3M® Scotchcast® Polyolefin Fibers for Concrete Reinforcement

Featuring the performance of steel, the advantages of synthetics and the benefits of designer properties all bundled together.
The Problem:
Concrete cracks

That’s a sad fact. And when it cracks, this can cause problems in pavement, bridges, roads, walls—virtually anything made of concrete. Large cracks allow penetration of water and corrosion-causing chemicals that can attack a concrete structure’s metal reinforcement. The challenge has been to find a way to change the concrete behavior from brittle to ductile, to increase its toughness, and to control formation of cracks.

Over the years, several solutions to the problem of concrete cracking have been used, with varying degrees of success. Each solution has had its drawbacks—steel fibers corrode and protrude; polypropylene fibers are difficult to mix.

The Solution:
Bundles

But, now 3M has a solution that avoids those disadvantages. 3M™ Scotchcast™ Polyolefin Fibers for concrete reinforcement offer the performance of steel and the advantages of synthetics without fiber “balling” during mixing. The secret is bundling.

3M’s breakthrough bundling solution is an innovative system that contains synthetic polyolefin fibers in small bundles that mix easily using conventional equipment. The result—concrete with superior physical properties.

---

Impact Test Disks

Without 3M Scotchcast Polyolefin fibers.

With 3M Scotchcast Polyolefin fibers.
How Does it Work?

Research has shown that the more fibers mixed into concrete the better the concrete performs. The key is to distribute the fibers throughout the concrete. In the past, the problem has been how to increase the fiber volume without causing balling of fiber in the concrete due to inadequate dispersion. Related to this was the problem of how to distribute the fibers uniformly so that some of the concrete in the mixer was fiber-free while another portion had so many fibers that they couldn’t be mixed.

**Hence, bundles.** Bundling the fibers permits greater quantities to be loaded into the concrete mixer without clogging the system. The bundles are distributed throughout the mixer because the mixer treats them like any large aggregate. The cellulose tape wrap disintegrates, releasing a controlled quantity of fiber into a localized volume of concrete. This enables all the fibers to be evenly dispersed throughout the concrete matrix.

**Typical mixing procedure for transit mixing truck:**
- Turn drum at maximum speed.
- Add fiber bundles as quickly as possible.
- Mix at maximum speed for 4 minutes.
- Reverse drum to clean off fins.
- Take load back down and mix for three more minutes.
- Discharge concrete.
Advantages

Although one obvious benefit to using 3M Scotchcast Polyolefin Fibers is improved crack resistance, the product has additional performance and economic advantages. Foremost is the longer life of the concrete, thereby reducing maintenance and replacement costs. In addition, the product offers:

• Better performance. Improved concrete properties include flexural fatigue strength, durability, ductility toughness and higher impact strength.
• No metal contamination. Synthetic Scotchcast fibers are non-corrosive, non-magnetic and have no hazardous protrusions.

Where can it be used?

3M™ Scotchcast™ Polyolefin Fibers can be used in a variety of government, industrial, commercial and residential projects. Some of the many applications are outlined below:

• Roads, highways, bridge decks, parking lots
• Airport runways
• High-load impact areas, fork-lift truck areas
• Chemical plants
• Applications to replace wire mesh
• Pipes, vaults, septic tanks
• Concrete tiles, architectural panels
• Rock and soil stabilization
• Mine and tunnel linings

Excellent for use in:

• cast-in-place
• precast
• shotcrete

Jersey barrier on U.S. Highway 83 reinforced with 3M™ Scotchcast™ fibers.

3M™ Scotchcast™ fiber bundles on conveyor in central batch plant.

Easy mixing. Projects can be completed more quickly, with faster scheduling because the system is easy to use with standard mixing equipment. This results in reduced labor costs.
In short, polyolefin bundled fibers work. They don’t rust and they don’t have dangerous protrusions. Because they outperform steel fibers using lesser quantities by weight, you’re also likely to see a reduction in weight-related on-the-job injuries. And, because they’re in bundles they don’t have the mixing problems of other fibers. So, whether you’re an architect, engineer, contractor or owner, when you’re ready to reinforce concrete for any job, specify 3M™ Scotchcast™ Polyolefin Fibers. Regardless of the application, you’ll have a higher value product with a longer life.

For additional technical information, including project case histories and specifications call 3M at 1-800-722-6721, or see our website www.3M.com/corrosion.
Important Notice

All statements, technical information, and recommendations related to 3M’s products are based on information believed to be reliable, but the accuracy or completeness is not guaranteed. Before using this product, you must evaluate it and determine if it is suitable for your intended application. You assume all risks and liability associated with such use. Any statements related to the product which are not contained in 3M’s current publications, or any contrary statements contained on your purchase order shall have no force or effect unless expressly agreed upon in writing, by an authorized officer of 3M.

Warranty; Limited Remedy; Limited Liability. This product will be free from defects in material and manufacture for a period of one year from the date of purchase. 3M MAKES NO OTHER WARRANTIES INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. If this product is defective within the warranty period stated above, your exclusive remedy shall be, at 3M’s option, to replace or repair the 3M product or refund the purchase price of the 3M product. Except where prohibited by law, 3M will not be liable for any loss or damage arising from this 3M product, whether direct, indirect, special, incidental or consequential regardless of the legal theory asserted.

3M
Corrosion Protection Products
6801 River Place Blvd.
Austin, TX 78726-9000
http://www.3M.com/corrosion

© 3M IPC 2000 86-6111-8050-8