

STRUX[®] 75/32 Synthetic Macro Fibers

Synthetic Macro Fiber for reinforcement of concrete

Product Description

STRUX[®] 75/32 fiber is a synthetic macro fiber complying with ASTM C1116/C1116M Type III, which can be used in ready-mixed concrete for different applications such slab-on-ground flooring, composite steel floor deck assemblies, topping slabs, thin-walled precast overlays and pavements. Unlike traditional microfiber reinforcement, STRUX[®] 75/32 macro fibers are specifically engineered to provide post-crack control performance.

STRUX[®] 75/32 macro fibers are extruded from a virgin polypropylene and polyethylene polymer blend. The geometry, strength and high modulus is specifically engineered to provide high post-crack control performance with excellent dispersion into the concrete matrix, reducing plastic and hardened concrete shrinkage cracking, and increasing fatigue resistance and concrete toughness. STRUX[®] 75/32 macro fibers have been specifically engineered to be a user-friendly fiber reinforcement to replace welded wire reinforcement, steel fibers and light rebar reinforcement. STRUX[®] 75/32 macro fibers are easier and safer to use, compared to these other types of reinforcement.

Compliance and Certification

- ASTM C1116 / C1116M, Standard Specification for Fiber-Reinforced Concrete, Type III Synthetic Fiber-Reinforced Concrete
- ASTM D7508 / D7508M, Standard Specification for Polyolefin Chopped Strands for Use in Concrete
- ANSI/SDI C-2017, Composite Steel Floor Deck Slabs (Section 2.4.B.15.a.3)
- UL and ULC Classified; CBXQ.R13667 and CBXQ7.R13667
- CSA B66-16, Design, material and manufacturing requirements for prefabricated septic tanks and sewage holding tanks

Product Advantages

- Can be used to completely or partially replace light rebar, welded wire reinforcement and steel fibers.
- Easy to mix and fast to disperse.
- Barely visible on the surface obtaining highly aesthetic concrete.
- Saves money through reduction or elimination of steel labor and material transportation, delivery and jobsite storage, and fewer construction days.
- Enhances safety by eliminating handling of steel fibers, welded wire reinforcement and rebar.
- Enhances jobsite safety by eliminating tripping hazards commonly associated with welded wire fabrics and light rebar.
- Eliminates concerns of proper positioning of reinforcement.
- Due to unique fiber design and uniform three dimensional dispersion, both plastic as well as drying shrinkage cracking is reduced, improving the ductility and durability of the concrete.
- Provides superior crack control due to the geometry and elastic modulus, corrosion resistant properties (non-ferric).

- Ease of pumping, passes easily through pump grates.
- May be used to provide effective crack width control.
- Reduces shotcrete rebound and improves cohesion.

Primary Applications

STRUX[®] 75/32 macro fibers may be used in a variety of ready mix and precast applications including residential and commercial slab-on-ground flooring, thin and conventional whitetoppings and overlays, pavements, composite steel deck floor assemblies, and thin-walled precast elements (septic tanks, vaults, walls, etc.).

Slab on ground:

STRUX[®] 75/32 macro fibers are specially designed for ease of use, rapid dispersion, excellent finishability and improved pumpability in slab-on-ground flooring and pavements for commercial, industrial, and residential construction, as well as other flat work and formwork applications.

Traditional light steel reinforced elements:

STRUX[®] 75/32 macro fibers can be used as a suitable alternative to WWF or light reinforcing steel specified for temperature and shrinkage reinforcement.

Precast and Prestressed concrete:

STRUX[®] 75/32 macro fibers can be used as a replacement for secondary reinforcement of normal and lightweight precast concrete elements and structures. (e.g. staircases, cellars, manholes, pits, septic tanks, vaults, walls, etc.)

White toppings and overlays

STRUX[®] 75/32 macro fibers is ideal for whitetoppings and overlays. Due to its rapid dispersion into the mixture and ease of finishability, the overall project productivity and contractor's profitability is enhanced.

Composite Steel Floor Deck for Normal and Lightweight Concrete

STRUX[®] 75/32 macro fibers can be used as a suitable alternative to welded wire fabric or light reinforcing steel specified for temperature and shrinkage reinforcement for composite steel floor deck assemblies. STRUX[®] 90/40 macro fibers comply with American National Standards Institute/ Steel Deck Institute (ANSI/SDI C-1.0) design code provisions for minimum reinforcing at the minimum addition rate of 4 lb./yd³ (2.4 kg/m³). STRUX[®]90/40 macro fibers are UL (U.S.) and ULC (Canada) classified with fire ratings up to two hours for D700, F700, D800, F800, D900 and F900 series except for 909, at a maximum addition rate of 5 lb./yd³ (3 kg/m³). To view UL and ULC Classification go online to www.ul.com, file #R13667.

Addition rates

STRUX[®] 75/32 macro fibers addition rates are dependent on the specific application and desired properties and will typically vary between 3 to 7.5 lbs./yd³ (1.8 to 4.5 kg/m³), but could go higher. Please consult your GCP Applied Technologies sales representative for proper addition rate of STRUX[®] 75/32 macro fibers for your application. Always consult local building codes.

Slab-on-Ground

The addition rate of STRUX[®] 75/32 macro fibers can be easily calculated using GCP's STRUX Slab Design Software (SDS), using several factors such as compressive strength of concrete, modulus of sub-grade reaction, strength and thickness of concrete and applied loads.

Composite Steel Floor Deck for Normal and Lightweight Concrete

The addition rate of STRUX[®] 90/40 macro fibers as an alternative to specified steel reinforcement for temperature and shrinkage can be easily calculated using GCP's STRUX[®] App available for both Android and Apple OS. Refer to the Uses section of this document for Code Compliance and UL/ULC Classification requirements.

Guidelines for Usage and Compatibility with Other Admixtures

The utilization of STRUX[®] 75/32 macro fibers may require the use of a mid-range water reducer or a high-range water reducer such as MIRA[®] or ADVA[®] families of admixtures to restore the required workability. In addition, slight increases in fine aggregate contents may be needed. STRUX[®] 75/32 macro fibers may be added to concrete at any point during the batching or mixing process. For more detailed instructions and information on the addition of STRUX[®] 75/32 macro fibers, refer to Technical Bulletin TB-1200.

STRUX[®] 75/32 macro fibers are compatible with all GCP admixtures. Their action in concrete is mechanical and will not affect the hydration process of the cement or compressive strength. Each liquid admixture should be added separately to the concrete mixture.

STRUX[®] 75/32 PHYSICAL PROPERTIES

Specific gravity	0.92
Absorption	None
Modulus of elasticity	1,389 ksi (9.5 GPa)
Tensile strength	90 ksi (620 MPa)
Melting point	320 °F (160 °C)
Ignition point	1,094 °F (590 °C)
Alkali, acid & salt resistance	High
Material	100% virgin polypropylene and polyethylene blend
Electrical and Thermal Conductivity	Low
Nominal Length	1.25 in. (32 mm)
Nominal Aspect Ratio	75
Nominal Equivalent Diameter	0.017 in. (0.43 mm)
Nominal Fiber Count	106,400 per lb (233,600 per kg)

Finishing

STRUX® 75/32 fibers reinforced concrete floors can be finished with most finishing techniques. STRUX® 75/32 fibers do not affect the finishing properties of concrete. Due to its characteristics, STRUX® 75/32 fibers are suitable to be used in power/hand troweled concrete, colored and broom finished concrete.

Packaging & Storage

STRUX® 75/32 fibers are available in 1 lb. or 5 lb. (0.45 kg or 2.3 kg) bags

Safety and Handling:

Read and understand the product label and Safety Data Sheet (SDS). All users should acquaint themselves with this information prior to working with the products and follow the precautionary statements. SDSs can be obtained by contacting your local GCP representative or office.

U.S. Patent No. 6,569,525

U.S. Patent No. 6,569,526

U.S. Patent No. 6,758,897

U.S. Patent No. 6,863,969

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