Plastics****REPORT HOLDER:****RENEW PLASTICS,  
A DIVISION OF N.E.W. PLASTICS CORPORATION**  
112 4<sup>TH</sup> STREET  
POST OFFICE BOX 480  
LUXEMBURG, WISCONSIN 54217-0480  
(920) 845-2326  
[www.renewplastics.com](http://www.renewplastics.com)**EVALUATION SUBJECT****EVOLVE® PLASTIC LUMBER DECKING (ALSO KNOWN  
AS PERMA-POLY DECKING)****1.0 EVALUATION SCOPE****Compliance with the following codes:**

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

**Properties evaluated**

- Structural
- Durability
- Surface-burning characteristics

**2.0 USES**

The EVOLVE® (also known as Perma-Poly) Plastic Lumber Decking is limited to exterior use applications as deck boards for balconies, porches and decks of one- and two-family dwellings of Type V-B (IBC) construction and dwellings constructed in accordance with the IRC.

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

EVOLVE® or Perma-Poly Plastic Lumber Decking is made of a plastic composite material that consists of 90 percent recycled high-density polyethylene (HDPE), with the remaining 10 percent being foaming agents and color with ultraviolet inhibitors. The deck boards are manufactured by an extrusion process in the colors black, dove grey, dark green, weatherwood, cherrywood and white. The deck boards are manufactured in <sup>3</sup>/<sub>4</sub>-inch-by-3<sup>1</sup>/<sub>2</sub>-inch (19 by 89 mm), <sup>3</sup>/<sub>4</sub>-inch-by-5<sup>1</sup>/<sub>2</sub>-inch (19 by 140 mm), <sup>3</sup>/<sub>4</sub>-inch-by-6-inch (19 by 152 mm) tongue and groove, 1-inch-by-5<sup>1</sup>/<sub>2</sub>-

inch (25.4 by 140 mm), 1-inch-by-6-inch (25.4 by 152 mm) tongue and groove, 1<sup>1</sup>/<sub>2</sub>-inch-by-3<sup>1</sup>/<sub>2</sub>-inch (38 by 89 mm), 1<sup>1</sup>/<sub>2</sub>-inch-by-5<sup>1</sup>/<sub>2</sub>-inch (38 by 140 mm) and 1-inch-by-11<sup>1</sup>/<sub>4</sub>-inch (25.4 by 286 mm) solid profiles. See Figure 1 for typical cross sections.

**3.2 Durability:**

When subjected to weathering, insect attack, and other decaying elements, the material used to manufacture EVOLVE® decking is equivalent in durability to preservative-treated or naturally durable lumber when used in locations described in Section 2.0 of this report. The deck boards have been evaluated for structural use when exposed to temperatures from -20°F to 125°F (-29°C to 52°C).

**3.3 Surface-burning Characteristics:**

When tested in accordance with ASTM E 84, the deck board products have a flame-spread index no greater than 200.

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

Installation of the deck boards 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 the manufacturer's published installation instructions differ from this report, this report governs.

**4.2 Design (Structural):**

When used as a deck board, EVOLVE® decking products have an allowable capacity, when installed at a maximum center-to-center spacing of supporting construction, as prescribed in Table 1.

**4.3 Installation:**

The end-to-end gap of the deck boards must be <sup>1</sup>/<sub>16</sub> inch (1.6 mm) for every 20°F (11°C) of difference between the installation temperature and the hottest anticipated temperature after installation. A minimum <sup>1</sup>/<sub>8</sub>-inch (3.2 mm) gap must be provided between deck board edges. The end of each deck board must be supported by a joist. Double joists are required where decking butt-joints occur. The EVOLVE® deck boards must be attached at each joist with two No. 7 by 2<sup>1</sup>/<sub>4</sub>-inch-long (57 mm) corrosion-resistant screws. Minimum fastener edge and end distances must be 1 inch (25.4 mm).

## 5.0 CONDITIONS OF USE

The EVOLVE<sup>®</sup> decking 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 The EVOLVE<sup>®</sup> (also known as Perma-Poly) Plastic Lumber Decking is limited to exterior use applications as deck boards for balconies, porches and decks of one- and two-family dwellings of Type V-B (IBC) construction and dwellings constructed in accordance with the IRC.
- 5.2 Balconies constructed on one- and two-family dwellings in accordance with the IBC and rated for 60 psf (2874 Pa) must not exceed 100 square feet (9.29 m<sup>2</sup>) in total area.
- 5.3 The use of EVOLVE<sup>®</sup> deck boards as stair treads is outside the scope of this report.
- 5.4 Installation must comply with this report, the manufacturer's published installation instructions and the applicable code. When the manufacturer's published installation instructions differ from this report, this report governs.
- 5.5 The use of deck boards as a component of a fire-resistance-rated assembly is outside the scope of this report.
- 5.6 Only those fasteners and fastener configurations described in this report have been evaluated for installation of the EVOLVE<sup>®</sup> deck boards. The compatibility of the fasteners with the supporting construction, including chemically treated wood, is outside the scope of this report.
- 5.7 Adjustment factors outlined in the AF&PA National Design Standard and applicable codes do not apply

to the allowable capacity and maximum spans for EVOLVE<sup>®</sup> deck boards.

- 5.8 The EVOLVE<sup>®</sup> decking must be 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.
- 5.9 The EVOLVE<sup>®</sup> decking is manufactured in Luxemburg, Wisconsin, under a quality control program with inspections by Intertek Testing Services Inc. (AA-690).

## 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 February 2008 (editorially revised April 2008).

## 7.0 IDENTIFICATION

The EVOLVE<sup>®</sup> decking described in this report is identified by a stamp on each individual piece or on the packaging. The stamp includes the manufacturer's name (RENEW Plastics), the product name (EVOLVE<sup>®</sup> decking), the name of inspection agency (Intertek Testing Services) and the ICC-ES evaluation report number (ESR-2497).

TABLE 1—DECK BOARD SPAN RATINGS

DECK BOARD	MAXIMUM SPAN (inches) <sup>1</sup>	ALLOWABLE CAPACITY (lbf/ft <sup>2</sup> ) <sup>2,3</sup>
EVOLVE <sup>®</sup> 3/4-by-3 1/2	12	100
EVOLVE <sup>®</sup> 3/4-by-5 1/2	12	60
EVOLVE <sup>®</sup> 3/4-by-6 T&G	12	60
EVOLVE <sup>®</sup> 1-by-5 1/2	16	60
EVOLVE <sup>®</sup> 1 1/2-by-3 1/2	24	60
EVOLVE <sup>®</sup> 1 1/2-by-5 1/2	24	100
EVOLVE <sup>®</sup> 1-by-6 T & G	16	100
EVOLVE <sup>®</sup> 1-by- 11 1/4 Bull Nose (used as deck board only)	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 perpendicular, of the supporting construction.

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

<sup>3</sup> Under the IBC, deck boards not rated for at least 100 bf/ft<sup>2</sup> are limited to 100 square feet (9.29 m<sup>2</sup>) in total area.

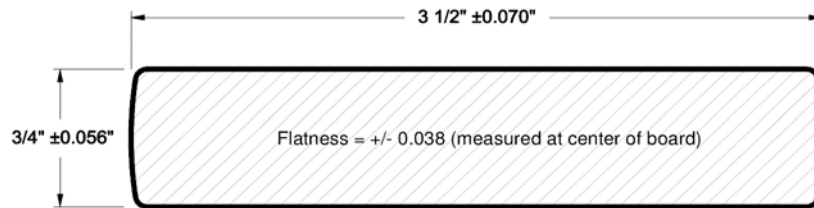
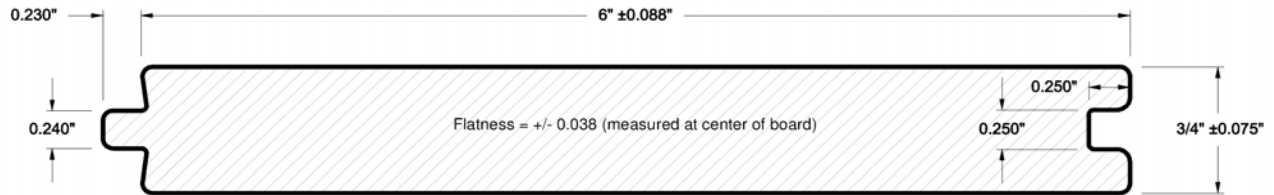
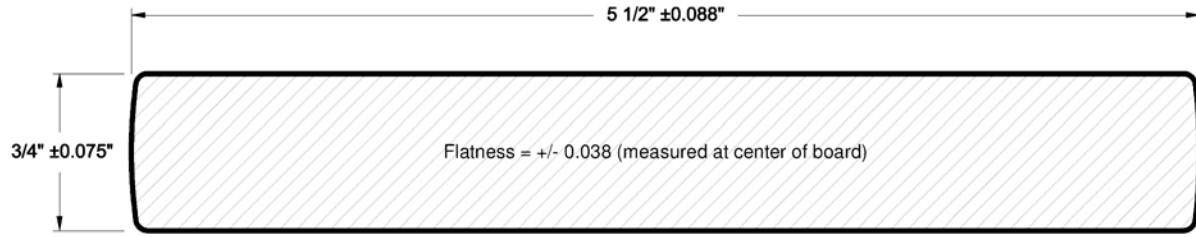
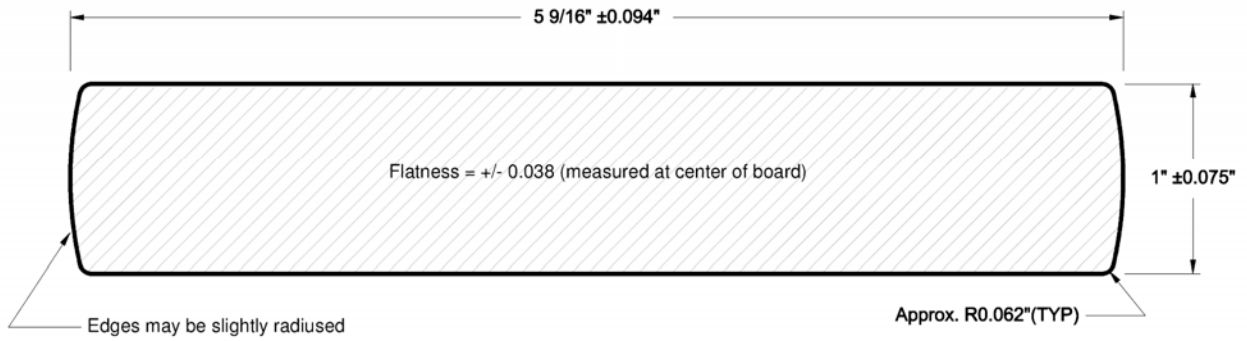


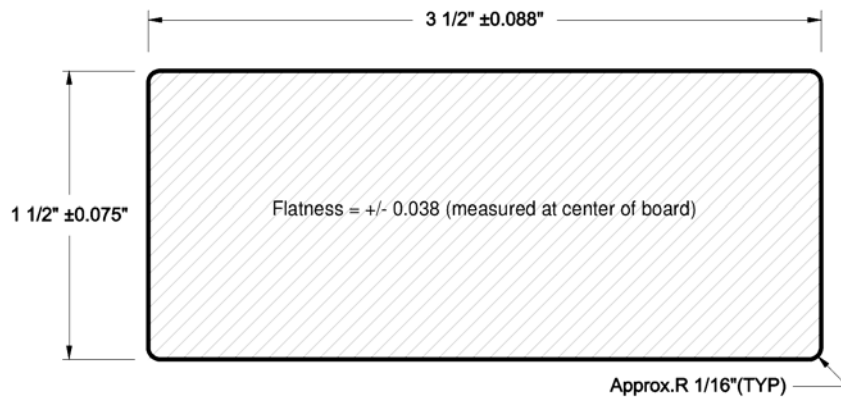
FIGURE 1—DECK BOARD PROFILES



**$\frac{3}{4}$ " x  $5\frac{1}{2}$ " Flat**  
Approximate Unit Weight -1.48 Lbs./Lin. Ft.

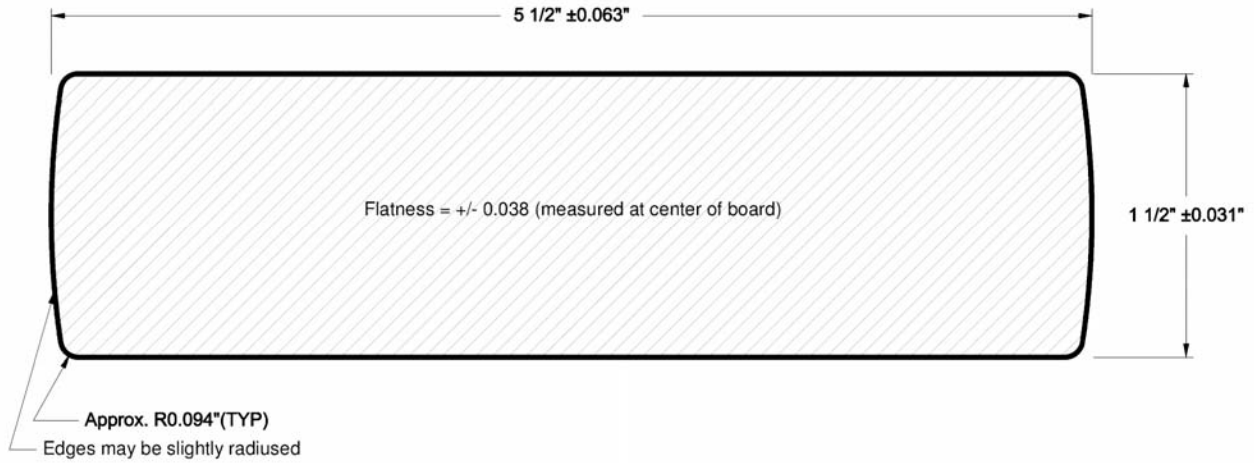


**1" x  $5\frac{1}{2}$ " Flat**  
Approximate Unit Weight - 1.76 Lbs./Lin. Ft.

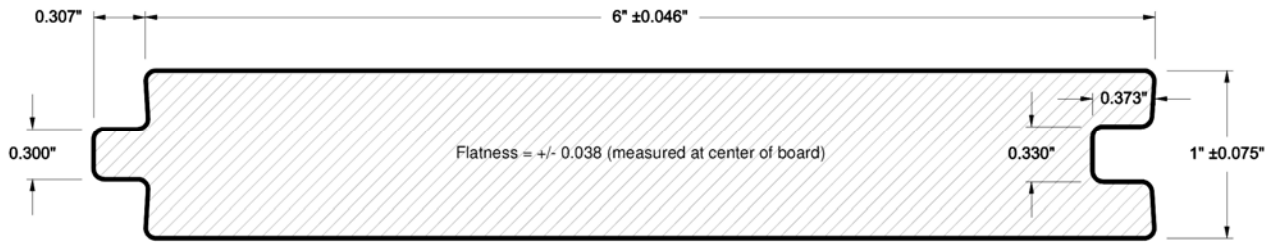


**$1\frac{1}{2}$ " x  $3\frac{1}{2}$ "**  
Approximate Unit Weight - 1.59 Lbs./Lin. Ft.

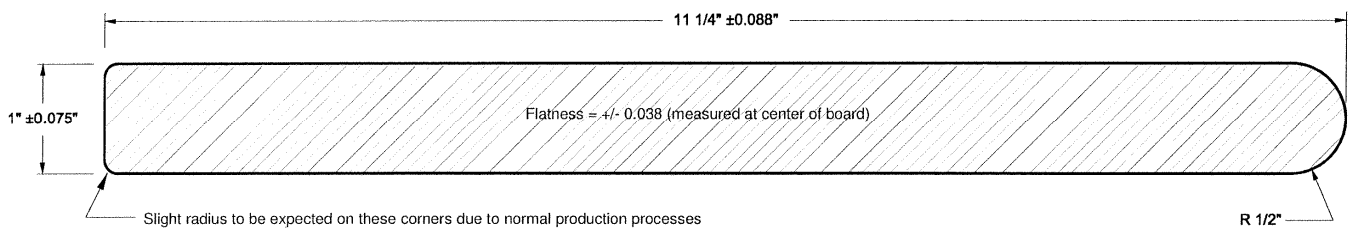
FIGURE 1—DECK BOARD PRFILES (Continued)



**1 1/2" x 5 1/2"**  
**Approximate Unit Weight – 3.75 Lbs./Lin. Ft.**



**1" x 6" T&G**  
**Approximate Unit Weight – 1.92 Lbs./Lin. Ft.**



**1" x 11 1/4" Bullnose**  
**Approximate Unit Weight – 3.68 Lbs./Lin. Ft.**

**FIGURE 1—DECK BOARD PROFILES (Continued)**