State of Louisiana
Department of Transportation and Development (DOTD)
Materials and Testing Section Approved Materials Procedure
for

FIBERS FOR CONCRETE REINFORCEMENT

MATERIAL SPECIFICATION REFERENCE:

DOTD Standard Specifications, ASTM C1116, Supplemental Specifications and Special Provisions.

APPROVED MATERIAL EVALUATION SUBMITTAL:

The manufacturer shall submit a completed Approved Materials Evaluation Submittal to the DOTD Materials and Testing Section Coordinator listed below.

PRELIMINARY REQUIREMENTS:

The complete submittal must include:

- Complete Approved Materials Evaluation Form
- Letter requesting evaluation of the material
- Product Data Sheets
- Safety Data Sheet (SDS)
- Manufacturer's specifications
- Independent Laboratory Test Results
- Sample

NOTE: Evaluation will not begin until all required items listed above are received by the Materials Laboratory

Certifications and/or Test Reports

The manufacturer shall provide a Certificate of Analysis (CA) reporting actual test results of the fiber according to ASTM C1116 (with the exception of ASTM C666 for Freeze/Thaw which is not required) and each fiber type's subsequent ASTM standard:

- Steel Fibers: ASTM A820 (Steel Fibers shall comply with the "Buy American" clause)
- Glass Fibers: ASTM C1666 (prove ASR resistance)
- Polyolefin Fibers: ASTM D7508
    - Minimum tensile strength of macro-synthetic fibers shall be 50 ksi when tested in accordance with ASTM D3822
    - Macro-synthetic fibers shall have an aspect ratio (L/D) between 50 and 150
    - Micro-synthetic fibers shall produce a minimum of 50% or greater reduction in Plastic Shrinkage Cracking of Restrained Fiber Reinforced Concrete when tested in accordance with ASTM C1579
- Natural Fibers: ASTM D7357

PRELIMINARY REQUIREMENTS CONTINUED:

Sample (to be furnished at no cost to the Department)

Submit a one (1) quart sample of the material for evaluation to the Materials and Testing Section.

TEST REQUIREMENTS:

Laboratory Testing

Laboratory testing will be conducted by a laboratory which is accredited by the Cement and Concrete Reference Laboratory (CCRL).

Fibers and their dosage shall obtain a minimum residual strength ratio (R_{e3}) of 25%, when tested in accordance to ASTM C1609. A standard Structural Class A1 mix design should be used following the parameters in Table 901-3 of the LA DOTD Standard Specifications. The manufacturer shall submit the mix design, fresh concrete properties (air and slump), compressive strength at time of test, and dosage used. The manufacturer shall provide mixing parameters to ensure no fiber balls.

Three (3) compressive strength cylinders 6 inches x 12 inches are to be cast in accordance with ASTM C192 and tested according to ASTM C39.

Beam testing may begin when an average compressive strength of 4,000-5,000 psi has been obtained. Three (3) beams approximately 6 inches x 6 inches x 20 inches should be cast and cured in accordance with ASTM C192, using external vibration for consolidation. Beams are to be tested in accordance with ASTM C1609 to a deflection of L/250, and obtain a minimum Residual Strength Ratio (R_{e3}) of 25%.

Evaluation Time (3 Months)

GENERAL:

Upon completion of the evaluation, the submitter will be notified in writing concerning the results of the evaluation and whether the material will or will not be added to the Approved Materials List (AML). The DOTD Materials and Testing Section Coordinator shall be notified in writing of any change from the original material submittal. The Department reserves the right to re-evaluate any material at any time. A Certificate of Analysis (CA) of the material shall be submitted every two (2) years to the DOTD Materials and Testing Section Coordinator to remain on the AML.

It is also the manufacturer's responsibility to supply the contact information of the representative responsible for the material to the Materials Section Coordinator to remain on the AML. This is done by completing the Approved Materials Evaluation Form every two (2) years or when there is a change in the manufacturing representative responsible for the material.

PROJECT ACCEPTANCE REQUIREMENTS:

An approved fiber shall have a fixed length and aspect ratio, and any changes in either parameter shall be approved by the Department for use on a LA DOTD project. The inclusion of any material on the AML is not blanket approval for its use. All materials, regardless of prior approval, shall be sampled in accordance to the Materials and Sampling Manual.

DISQUALIFICATION AND REMOVAL:

Any material may be removed from the AML at any time. Causes for removal from the AML may include, but are not limited to the following:

- Non-conformance with specifications
- Performance requirements
- Failure to notify the Department of any change in material formulation
- Failure of the supplier to provide proper certifications as required by this procedure
- Failing test results obtained by the Materials Section of project verification samples
- Failure to supply current contact information for the material representative in accordance with this procedure

REQUALIFICATION:

Any material which has been disqualified and/or removed from the AML will be considered for re-evaluation only after submission of a formal request along with acceptable evidence that the problems causing the disqualification and/or removal have been resolved.

DOTD MATERIALS AND TESTING SECTION COORDINATOR:

Justin Morris, P.E.
Physical Test Engineer
DOTD Materials and Testing Section
5080 Florida Blvd.
Baton Rouge, LA 70806-4132
(225) 248-4219
Justin.Morris@la.gov

Approved 08/19/19

BRIAN OWENS, P.E.
DOTD MATERIALS ENGINEER ADMINISTRATOR