PNE® MS-6013

Copper-coated Steel Micro fibers for UHPC

Product Description

PIONEER® PNE® MS-6013 steel fibers are made from high-strength, copper-coated fine steel wires, specifically designed for reinforcing ultra-high-performance concrete (UHPC). The unique copper coating not only enhances the bond between the fibers and the concrete but also improves the fiber's corrosion resistance. With its small diameter, high tensile strength, excellent dispersion, and strong adhesion to cement-based materials, PIONEER® PNE® MS-6013 effectively reduces cracking caused by autogenous and drying shrinkage in UHPC and reactive powder concrete (RPC). Additionally, it significantly improves flexural strength, impact resistance, and fatigue performance.

Uses

PIONEER® PNE® MS-6013 effectively reduces cracking in ultra-high-performance concrete (UHPC) and reactive powder concrete (RPC) caused by autogenous and drying shrinkage. It also significantly enhances flexural strength, impact resistance, and fatigue performance. It is recommended for use in the following concrete structures:

- High-speed rail, RPC slabs, bridge decks, and critical precast components, where it improves tensile strength, wear resistance, crack resistance, bending strength, and impact resistance. This boosts overall concrete performance, extends its service life, and reduces maintenance costs.

- Major construction projects such as highway bridges, hydraulic dams, railway engineering, port and marine engineering, tunnels and mining operations, and pipeline projects.

Product Advantages

PIONEER® PNE® MS-6013 represents cutting-edge concrete steel fiber technology, specifically designed for ultra-high-performance concrete (UHPC) structures. Its key features include:

- Provides a three-dimensional reinforcement system for concrete.
- Replaces or partially replaces traditional rebar in concrete.
- Enhances crack resistance, ductility, energy absorption, and toughness of the concrete.
- Improves impact resistance, fatigue durability, and shear strength.
- Reduces shrinkage and settlement cracking in concrete.
- Shortens flooring installation time—eliminates the need for placement, cutting, and handling of traditional rebar.
- Easy to finish.

Compliance and Certification

- ASTM A820/A820M - "Standard Specification for Steel Fibers for Fiber-Reinforced Concrete
- ACI 544.1R - "Report on Fiber-Reinforced Concrete"
- EN 14889-1:2006 - "Fibres for Concrete – Part 1: Steel Fibres – Definitions,
- Specifications and Conformity
- Meets ASTM C1116/C1116M, Type I fiber-reinforced concrete

Physical Properties

- Material: Steel
- Density: 7.85
- Fiber Type: Copper-coated Steel Micro fiber
- Length: 0.5 inch (13mm)
- Equivalent Diameter: 0.008 inch (0.2 mm)
- Aspect Ratio: 60
- Tensile Strength: 400 ksi (2,700 MPa)

Addition Rates

PIONEER® PNE® MS-6013 is typically used in ultra-high-performance concrete (UHPC) at a range of 2-4% by volume, which translates to approximately 344-692 pounds per cubic yard (156-314 kilograms per cubic meter) of concrete.For specific dosage recommendations based on your application and project needs, please contact your PIONEER® representative for technical support.

Packaging and Storage

PIONEER® PNE® MS-6013 is packaged in 55-pound (25-kilogram) polyethylene-lined paper bags, making it easy to handle and use.

Shelf Life and Storage Conditions

The product has a shelf life of 5 years when stored in dry conditions.
Pallets should be protected from rain and snow. Do not stack pallets on top of each other.

Technical Support

PIONEER® PNE®MS-6013 complies with ACI 544.4R-18 - Guide to Design with Fiber-Reinforced Concrete and ACI 506.1R-08 - Guide to Fiber-Reinforced Shotcrete. These guides provide detailed information on design methods, material selection, construction practices, and performance evaluation for fiber-reinforced concrete, including steel fiber-reinforced concrete.

PIONEER®'s fiber experts will assist you in developing a technical plan using steel fibers. Fill out the form below to receive a detailed report that will help address your project design and fiber selection needs. We guarantee that all your information will be kept confidential.