

HGM® PAN

Polyacrylonitrile Synthetic Fiber for Asphalt

Product Description

PIONEER® HGM® PAN is made from 100% pure Polyacrylonitrile and is specifically designed as a monofilament fiber for asphalt reinforcement. Adding PIONEER® HGM® PAN to asphalt mixes improves adhesion, high-temperature stability, and fatigue durability. It also enhances low-temperature crack resistance and prevents reflective cracking, making it an effective solution for addressing asphalt pavement durability issues and early damage, and for extending the lifespan of asphalt surfaces.

Uses

PIONEER® HGM® PAN is typically used in the intermediate and surface layers of asphalt pavements to enhance overall performance, extend pavement lifespan, and reduce long-term maintenance costs. Applications of PIONEER® HGM® PAN include:

- New asphalt pavement surfaces
- Overlays on old asphalt pavements, existing concrete pavements, or bridge decks
- Maintenance and repair of asphalt pavements
- Surfacing for steel bridge decks
- Large-scale asphalt pavements, such as those for airports and parking lots
- Asphalt concrete surfaces with various gradations (e.g., SMA, AC, LH)
- Asphalt concrete surfaces under diverse conditions, including hot mix asphalt, warm mix asphalt, and patching.

Product Advantages

PIONEER® HGM® PAN offers higher strength and modulus of elasticity, along with excellent UV resistance and weatherability. It enhances pavement performance by improving high-temperature stability, low-temperature crack resistance, water resistance, and fatigue durability.

- Higher strength and modulus of elasticity for better asphalt pavement toughness.
- Excellent UV resistance and weatherability.
- Ultra-fine fibers, providing a higher number of fibers per ton of asphalt mix.
- Improved dispersion and reinforcement within the asphalt mix.
- Increased oil content in the mix, enhancing adhesion strength and stability of the asphalt pavement.
- Enhanced toughness and low-temperature crack resistance of the asphalt mix.
- Reduced permanent deformation and improved resistance to wear.
- Minimized impact of moisture on the pavement, enhancing water stability.

Compliance and Certification

ASTM D7552: Standard Specification for Fiber-Reinforced Asphalt Concrete

AASHTO M320: Standard Specification for Performance-Graded Asphalt Binder

ASTM D8079: Standard Specification for Performance-Graded Asphalt Binder Using Ground Tire Rubber (GTR) and Other Additives

Physical Properties

- Specific Gravity: 1.18
- Material: 100% Polyacrylonitrile (PAN)

- Fiber Type: Monofilament synthetic fiber
- Diameter: 0.0008 in. (0.02 mm)
- Nominal Length: 0.25, 0.5 in. (6, 12 mm)
- Tensile Strength: 73-132 ksi (500-900 MPa)
- Modulus of Elasticity: 1000-1450 ksi (7-10 GPa)
- Melt Point: 220-240°C
- Alkali, Acid, and Salt Resistance: High
- UV-resistant: Excellent
- Color: yellow/white

Dosage

The application of PIONEER® HGM® PAN in asphalt pavements is based on traffic volume. For highways, major roads, urban expressways, and bridge decks, the recommended dosage is 1-3 kg per ton of asphalt mix.

Construction

- Raw Materials: There are no special requirements for raw materials when adding PIONEER® HGM® PAN to asphalt mixes.
- Mixing Process: The mixing process for asphalt mixes with PIONEER® HGM® PAN is essentially the same as for those without it.
- Construction Procedure: The construction procedures for asphalt mixes with PIONEER® HGM® PAN are identical to those without it.
- Compaction: Asphalt mixes with PIONEER® HGM® PAN require 3-4 additional passes during compaction to achieve a density of 98% or more.

Packaging

PIONEER® HGM® PAN are available in a variety of packaging options, For custom packaging, please reach out to a PIONEER® sales representative.

Technical proposal

PIONEER® HGM® PAN meets the ASTM D7552: Standard Specification for Fiber-Reinforced Asphalt Concrete. Contact a PIONEER® fiber expert today to request a technical proposal for your project. Please fill out the form below; we assure you that all your information will be kept confidential.