Hammerfast®
Construction Chemicals

Makro Fiber Elyaf (54 mm)

100% Pure Polypropylene 54 mm Macro Fiber Reinforcement

Description
Hammerfast Macro Fiber 54 mm is a high-performance polymer-based synthetic fiber reinforcement that can be used as an alternative to steel mesh or steel fibers in concrete. It enhances the load-bearing capacity of concrete against structural loads and provides effective crack control through its three-dimensional homogeneous distribution within the matrix. It is manufactured from 100% pure polypropylene raw material.

Advantages
- Reduces plastic shrinkage and drying shrinkage cracks
- Improves impact and fatigue resistance
- Enhances flexural strength
- Increases energy absorption capacity (high concrete toughness)
- Reduces reinforcement labor and accelerates application
- Does not corrode (advantage over steel reinforcement)
- Extends the service life of concrete
- Increases load-bearing capacity
- Provides homogeneous distribution with its specially designed surface structure
- Ensures effective crack control throughout the concrete
- Easy mixing and fast application
- Reduces labor and equipment costs
- High resistance to corrosion, alkalis, and acids
- Polymer structure does not interfere with magnetic fields
- Lower carbon footprint compared to steel reinforcement
- Easy storage and more efficient logistics
- Improves resistance to freeze-thaw cycles
- Does not damage machinery and equipment in shotcrete applications compared to steel fibers
- Reduces rebound in shotcrete applications by up to 40%, lowering overall project cost

Areas of Use
- Industrial concrete floors
- Field concrete and infrastructure projects
- Rail systems and rail substructure concrete
- Tunnel linings and shotcrete applications
- Canal and infrastructure projects, mining applications
- Dams and hydroelectric power plants
- Road and parking area concretes
- Bridges
- Structural precast concrete elements
- Airport apron and runway concretes
- Pile-supported slab applications

Dosage
Hammerfast Macro Fiber 54 mm is used in different applications at dosages ranging between 2.00 – 8.00 kg/m³.

Mixing
- Hammerfast Macro Fiber 54 mm is produced in special water-soluble packages.
- In batching plant and on-site applications, it can be added directly into the concrete together with its packaging, ensuring fast and easy application.
- Compatible with all types of concrete admixtures and concrete classes.
- Specially manufactured for use in both batching plant and transit mixer applications. In batching plants: fed into the aggregate belt in packaged form during production. On-site mixing: packages are added into the transit mixer according to the specified dosage. After the last package is added, mixing should be performed at high speed for minimum 8 minutes and maximum 10 minutes.

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Technical Properties

Density	0,91 gr/cm^3
Length	54 mm
Fiber Diameter	0,95 mm
Tensile Strength	530 MPa
Elastic Modulus	7,2 GPa
Melting Point	160 °C
Acid & Alkali Resistance	High
Corrosion Resistance	High
Fiber Count	28000 Milyon ~#/kg
Electrical Conductivity	None
Water Absorption	None
Fiber Surface	Embossed
Raw Material	Pure Polypropylene
HS Code	5503.40.00.00.00

Not: Values are obtained at 23 ± 2°C temperature and 50 ± 5% relative humidity.

Test Data (Notched Beam Flexural Test)

	f150 (MPa)	Re3 (%)
2 kg/m^3	1,7	37
3 kg/m^3	2,1	45
4 kg/m^3	2,8	56
5 kg/m^3	3,1	65

***Re3=** Equivalent Flexural Strength Ratio

ASTM C-1609 tests were carried out on beam specimens with dimensions of 150 × 150 × 500 mm..

Precautions

- Fibers should be added gradually and in a controlled manner to the concrete mix. Dumping all at once may cause balling.
- Adequate mixing time (minimum 5–10 minutes) must be ensured to achieve homogeneous distribution. Insufficient mixing reduces performance.
- Fiber addition may reduce workability; suitable superplasticizers should be used if necessary. Do not add extra water.
- If fibers are intended to replace traditional reinforcement, structural and engineering calculations must be performed.
- In high dosage applications, fibers may become visible on the surface during finishing (e.g., power trowel). Surface corrections may be required.
- Proper joint planning and cutting timing are critical, especially in industrial floor applications.
- Fibers can be added before or after water addition; however, for best results, adding them together with aggregates is recommended.
- Concrete mix design should be optimized considering fiber effects, particularly aggregate gradation and cement dosage.
- Fibers should not be poured in open windy environments to prevent material loss.
- Keep away from open flames and high heat sources (polypropylene-based material).
- Packaging should be protected from damage, moisture, and physical deformation during storage.

Storage and Shelf Life

- The product can be stored for up to 24 months from the production date if kept in its original, unopened packaging, in a dry and closed environment, protected from direct sunlight.
- If unused, the packaging should be tightly sealed, and pallets should not be stacked. High temperatures may increase viscosity and deteriorate the chemical structure of the product.

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Packaging

- Hammerfast Makro Fiber 54 mm is packed in special water-soluble packages.
- The standard package weight is 3,00 kg (±1.5%).
- 360 kg of product is shipped per pallet.

Cleaning of Tools

All tools used should be cleaned immediately after application with lukewarm wate

Safety Precautions

- Keep out of reach of children
- Do not eat or ingest
- Keep away from food products
- Do not inhale directly or allow contact with the body
- Chemically inert and non-toxic
- In case of eye contact, rinse thoroughly with water and seek medical attention
- Use gloves, goggles, and protective clothing during application
- Flammable; keep away from open flames
- Suitable for recycling
- Refer to the Material Safety Data Sheet (MSDS) for detailed safety information.

Quality Certificates

- ISO 9001
- ISO 14001

9001:2015 14001:2015

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