



INNOVATIVE  
POLYMER  
SOLUTIONS



**X MESH**™  
**POLIARM**™  
**MICROARM**™  
**MICROCOLOR**™  
**DIFLON ELECTRO**™





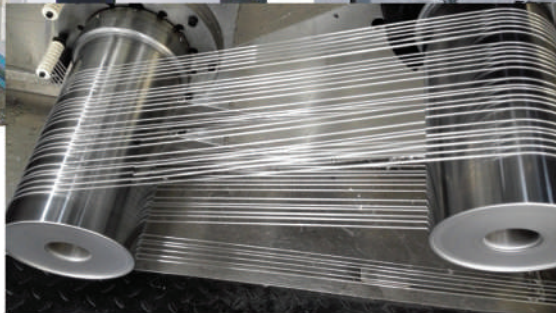
LLC DIIF is a company of the **Standart Industrial Group**.

The company specializes in manufacture of micro- and macrofibers, and multifilament yarn for various branches of industry.

Our company has been supplying its products to major building companies, manufacturers of concrete and dry mortars, and other industrial enterprises for more than 15 years.

We supply our products to **Ukrainian, CIS and EU markets**.

**The company's mission is to provide enterprises of building and construction industry as well as other branches of industry with high-quality innovative polymer materials which improve considerably physical and mechanical properties and performance characteristics of their products.**



## OUR COMPANY PRODUCES POLYMER FIBERS UNDER TRADEMARK "Fiber":

- MicroArm TM microfiber
- Polypropylene multifilament yarn
- PoliArm TM, X Mesh TM macrofiber
- Micro Color TM color microfiber
- Diflon Electro TM ultrafiber





## LABORATORY

The company has its own laboratory fitted with modern equipment ensuring high-accuracy quality control of the products manufactured. A quality certificate is provided for each lot of products.

## QUALITY MANAGEMENT SYSTEM

The company has developed and implemented quality management system certified for compliance with DSTU ISO 9001:2015 standard.

## CERTIFICATION

**X Mesh, PoliArm and MicroArm** polymer fibers are certified for compliance with EN 14889-2:2006 by notified body Building Research Institute (Poland), with annual production control inspections.

All products are tested on a regular basis at certified laboratories of specialized institutes and have positive recommendations for use, including expert statement issued by the State Enterprise "State Research Institute of Building Constructions".

- European certificate of conformity according to EN 14889-2:2006
- Quality certificate issued by Quality Assurance Service
- Sanitary statement issued by Toxicological Laboratory of Sanitary and Epidemiological Service



## COOPERATION

- **Building Research Institute (Poland)**
- **M.P. Shulgin State Road Research Institute**
- **IL OAO DNIISP** – Testing Laboratory "Dnipropetrovsk Research Institute of Building Production"
- **IL PNOIITS** – Testing Laboratory "Prydniprovskiy Research Institute of Innovative Technologies in Building"
- **KhNADU** – Kharkiv National Automobile and Highway University
- **Research and Design Institute "Donetsk Promstroinilproekt"**
- **IL OOO Stroiindustriia** – Testing Laboratory "Stroiindustriia LTD"
- **NDIBK** – State Research Institute of Building Constructions
- **IL Don NASA** – Testing Laboratory "Donbas National Academy of Civil Engineering and Architecture"





## Effect produced by Fiber™ MicroArm™, PoliArm™ and X Mesh™ fibers on basic properties of cement concrete and mortar

In the course of a longstanding cooperation with design and research institutions, positive effect produced by TM Fiber polymer fibers on properties of concrete is confirmed, which is evidenced by laboratory and industrial tests carried out at scientific institutions and construction sites.



### Shrinkage and shrinkage cracking of concrete and mortar

Shrinkage and shrinkage cracking of concrete and mortar

Addition of fibers at certain mixing ratios facilitates substantial reduction of shrinkage, thus preventing concrete cracking.

It is known that solidification of concrete is accompanied by shrinkage phenomena occurring in the course of physicochemical transformations. The phenomena are typical for concrete mixes of high workability grades, and, if no preventive measures are taken, this results in cracking of evaporation surface. Cracking processes are characteristic of heavy-weight concrete, mortars as well as light-weight aerated or foamed concrete. Plastic shrinkage develops during the first 4 to 6 hours after placement and compaction of concrete mix under condition that there is a possibility for water evaporation from the fresh concrete. Deformations can be as high as 2 to 3 mm/m<sup>2</sup>. Occurrence of plastic shrinkage is unacceptable as it can cause catastrophic and irreversible degradation of all properties.



### Resistance to bending loads

Numerous tests on concrete specimens with the use of polymer fibers have shown that bending tensile strength is increased up to 35% depending on concrete type and fiber quantity, which is particularly important for production of concrete and monolithic floor slabs.



### Resistance to impact loads

With the use of polymer fibers, concrete structures can withstand higher impact loads even in comparison with high-density grades of concrete. This fact is considered to be a strong argument for the use of fibers in construction of fortifications as well as in areas where concrete coatings carry high impact loads. Addition of fibers to concrete mixes for construction of thin-wall reinforced concrete structures and foamed concrete makes it possible to carry out stripping without spalls due to mechanical bonding of cement particles with the fiber.



### Reduction of concrete surface abrasability, and quality improvement of mortar and concrete surfaces

Addition of TM Fiber polymer fibers to concrete mixes increases the concrete abrasability significantly; this allows achieving higher density and strength of structure as a whole. Due to its homogeneous distribution in concrete, chemical composition and large number of fibers per area unit, the fiber sustains abrasive loads. In screeds and industrial flooring applications, the surface of fiber reinforced concrete ensures good adhesion with subsequent finish coatings applied.

The studies have demonstrated the reduction of concrete abrasability up to **52%**.





### Segregation and water separation of concrete and mortar mixes

Addition of polymer fibers to concrete facilitates substantial reduction of bleeding and segregation of concrete mixes.



### Frost resistance

Three-dimensional distribution of polymer fiber in concrete mix contributes partly to transformation of capillary porosity to a closed system of finer pores thus increasing the concrete frost resistance. The ability of polymer fiber to sustain pressure from expanding freezing water in concrete increases the number of freezing and thawing cycles without damage of the concrete internal structure.



### Corrosion chemical resistance of concrete

The polymer fiber has a chemically resistant polypropylene base, and, for industrial floor covering applications, it is an alternative to corrosion susceptible top reinforcement mesh and metal or steel fiber. So, the use of polymer fiber in concrete increases its corrosion resistance to a great degree. The fiber reinforced concrete becomes less susceptible to alkalis and acids, to leach and electrocorrosion processes.



### Polymer fiber of TM Fiber is a cost efficient alternative to reinforcement mesh in cement screed construction

Construction of cement-sand mortar screeds using polypropylene fiber is more cost efficient and economically feasible for reduction of work cost compared with cement screeds where metal mesh is used.

## Advantages of TM Fiber polypropylene fibers

Use of polymer fibers in concrete as a micro- and macro-reinforcing ingredient results in substantial improvement of its strength properties:

- Reduction of shrinkage phenomena
- Higher bending tensile strength
- Reduction of concrete mix segregation
- Improvement of frost resistance
- Higher resistance to impact loads
- Reduction of abrasability
- Corrosion resistance
- Decrease of labor intensity of construction work
- Reduction of costs associated with logistics, warehousing and storage, and, subsequently, production of more durable and maintenance-free building structures, which is a primary task in modern civil engineering and production of construction materials.





# MICROARM

## POLYPROPYLENE FIBER

**MicroArm fiber** is a material consisting of high-strength extruded polymer filaments subjected to chemical and composite modification. It is intended for micro-reinforcement of concrete to prevent its shrinkage cracking.



FIBER LENGTH: 2 mm – 36 mm

### PROPERTIES

- Reduction of shrinkage cracking – up to **70%**
- Increase of concrete bending tensile strength – up to **35%**
- Increase of impact and fatigue strength – up to **30%**
- Reduction of abrasability – up to **52%**
- Increase of frost resistance – up to **30%**
- Increase of water proofing properties – up to **40%**
- Increase of impact toughness
- Prevention of concrete mix segregation
- Reduction of mix bouncing off during pneumatic concrete placing and plastering work

### APPLICATIONS

- Industrial concrete floors and screeds
- Road and airfield pavements, paving slabs
- Construction of tunnels and carrying walls
- Concrete structures and products, piling, floor slabs
- Production of foamed concrete, sprayed concrete
- Production of dry mortars
- Decorative concrete products
- Paving flagstones and kerbstones
- Agricultural and livestock buildings
- Waterworks for service in corrosive chemical environments
- Water storage basins, revetments, light houses, bridges
- Roads
- Plasters

Around **2,500,000 m<sup>3</sup>** of commercial concrete have been produced using **MicroArm polypropylene fiber**





# MICROARM

## POLYPROPYLENE FIBER

Fiber length,* mm	Recommendation for use	Fiber dosage, kg/m <sup>3</sup>
2	Dry mix mortars	0.6 to 0.9
4	Dry mix mortars, plastering work, decorative products made of gypsum and concrete, liquid wallpaper	0.6 to 0.9
6	Dry mix mortars, plastering work of buildings, screeds, paving flagstones, landscape architecture products	0.6 to 1.1
12	Screeds, floor construction in warehouses, garages, industrial premises, road pavements, cellular concrete, sprayed concrete	0.9 to 2.0
18	Construction of jointless concrete industrial floors exposed to high mechanical loads (airfield pavements, logistics centers, hydroelectric power plants, road pavements, etc.)	0.9 to 2.5

\* The fiber length used depends on concrete coating thickness and on particle size of aggregates.



### NUMBER OF FIBERS per 1 kg

2 mm	– 1 600 000 000 pcs.
4 mm	– 800 000 000 pcs.
6 mm	– 500 000 000 pcs.
12 mm	– 250 000 000 pcs.
18 mm	– 185 000 000 pcs.

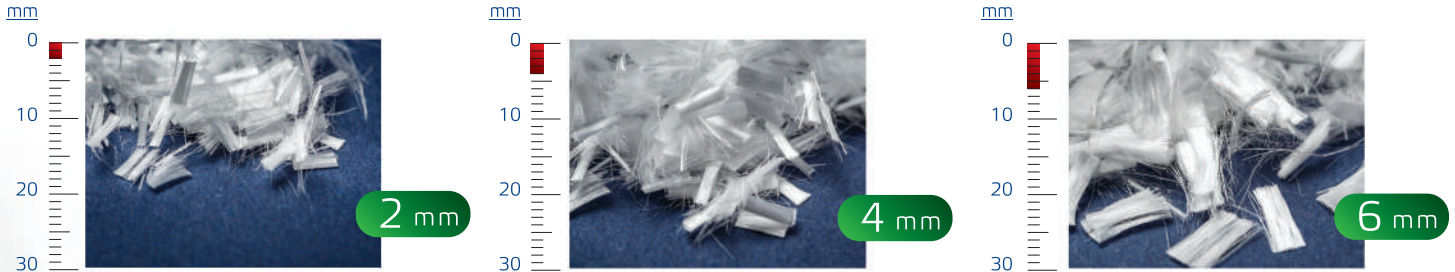
### PERFORMANCE DATA Fiber Class I

Linear density	0.3±0.05 tex
Diameter	0.02 mm
Length	2 to 36 mm
Material	virgin polypropylene 100%
Specific gravity	0.91 kg/m <sup>3</sup>
Modulus of elasticity	3,500 N/mm <sup>2</sup>
Tensile strength	360 to 560 N/mm <sup>2</sup>
Softening temperature	156°C
Color	transparent white
Recommended dosage	0.6 to 2.5 kg per 1 m <sup>3</sup> of concrete
Chemical resistance to acids, alkalis, solvents	complete resistance to all



# MICROARM 2, 4, 6 mm

## POLYPROPYLENE FIBER



### INTENDED USE

The fiber is intended for addition to dry mix mortars, liquid wallpaper, for production of gypsum and concrete decorative products, landscape architecture products, paving flagstones, screeds, plaster and stucco for interior and façade work.

### PROPERTIES

The use of MicroArm polypropylene fiber improves adhesion of plaster to underlay and to subsequent finishing coatings. When applying mortar mix onto vertical surfaces, spillage of material is reduced, and the material consumption is reduced, accordingly. The impact strength of corners and butt-ends is increased, thus preventing spalls. The fiber is non-corrodible and withstands long contact with aggressive media, that is why it is used in applications where other materials fail.

### APPLICATION BENEFITS

- Higher cracking resistance
- Improved abrasion resistance properties of surfaces
- Lower water absorption
- Higher frost resistance
- Higher impact resistance
- Mortars are more convenient for placing
- Reduced segregation of cement-sand concrete
- Reduced drying shrinkage
- Improved bending strength
- Explosive spalling of concrete at high temperatures is prevented

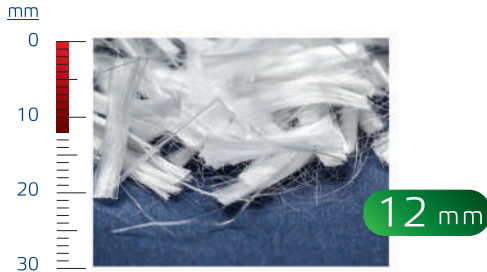
**RECOMMENDED DOSAGE: 0.6 to 1.1 kg per 1 m<sup>3</sup>**





# MICROARM 12, 18 mm

## POLYPROPYLENE FIBER



### INTENDED USE

The fiber is intended for construction of screeds, floors in warehouses, garages, industrial premises, for production of road pavements, cellular concrete, sprayed concrete, as well as for construction of jointless concrete industrial floors exposed to high mechanical loads (airplane sheds, logistics centers, hydroelectric power plants, road pavements).

### PROPERTIES

The use of MicroArm polypropylene fiber in construction of screeds, floors, road pavements reduces internal stresses in products, ensures homogeneous and uniform reinforcement of concrete mix as compared with metal mesh, thus increasing the finished product strength and service life.

### APPLICATION BENEFITS

- Higher impact resistance
- Improved abrasion resistance properties of surfaces
- Lower water absorption
- Higher frost resistance
- Mortars are more convenient for placing
- Reduced segregation of cement-sand concrete
- Reduced drying shrinkage
- Improved chemical resistance
- Prevention of shrinkage cracks up to 70%
- Improved bending tensile strength
- Substantially increased resistance to shock and vibration loads
- Higher resistance of concrete to fire

**RECOMMENDED DOSAGE: 0.9 to 2.5 kg per 1 m<sup>3</sup>**







## RECOMMENDATIONS FOR USE

- With addition of **TM FIBER MicroArm** fiber, there is no need to use shrinkage reinforcement mesh
- No special equipment or tools are required to add **TM FIBER MicroArm** fiber to concrete. No premixing with water is needed.
- It is recommended to add **TM FIBER MicroArm** fiber at initial stage of mixing
- **TM FIBER MicroArm** fiber is distributed uniformly both in ready-mix concrete and in case of dry mixing of ingredients (sand, crushed stone, cement)
- The fiber can be added to concrete mix during transportation in concrete mixer trucks
- Polymer-fiber reinforced concrete can be applied to vertical surfaces mechanically using a concrete pump or a concrete sprayer to produce a shotcrete coating

## MIXING

- **TM FIBER MicroArm** fiber can be mixed using any types of mixers such as gravity mixers, forced mixers, or manually.
- Add **TM FIBER MicroArm** fiber of required length to concrete in an amount according to recommended dosage rates calculated as per 1 m<sup>3</sup>.
- Mix thoroughly to ensure even distribution of fiber: manual mixing – up to **6 minutes\***, mechanical mixing – **2 to 4 minutes\***
- When **TM FIBER MicroArm** fiber is added to ready mixed concrete directly into a concrete mixer truck (a mixer), the mixing operation shall be carried out at high speed until the fiber is distributed uniformly



\* The mixing time indicated is recommended for **TM FIBER MicroArm** fiber dosage rates of **0.6 to 0.9 kg per 1 m<sup>3</sup>**. For higher dosage rates, the mixing time may be extended until uniform distribution of fiber is obtained.

## STORAGE

- **TM FIBER MicroArm** fiber should be stored in original closed packages in dry ventilated premises.
- Storage temperature: **from – 40°C to +80°C**
- Store out of direct sunlight.
- After storage at sub-zero temperature, keep the fiber at above-zero temperature for at least **12 hours** before use.
- Storage time is unlimited provided the recommended storage conditions are observed.

## RECYCLING

- The fiber and package are recyclable. They may be disposed of as household wastes.

## PACKING

- **MicroArm** polypropylene fiber is available in **0.6 kg** and **0.9 kg** polyethylene bags.



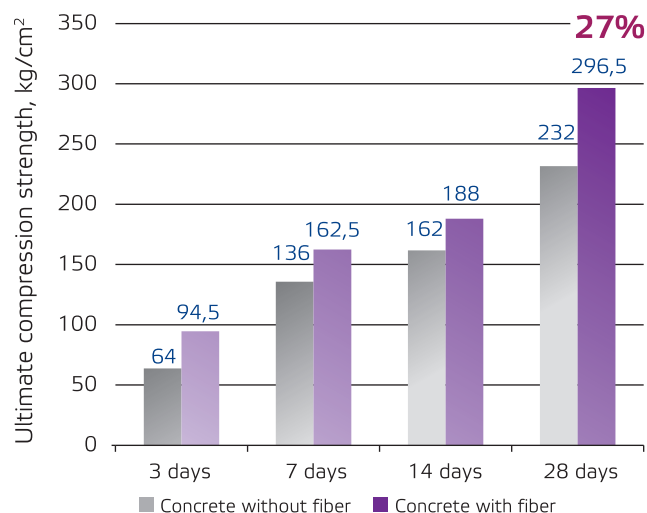
### NOTES

- It is recommended that personal respiratory protection equipment (respirators) should be used during operations with the fiber
- **TM FIBER MicroArm** fiber is compatible with any concrete admixtures
- Finished reinforced surface requires no additional surface treatment.



## TESTING

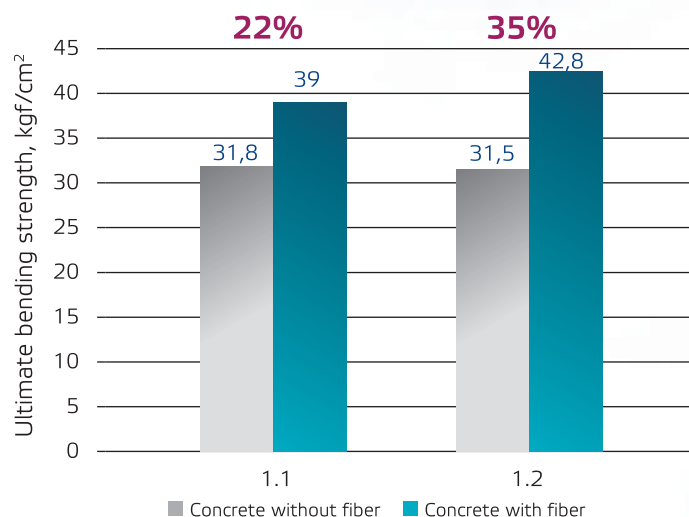
### Effect produced by **MicroArm fiber** on **compression** strength of concrete



Specimens of M200 concrete with **MicroArm 12 mm** fiber on 28<sup>th</sup> day showed compression strength gain of **27%** as compared with the concrete of the same grade without fiber.

\* Testing results obtained by Testing Laboratory IL OAO DNIISP

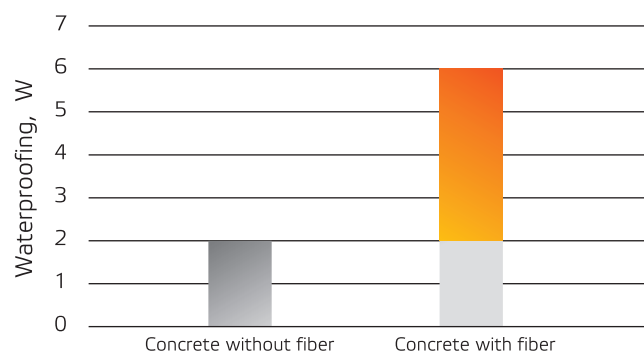
### Effect produced by **MicroArm fiber** on **bending** tensile strength of concrete



All specimens of M200 concrete with addition of **MicroArm 12 mm** fiber at the rate of 0.9 kg/m³ showed bending tensile strength gain of **22% to 35%** without increase of cement dosage.

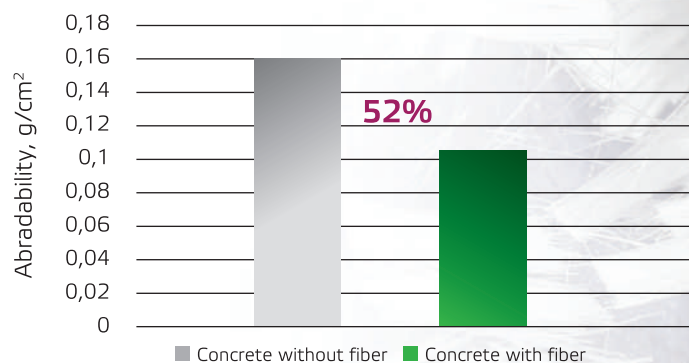
\* Testing results obtained by Testing Laboratory IL OAO DNIISP

### Effect produced by **MicroArm fiber** on **waterproofing** properties of concrete



M250 concrete with **MicroArm 12 mm** fiber added at the rate of 0.9 kg/m³ showed improvement of concrete waterproofing properties to **W4-W6** grade as compared with M250 concrete without fiber having waterproofing properties of **W2** grade.

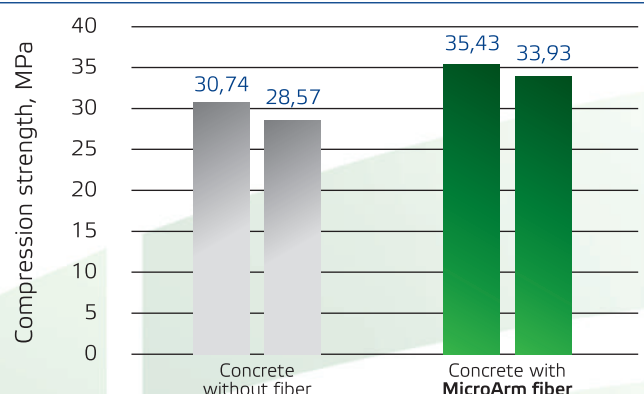
### Effect produced by **MicroArm fiber** on **abrasability** properties of concrete



Abradability of M250 concrete with **MicroArm 12 mm** fiber added at the rate of 0.9 kg/m³ reduced by **52%** as compared with abrasability properties of concrete without fiber.

\* Testing results obtained by Testing Laboratory IL OAO DNIISP

### Effect produced by **MicroArm fiber** on residual strength of concrete in **freezing test**



After 45 freezing and thawing cycles, concrete of B25 class reinforced with **MicroArm 12 mm** fiber showed strength of 33.93 MPa. The strength loss was **4.23%** which is less than the **5%** value stipulated by ДСТУ Б В. 2.7-49-96 standard.

Concrete of B25 class without fiber after 45 freezing and thawing cycles lost strength by 7.5% which exceeds the 5% value stipulated by ДСТУ Б В. 2.7-49-96 standard and does not comply with the concrete frost resistance grade F200.

Addition of **MicroArm 12 mm** polypropylene fiber to concrete of B25 class at the rate of **0.9 kg/m³** contributes to improvement of its frost resistance properties.

\* Expert statements issued by Research and Design Institute "Donetsk Promstroinilproekt"





# POLIARM

## POLYPROPYLENE FIBER

### A MODERN ALTERNATIVE TO METAL FIBER AND STEEL MESH REINFORCEMENT

**PoliArm fiber** is a texturized synthetic macrofiber intended for three-dimensional reinforcement of concrete. It consists of individual hard fibers of sinusoidal waved shape made of oriented virgin polypropylene and treated with a special compound to improve adhesion with concrete.



FIBER LENGTH: 25 – 55 mm

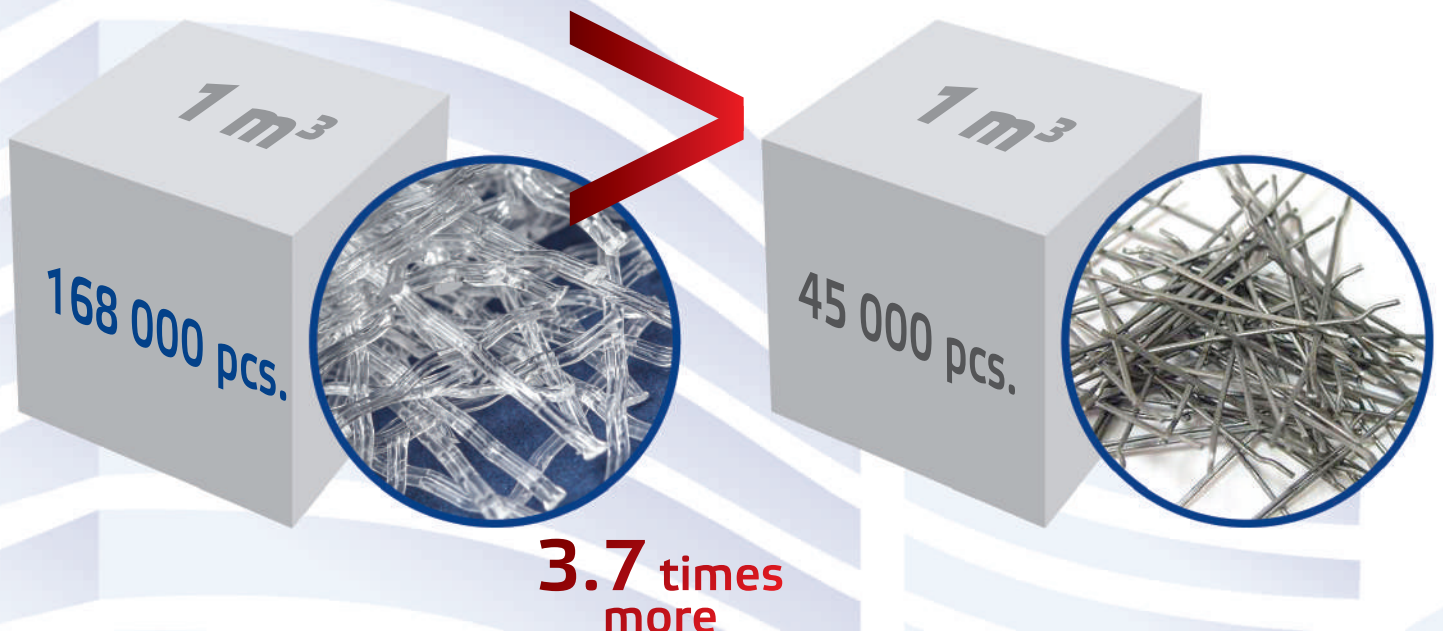
#### PROPERTIES

- Increase of compression strength and bending tensile strength – up to **24%**
- Increase of impact and fatigue strength
- Reduction of bleeding
- Prevention of concrete mix segregation
- Improvement of concrete fire resistance
- Reduction of labor costs and work completion time up to **40%**
- Reduction of weight without degradation of strength properties of concrete structures as compared with steel fiber
- No damage to concrete mixing and conveying equipment

- 1 m<sup>3</sup> of concrete mix contains **168,000 pcs. PoliArm polypropylene fibers\*** compared with **45,000 pcs. steel fibers\*** – i.e. **3.7 times more** elementary fibers.

\* At dosage rate of PoliArm fiber 40 mm 4 kg/m<sup>3</sup>.

\* At dosage rate of steel fiber 14 kg/m<sup>3</sup>.





# POLIARM

## POLYPROPYLENE FIBER

### APPLICATIONS

- Industrial concrete floors and screeds
- Road and airfield pavements
- Concrete structures and products
- Waterworks
- Sprayed concrete
- Covering of tunnels and carrying walls
- Buildings and structures for service in corrosion chemical environments
- Agricultural and livestock buildings



### NUMBER OF FIBERS per 1 kg

**25 mm – 90 000 pcs.**

**40 mm – 42 000 pcs.**

**55 mm – 28 000 pcs.**

### PERFORMANCE DATA Fiber Class II

Length	25 to 55 mm
Material	virgin polypropylene 100%
Specific gravity	0.91 kg/m <sup>3</sup>
Modulus of elasticity	3,500 N/mm <sup>2</sup>
Tensile strength	360 to 560 N/mm <sup>2</sup>
Softening temperature	156°C
Color	transparent white
Chemical resistance to acids, alkalis, solvents	complete resistance to all

Around **2,000,000 m<sup>2</sup>** of industrial floors have been produced using **PoliArm polypropylene fiber**

Fiber length,* mm	Recommendation for use	Fiber dosage, kg/m <sup>3</sup>
25	Industrial floors, screeds, road and airfield pavements	2.0 to 4.0
	Concrete structural elements of residential and industrial buildings	2.0 to 6.0
40	Concrete structural elements of tunnels, roads, pits	2.0 to 10.0
	Waterworks, bank storage vaults	10.0 to 14.0

\* The fiber length used depends on concrete coating thickness and on particle size of aggregates

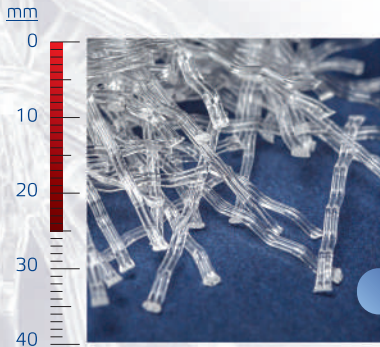






# POLIARM 25 mm

## POLYPROPYLENE FIBER



### INTENDED USE

**TM FIBER PoliArm fiber** is a high-quality modern alternative to steel fiber.

It is intended for construction of industrial concrete floors, screeds, road and airfield pavements, concrete structural elements of residential and industrial buildings.

### PROPERTIES

The **PoliArm fiber**, due to its **8.5 times** lower specific gravity compared with metal fiber, makes it possible to fill concrete with much higher amount of fibers per unit volume without increasing the load on foundations.

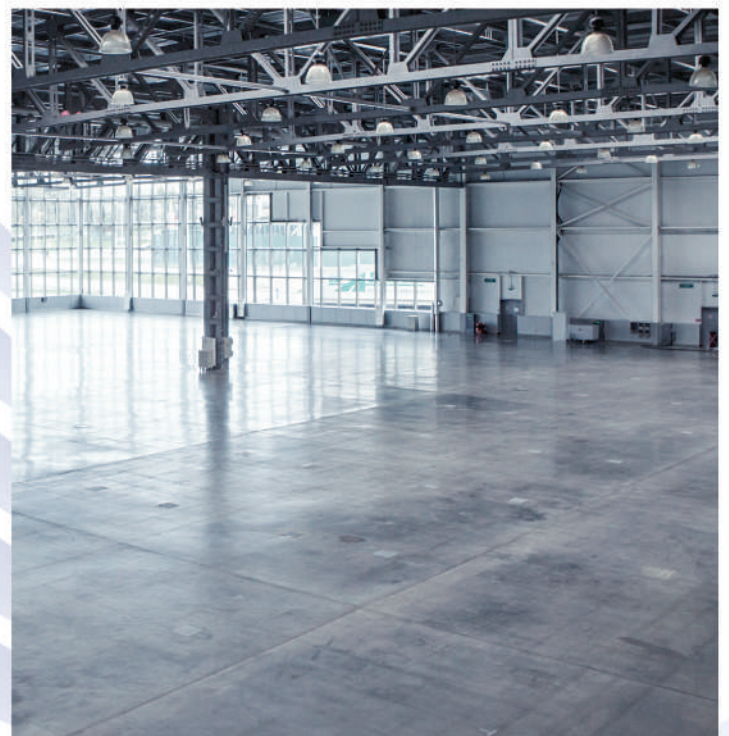
One of substantial advantages of **PoliArm fiber** is the fact that, unlike steel fiber, it does not increase wear of concrete mixers, dispensers and pumps.

Due to combination of high amount of fibers per kilogram weight, and due to the fiber shape and adhesive capacity, substantial increase of concrete and mortar bending tensile strength is achieved.

**RECOMMENDED DOSAGE: 2.0 to 6.0** kg per 1 m<sup>3</sup>

### APPLICATION BENEFITS

- Increase of impact and fatigue strength
- Reduced bleeding
- Improved concrete abrasion resistance
- Prevention of concrete mix segregation
- Higher adhesive properties
- Prevention of explosive spalling of concrete at high temperatures
- Reduced weight of structures without degradation of strength properties
- Compensation of internal stresses through lower density
- Reduction of work needed for placement of steel mesh reinforcement
- Higher weather resistance
- Resistance to corrosion and seawater
- Anti-electrostatic properties
- Operation without damage to concrete mixing and conveying equipment

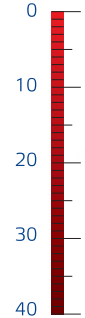




# POLIARM 40,55mm

## POLYPROPYLENE FIBER

mm



40 mm

55 mm

### INTENDED USE

**TM FIBER PoliArm fiber** is a high-quality modern alternative to steel fiber.

It is intended for construction of concrete structural elements of tunnels, roads, pits, waterworks, bank storage vaults.

### PROPERTIES

**PoliArm fiber**, unlike metal fibers, does not gravitate to lower layers of concrete; it is distributed evenly throughout the product ensuring reduction of cracking, and excludes corrosion common to metal reinforcement.

When used for pneumatic concrete placing to vertical and especially horizontal ceiling surfaces, **PoliArm** fiber not only facilitates reduction of concrete bouncing off thus reducing concrete spillage, but also enables placement of thicker concrete layers in one cycle without quality loss of shotcrete coating.

### APPLICATION BENEFITS

- Increase of compression strength and bending tensile strength
- Increase of impact and fatigue strength
- Reduced bleeding
- Improved concrete abrasion resistance
- Prevention of concrete mix segregation
- Higher adhesive properties
- Improved concrete fire resistance
- Reduced weight of structures without degradation of strength properties
- Compensation of internal stresses through lower density
- Operation without damage to concrete mixing and conveying equipment

**RECOMMENDED DOSAGE: 2.0 to 14.0 kg per 1 m<sup>3</sup>**





## RECOMMENDATIONS FOR USE

### TM Fiber PoliArm FIBER IS A HIGH-QUALITY MODERN ALTERNATIVE TO METAL FIBER

- No special equipment or tools are required to add **TM FIBER PoliArm** fiber to concrete. No premixing with water is needed.
- It is recommended to add **TM FIBER PoliArm** fiber at initial stage of mixing
- **TM FIBER PoliArm** fiber is distributed uniformly both in ready-mix concrete and in case of dry mixing of ingredients (sand, crushed stone, cement)
- The fiber can be added to concrete mix during transportation in concrete mixer trucks

## MIXING

- **TM FIBER PoliArm** fiber can be mixed using any types of mixers such as gravity mixers, forced mixers, or manually.
- Add **TM FIBER PoliArm** fiber of required length to concrete in an amount according to recommended dosage rates calculated as per 1 m<sup>3</sup>.
- Mix thoroughly to ensure even distribution of fiber: manual mixing – up to **6 minutes\***, mechanical mixing – **4 to 5 minutes\***
- When **TM FIBER PoliArm** fiber is added to ready mixed concrete directly into a concrete mixer truck (a mixer), the mixing operation shall be carried out at high speed until the fiber is distributed uniformly



\* The mixing time indicated is recommended for **TM FIBER PoliArm** fiber dosage rates of **5 to 6 kg per 1 m<sup>3</sup>**. For higher dosage rates, the mixing time may be extended until uniform distribution of fiber is obtained.

## STORAGE

- **TM FIBER PoliArm** fiber should be stored in original closed packages in dry ventilated premises.
- Storage temperature: **from – 40°C to +80°C**
- Store out of direct sunlight.
- After storage at sub-zero temperature, keep the fiber at above-zero temperature for at least **12 hours** before use.
- Storage time is unlimited provided the recommended storage conditions are observed.

## RECYCLING

- The fiber and package are recyclable. They may be disposed of as household wastes.

## PACKING

- **PoliArm polypropylene fiber** is available in **0.5 kg** and **1.0 kg** polyethylene bags.



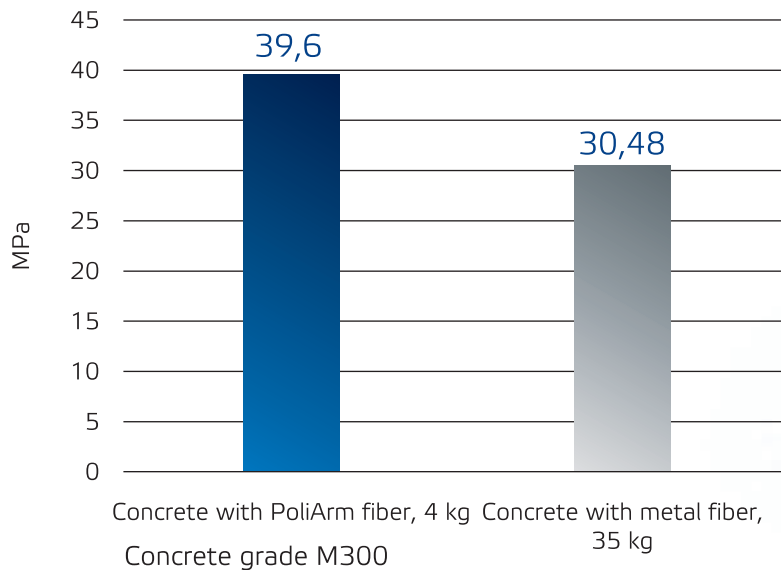
### NOTES

- It is recommended that personal hand protection equipment should be used during operations with the fiber
- If necessary, surface of concrete reinforced with **TM FIBER PoliArm** fiber can be treated using special equipment (by grinding)
- **TM FIBER PoliArm 25 mm, 40 mm and 55 mm** fiber is compatible with any concrete admixtures



## TESTING

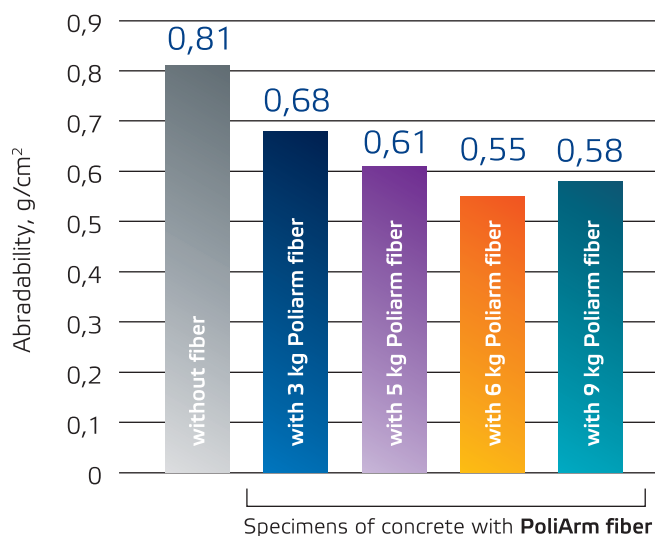
Effect produced by **PoliArm fiber**  
on **bending** tensile strength of concrete as compared with metal fiber



The specimen of concrete prepared with **4 kg PoliArm polypropylene fiber** shows much higher bending tensile strength than the identical specimen of concrete prepared with 35 kg metal fiber (calculated as per 1 m<sup>3</sup>).

\* Based on testing results obtained by SL 000 "Disk Beton" Laboratory

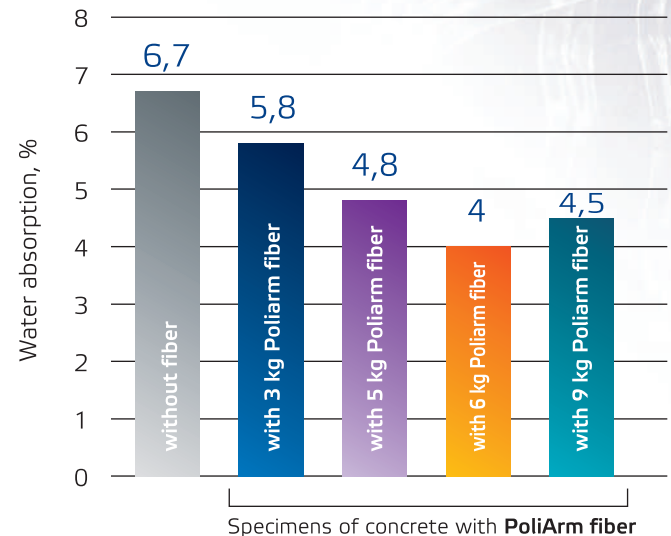
Effect produced by **PoliArm fiber**  
on **abrasability** properties of fine grain concrete



The use of **PoliArm fiber** added at various rates reduces abrasability of M100 concrete.

\* Expert statements issued by KhNADU

Effect produced by **PoliArm fiber** on **water absorption** properties of fine grain concrete



The use of **PoliArm fiber** reduces water absorption of M100 fine grain concrete as compared with the same concrete without fiber.

\* Expert statements issued by KhNADU

# X MESH

## POLYPROPYLENE FIBER



**X Mesh™ Fiber** – structured synthetic macrofiber made of oriented polypropylene copolymer in the form of twisted hard fibers, treated with a special compound that improves adhesion to concrete grout.

### INTENDED PURPOSE

X Mesh™ fiber is intended for volumetric concrete reinforcement. Its structure, with a rough surface for better adhesion in a concrete matrix, is specially designed as a replacement for steel alternatives (fiber, mesh) reduction in the number of reinforcement and serves to provide tensile strength in bending, increase energy absorption capacity, increase resistance to impact and abrasion, prevent cracking and increase the concrete strength.

### APPLICATION

- Industrial concrete floors
- Cement sand screeds
- Mortars
- SAF casting from concrete
- Parking lots
- Road, bridge and airfield pavements
- Shotcreting
- Residential and non-residential buildings concrete structural elements, tunnels, mines, roads, bridges
- Hydraulic structures
- Bank vaults
- Concretes of B5-B100 class, etc.





## PERFORMANCE DATA

Form	<b>twisted fiber</b>
Colour	<b>grey</b>
Length	<b>23; 39; 54 mm</b>
Specific density	<b>0.91 kg/m<sup>3</sup></b>
Tensile strength	<b>&gt; 700 MPa</b>
Elasticity modulus	<b>&gt; 7600 MPa</b>
Equivalent diameter	<b>0.45 mm</b>
Elongation	<b>10-25 %</b>
Melting point	<b>160-170 °C</b>
Water absorption	<b>no</b>
Acid and alkali resistance	<b>full</b>
Single fiber quantity	<b>up to 900,000 pcs./kg</b>



## APPLICATION EFFECT

- Volumetric distribution in a concrete matrix, reduction of cracking and delamination
- Tensile strength in bending increase
- Impact resistance increase
- High efficiency of energy absorption at low dosage
- Fire resistance increase
- Corrosion resistance in aggressive environments
- No impact on concrete mixing and feeding unit wear
- Economic benefit (acceleration of operations, reduction of labor and logistics costs)

## DOSAGE

1-3 kg of X Mesh™ Fiber per 1m<sup>3</sup> of concrete – depending on application.

X Mesh™ fiber is evenly distributed both in the ready-mixed concrete and in case of components dry mixing in any type of mixer, as well as does not create any restrictions at concrete pump feeding.

## PACKAGING

X Mesh™ fiber is packed in 1 kg plastic bags.





# DIFLON ELECTRO™

## ULTRAFIBER



**TM Fiber Diflon Electro ultrafiber** consists of high-strength extruded polymer microfibers subjected to chemical and composite modification.

### INTENDED USE

It is intended for electrical engineering industry as an addition to positive and negative pastes applied in production of lead-acid batteries used in transportation vehicles.

FIBER LENGTH: 2 mm

### PROPERTIES

Technical result of addition of **Diflon Electro polypropylene** fiber to lead-acid storage battery pastes improves mechanical strength of electrodes; it facilitates pore formation and increases service life. The polypropylene fiber is not damaged by acid; it forms a space frame which prevents the paste creeping.

### APPLICATION BENEFITS

- Increased mechanical strength of electrodes
- Longer battery service life
- Good spreading properties of pastes for storage batteries
- Minimization of losses due to spoilage during electrode forming, drying and transportation

### PERFORMANCE DATA

Linear density, tex	0.3±0.02
Individual fiber length, mm	2.0±0.2
Tensile strength, N/mm <sup>2</sup> , minimum	250
Percent elongation, %	20.0±10.0
Humidity, %, maximum	5.0
Chlorine ion	None

# MICROCOLOR™

## COLOR FIBER

**MicroColor™ color fiber** – is a dyed microfiber made of virgin polypropylene.

### INTENDED USE

It is intended for production of liquid wallpaper, various types of decoration, flocking.

### PROPERTIES

With the wide range of colors available for **MicroColor™ COLOR FIBER**, a rich variety of color liquid wallpaper and textured compositions can be created.

FIBER LENGTH: 4 mm, 6 mm



### APPLICATION BENEFITS OF COLOR FIBER

#### WHEN USED IN LIQUID WALLPAPER

- Environmentally friendly. Non-allergenic and irritant-free. Due to its antistatic properties, the fiber does not collect dust.
- The fiber material is moisture repellant; the fiber does not absorb water, it is air and vapor permeable; no condensate is formed on surfaces.
- The fiber has good adhesion to surfaces; no special wall treatment is required before wallpaper application.
- Surfaces coated with TM MicroColor fiber have high heat insulating and sound absorbing properties.

### PERFORMANCE DATA

Specific gravity	0.91
Color	as per order
Package size, kg	as per order
Fiber length	4 mm, 6 mm
Individual fiber length, $\mu\text{m}$	20 to 40
Linear density, tex	1 $\pm$ 0.2
Humidity, %, maximum	5.0 to 7.0
Acid and alkali resistance	high
Electrical conductivity	low
Fiber surface area, $\text{m}^2/\text{kg}$	180 to 240
Number of individual fibers, million pcs. per kg	500 to 800
Melting temperature, $^{\circ}\text{C}$	160

# MULTIFILAMENT YARN

## TM FIBER POLYPROPYLENE MULTIFILAMENT YARN



**TM Fiber polypropylene yarn** is high-strength multifilament yarn having a linear density of **900 to 3600 denier**.

### INTENDED USE

It is intended for production of yarns, cords, twisted and plaited ropes, woven tapes, fabrics, big bags; it is used in footwear and bag fabrication.

### PROPERTIES

The yarn is resistant to acids, alkalis, organic solvents, cold and moisture resistant; it has high flexing strength and endurance; it is wear resistant, non-susceptible to decay and mold fungi.

### APPLICATION BENEFITS

- High strength, low specific gravity
- Stability to rapid temperature drops
- UV-stabilized material, light durability
- Neutral to acids, alkalis and other aggressive chemical agents

### PERFORMANCE DATA

Technical Specifications TU 24.7-32781078-006:2008

	Linear density		Breaking load, $\text{N}/\text{mm}^2$ (minimum)	Yarn breaking elongation, %	Yarn length, rm per 1 kg
	tex	denier			
<b>TM FIBER polypropylene multifilament yarn</b>	100	900-940	360-390	25,5-29,5	10 000
	200	1800	380-400	25,5-29,5	20 000
	300	2700	400-420	25-27	30 000
	350	3150	430-460	25-27	35 000
	400	3600	450-480	19,6	40 000

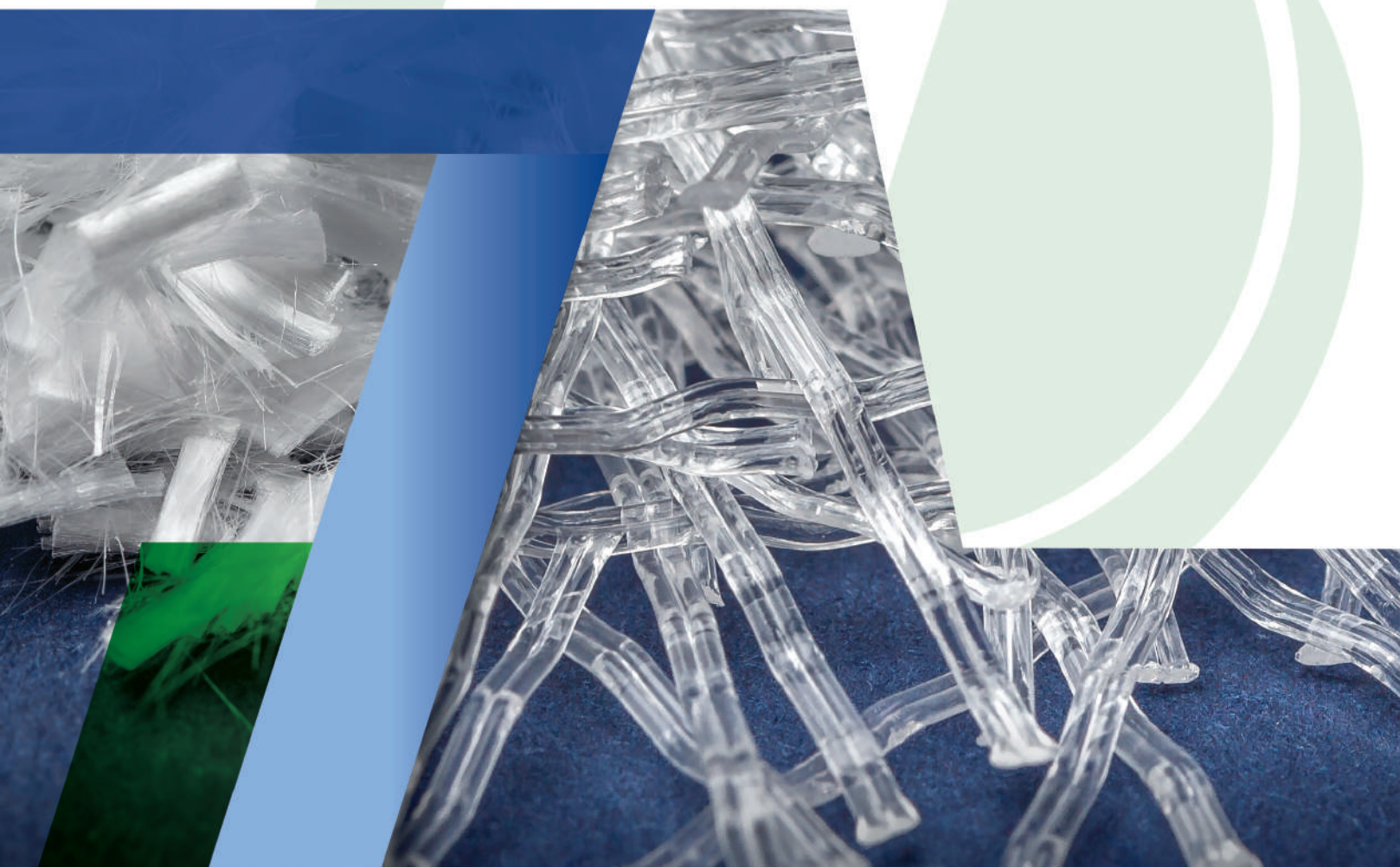
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**INNOVATIVE  
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