

ISOMATEX S.A.
Advanced Fiber Manufacturer

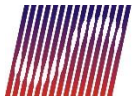
High-end enhanced volcanic rock filaments



**A NEW REVOLUTIONARY FIBRE
REINFORCEMENT**

for
**HIGH PERFORMANCE COMPOSITES
&
TECHNICAL TEXTILES**

FILAVA



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The manufacturing facility

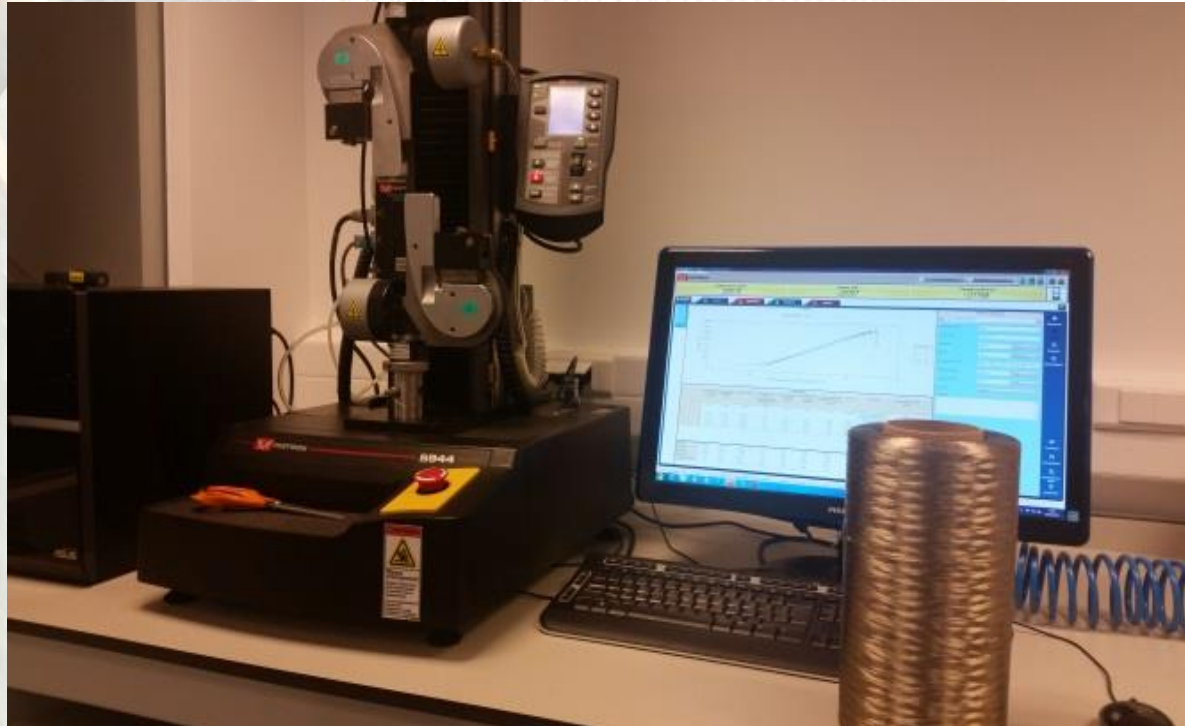


2017 – 2019 : Upgrade of manufacturing facility for upscaled production capacity
1st step - > **400** tons yearly terms



The manufacturing facility

- In-house R&D department continuously working on sizing development.
- Highly referenced laboratory for internal analysis and for the product's Quality Control

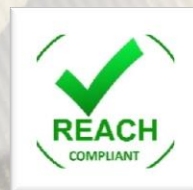


The company's vision and values

- By understanding customers' needs and **the technical specifications of complex manufacturing processes in high-performance niche markets**, we offer a revolutionary new **product that ensures state-of-the-art conceptual design and manufacturing** well beyond the existing solutions
- We offer ingenious and high value-added solutions to support our customers in their search for continuous growth and superior performance

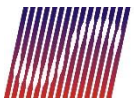


- A **Volcanic rock fibre**, unique product thanks to a genuine and innovative treatment of the raw material (rocks enriched with various mineral additives)
- A **tailored recipe** of minerals with aim to increase and guarantee the product's original mechanical and chemical properties. The components used in the batch aggregation and the fabrication process are ISOMATEX's know-how and constitute its exclusive expertise
- A revolutionary product with a **high level of quality** offering similar mechanical features as R- or S-Glass fibres and very close to the Carbon
- A **cost-effective substitute** to R-, S- glass, aramid or carbon fibre products in many applications
- R&D department involved in each project to determine the **adapted sizing for each application and downstream process**
- a **narrow collaboration with various European R&D centrum and Universities** and a significant investments in research and development



FILAVA: a quality guaranteed

- All organic ingredients used in sizing formulae are **compliant to the European Union's REACH regulation**
- FILAVA's manufacturing process is subject to rigorous checks under our quality management system. **Optimal traceability** of all the products that we manufacture as well the concerned process
- R&D department continuously working on **sizing formulae optimisation**
- Continuous **Quality Control** and product validation
- Use of **cutting edge modelling software** for all the devices involved in the production process
- ISOMATEX is involved in **close partnerships with customers and transformers** with a constant follow-up for each applications and post-processing specifications.



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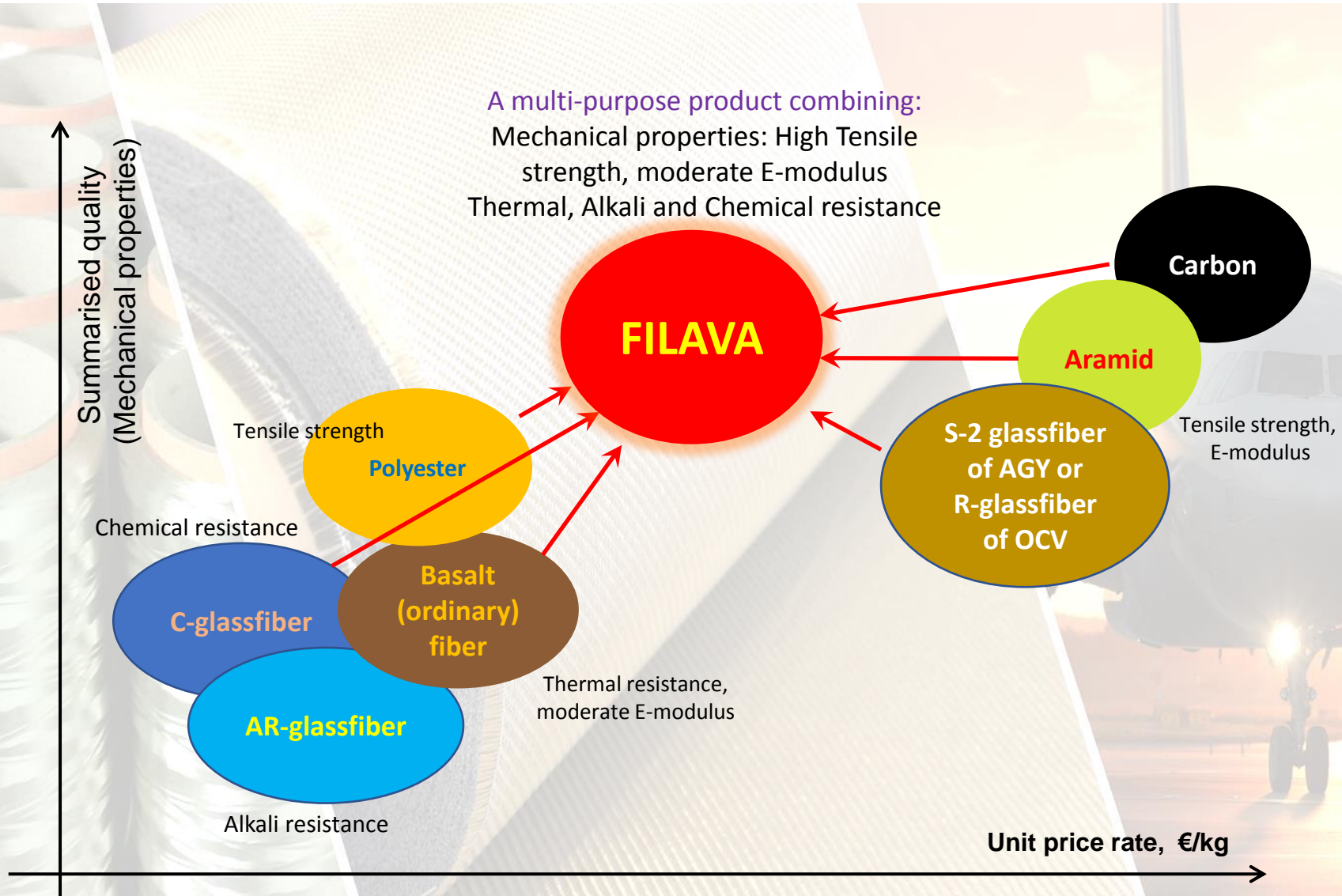
FILAVA: the Key Benefits and major advantages



OUR PRODUCTS

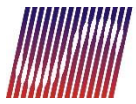
FILAVA

Market's position, benchmark analysis



FILAVA: the Key Benefits and major advantages

- ✓ High **tensile strength** similar to R- and S-2 glass fibers and very close to the Carbon Fibers'
- ✓ High **impact resistance** thanks to 2,5 times better elongation than Carbon fibres'
- ✓ A **moderate density** vs Carbon and similar to R-glass fibres
- ✓ An **High E-modulus** vs any commercially available glass fibres
- ✓ High **heat resistance** with excellent dimensional stability under **850°C** (no shrinkage) with thermal resistance up to **1.000°C**
- ✓ High **corrosion resistance** in chemical and Alkali- environments

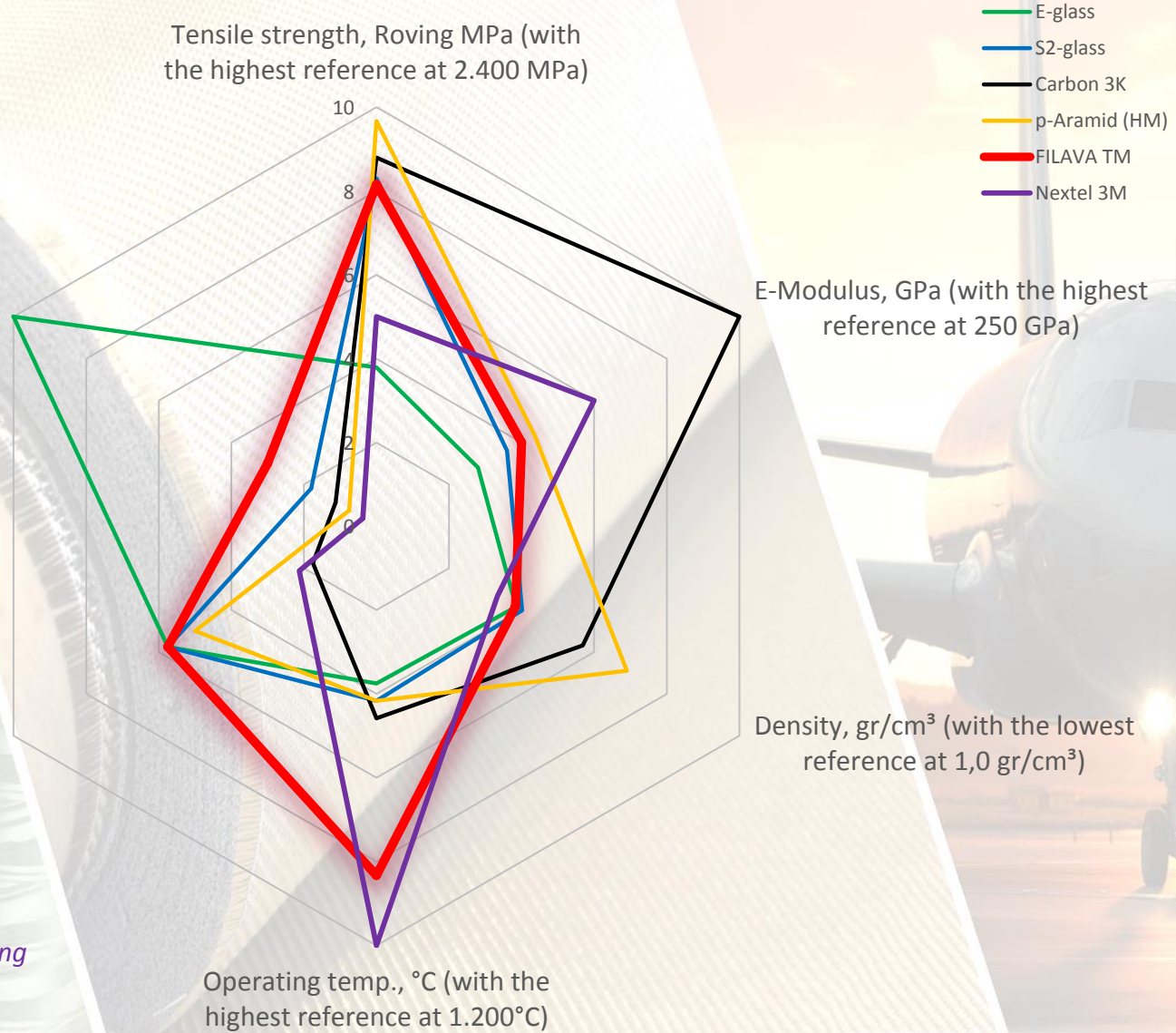


FILAVA: the Key Benefits and major advantages

- Multi-resin **compatible sizing for maximum process flexibility** in downstream transformations (twisting, weaving, knitting, chopping ... etc.)
- All organic ingredients used in sizing formulae are **compliant to the European Union's REACH regulation**
- **Good wettability** and infusion by organic matrices
- There is **no risk of bimetallic (galvanic) corrosion** from contact with aluminium or any steel-alloys
- Fully **sustainable and recyclable product**
- Better energy performance (kWh/kg) in the manufacturing process with **low energy balance compared to Glass fibres and Carbon fibres**

Market's position, benchmark analysis

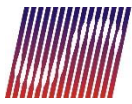
Main mechanical and thermal characteristics and properties



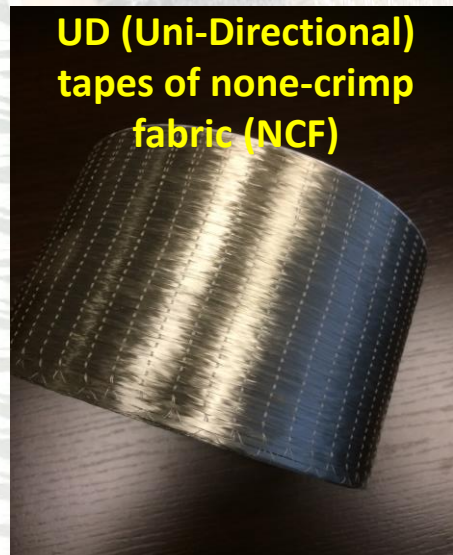
Mechanical properties' values according to ISO 3341:2000 concerning sized and dried yarns

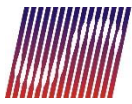


ISOMATEX's product portfolio

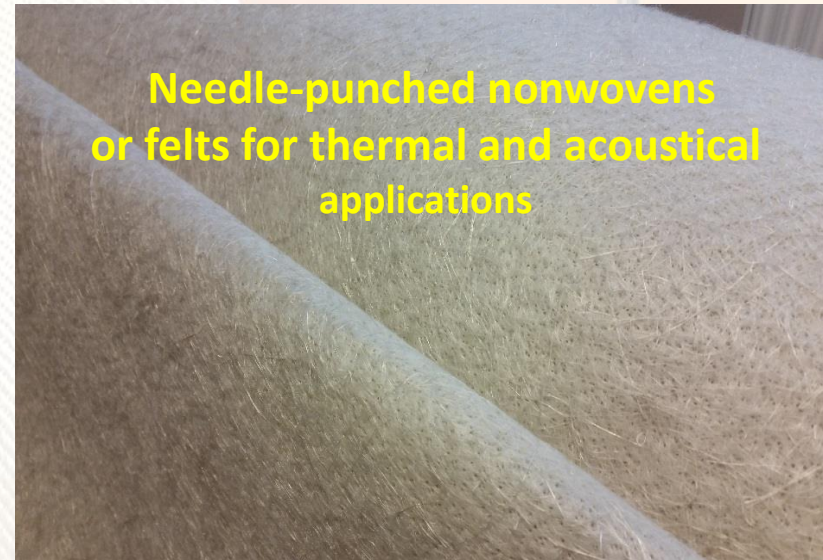
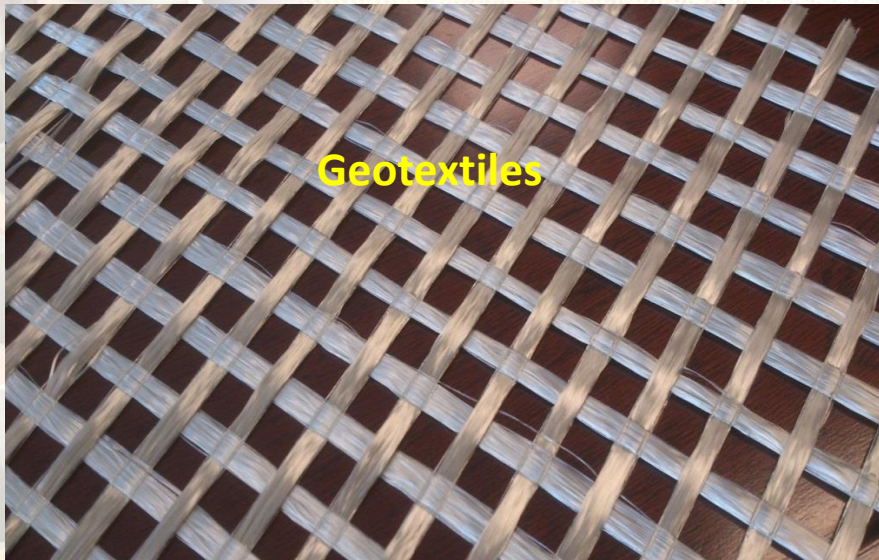


Large product range and formats commercially available

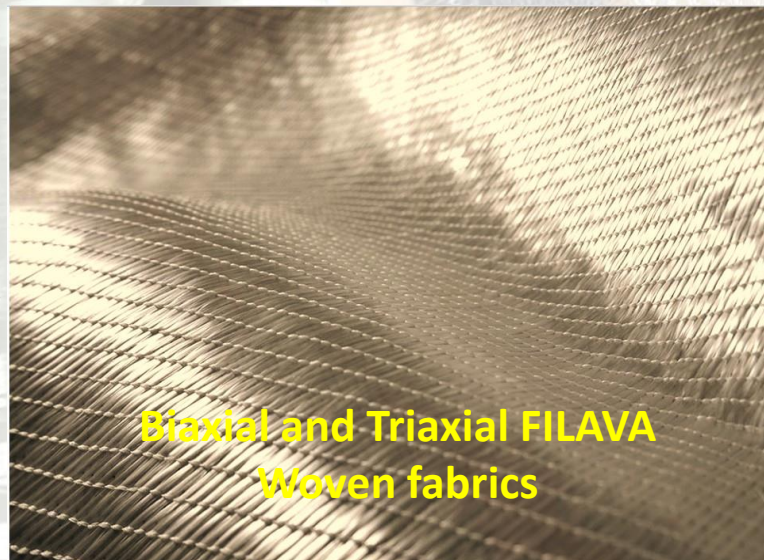




Large product range and formats commercially available



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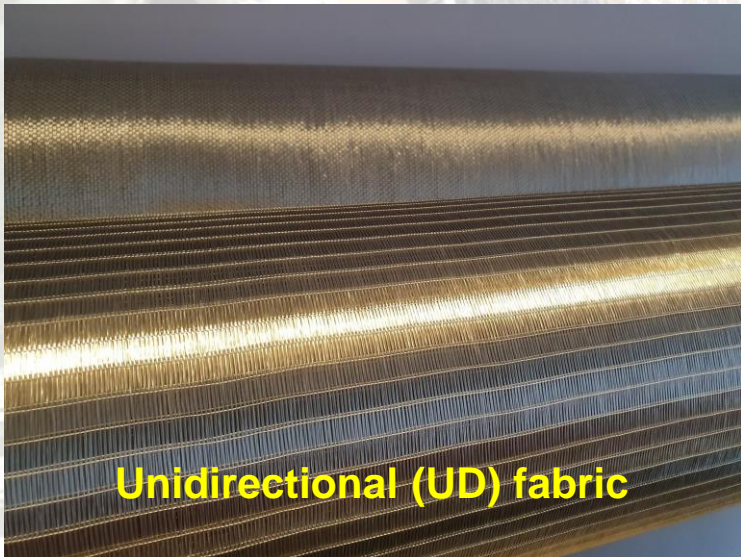
Large product range and formats commercially available



Tapes



Hybrid Carbon / FILAVA twisted yarn

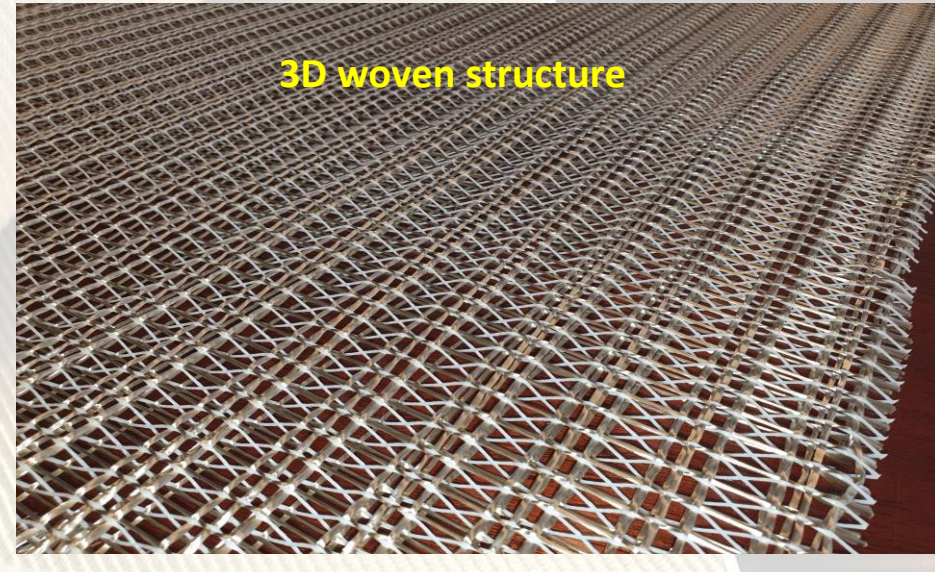
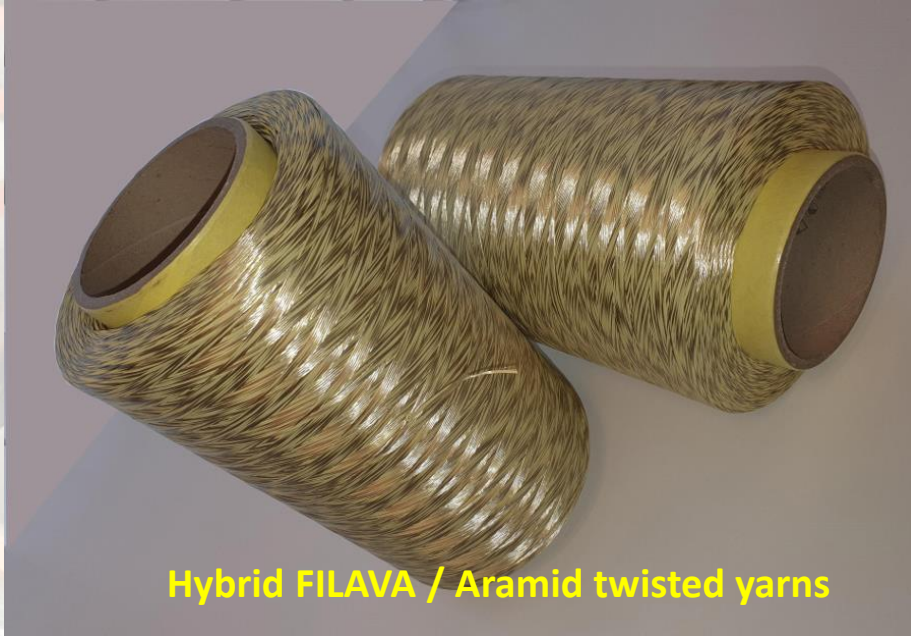


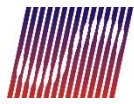
Unidirectional (UD) fabric



**Hybrid FILAVA / FLAX woven
fabrics**

Large product range and formats commercially available





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Advanced Fiber Manufacturer

**Numerous end-use applications
made out and reinforced by FILAVA™**

FILAVA

Numerous end-use applications

The fibre reinforcement for structural applications for advanced composites and ballistics



Outer fibre skin-layer for propeller's blade applied in a braided sleeve



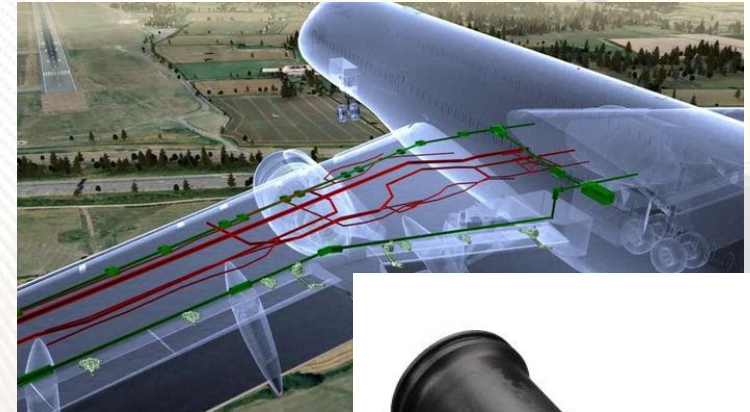
Bullet proof armour panel: the whole fibre reinforcement



The blades of 15 m. length

Numerous end-use applications

The fibre reinforcement for structural applications for advanced composites and aircrafts



Composite pipes and tubes
for aerospace fluid transfer



Numerous end-use applications

Structural applications in Automotive and boatbuilding industries



Numerous end-use applications

Thermal protections and Fire-proof applications



High-Temperature knitted or braided Sleeves for exhaust pipe protection



Thermal insulations for continuous operating temperature **in range of 850 to 1.000°C**



Lightweight structural fire protection for marine applications

Numerous end-use applications

Automotive

Frame frontal crossmember



B-pillars and most critical structural supports



Numerous end-use applications

Sport and leisure

Bike frames and structural elements



Skis

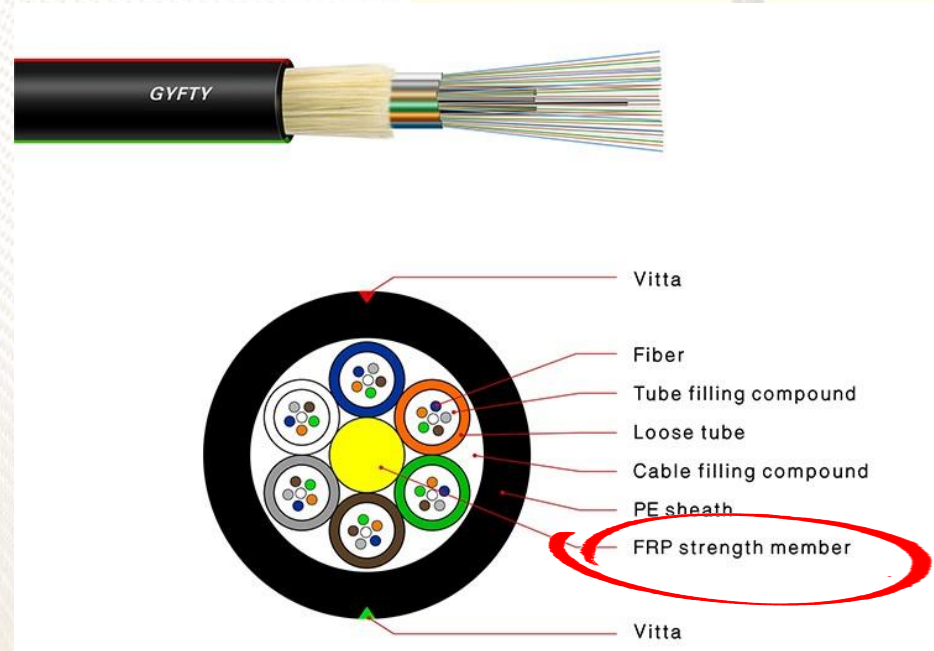
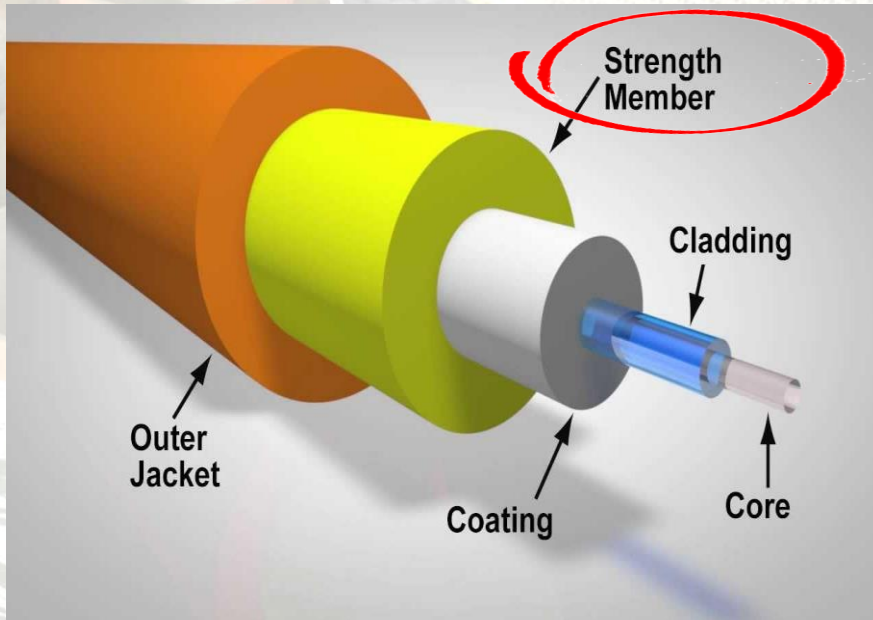


Padel Racket



Civil engineering

Cable optic - central Strength Member



Background :

- Reinforcements used in high-end composites are typically
 - either a **carbon** fiber or **glass** fiber



<i>Main properties and comparison</i>	Carbon	Glass	Filava
Weight / performance ratio	G	B	G
Corrosion resistance	B	N	G
Alkali resistance	B	N	G
Fatigue resistance	B	N	G
Thermal resistance	N	B	G
Impact damage (chock absorption)	B	B	G
Cost	B	G	N



Bad or Fair



Neutral or medium



Good or Excellent



for your attention!