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## Geotec™ Polypropylene Fiber-Mesh



### [Description]

With polypropylene as its raw material, this fiber is produced by special technology. The products appear net-like structure with many fiber monofilaments connected.

When the fiber is put into the concrete, the horizontal structure in fiber monofilament can be destroyed in the course of stirring owing to friction and rubbing, and the fiber monofilament or net-like structure will fully stretch, thus the concrete is reinforced by a great number of polypropylene fibers.

As a new type concrete-strengthening fiber, it becomes a new popular subject in the field of fiber concrete research and application after glass fiber and steel fiber.

### [Technical Data]

Density(g/cm <sup>3</sup> )	0.91	Elastic Modulus (MPa)	>3500
Length(mm)	6,10,12,15,20	Equivalent Diameter (mm)	100
Shape	Beam-like Net	Crack Elongation(%)	>=10
Acid &Alkali Resistance	Strong	Water-Absorbency	No
Tensile Strength(MPa)	346-560	Melting Point(C)	160-170

### [Reinforced Functions to Concrete]

Compared with steel fiber, full-dispersed polypropylene fiber has advantages in its thinness, large amount, non-water absorbency, strong acid & alkali resistance and similar elastic modulus with that of concrete. The reinforced functions run as follows;

1. Increase seepage resistance
2. Prolong endurance
3. Improve steel protection
4. Increase cracking resistance
5. Increase fire resistance
6. Strengthen spurt & fatigue
7. Improve tensile, bending & folding strength

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8. Improve plastic deformity
  9. Strong acid & alkali resistance and good endurance

### [Suitable Fields for Polypropylene Fiber]

1. Projects like concrete road, bridge, airport road and factory floor which strictly require cracking resistance. The life span of these projects will be lengthened for 5-10 years.
2. The walls of tunnels, mines, roofs and reservoir projects with special construction. When using spray technology in concrete construction, the polypropylene fiber added into the concrete can effectively decrease the spray concrete's deformation rate of the walls less than 8% and that of the roof less than 12%, and also can reduce the friction. It can improve the constructing efficiency and working environment and popularize the spray technology
3. River courses and dams, etc. The polypropylene fiber can improve concrete's resistance to crack and squirt and wear to lengthen projects' life span.
4. Military defense works, dock banks and piers, etc. This fiber can greatly strengthen the concrete's spurt resistance and heighten these projects' safety and lengthen their life span.

### [Application Instruction]

**Structure Design:** Despite of the more improved properties of the fiber concrete, the fiber generally still serves as the minor reinforced bar to prevent the concrete from cracking and shrinking and prolong its life span rather than major reinforced bar to bear the load of the structure. A number of experiences have proved that the great increasing number of the fiber monofilament with the scattered polypropylene fiber-mesh, has no evident effect on the design parameters like the intensity and elastic modulus, because 0.9kg/m<sup>3</sup>-1.8kg fiber is only converted into 0.1%-0.2% of the volume in per cubic meter of concrete. It is suggested that the ratio of the main reinforced bars remains the same as the original design.

**Length:** Generally, the proper length of the fiber added into the concrete is 20mm, and in the spray concrete is 10mm.

**Ratio Design:** Usually the proper amount of fiber to concrete is 0.9kg/m<sup>3</sup>, and the water-proof layer of the bridge requires 1.35-1.8kg/m<sup>3</sup>, and the spray concrete in the tunnel is also the same and other materials remain the same. The ratio of fiber and concrete can be determined by tests for special purposes. The fiber has better effects on the concrete with active compound materials, such as silicon ash, coal powder, ground slag and zeolite powder.

**Mixer Adoption:** Double-axle horizontal compelling mixer is better and self-dropping cylinder mixer can be used, too.

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**Mixing Process:**Crushed stones, fibers and sands are put into the mixer in succession. After stirring for two minutes, fiber will fully spread and then add cement and water and stir normally. The addition of materials also can be put into as usual, but the stirring time should be properly prolonged to make fiber completely mixed.

**Stirring Time:**The purpose of the stirring is to make fiber fully spread into monofilament or the net fully spread, so generally the stirring time is 2-3 minutes after the addition of polypropylene fiber-mesh.

**Shaping Process:**There is no special requirement, but full solidification of the concrete should be guaranteed.

**Maintenance Process:**There is no special requirement. The maintenance of the fiber concrete can be done normally, and its early maintenance is needed.

**Endurance:**Any organic materials will get aging and lose their superior property under the integrative influence of heat, light and oxygen, But Fiber-mesh hasn't these influence because it is completely protected inside the concrete.

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