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Legacy report on the 2000 International Building Code®, the 2000 International Residential Code®, the 2002 Accumulative Supplement to the International Codes™, the BOCA® National Building Code/1999, the 1999 Standard Building Code®, the 1997 Uniform Building Code™, and the 1998 International One- and Two-Family Dwelling Code®

DIVISION: 6—WOOD AND PLASTICS
Section: 06500—Structural Plastics

EVALUATION SUBJECT:

CAREFREE COMPOSITE DECKING

MANUFACTURER:

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1.0 SUBJECT

Carefree Composite wood composite decking.

2.0 PROPERTY FOR WHICH EVALUATION IS SOUGHT

- 2.1 Structural Performance
2.2 Durability
2.3 Surface Burning Characteristics
2.4 Slip Index

3.0 DESCRIPTION

Carefree Composite Decking is a solid wood composite flooring plank comprised of approximately 67% wood fiber and 33% thermoplastic polymer plastic material. Carefree Composite Decking is manufactured utilizing an extrusion process in a solid cross section with a nominal sizes of 5/4 x 6 inches (32 x 152 mm) and 2 x 6 inches (51 x 152 mm). The actual dimensions of the profiles are 1 3/32 x 5 15/32 inches (28 x 139 mm) and 1 19/64 x 5 15/32 inches (33 x 139 mm), see Figure 1. The products are available in standard 12, 16, and 20 foot ( 3 660, 4 880, and 6 100 mm) lengths. Carefree Composite Decking shall be limited to use as a floor decking for exterior balconies, porches, decks and similar appendages, as described in this report and the manufacturer's published installation manual, for buildings of combustible construction where the floor/ceiling assemblies are permitted to be unprotected construction.

Exception: The use of the 5/4 inch (25 mm) and 2 inch (51 mm) thick deck planking in a stair tread application is outside the scope of this report.

3.1 Structural Performance

3.1.1 Load

Carefree Composite Decking planks, when used as flooring, shall be limited to applications requiring a maximum uniformly distributed live loads of 100 lbf/ft² (4.8 kPa). See Section 4.1 for specific load versus span conditions and fastener installation requirements.

3.1.2 Uplift

Uplift capacity of the Carefree Composite Decking planks is limited to normal withdrawal values of the decking supports as calculated in accordance with the applicable code-referenced design methods consistent with the support material. See Section 4.1 of this report for fastener installation requirements.

3.2 Durability

The Carefree Composite Decking material is equivalent in durability to preservative-treated or naturally durable lumber when subjected to weathering, insect attack, and other decaying elements. As such, the Carefree Composite Decking material is permitted to be used as an alternative to preservative-treated or naturally durable lumber on decks, fences, and other exterior combustible applications. Additionally, it is permitted to be used in direct contact with the ground.

3.3 Surface Burning Characteristics

The surface-burning characteristics, as determined in accordance with ASTM E84, are a flame spread index (FSI) not more than 75 and a smoke-developed index (SDI) less than 450.

3.4 Slip Index

The Carefree Composite product was tested in accordance with ASTM D1679-00. The Slip Index of Carefree Composite has been determined to be 0.71 in a dry condition and 0.70 when wet.

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#### 4.0 INSTALLATION

Carefree Composite Decking shall be installed in accordance with the *Carefree Composite Decking Installation Instructions* and this report. U.S. Plastic Lumber Corporation or licensed distributor shall provide the user of this report with the *Carefree Composite Decking Installation Instructions*. Where the manufacturer's installation instructions differ from the installation instructions contained in this report, this report shall be null and void.

The maximum span for the 5/4 inch (25 mm) Carefree Composite Decking when utilizing the 100 lbf/ft<sup>2</sup> (4.8 kPa) loading condition shall be 12 inches (305 mm) from center to center of the supporting construction. When utilizing the 60 lbf/ft<sup>2</sup> (2.9 kPa) live load condition, the maximum allowable span for the 5/4 inch (25 mm) Carefree Composite Decking shall be 16 inches (406 mm) from center to center of the supporting construction. This is based on a minimum three span condition.

The maximum span for the 2 inch (51 mm) Carefree Composite Decking when utilizing the 100 lbf/ft<sup>2</sup> (4.8 kPa) loading condition shall be 16 inches (305 mm) from center to center of the supporting construction. When utilizing the 60 lbf/ft<sup>2</sup> (2.9 kPa) live load condition, the maximum allowable span for the 2 inch (51 mm) Carefree Composite Decking shall be 24 inches (406 mm) from center to center of the supporting construction. This is based on a minimum three span condition.

Carefree Composite Decking is fastened to each support with a minimum of two (2) - 10d ringed or spiral shank nails, 10d or 16d smooth shanked nails, or 3 inch (76 mm) long #8 decking screws. All fasteners shall be stainless steel, hot-dipped zinc coated galvanized, or other approved corrosion resistant coating. Fasteners shall maintain a minimum end distance of 1/4 inch (6.4 mm). Installation of the fasteners in the supporting construction shall follow the requirements associated with the design procedures outlined the 1997 edition of *AF&PA National Design Standard*.

Each end of each Carefree Composite Decking shall bear on the support construction a minimum of 1 1/2 inches (38 mm). The maximum allowable overhang is limited to 2 inches (51 mm). Edge gaps between planks shall be a minimum of 1/8 inch (3.2 mm) with 1/4 inch (6.4 mm) as the recommended gap. End gaps between abutting planks shall allow 1/8 inch (3.2 mm) for every 20° F (11.1° C) difference in installation temperature and the highest anticipated ambient temperature.

#### 5.0 IDENTIFICATION

Carefree Composite Decking, or the packaging, manufactured in accordance with this research report shall bear the following identification:

- 5.1 "See ICC-ES Legacy Report No. NER-696."
- 5.2 Additionally, each piece of Carefree Composite Decking, or packaging, shall have a permanent label containing the mark of the third-party inspection agency, PFS Corporation.

#### 6.0 EVIDENCE SUBMITTED

- 6.1 A signed Third Party Inspection agreement between PFS Corporation and U.S. Plastic Lumber for the Chicago, Illinois manufacturing facility, dated February 1, 2003

- 6.2 A signed Third Party Inspection agreement between PFS Corporation and U.S. Plastic Lumber for the Ocala, Florida manufacturing facility, dated February 1, 2003

- 6.3 *PFS Test Report #00-31 on Wood Thermoplastic Composite Lumber "Carefree Composite Decking" for U.S. Plastic Lumber*, dated October 31, 2001 which contains the following:
  - 1) Durability testing in accordance with ASTM G26.
  - 2) Soil block testing in accordance with ASTM D1413.
  - 3) Termite Resistance in accordance with ASTM D3345.
  - 4) Flexural testing in accordance with ASTM D4761 at ambient and elevated temperatures.
  - 5) Tension parallel to length in accordance with a modified ASTM D198.
  - 6) Compression strength in accordance with ASTM D198.
  - 7) Creep testing.
  - 8) Duration of load effects.
  - 9) Nail and screw withdrawal in accordance with ASTM D1761.
  - 10) Lateral resistance of screws and nails in accordance with ASTM D1761.
  - 11) Water absorption and thickness swell in accordance with ASTM D1037.
  - 12) Coefficient of linear expansion in accordance with ASTM E228.
  - 13) Carpenter ant infestation.
  - 14) Surface resistance to slippage in accordance ASTM F1679.

- 6.4 Quality Control Processes Manual dated July 12, 2001 for the Chicago, Illinois facility.
- 6.5 Carefree Composite Decking Installation Guide.
- 6.6 ITS test report #3036029, titled "*Report of Product Evaluation, Test Standard ASTM D4761 & ASTM G154, Conducted on Carefree Composite Wood Composite Lumber*", dated May 12, 2003.
- 6.7 Structural calculations from Leonard Busch Associates PC, dated April 24, 2003.

#### 7.0 CONDITIONS OF USE

The ICC-ES Subcommittee for the National Evaluation Service finds that the Carefree Composite Decking, described in this report, complies with or is a suitable alternate to the systems specified in the 2000 *International Building Code*<sup>®</sup>, the 2000 *International Residential Code*<sup>®</sup>, the 2002 *Accumulative Supplement to the International Codes*<sup>™</sup>, the BOCA<sup>®</sup> *National Building Code/1999*, the 1999 *Standard Building Code*<sup>®</sup>, the 1997 *Uniform Building Code*<sup>™</sup>, and the 1998 *International One- and Two-Family Dwelling Code*<sup>®</sup>, subject to the following conditions:

- 7.1 Fasteners used for the installation of the Carefree Composite Decking shall be as described in this report. Other methods of fastening are outside the scope of this report.

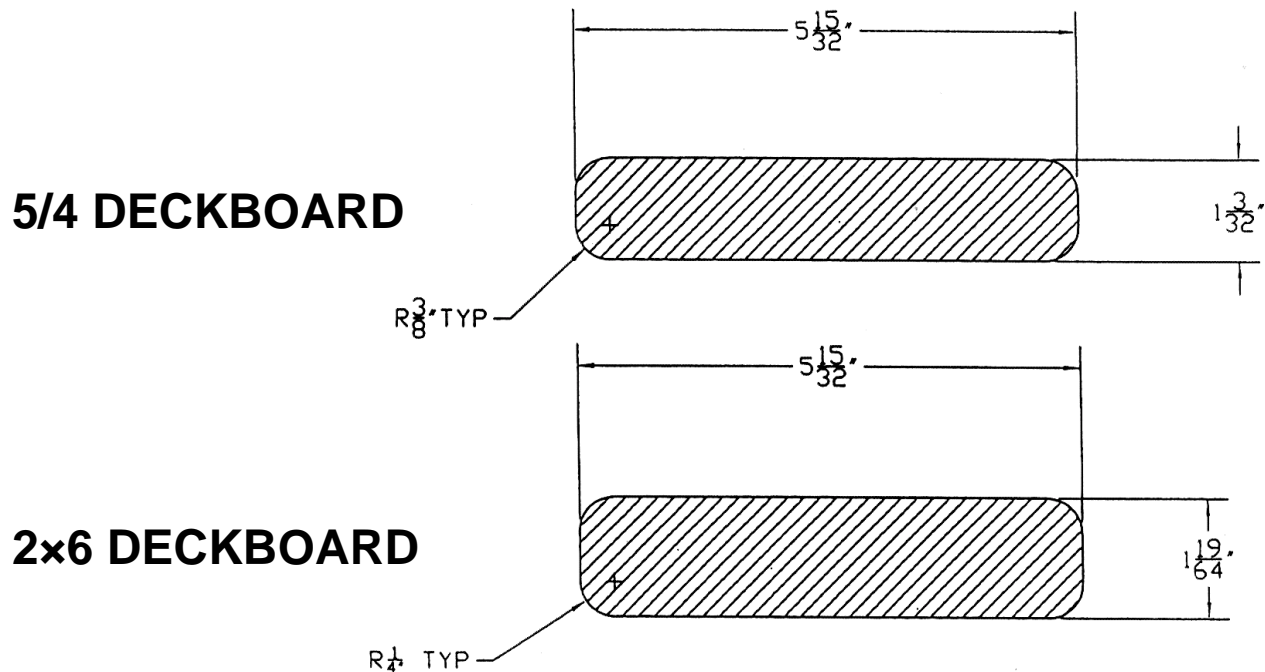
- 7.2 The installation of Carefree Composite Decking in a direction other than perpendicular to the supporting construction is outside the scope of this report.
- 7.7 The use of Carefree Composite Decking in areas where snow and drift loads are in excess of the design conditions, specified in Section 3.1.1 of this report, is outside the scope of this report.
- 7.8 The appropriateness of the determined slip index, with respect to the requirements for slip resistance in the applicable codes, is subject to the specific approval of the code official.
- 7.9 The use of Carefree Composite Decking as a component of a fire-resistance-rated assembly is outside the scope of this report.
- 7.10 Carefree Composite Decking shall be directly fastened to floor joists having adequate strength and stiffness. Engineering calculations and construction documents consistent with this report shall be submit-

ted to the local code official for approval. The calculations shall verify that the supporting substructure complies with building code requirements and the building plans shall show the method of attachment to the joists. The individual preparing such documents shall possess the necessary credentials regarding competency and qualifications as required by the applicable code and the professional registration laws of the state where the construction is undertaken.

- 7.11 Adjustment factors outlined in the AFPA 1997 *National Design Standard* and applicable codes shall not apply to the allowable design values for Carefree Composite.

- 7.12 This report is subject to periodic re-examination. For information on the current status of this report contact ICC-ES.

*This report is subject to re-examination in one year.*



SI Units: 1 inch = 25.4 mm

**FIGURE 1\*—CAREFREE COMPOSITE DECKING CROSS SECTIONS**

\* THIS DRAWING IS FOR ILLUSTRATION PURPOSES ONLY. IT IS NOT INTENDED FOR USE AS A CONSTRUCTION DOCUMENT FOR THE PURPOSE OF DESIGN, FABRICATION OR ERECTION.