



Nycon ConTrolPCM Polypropylene Monofilament Fibers

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 uses of polypropylene fibers is as a plastic shrinkage/settlement reinforcement and secondary temperature/shrinkage reinforcement, both of which generate an appreciable increase in post-crack energy absorption capacity, ductility, and overall durability in concrete.

Description

Nycon ConTrolPCM polypropylene monofilament fibers are a three-dimensional concrete reinforcing system manufactured from 100% virgin homopolymer polypropylene. The cross-section of the fiber has a circular hair-like design. Within the concrete matrix, ConTrolPCM mechanically bonds with the mortar to optimize performance. The fibers are hydrophobic, chemically inert and non-corrosive in concrete, and non-hazardous to workers.

ConTrolPCM fibers are engineered and manufactured to perform as a concrete reinforcement at a minimum of 0.06% by volume. They comply with ASTM C-1116, Section 4.1.3, and ICBO ES AC32 Sections 4.1.1 and 4.1.2, as well as with other national building codes.

<p>Benefits of Nycon ConTrolPCM 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>ConTrolPCM Advantages:</p> <ul style="list-style-type: none"> ▪ 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, decreases construction time and labor, increases productivity.
<p>Uses:</p> <p>Nycon ConTrolPCM 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 ▪ Barriers, sound abatement ▪ Stairs & columns ▪ Retaining 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 0.6% by volume, which is 1.0 pounds per cubic yard (0.6 kgs/cubic meter). At this dosage level Nycon ConTrolPCM fibers perform as plastic-shrinkage reinforcement. For certain applications, the fibers can be used at 0.75 to 1.0 pounds per cubic yard (0.45 to 0.6 kg/cubic meter). They can also be used at higher dosages, depending on desired results. The fibers may be used at even higher dosage rates, up to 8 pounds per cubic yard (5 kgs/cubic meter), in specific precast applications, e.g., tunnel liners and bridge decks. For specialty concrete performance and recommended fiber application rates, contact Nycon's engineering department.

Mixing Procedures:

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

Finishability:

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

Compatibility:

Nycon ConTrolPCM fibers are compatible with all concrete admixtures and additives and require no adjustments to standard dosage levels for admixtures or additives.

Guidelines:

Nycon ConTrolPCM fibers should not be used to replace structural, load-bearing reinforcement, or to reduce the concrete cross-section.

Packaging:

Standard bag weights per cubic yard are .75, 1.0, 1.5, 5.0, and 10 pounds; standard bag weights per cubic meter are 0.45kg, 0.60kg, 0.90kg, 3.0kg, and 4.5kg. Special packaging is available up to 10 pounds/bag (4.5 kg/bag). Bags are packed in cartons, shrink-wrapped, and palletized for protection during shipping.

Standard Specification:

Nycon ConTrolPCM fibers meet ASTM C1116, Standard Specification for Fiber-Reinforced Concrete and Shotcrete, Paragraph 4.1.3, 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. AC 32 contains specific tests with performance requirements to define acceptance at four levels. Nycon's ConTrolPCM fibers have been tested for compliance with AC 32, Sections 4.1.1 (plastic-shrinkage reinforcement) and 4.1.2 (secondary reinforcement). ConTrolPCM was found to meet or exceed the AC 32 criteria for both plastic-shrinkage and secondary/temperature-shrinkage reinforcement.

Mini-Specification:

Use only 100% virgin polypropylene monofilament fibers containing no reprocessed olefin materials, meeting the requirements of ASTM C1116, Section 4.1.3, and manufactured specifically for use as plastic-shrinkage and secondary reinforcement for concrete. The standard dosage rate shall be 1.0 pound/cubic yard (0.6kgs/cubic meter). Fibers at this dosage level are added to control cracking from plastic shrinkage/settlement, hardened concrete drying shrinkage, and thermal expansion/contraction. Additional quantifiable durability enhancements include increased impact resistance, fatigue strength, abrasion resistance, and fatigue 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 ConTrolPCM Polypropylene Monofilament Fiber Specification Data			
Nycon ConTrolPCM polypropylene monofilament fibers are engineered specifically as a concrete reinforcement and are produced from 100% extruded virgin resin.			
Fiber Type	Homopolymer Polypropylene Monofilament	Matrix Bonding	Good
Fiber Orientation		Thermal Conductivity	Low
Fiber Length	0.75" (19mm), 1.5 (38mm)	Electrical Conductivity	Low
Color	White/Clear	Water Absorption	Nil
Denier	15	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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