

ICC-ES Evaluation Report

ESR-4066

Reissued May 2024


This report also contains:

Subject to renewal May 2025

- CBC Supplement
- FBC Supplement
- LABC Supplement

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<p>DIVISION: 03 00 00— CONCRETE</p> <p>Section: 03 24 00— Fibrous Reinforcing</p>	<p>REPORT HOLDER:</p> <p>MASTER BUILDERS SOLUTIONS ADMIXTURES US, LLC</p>	<p>EVALUATION SUBJECT:</p> <p>MASTERFIBER MAC MATRIX & MASTERFIBER MAC 360 FF</p>	
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1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, 2015 and 2012 [International Building Code® \(IBC\)](#)
- 2021, 2018, 2015 and 2012 [International Residential Code® \(IRC\)](#)

For evaluation for compliance with codes adopted by [Los Angeles Department of Building and Safety \(LADBS\)](#), see [ESR-4066 LABC and LARC Supplement](#).

Properties evaluated:

- Durability
- Crack control in concrete

2.0 USES

MasterFiber MAC Matrix & MasterFiber MAC 360 FF are polyolefin chopped strand fiber that is used as shrinkage and temperature reinforcement for plain concrete footings and plain concrete slabs supported directly on the ground.

MasterFiber MAC Matrix & MasterFiber MAC 360 FF are also used to reduce shrinkage and temperature cracking in structural plain concrete footings and structural plain concrete slabs supported directly on the ground.

MasterFiber MAC Matrix & MasterFiber MAC 360 FF are also used as an alternative to shrinkage and temperature reinforcement for concrete of composite steel floor deck-slabs in accordance with SDI-C as referenced by IBC.

Under the IRC, an engineered design in accordance with IRC Section R301.1.3 must be submitted to the code official for approval.

3.0 DESCRIPTION

3.1 MasterFiber MAC Matrix:

The MasterFiber MAC Matrix product is a macrofiber chopped strand. It is chopped to the specified uniform length for the product ordered. The Masterfiber Mac Matrix product length is 2.1 inches (54 mm).

The MasterFiber MAC Matrix product is packaged in bags by unit weight or unit mass. A number of bags are added to the mixer based on the dosage per the concrete mixture unit volume. The bags separate and are torn open and apart in the mixing process and aid in blending the fiber product into the concrete mixture.

3.2 MasterFiber MAC 360 FF

The MasterFiber MAC 360 FF product is a hybrid chopped strand. It is chopped to the specified uniform length for the product ordered. The macrofiber portion of Masterfiber MAC 360 FF has a product length of 2.0 inches (50 mm).

The MasterFiber MAC 360 FF product is packaged in bags by unit weight or unit mass. A number of bags are added to the mixer based on the dosage per the concrete mixture unit volume. The bags separate and are torn open and apart in the mixing process and aid in blending the fiber product into the concrete mixture.

3.3 Structural Plain Concrete:

Structural normal-weight plain concrete must comply with Section 1906 of the IBC.

4.0 INSTALLATION

The concrete with fibers must comply with ASTM C1116, Type III. MasterFiber MAC Matrix fibers must be blended into the concrete mixture equal to or within the range of volume fractions at 0.2 percent to 0.5 percent (reinforcement ratio). The volume fraction can also be expressed as dosage or an amount (mass or weight) per unit volume of concrete (3 to 7.5 lb/yd³ or 2 to 4.45 kg/m³). MasterFiber MAC 360 FF fibers must be blended into the concrete mixture equal to or within the range of volume fractions at 0.26 percent to 0.5 percent (reinforcement ratio). The volume fraction can also be expressed as dosage or an amount (mass or weight) per unit volume of concrete (4 to 7.5 lb/yd³ or 2.4 to 4.45 kg/m³).

The MasterFiber MAC Matrix & MasterFiber MAC 360 FF fiber products may be added to the concrete at the concrete batch plant or to the ready-mix truck at the jobsite. The manufacturer's published installation instructions and this report must be strictly adhered to for adequate dispersal of fibers throughout the batch mixture. A copy of the manufacturer's published installation instructions must be available at all times at the location of the fiber installation into the concrete.

5.0 CONDITIONS OF USE:

The MasterFiber MAC Matrix & MasterFiber MAC 360 FF polyolefin chopped strand fibers described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 Concrete with polyolefin chopped strand must comply with ASTM C1116/C1116M, Type III.
- 5.2 Fibers must be blended into the concrete mixture in accordance with the installation requirements in the ICC-ES evaluation report and the manufacturer's published installation instructions. If there is a conflict between the evaluation report and the manufacturer's published installation instructions, the more restrictive governs.
- 5.3 Registered design professional must approve the use of polyolefin chopped strand fibers and the mixture proportions.
- 5.4 Structural plain concrete including concrete over composite steel decks must comply with the applicable IBC sections.
- 5.5 Structural reinforcement for continuity must be provided in accordance with the approved engineering design of a registered design professional and the applicable codes (IBC).
- 5.6 Polyolefin chopped strand fiber must not be used to replace any structural reinforcement or the joints specified in the 2021, 2018 and 2015 IBC (ACI 318-19 and ACI 318-14 Sections 24.4 and 14.3.4, respectively) and 2012 IBC (ACI 318-11 Sections 7.12 and 22.3, respectively).
- 5.7 When polyolefin chopped strand fibers are added at the ready-mix plant, a batch ticket signed by a ready-mix representative must be available to the code official upon request. The delivery ticket must include information noted in Section 12 of ASTM C1116/C1116M.
- 5.8 Volume fractions of MasterFiber MAC Matrix polyolefin chopped strand fibers are 0.2 to 0.5 percent of the concrete mixture (reinforcement ratio). The volume fraction can also be expressed as a dosage or an amount (mass or weight) per unit volume of concrete (3 to 7.5 lb/yd³ or 2 to 4.45 kg/m³). Interpolation for other volume fractions between the tested volume fractions are permitted. Volume fractions of MasterFiber MAC 360 FF are 0.26 to 0.5 percent of the concrete mixture (reinforcement ratio). The volume fraction can also be expressed as a dosage or an amount (mass or weight) per unit volume of concrete (4 to 7.5 lb/yd³ or 2.4 to 4.45 kg/m³).

- 5.9 The fire-resistance rating of fiber reinforced concrete composite steel deck constructions has not been evaluated by ICC-ES and is outside the scope of this report. When requested, evidence of the fire-resistance rating of the construction must be submitted to the code official for their approval.
- 5.10 The use of fibers in concrete of composite steel floor deck-slabs construction must comply with Section 2.4.B.13.a.3 of ANSI/SDI C with the specified minimum 4.0 lb/yd³ dosage.
- 5.11 MasterFiber MAC Matrix & MasterFiber MAC 360 FF polyolefin chopped strand fibers are manufactured by Great Lakes Polymer Technologies dba Fabpro Polymers in Kingman, Kansas.

6.0 EVIDENCE SUBMITTED

Data in accordance with the [ICC-ES Acceptance Criteria for Polyolefin Chopped Strands For Use in Concrete \(AC383\)](#), dated January 2018, editorially revised April 2021.

7.0 IDENTIFICATION

- 7.1 Each container of MasterFiber MAC Matrix & MasterFiber MAC 360 FF must bear the manufacturer's name, trademark and address; the product name; and the ICC-ES evaluation report number (ESR-4066).
- 7.2 The report holder's contact information is the following:

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23700 CHAGRIN BOULEVARD
CLEVELAND, OHIO 44122
(216) 839-7500
www.master-builders-solutions.com

DIVISION: 03 00 00—CONCRETE
Section: 03 24 00—Fibrous Reinforcing

REPORT HOLDER:

MASTER BUILDERS SOLUTIONS ADMIXTURES US, LLC

EVALUATION SUBJECT:

MASTERFIBER MAC MATRIX & MASTERFIBER MAC 360 FF

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that the MasterFiber MAC Matrix & MasterFiber MAC 360 FF fibers, described in ICC-ES evaluation report [ESR-4066](#), have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2020 *City of Los Angeles Building Code* (LABC)
- 2020 *City of Los Angeles Residential Code* (LARC)

2.0 CONCLUSIONS

The MasterFiber MAC Matrix & MasterFiber MAC 360 FF fibers, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4066](#), comply with the LABC Chapter 19, and the LARC, and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The MasterFiber MAC Matrix & MasterFiber MAC 360 FF fibers, described in this evaluation report supplement, must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-4066](#).
- The design, installation, conditions of use and identification of the MasterFiber MAC Matrix & MasterFiber MAC 360 FF fibers are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report [ESR-4066](#).
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 must be submitted.

This supplement expires concurrently with the evaluation report, reissued May 2024.

DIVISION: 03 00 00—CONCRETE
Section: 03 24 00—Fibrous Reinforcing

REPORT HOLDER:

MASTER BUILDERS SOLUTIONS ADMIXTURES US, LLC

EVALUATION SUBJECT:

MASTERFIBER MAC MATRIX & MASTERFIBER MAC 360 FF

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that the MasterFiber MAC Matrix & MasterFiber MAC 360 FF, described in ICC-ES evaluation report ESR-4066, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2019 *California Building Code (CBC)*
- 2019 *California Residential Code (CRC)*

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of the State Architect (DSA), see sections 2.1.1 and 2.1.2 below.

2.0 CONCLUSIONS**2.1 CBC:**

The MasterFiber MAC Matrix & MasterFiber MAC 360 FF, described in Sections 2.0 through 7.0 of the evaluation report ESR-4066, comply with CBC Chapter 19, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional design and inspection requirements of CBC Chapters 16 and 17, as applicable.

2.1.1 OSHPD: The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.

2.1.2 DSA: The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

2.2 CRC:

The MasterFiber MAC Matrix & MasterFiber MAC 360 FF are, described in Sections 2.0 through 7.0 of the evaluation report ESR-4066, comply with CRC Section R301.1.3, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report.

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DIVISION: 03 00 00—CONCRETE
Section: 03 24 00—Fibrous Reinforcing

REPORT HOLDER:

MASTER BUILDERS SOLUTIONS ADMIXTURES US, LLC

EVALUATION SUBJECT:

MASTERFIBER MAC MATRIX & MASTERFIBER MAC 360 FF

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that MasterFiber MAC Matrix & MasterFiber MAC 360 FF, described in ICC-ES evaluation report ESR-4066, has also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2020 *Florida Building Code—Building*
- 2020 *Florida Building Code—Residential*

2.0 CONCLUSIONS

Use of the MasterFiber MAC Matrix & MasterFiber MAC 360 FF, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-4066, comply with the *Florida Building Code—Building* and the *Florida Building Code—Residential*, provided the design requirements are determined in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-4066 for the 2018 *International Building Code*® meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable.

Use of the MasterFiber MAC Matrix & MasterFiber MAC 360 FF for compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and the *Florida Building Code—Residential* have not been evaluated and is outside the scope of this supplemental report.

For products falling under Florida Rule 61G20-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official, when the report holder does not possess an approval by the Commission).

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