

PCF	<h2 style="margin: 0;">Nycon ConTrolPCF</h2> <h3 style="margin: 0;">Collated Polypropylene Fibrillated Fibers</h3>
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Since the early 1970's, construction professionals have recognized the value of polypropylene fibers as a reinforcement alternative to conventional wire mesh in hardened concrete. The primary use of polypropylene fibers is as a secondary/temperature-shrinkage reinforcement, which generates an appreciable increase in post-crack energy absorption capacity, ductility, and overall durability in concrete.

Description

Nycon ConTrolPCF is a collated fibrillated polypropylene fiber that mechanically bonds with the concrete matrix. ConTrolPCF is manufactured from 100% virgin homopolymer polypropylene and contains no reprocessed olefin materials. ConTrolPCF is extruded as a flat sheet producing a rectangular cross-section to optimize the surface area. The lattice pattern of the fibers is created in the manufacturing process and consists of main fibrils connected by cross fibrils. Concrete passes through the lattice which opens in the matrix and anchors the fiber reinforcement as it hardens. The fibers are chemically inert in concrete, hydrophobic, non-corrosive, non-magnetic, and pose no hazards to workers.

Nycon ConTrolPCF fibers are engineered and manufactured to an optimum configuration for use as a concrete reinforcement at a minimum of 0.09% by volume. They comply with ICBO ES AC32 Section 4.1.1 and 4.1.2 as plastic and secondary concrete reinforcement, with ASTM C-1116, Section 4.1.3., as well as with other national building codes.

<p>Benefits of Nycon ConTrolPCF Fibers in Concrete:</p> <ul style="list-style-type: none"> ▪ Increases impact and abrasion resistance. ▪ Reduces mirco-macro cracking. ▪ Enhances bond with mortar due to lattice network design. ▪ Reduces permeability. ▪ Produces excellent surface on formed face. ▪ Minimizes loss due to cracking, chipping, or breakage from handling. ▪ Reduces rate of rejection due to damage. 	<p>ConTrolPCF Advantages:</p> <ul style="list-style-type: none"> ▪ Proactive crack-fighting reinforcement vs. reactive WWF reinforcement. ▪ Non-magnetic, rustproof, alkali-resistant. ▪ Requires no minimum amount of concrete cover. ▪ Consistent, uniform distribution throughout the concrete matrix. ▪ Safe and easy to use. ▪ Compared to WWF, decrease construcion time and labor, increases productivity.
<p>Uses:</p> <p>Nycon ConTrolPCF fibers are ideal for applications where a tough, ductile, corrosion-resistant concrete is required, as in:</p> <ul style="list-style-type: none"> ▪ Burial vaults ▪ Septic tanks ▪ Cement pipes, manholes ▪ Drainage units, meter boxes ▪ Box culverts ▪ Stairs ▪ Architectural panels ▪ Retaining barriers ▪ Noise abatement barriers 	<p>Applications:</p> <ul style="list-style-type: none"> ▪ Commercial, industrial and residential buildings ▪ Academic, healthcare, correctional and other institutional facilities ▪ Highways, bridge deck, tunnels ▪ Wastewater treatment, sewage, nuclear power and hydroelectric plants ▪ Parking facilities, tilt-up panels and retaining walls ▪ Port and marine structures, water conduits ▪ Linings and pavements for mines and tunnels ▪ Blast-resistant structures, seismic resistant elements

Dosage Rate:

The standard dosage level is 1.5 pounds per cubic yard (0.9 kgs/cubic meter). At this dosage level Nycon ConTrolPCF fibers perform as plastic-shrinkage and secondary/temperature-shrinkage reinforcement. For certain applications, the fibers can be used at 0.75 to 1.0 pound per cubic yard (0.45 to 0.6 kg/cubic meter). They can also be used at higher dosages, depending on desired results. For specialty concrete performance and recommended fiber application rates, contact Nycon's engineering department.

Mixing Procedures:

Nycon ConTrolPCF fibers can be added to the mix before, during or after batching and mixing conventional concrete materials. If fibers are added after conventional materials have been mixed, approximately 3-4 minutes of additional mixing time is required to achieve optimum distribution of the fibers. No additional water or other mix design changes are required at standard dosage levels.

Finishability:

Any conventional finishing method can be employed with Nycon ConTrolPCF . When using a broom or tined rake, pull in one direction only.

Compatibility:

Nycon ConTrolPCF fibers are compatible with all concrete admixtures and additives. No adjustments to standard dosage levels for admixtures or additives are required.

Guidelines:

Nycon ConTrolPCF fibers should not be used to replace structural, load-bearing reinforcement, or as a means to use thinner concrete sections than specified.

Packaging:

Standard bag weights per cubic yard is 1.5 pounds; standard bag weights per cubic meter is 0.9kg. Special packaging is available to accommodate mixing systems. Bags are packed in cartons, shrink-wrapped, and palletized for protection during shipping.

Standard Specification:

Nycon ConTrolPCF fibers meet ASTM C1116, Paragraph 4.1.3, Standard Specification for Fiber-Reinforced Concrete and Shotcrete, which is typically quoted in most specifications. There are three building code bodies that have standard requirements for synthetic fiber reinforced concrete: International Conference of Building Officials (ICBO), Building Officials and Code Administrators (BOCA) and Southern Building Code Congress International (SBCCI), of which ICBO Engineering Services Acceptance Criteria (AC) 32 is the most comprehensive specification for the use of synthetic fiber in concrete. AC 32 contains specific tests with performance requirements to define acceptance at four levels. Nycon's ConTrolPCF fibers have been tested for and are in compliance with Sections 4.1.1 and 4.1.2, which qualify synthetic fiber for use as plastic and secondary/temperature-shrinkage reinforcement. Data from the tests required show that Nycon's ConTrolPCF meets or exceeds the AC 32 criteria at a dosage rate of 1.5 pounds/cubic yard (0.9kgs/cubic meter).

Mini-Specification:

Use only 100% virgin collated fibrillated polypropylene (CFP) fibers containing no reprocessed olefin materials. These fibers shall be specifically manufactured to perform as concrete secondary reinforcement. Application per cubic yard shall equal a minimum of 0.9% by volume (1.5 pounds/cubic yard or 0.9kgs/cubic meter). Fibers at this dosage level are added to control cracking due to plastic concrete shrinkage/settlement, hardened concrete drying shrinkage, and thermal expansion/contraction. Additional quantifiable durability enhancements include increased impact resistance, fatigue strength, abrasion resistance and residual strength.

Note:

Complete CSI manu-spec format specification and a material data safety sheet are available from your Nycon representative.

Support Services:

Nycon engineers are available for assistance in selecting the appropriate Nycon synthetic fiber product and dosage level for specific applications and for field support.

Nycon ConTrolPCF Collated Polypropylene Fibrillated Fiber Specification Data

Nycon ConTrolPCF polypropylene fibrillated fibers are engineered specifically as a concrete reinforcement and are produced from 100% extruded virgin resin.

Fiber Type	Homopolymer Polypropylene Collated Fibrils	Matrix Bonding	Excellent
Fiber Orientation		Thermal Conductivity	Low
Fiber Length	0.75" (19mm), 1.5" (38mm)	Electrical Conductivity	Low
Color	White/Clear	Water Absorption	Nil
Denier	5000	Alkali Resistance	High
Ultimate Elongation	20% at 70°F (21°C)	UV Resistance	High
Melting Point	330°F (165°C)	Corrosion Resistance	High
Ignition Point	1100°F (594°C)	Polarity	Anti-magnetic
Specific Gravity	0.91	Dye-ability	Excellent
Tensile Strength	55 ksi (379 MPa)	Air Entrainment	No Effect
Youngs	600 ksi (4137 MPa)	Additives/Admix	No Effect

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