CONSTRUCTION POLYPROPYLENE (PP) FIBRES
CPP

WHY USE CETEX CONSTRUCTION FIBRES?

Concrete possesses high compressive strength but it is very brittle and weak in tension. Unlike traditional steel bars, **CETEX** construction fibres are uniformly distributed throughout the concrete mix and they become an integral part of the concrete. These fibers form network that reaches every section of the concrete for uniform 3-dimensional reinforcement. Addition of fibres results in increase in tensile strength and flexural strength. Hence it is ideal for seismic designs and high strength concrete.

Cracks are caused mainly because of plastic shrinkage or thermal stress due to fluctuation of ambient temperature. Use of **CETEX** fibers results in substantial reduction in crack formation by discouraging the segregation of the ingredients while increasing tensile strength and plasticity of concrete. These fibers control formation of micro cracks by absorbing the stresses, which if left unchecked, results in larger cracks. This is achieved by dispersion of millions of **CETEX** fibers, which form a high strength 3-dimensional reinforcement network. This reduction or elimination of plastic cracks enables the concrete to develop its optimum long term durability.

In certain applications like flooring, light precast and concrete flooring, etc **CETEX** fibres can be used as primary reinforcement, without steel. It is not only improves the quality, but it is also economical.

CETEX fibres are chemically treated for better dispersion and adherence to the cementitious mix. This results in improved bonding of the fiber in the composite.

Water permeability decreases due to the reduction in formation of micro cracks and future opening of cracks. The formation of 3-dimensional network of **CETEX** fibres in the cast reduces water migration in it. **CETEX** fibers aid in waterproofing.

CETEX fibres hold together fine particles of sand, cement and stone chips. This increases the abrasion and impact resistance when exposed to excessive wear from tyres, foot movement, impact forces, etc.

CETEX fibres provide increased adhesion and reduce the rebound ‘splattering’ during plastering, shot-crete and guniting. This results in increased coverage and thicker layers in the first attempt; thereby it reduces the wastage of material and manpower.

CETEX fibers are used for fire protection of concrete. When concrete is exposed to fire, due to high temperature the fibers melt and relieve volatile steam pressure in concrete, thus preventing spalling and damage to the structure.

When used in plaster mortar, **CETEX** fibres provide a 3- dimensional reinforcement, unlike chicken mesh, which provides 2-dimensional reinforcement.

In applications where aesthetics are especially important, one can choose **CETEX** fibres. It gives a better finish easily and smoothly with common tools.

CETEX fibers are safe and easy to use and are cost effective. Its usage does not require installation of any extra machinery. It can be added directly to the concrete mixture of RMC truck.

CETEX fibres are environment friendly and non-hazardous.

CETEX fibres have high aspect ratio which results in better reinforcement. The surfaces of fibers are treated with proprietary chemicals for better dispersion at time of usage and bonding with concrete mix.

CONSTRUCTION POLYPROPYLENE (PP) FIBRES
CPP

CETEX polypropylene (PP) Construction fibers are hydrophobic, which do not absorb the water, and are non- corrosive. Moreover, the polypropylene fibers have excellent resistance against alkali, chemicals and chloride and have low heat conductivity. By these characteristics polypropylene fibers have therefore no significant effect on the water demand of the fresh concrete. They do not intervene in hydration of cement and hence do not influence unfavorably the effects of all constituents in the concrete mixture.

Polypropylene is the lightest synthetic polymer. Hence the count of fibre for a given weight is maximum in case of polypropylene. It is 52% lighter than polyester and 26% lighter than nylon and acrylic. Hence polypropylene fibers are ideal for reinforcement. **CETEX** fibers are treated with special chemicals for better dispersion and bonding of the fiber with the cementitious matter. **CETEX** construction fibers are compatible with all concrete admixtures and performance enhancing chemicals. **CETEX** fibres are easy to use and they disperse easily.

SPECIFICATION OF CETEX POLYPROPYLENE FIBRES:

Material	:	Virgin Polypropylene (PP)
Length	:	6, 12, 24, 40, 55 mm
Melt Point	:	162°C
Specific Gravity	:	0.91
Ignition Point	:	360°C
Thermal Conductivity	:	Low
Electrical Conductivity	:	Low
Alkali Resistance	:	100% Alkali Proof
Acid & Salt Resistance	:	High
Diameter (approx)	:	24 - 44 micron
Aspect ratio (approx)	:	250 – 1250

DIRECTION OF USE

For onsite machine mixing :- Small quantity of water is dosed in empty drum to clean the drum after each batch. Add fibre in the rotating drum. Then add chips/sand/cement/water in the concrete mixer and continue normal operation.

For dosing in Ready Mix Truck :- Add fibres in small lots in the rotating drum. After dosing is complete allow extra 20-30 revolutions of drum at maximum RPM.

For Manual Mixing (CPP06/12) :- Put fibers in a bucket of water and stir it so that fibres disperse in water. Spread the water and fibre mixture on the dry cementatious mix.

DOSAGE

For crack prevention: - 600 gm/m^3 (min.); For Fire Protection of Concrete:- 1.0 Kg/m^3 (Min.)
As primary reinforcement: - 1.0 – 8.0 Kg/m^3 (depending on conditions required.)

The above mentioned dosage is just a guideline. It is recommended to optimize the dosage depending on the requirement.

CONSTRUCTION POLYPROPYLENE (PP) FIBRES
CPP

TYPES OF THE CETEX CONSTRUCTION FIBRES

(All these fibres conform to ASTM C 1116/C 1116M - 06 4.1.3 Type III & BS EN 14889-2:2006.)

CPP06
These are polypropylene fibres of 6 mm length. They are mainly used in plasters for finishing coat or ornamental castings for crack prevention as well as additional reinforcement. Suitable care has been taken to insure dispersion of fibres for hand mixing of mortar.
Diameter :- 24 micron; Aspect ratio :- 250

CPP12
These are polypropylene of with 12 mm length. They are used in mortar mix where the thickness of application of the mortar is 10 mm or more. They are suitable for initial coat of plaster, waterproofing of structure. They are also added in concrete for additional reinforcement, where mixing is manual.
Diameter :- 24 micron; Aspect ratio :- 500

CPP24
These are polypropylene fibers of 24 – 25 mm length. They are used in concrete mixing machines. Being on border line between micro & macro fibres, it prevents crack formation and provides reinforcement. It is suitable for crack prevention in concretes, where maximum size of aggregate is 19-20mm. Being longer than maximum size of aggregate, each and every strand is effective. They are used for various concrete application.
Diameter :- 30 micron; Aspect ratio :- 833

CPP40
These are polypropylene fibres of 38-41mm length. The longer length, results in better reinforcement, thereby improving the strength of the concrete. They are used in concrete for higher strength.
Diameter :- 38 micron; Aspect ratio :- 1000

CPP55
These are polypropylene fibres of 54-56mm length. The longer length, results in better reinforcement, thereby improving the strength of the concrete.
Diameter :- 44 micron; Aspect ratio :- 1250

CPPST (Structural Graded Fibres)
These are graded (mixed length) polypropylene fibers. They are suitable for various concrete structural works. It can be used to decrease or replace the steel in concrete, particularly in floors and certain pre-cast. Mostly it is a blend of CPP24 and CPP40. Customized blending of the fibres including CPP55 can be provided for better results. Due to the long length of CPP55 and CPP40; they give better anchorage and reinforcement while CPP24 increases the number of fibres in a given dosage, preventing crack formation. It has been found that graded fibers give better result compared to individual length fibers. It is recommended for heavy structural concrete/load bearing structures. It is the most popular for concrete application.

Note: The addition of fibers to a given mix may appear to decrease the slump. The workability, however, will not be affected and additional water should not be added.