

MAINE DEPARTMENT OF TRANSPORTATION
PRODUCT ACCEPTANCE CRITERIA FOR

Macro Synthetic Fibers for Concrete Reinforcement

General Description

This section includes the requirements for acceptance of macro-synthetic fibers which are permitted as a replacement for 6" x 6" #10 gauge welded wire fabrics reinforcement in the following selected precast concrete products:

Precast concrete manhole and catch basin units as allowed under MaineDOT Standard Specification, 712.06 Precast Concrete Units.

Requirements

The fiber manufacturer is required to obtain certified independent testing lab reports that confirm the product being submitted meets the requirements listed below and submit those results to the Maine Department of Transportation's New Product Committee.

1. Macro synthetic fibers shall be manufactured from virgin polyolefins (polypropylene and polyethylene), nylon, and carbon and comply with ASTM C1116, Type III Synthetic Fiber-Reinforced Concrete. Fibers manufactured from materials other than those listed above must show documentary evidence confirming their long term resistance to deterioration when in contact with the moisture and alkalis present in cement paste and the substances present in admixtures throughout the anticipated useful life of the structure.
2. The minimum fiber length required is 1.50 inches.
3. Macro-synthetic fibers have an aspect ratio (length divided by the equivalent diameter of the fiber) between 45 and 150.
4. Macro-synthetic fibers shall have a minimum tensile strength of 40 ksi when tested in accordance with ASTM D 3822.
5. Macro-synthetic fibers shall have a minimum modulus of elasticity of 400 ksi when tested in accordance with ASTM D 3822.
6. Minimum dosage rate in pounds of fibers per cubic yard is established by determining an average residual strength of no less than 150 psi when tested in accordance with ASTM C1399. In all cases, manufacturers must indicate the appropriate dosage rate per cubic yard of concrete to achieve the above specifications.

The fiber manufacturer is required to obtain independently performed test results that confirm the requirements listed herein and submit those for approval.

Fibers meeting all of the above criteria will be pre-qualified for use and added to the Department's Qualified Products List of Macro Synthetic Fibers for Concrete Reinforcement.