

ICC-ES Evaluation Report

ESR-1032

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DIVISION: 03 00 00—CONCRETE
Section: 03 24 00—Fibrous Reinforcing**REPORT HOLDER:****BUCKEYE TECHNOLOGIES**
1001 TILLMAN
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www.ultrafiber500.com
ultrafiber500@bkitech.com**EVALUATION SUBJECT:****BUCKEYE ULTRAFIBER 500® VIRGIN CELLULOSE
FIBERS****1.0 EVALUATION SCOPE****Compliance with the following codes:**

- 2009 *International Building Code*® (IBC)
- 2009 *International Residential Code*® (IRC)
- Other Codes (see Section 8.0)

Properties evaluated:

- Fiber durability.
- Crack control in concrete.
- Fire-resistance-rated construction
- Noncombustible construction

2.0 USES

Buckeye UltraFiber 500® virgin cellulose fibers are used as a fiber admixture in normal-weight concrete in buildings of any construction type for:

Reducing plastic shrinkage cracking of reinforced concrete and structural plain concrete.

Reducing shrinkage and temperature cracking in structural plain concrete slabs on grade.

Components of fire-resistance-rated floor/ceiling and floor-design assemblies.

3.0 DESCRIPTION**3.1 Cellulose Fibers:**

Buckeye UltraFiber 500® is made from virgin cellulose fibers that have been chemically processed and then treated with a mineral-based chemical that results in an alkaline-resistant fiber. The fibers have an average denier of 2.8.

3.2 Structural Plain Concrete:

Structural plain concrete must comply with Section 1909 of the IBC. Concrete must be proportioned as normal weight and comply with applicable requirements set forth in Section 1904 of the IBC.

4.0 INSTALLATION**4.1 General:**

Buckeye UltraFiber 500® virgin cellulose fibers must be dispersed uniformly through the concrete mixture in accordance with ASTM C 1116.

The fibers must be blended into the concrete mix at a minimum rate of $\frac{3}{4}$ pound per cubic yard (0.44 kg/m³) of concrete. The dosage must not exceed 15 pounds per cubic yard (8.9 kg/m³). When concrete slabs are exposed to abrasive and/or impact conditions (e.g. forklifts), the dosage rate must be a minimum of 1.5 pounds per cubic yard (0.89 kg/m³) of concrete.

The manufacturer's published installation instructions using either a dispersible bag system or a bulk time metric system and this report must be strictly adhered to, and a copy of the manufacturer's installation instructions must be available at all times on the jobsite during installation.

4.2 Fire-resistance-rated Construction:

Buckeye UltraFiber 500® virgin cellulose fibers may be used as an alternative to welded wire fabric in concrete and steel floor units of listed fire-resistant-rated floor/ceiling and floor-design assemblies at a minimum dosage rate of 1.0 pound per cubic yard (0.59 kg/m³) and maximum dosage rate of 2.0 pound per cubic yard (0.59 kg/m³) of concrete for up to two-hour fire-resistance ratings. Concrete-steel form unit floor assemblies must be a minimum of No. 22 gage steel for fluted decks and No 20/20 gage for cellular units, and must have minimum 2¹/₂-inch-thick concrete over the top of the flutes. Except for substitution of the fibers for the welded-wire fabric, all other aspects of the fire-resistance-rated assembly must comply with its listing.

5.0 CONDITIONS OF USE

The Buckeye UltraFiber 500® virgin cellulose fibers described in this report comply with, or are a suitable alternative to what is specified in, those codes specifically listed in Section 1.0 of this report, subject to the following conditions:

5.1 Design and construction of concrete utilizing the Buckeye UltraFiber 500® fibers must be in accordance with the requirements of the applicable codes and ACI 318, as applicable.

- 5.2 The fibers must be blended in accordance with the manufacturer's published instructions and Section 4.0 of this evaluation report. If there is a conflict between this report and the manufacturer's published installation instructions, this report governs.
- 5.3 The use of the fibers is limited to normal-weight concrete.
- 5.4 The fibers must not be used to replace any structural reinforcement. Structural reinforcement is described in Section 3.5 of ACI 318 (IBC).
- 5.5 For structural plain concrete, control joints, as required by Section 1909.3 of the IBC, must be provided.
- 5.6 For reinforced concrete, structural reinforcement and shrinkage and temperature reinforcement in accordance with Section 1907.12 of the IBC, must be provided.
- 5.7 Use of fibers must be approved by a registered design professional, if applicable.
- 5.8 A batch ticket, signed by a ready-mix representative, must be available to the code official upon request. The delivery ticket must include, in addition to the items noted in ASTM C 94, the type and amount of fibers added to the concrete mix.

6.0 EVIDENCE SUBMITTED

Data in accordance with ICC-ES Acceptance Criteria for Concrete with Virgin Cellulose Fibers (AC217), dated June 2010.

7.0 IDENTIFICATION

Each box of Buckeye UltraFiber 500[®] virgin cellulose fibers must be identified with the Buckeye Technologies name and/or trademark, address and telephone number; product trade name; dosage rate; use instructions; and the evaluation report number (ESR-1032).

8.0 OTHER CODES

In addition to the codes referenced in Section 1.0, the product described in this report was evaluated for compliance with the requirements for the following legacy codes and earlier editions of the International Codes:

- 2006 *International Building Code*[®] (2006 IBC)
- 2006 *International Residential Code*[®] (2006 IRC)
- 2003 *International Building Code*[®] (2003 IBC)
- 2003 *International Residential Code*[®] (2003 IRC)
- BOCA[®] *National Building Code/1999* (BNBC)

- 1999 *Standard Building Code*[®] (SBC)
- 1997 *Uniform Building Code*[™] (UBC)
- 1998 *International One- and Two-Family Dwelling Code*[®] (I1&2)

The Buckeye UltraFiber 500[®] virgin cellulose fibers described in this report comply with, or are a suitable alternative to what is specified in, the codes listed above, subject to the provisions of Sections 8.1 through 8.6.

8.1 Uses:

See Section 2.0.

8.2 Description:

See Section 3.0, except for the following modification:

Structural plain concrete provisions are found in Chapter 22 of ACI 318, Section 1922 of the UBC and Section 1909 of the 2003 IBC.

8.3 Installation:

See Section 4.0.

8.4 Conditions of Use:

See Section 5.0, except for the following modifications:

Section 5.4 is replaced by:

The fibers must not be used to replace any structural reinforcement. Structural reinforcement is described in Section 3.5 of ACI-318-02 (2006 and 2003 IBC), Section 3.5 of ACI 318-95 (BNBC and SBC) or Section 1903.5 of the UBC.

Section 5.5 is replaced by:

For structural plain concrete, control joints, as required by Section 1909.3 of the 2006 and 2003 IBC, Section 1922.3 of the UBC, Section 1909.4 of the BNBC or Section 1907.4 of the SBC, must be provided.

Section 5.6 is replaced by:

For reinforced concrete, structural reinforcement and shrinkage and temperature reinforcement in accordance with Section 1907.12 of the 2006 and 2003 IBC, Section 1907.12 of the UBC, or Section 7.12 of ACI 318-95 (BNBC and SBC), must be provided.

8.5 Evidence Submitted:

See Section 6.0.

8.6 Identification:

See Section 7.0.