



# National Evaluation Service, Inc.

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## NATIONAL EVALUATION REPORT

### Report No. NER-630

*Issued February 1, 2002*

*Revision A December 1, 2002*

#### DIVISION 06 – WOOD AND PLASTIC

#### Section 06500 – Structural Plastic

#### MANUFACTURER:

**EPOCH COMPOSITE PRODUCTS, INC.**  
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#### EVALUATION SUBJECT:

**EPOCH COMPOSITE LUMBER**

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Product Evaluation Listing

**1.0 SUBJECT**

**2.0 PROPERTY FOR WHICH  
EVALUATION IS SOUGHT**

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**1.0 SUBJECT**

**EPOCH/Evergrain Wood Thermoplastic Composite Lumber**

**2.0 PROPERTY FOR WHICH EVALUATION IS SOUGHT**

- 2.1** Structural Performance
- 2.2** Durability
- 2.3** Fire Resistance Characteristics

**3.0 DESCRIPTION**

**3.1 General**

EPOCH/Evergrain Wood Thermoplastic Composite Lumber is an alternate to preservative-treated or naturally durable lumber for use as a flooring or nonstructural trim component for exterior balconies, porches, decks, other walking surfaces and guardrails of combustible construction. EPOCH decking members are designated as nominal 1 x 6 inch (25.4 x 152mm), 2 x 6 inch (51 x 152mm) and 2 x 4 inch (51 x 102mm) in size. EPOCH railing members are designated as nominal 2 inch by 2 inch (51 x 51mm) baluster, 2 inch by 6 inch (51 x 152mm) rail cap and 2 inch by 4 inch (51 x 102mm) side rail.

EPOCH wood thermoplastic composite lumber is a manufactured composite material that consists of approximately 50% wood fibers and 50% thermoplastic polymer material. The wood thermoplastic composite material is manufactured by a compression molding process to produce comparable lumber-sized members up to a nominal thickness of 2 inches (51mm) and maximum nominal depth of 6 inches (152mm).

**3.2 Structural Performance**

**3.2.1 Load**

**Table 1** of this report lists allowable spans for EPOCH used as planking (flat-wise bending). This table shall be used for determining the maximum allowable span of EPOCH used as decking.

**Table 2** of this report contains material and installation requirements for guardrail assemblies. When installed in accordance with this report, the system complies with the structural load requirements specified in the applicable building code for lateral load conditions applied to balcony railings and guardrails.

**3.2.2 Fasteners**

Allowable withdrawal and lateral design values for nails or screws used as fasteners in EPOCH material shall be determined using the nail, screw and bolt design formula in accordance with the applicable code requirements for solid-sawn lumber. For purposes of fastener calculation only, EPOCH shall be assumed to have an effective specific gravity of 0.50. There shall be no increases made to the load values indicated in AFPA NDS-97 when designing fasteners in EPOCH. Minimum fastener spacing shall be ½ inch (12.7mm) from the end of board and 1 inch (25.4mm) from the side of the board. EPOCH shall be fastened with nails having a minimum diameter of 0.13 inch (3.33mm) to a minimum depth of 1-1/2 inches (38mm) into joist.

**3.3 Fire Characteristics**

The surface-burning characteristics in accordance with ASTM E 84 are a flame spread index (FSI) of greater than 75 and less than 200, and a smoke-developed index (SDI) of greater than 450.

**3.4 Durability**

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

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**3.5 Slip-resistance**

EPOCH wood thermoplastic composite lumber was tested in accordance with ASTM D2047. EPOCH wood thermoplastic composite lumber has been determined to have a coefficient of friction of 0.88 in the dry condition and coefficient of friction 0.96 when tested wet.

**4.0 INSTALLATION**

Installation shall comply with the manufacturer's instructions and this report.

**TABLE 1<sup>1,2,3,4,5,6</sup>**  
**EPOCH DECKING SPAN CHART**

Member Size (inches)	Maximum Uniform Live Load (130° F)
	100 psf
	Maximum Member Span Between Supports
2 x 6	20 inches
1 x 6	16 inches

Notes:

1. The spans and decking sizes indicated in this table are recommendations by the manufacturer that are to be used in lieu of application-specific calculations.
2. Values indicated in this table are recommended maximum center-to-center joist spacing for EPOCH Decking. Values are based on a fully loaded single and three (3) span continuous condition engaging four (4) joists. Decking shall be securely fastened to each joist.
3. Recommended spans and members size are based on a maximum deflection of L/360 for 1x6 and L/240 for 2x6.
4. All decking members shall be installed flatwise.
5. SI units conversion: 1 psf = 49 Pa, 1 inch = 25.4 mm, 1 ft. = 0.3m.
6. The allowable values are based on use at a maximum air temperature of 130 degrees F.

**TABLE 2<sup>1,2,3,4,5</sup>**  
**EPOCH GUARDRAIL CHART**

Maximum Section Span and Height Between Supports	Maximum Live Load (130° F)
6 ft. Wide by 42 inches High	200 psf In-Field
	200 lbs Concentrated Mid-Point Top Rail
	50 plf Horizontally and 100 plf Vertically

Notes:

1. The spans indicated in this table are recommendations by the manufacturer that are to be used in lieu of application-specific calculations.
2. Values indicated in this table are recommended maximum span for EPOCH Railing. Values are based on a fully loaded guardrail mounted to solid wood post or sidewalls. Railing shall be securely fastened at each end of each section to solid wood post or sidewalls.
3. Recommended span is based on a maximum deflection recovery of 75% or higher.
4. SI units conversion: 1 psf = 49 Pa, 1 inch = 25.4 mm, 1 ft. = 0.3m.
5. The allowable values are based on use at a maximum air temperature of 130 degrees F.

**5.0 IDENTIFICATION**

EPOCH wood thermoplastic composite lumber shall be permanently identified with the manufacturer's name and address, the product name, manufacturing location, the name or logo of the third party inspection agency (PFS Corporation), and this National Evaluation Service report number.

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**6.0 EVIDENCE SUBMITTED**

- 6.1** Quality control manual, prepared in conjunction with PFS Corporation and signed by representatives of PFS Corporation and EPOCH Composite Products, Inc., dated October 3, 2001, and revised November 21, 2002
- 6.2** Test report on Wood Thermoplastic Composite Lumber in accordance with ASTM D-5456 and ASTM D-2047, prepared by PFS Corp., Report No. 00-58,  
 • First Report, dated June 8, 2001, signed by James Van Schoyck, Richard Reinhart, P.E., and Dwight E. McDonald.  
 • Addition I to report, dated October 3, 2001, signed by James Van Schoyck, Richard Reinhart, P.E., and Dwight E. McDonald.  
 • Addition II to report, dated November 5, 2001, signed by James Van Schoyck, Richard Reinhart, P.E., and Dwight E. McDonald.  
 • Addition III to report, dated December 14, 2001, signed by James Van Schoyck, Al Adams, and Dwight E. McDonald.
- 6.3** Evaluation of PFS Test Report No. 00-58, prepared by Barlow Engineering, PC, Project No. 01228, dated and signed June 22, 2001, by James Barlow, P.E.
- 6.4** Flame Spread Test in accordance with ASTM E-84, prepared by PFS Corp., Report No. 00-58, dated May 23, 2001, signed by James A. Rothman, P.E., and Michael J. Slifka, P.E.
- 6.5** Guardrail Test prepared by PFS Corp., Report No. 00-67B, dated May 14, 2002, signed by James Van Schoyck, Larry L. Turner, P.E., and Dwight E. McDonald.
- 6.6** Calculation on temperature affects by PFS Corp., dated March 1, 2002, signed by Larry L. Turner, P.E.

**7.0 CONDITIONS OF USE**

The National Evaluation Service Committee finds that EPOCH wood thermoplastic composite lumber as described in this report complies with or is a suitable alternate to that specified in the *2000 International Building Code© with 2002 Supplement*, *BOCA National Building Code/1999*, the *1999 Standard Building Code*, the *1997 Uniform Building Code*, and the *2000 International Residential Code with 2002 Supplement*, subject to the following conditions:

- 7.1** EPOCH wood thermoplastic composite lumber shall not be used as a component of trusses or structural diaphragms, and shall not be used in interior framing applications for joists, rafters, studs, beams, columns, or posts.
- 7.2** The design and installation of EPOCH wood thermoplastic composite lumber shall be in accordance with the manufacturer's published installation instructions and this report.
- 7.3** Use of EPOCH wood thermoplastic composite lumber for structural applications other than those described in Tables 1 and 2 of this report is beyond the scope of this report.
- Any allowable designs used in the structural calculations are outside the scope of this evaluation report.
- 7.4** The maximum spans of EPOCH decking and railing shall comply with **Table 1 & 2** of this report.

The design values listed in **Table 1 & 2** of this report are for loads of a normal load duration and are applicable to either dry or wet conditions of use. The design values are applicable in uses up to a temperature not exceeding 130° F (54.4° C).

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Adjustment factors in NDS-97 and applicable Codes shall not adjust the Values in **Table 1 & 2**, unless increasing the load duration. The allowable values are applicable in uses up to a temperature of 130° F (54.4° C).

- 7.5** Each piece of EPOCH shall bear a brand, stamp, or label with the information identified in Section 5.0 of this report.
- 7.6** Allowable capacity of fasteners installed in EPOCH shall comply with Section 3.2.2 of this report.
- 7.7** EPOCH shall be limited to use with building types where the use of combustible material is permitted. EPOCH shall not be used as a component of heavy timber construction.
- 7.8** EPOCH decking shall be gapped to permit adequate drainage in accordance with the manufacturer's instructions. EPOCH shall not be attached to any solid surface or water-tight flooring systems, such as sheathing, waterproof membranes, concrete, roof decks or patios.
- 7.9** EPOCH shall be fastened directly to floor joists having adequate strength and stiffness.
- 7.10** If the use and installation of EPOCH/ Evergrain Wood Thermoplastic Composite Lumber conflicts with this evaluation, this evaluation is null and void.
- 7.11** Design calculations and details for specific applications, which address the ability of the supporting construction to resist all imposed loads required by the applicable code, shall be furnished to the code official verifying compliance with this report and the applicable code. 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 under taken.
- 7.12** This report is subject to periodic re-examination. For information on the current status of this report, consult the [NES Product Evaluation Listing](#) or contact the [NES](#).

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