



PRODUCT FACT DATA SHEET

APEX-CF™

Fiber Reinforcement for Concrete

APEX-CF is a premier 100% virgin copolymer macro synthetic fiber specifically engineered for pavement applications and ease of use and finishing. This split filament fiber offers long-term durability, structural improvement, and effective temperature/shrinkage crack control. APEX- CF is non-corrosive, non-magnetic, and 100% acid and alkali proof, yielding a high-performing and durable concrete.

Features /

- Macro synthetic fiber made of 100% virgin copolymer
- Split filament fibers which yields a high-performance concrete
- Effective temperature/shrinkage crack control

Benefits /

- Enhance durability
- Reduce plastic shrinkage cracking
- Reduce crack width opening
- Improve flexural toughness and fatigue resistance
- Increase impact and shear resistance
- Increase post-cracking residual strength

Reinforcement Objective /

Apex CF reduces plastic and settlement shrinkage cracking prior to the initial set, controls hardened concrete shrinkage cracking, improves impact resistance, and enhances concrete toughness and durability. Apex CF is successfully used to replace steel fibers, welded wire mesh, conventional reinforcing bars or as an additive to enhance concrete performance in pavement applications.



Apex CF

Applications /

APEX-CF is designed for use in concrete applications such as overlays, pavements, and bridge decks. Contact Pacific GeoSource for guidance regarding additional applications for Apex CF.

| Physical Properties | |
|--------------------------|-------------------------|
| Tensile Strength | 65-90 ksi (448-621 MPa) |
| Length | 1.5 in (38 mm) |
| Melting Point | 330°F (166°C) |
| Material | Virgin Copolymer |
| Form | Split Filament |
| Color | White/Clear |
| Acid / Alkali Resistance | 100% Resistant |
| Absorption | None |

Table 1.



Reinforcement Dosage /

Apex CF is to be used at 3.0, 4.0, or 5.0 lb/yd³ of concrete, depending on application and desired performance. Contact Pacific GeoSource for design assistance and dosage recommendations.

| Dosage by Volume % | Dosage by Weight | |
|--------------------|------------------|---------|
| | lb/cu yd | kg/cu m |
| 0.20 | 3.0 | 1.8 |
| 0.27 | 4.0 | 2.4 |
| 0.33 | 5.0 | 3.0 |

Table 2.

Packaging /

APEX CF is available in convenient degradable mixer-ready bags in 1.0 to 5.0 lb increments (1.0 and 2.0 kg). Bulk packaging is also available.

Installation Guidance/

Follow American Concrete Institute (ACI) specification for standard concrete mixing, placement, and finishing. An ACI certified contractor is highly recommended.

Adding: APEX CF is packaged in mixer-ready bags that can be added directly into the concrete mixing system.

- 1) Apex CF should be added during or after batching of the other ingredients and is recommended to be the last ingredient into the mix. **Apex CF should not be the first mix ingredient.**
- 2) Add other admixtures independently from fiber addition. Apex CF is compatible with concrete admixtures. If multiple admixtures are used, ensure admixtures are compatible with one another.
- 3) When the truck is only partially full, reverse drum and then add fiber.
- 4) A volumetric truck may have difficulty at medium to high fiber dosages.

Mixing Apex CF: Apex CF is designed to easily mix within concrete. However, the following guidelines should be followed:

- 1) When possible, add fibers to a rotating drum. Fibers can be added at the plant or at the job site.
- 2) Once all fibers have been added to the batch, **mix five minutes at standard mixing speed.**

Road-revolution speed should not be counted as part of the required fiber mixing time or considered adequate for reducing standard mixing time.

- 3) Ensure the concrete drum is performing optimally and that the fins within the drum are not worn.

Slump: Fibers will reduce the visual slump measured by the slump-cone test, however, a loss of workability should be minimal. To regain any loss of workability or slump, the following is recommended:

- 1) Ensure any hold back water is added. Do not exceed the water amount prescribed in the mix design. The addition of excess water should be avoided.
- 2) If increased workability is required, the use of appropriate admixtures is recommended, often a medium range water reducer is sufficient. Avoid the addition of excess water.

Finishing: Ensure proper finishing and timing. Please note, that macro-synthetic fibers may slow the rate of bleed water slightly.

- 1) Do not begin finishing early.
- 2) Avoid excess finishing passes. For example, 1 pass at 45° angle is sufficient for a broom finish with fiber. Avoid multiple passes, as this reorients the fibers and affects surface appearance.

Pumping: If Apex CF is to be pumped, the following is recommended:

- 1) A round-bar grate is highly recommended on the hopper of the pump truck.
- 2) A vibrator attached directly to the grate is also recommended to aid in movement of the concrete through the grate.

Project Planning: Pacific GeoSource highly recommends a pre-pour meeting to help eliminate any potential hassles or address potential concerns.

- 1) The previous points of adding, mixing, slump, and finishing should be addressed.
- 2) A test slab/pour to ensure mixing and finishing is highly recommended.



Troubleshooting: Based on experienced, the following are the primary factors if troubleshooting is needed on the job site:

- 1) Mix Time: Ensure 5 minutes mix time at standard mixing speed.
- 2) Batching Order: Ensure fiber is added as the last ingredient.
- 3) Equipment: Ensure equipment is adequate for proper mixing.
- 4) Water: Ensure all hold back water is added. Do not add water in excess of the mix design specification.

Compliance & Certification /

ASTM C1116 / C1116M-10a, Standard Specification for Fiber-Reinforced Concrete, "Type III Synthetic Fiber-Reinforced Concrete"

ASTM D7508 / D7508M-10(2015), Standard Specification for Polyolefin Chopped Strands for Use in Concrete

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