



newcrete M to prevent plastic cracking

PRODUCT PAGE

fiberfor
engineered construction solutions



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The Problem

Plastic cracking is created as a consequence of immoderate contractions, due to material evaporation and shrinkage; in plastering materials (concrete or mortar), soon after it has been placed and still plastic (24 hours after pouring). These cracks

are liable to develop from a simple crack to more significant cracking that affects the quality and durability of the poured elements in a number of ways:

- ▶ Significant weakening of the element until a collapse of the pouring and decrease in its mechanical properties
- ▶ Damage to the visible esthetics of the poured elements
- ▶ Damage to the element surface and its sealant capability against the penetration of water and/or corrosive chemicals (Carbon Dioxide, Chlorides and Sulfates, etc.) that create corrosion and shorten the element's life span.

The Solution

The designated development of the Fiberfor Co. Ltd, based upon a group of polyamide fibers (polymer nylon), has been engineered and suited to prevent cracking thanks to their chemical and structural properties.

The micro-fibers, characterized by a uniquely thin structure, contribute towards the attainment of various mechanical properties (friction and anchoring) that improve the connection to the matrix and restrain cracking, and the reception of optimal geometric properties (diameter and cross-section to obtain high content (number of fibers per cubic meter).

The hydrophilic (water absorbent) nylon fibers, in contrast to hydrophobic polypropylene (water repellent) fibers disperse out across the matrix in a uniform, optimal fashion, fixing the water in the cementic system, thereby preventing dehydration, shrinkage and the consequential cracking.

The Advantage

The fibers adapted to the cracking problem, enable a highly efficient level of restraint. Moreover, thanks to the fibers' properties, improved workability and flow capabilities are obtained without the need to adapt the mixes composition for use with fibers.

Newcrete M enables use at a low weight of fiber per cubic meter concrete while maintaining high fiber contents (approximately 100 million fibers per cubic meter). Use of the proposed product, significantly reduces early stage plastic cracking, so that it will not develop into a constructive crack and aids in the production of a better quality, more durable element that extends the product's life span over time.

Primary Applications

A designated development for preventing and resolving cracking issues

The product was developed specifically for the plastic cracking problem, while the company's experts adapt the solution to each project, by examining the application type, the poured aggregates composition, climate conditions and additional parameters that affect the element's quality. Among the applications enjoying suitable solutions are:

- ▶ Floors and surfaces
- ▶ Prefabricated Elements
- ▶ Bridges and piers
- ▶ Ceilings and tension ceilings
- ▶ Cement and decorative sprays
- ▶ Water treatment, pools, reservoirs and waste facilities
- ▶ Compounds and leveling compounds
- ▶ Roads, paths and sidewalks

- ▶ Self Compacting Concrete (SCC)

Technological Characteristics

The Fibers' Composition

The fibers are made of water absorbent (hydrophilic) nylon, in contrast to water resistant (hydrophobic) polypropylene and grants significant advantages to hydration, workability and concrete flow processes.

Chemo - Physical Properties

The fibers are characterized by physical properties that enable a high internal curing, because of their ability to absorb water in quantities of 4 to 5 percent of their weight and do not affect the concrete's slump (absorbs approximately 15 grams within the 150,000 gram water per cubic meter in the cementic matrix).

The fibers have a high friction coefficient that enables an energetic restraint of the development of cracks and improves the quality of the poured element: strength, elongation and withstanding blows.

The fibers improve the bond to the matrix and increases the efficiency of the pouring's reinforcement and durability.

Technical Properties

Structure	Filamentary
Length	12 millimeter
Nominal Diameter	12 micron
Density	1.14 grams per cubic cm
Nominal DiTex	1.5
Tensile Strength	350 MPa
Elastic Modulus	2200 MPa
Liquefaction Temperatures	264°C
Alkali Resistance	Very High
Acidic Resistance	Very High
UV Radiation Resistance	Very High
Color	Transparent

Contents and Quantities

Fiber Quantity per Cubic Meter

The optimal quantity is one product bag containing 300 to 350 gram fibers per cubic meter concrete.

* In contrast to 900 grams Polypropylene Fibers per cubic meter

Cement Quantity per Cubic Meter

The recommended quantity is according to SII 118 or the engineer's specifications.

Test Results

Today, by simply adding newcreteM fibers to any cement mixture, according to the recommended dose, it is possible to reduce significantly the appearance of plastic cracking and defects in the finishing before they are created; thereby preventing the development of the cracking, from plastic cracking to structural cracking. This product through its proper use has a proven capability to aid in providing the highest quality finished product possible!

Testing and Standards

According to the results obtained in testing by the St. Paul Minnesota based Twin City Testing Corporation that tested the effectiveness of newcreteM fibers in relation to the required criteria. The fibers were found not to harm the concrete's properties and performance in contents of 300 cubic meter concrete and comply with all ICC - ES standards and requirements requested in relation to the integration of synthetic fibers in concrete (AC32) Clause 3.A.1.

Service and Support

The Laboratory

The product was developed in our laboratory. The laboratories are state of the art and among the most advanced in the field of fibers and concrete, servicing to adapt the solution to each application and for technical consultation needs during any job for the benefit of meeting the specific needs of each project.

Experts in the Field

The product is adapted to the specifications of each application, at both the fiber and the concrete levels.

The company's experts offer technical support services at the design level to assist and define the solution's scope and character (the quantity and type of fibers required) and during implementation and execution, through accompanying, consulting and providing expert technical support as required.

Actual Application

Blending Fibers into the Aggregate

It is possible to add fibers during each of the concrete preparation stages. There is no need to modify the composition of the planned concrete aggregate.

The product bags decompose in the concrete aggregate and release the fiber content into the mixture with the fibers disperse uniformly across the matrix.

Add the amount of fibers suitable to the concrete volume in the drum, according to the required dose and mix at the maximum speed (at least 70 rotations) for at least 4 minutes.

A Comparative Analysis of the Fibers

Examined Criteria	newcrete M	Polypropylene
Density	1.14	0.91
Liquefaction Temperatures	263° C	160° C
Concrete Bonding	Excellent (hydrophilic)	Problematic (hydrophobic)
Quantities in Grams	300 grams/cubic meter	900 grams/cubic meter
Fiber Thickness	12 micron	30 micron
Chemical Components	Carbon, Hydrogen, Oxygen and Nitrogen	Carbon and Hydrogen
Surface Properties	High Friction Coefficient	Smoothing
Numerical Contents	120 to 100 million/cubic meter	75 million/cubic meter
Strength Characteristics	500 MPa	300 MPa
Elongation	80%	10%
Impact Resistance	High	Moderate
UV Radiation Resistance	High	Low
Mixing the fibers into the Concrete	Easy and Uniform	Dispersal and Closure Problems
Workability	Improved Flow	Difficult Workability
Curing	Prevents Dryness	Needs Special Curing
Internal Curing	Increased Final Strength	Reduced Final Strength
Concrete Coherency	High	Creating Spaces
Bleeding and Segregation	Active Prevention	Passive Prevention
Flexibility	High	Moderate
Concrete Impact Resistance	High	Moderate
Final Strength	Up to 10% greater than control	Up to 10% less than control
Uniform Dispersion in the Matrix	Excellent	Problematic
Friction and Bonding in the Matrix	Excellent	Poor
Restrained Cracking	Effective	Effective
Captures Water and Prevents Dehydration	Excellent	Non Existent
Coherency	High	Moderate
Impermeability	High	High
Flow and Filling Capability	Excellent	Poor
Initial Strength (Green)	Higher in relation to the control	Higher in relation to the control

Packaging and Storage

Storage

The shelf-life of the packaged product is approximately one year. The product must be stored in a dry and protected environment.

Delivery

The product is manufactured and packaged in the company's facilities.

The product comes packaged in decomposable paper bags or in bulk.

The quantity of fibers in the packaging can be adapted according to the customers specific needs and requirements.

The shipped product arrives in decomposable bags, packed in carton boxes.

A label containing the product's specifications is attached to each carton.

Packaging and Shipping

The dimensions of the carton packaging are 46 x 34 x 39 (height, length, width) and each carton contains 50 packages of 300 or 350 grams fibers per bag.

The product comes with the following documentation:

- ▶ Bill of Lading
- ▶ Invoice
- ▶ Instructions for Use
- ▶ MSDS Safety Instructions
- ▶ Product Quality Compatibility Approval

Our Development, Your Success

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