



ICC-ES Evaluation Report

Reissued July 2022

ESR-4595

This report is subject to renewal July 2024.

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

REPORT HOLDER:

POLIPROPILEN ELYAF SANAYI & DIS TICARET A.S.

EVALUATION SUBJECT:

POLYFIBERS® POLYTWIST® PT54

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018 and 2015 *International Building Code*® (IBC)
- 2021, 2018 and 2015 *International Residential Code*® (IRC)

Properties evaluated:

- Durability
- Crack control in concrete

2.0 USES

Polyfibers® Polytwist® PT54 is polyolefin chopped strand fibers that are used as shrinkage and temperature reinforcement for plain concrete footings and plain concrete slabs supported directly on the ground.

Polyfibers® Polytwist® PT54 is also used to reduce shrinkage and temperature cracking in structural plain concrete footings and structural plain concrete slabs supported directly on the ground.

Polyfibers® Polytwist® PT54 is 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 POLYFIBER® POLYTWIST® PT54 Fibers:

The Polyfibers® Polytwist® PT54 product is macro synthetic fibers. Fibers are chopped or cut to the specified uniform length for the product ordered, and are provided in twisted bundles which aid in homogenous distribution in concrete. The standard product length is 2.125 inches (54 mm).

3.2 Structural Plain Concrete:

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

4.0 INSTALLATION

The concrete with fibers complies with ASTM C1116, Type III. Fibers must be blended into the concrete mixture equal to or within the range of volume fractions at 0.2 percent to 0.55 percent of the specified volume fraction (reinforcement ratio). The volume fraction can also be expressed as dosage or an amount (mass or weight) per unit volume of concrete (3 to 8.4 lb./yd³ or 1.8 to 5.0 kg/m³).

The fiber product 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 Polyfibers® Polytwist® PT54 polyolefin chopped strand fibers as 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 complies with ASTM C1116/C1116M, Type III, and ASTM D7508/7508M.
- 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 mixing instructions. If there is a conflict between the evaluation report and the manufacturer's published mixing 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 IBC (ACI 318-19 and ACI 318-14 Sections 24.4 and 14.3.4, respectively).
- 5.7** When polyolefin chopped strand fibers are added at the ready-mix plant, a batch ticket signed by a ready-mix representative shall 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 polyolefin chopped strand fibers are 0.2 percent to 0.55 percent of the specified volume fraction (reinforcement ratio). The volume fraction can also be expressed as dosage or an amount (mass or weight) per unit volume of concrete (3 to 8.4 lb./yd³ or 1.8 to 5.0 kg/m³). Interpolation for other volume fractions between the tested volume fractions is permitted.
- 5.9** The fire-resistance rating of fiber reinforced concrete composite steel deck construction 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 (2.4 kg/m³) dosage.

5.11 Polyfibers® Polytwist® PT54 polyolefin chopped strand fibers are manufactured by Polipropilen Elyaf Sanayi & Dis Ticaret A. S. in Bilecik, Turkey.

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 Polyfibers® Polytwist® PT54 must bear the manufacturer's name, trademark and address; the product name; and the ICC-ES evaluation report number (ESR-4595).

7.2 The report holder's contact information is the following:

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POLYFIBERS® POLYTWIST® PT54

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that Polyfibers® Polytwist® PT54, described in ICC-ES evaluation report ESR-4595, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2019 *California Building Code (CBC)*

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 State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2019 *California Residential Code (CRC)*

2.0 CONCLUSIONS**2.1 CBC:**

The Polyfibers® Polytwist® PT54, described in Sections 2.0 through 7.0 of the evaluation report ESR-4595, 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 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 Polyfibers® Polytwist® PT54, described in Sections 2.0 through 7.0 of the evaluation report ESR-4595, comply with CRC Section R301.1.3, provided the design and installation are in accordance with the 2018 *International Residential Code*® (IRC) provisions noted in the evaluation report.

This supplement expires concurrently with the evaluation report, reissued July 2022.