

## **FiberVisions<sup>®</sup> Binder Fibers** ***the sensible alternative***

The idea of combining a matrix material with a reinforcing element was invented over two thousand years ago. Today, this technique is still in use and is being continuously improved.

Reinvented by the need of the aerospace industry for high performance, lightweight materials, this technology has spread to other industries and applications.

Today, composites are a primary method to achieve:

- lightweight constructions with associated benefits of faster speeds, increased loads, and reduced power
- reduced or eliminated need for supporting framework.
- increased product life, i.e. high resistance to fatigue, impact, environmental and corrosion.

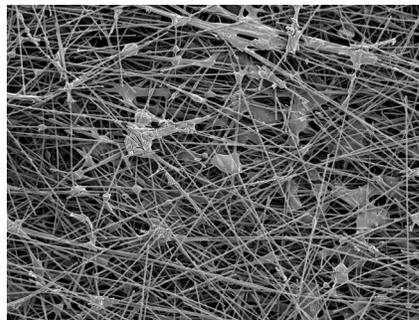
Polypropylene (PP) and polyethylene (PE) fibers are well accepted for uses in composites. They are also environmentally friendly, recyclable binders which can be used in place of chemical binders. They are suitable for use in both matrix and reinforcement applications.

### **FiberVisions<sup>®</sup> contribution**

FiberVisions<sup>®</sup> manufactures a full range of PP and PE mono- and bicomponent fibers which are suitable for use in composites.

- Nonwovens: our fibers contribute efficiently to the strength and integrity of many sandwiched nonwoven products used for support in cars and construction.

- Binders: fibers for use as binder fibers in blends with natural fibers allow the production of lightweight, strong, and stiff composites with good thermal stability and acoustic properties. These products are used in car interior parts, construction elements, furniture and housings.



FiberVisions<sup>®</sup> is always in close dialogue with the customer to ensure that fiber development matches their requirements which, often results in fibers designed for the individual customer.

### **Environmental friendly materials**

Polypropylene and polyethylene are thermoplastic polymers; these materials melt when exposed to heat. When cooled, the materials become solid again. This process can be repeated several times.

Polyolefins have a low carbon footprint compared to other polymers, as indicated by the net cradle to factory gate greenhouse gas emissions (CO<sub>2</sub> equivalents/kg polymer). At the end of use, PP and PE can either be incinerated or recycled. These products contain no dioxins or heavy metals and their complete incineration

produces only water and carbon dioxide.

Recycling of PP and PE is common in the plastics industry.

### **Technical solutions**

Polypropylene and polyethylene both have a very low density (0.9 g/cm<sup>3</sup>) and are lighter than water. In contrast to other polymers which are denser, this results in a larger number of reinforcing elements or binding points per kilogram of material used in the composite, and results in a significant contribution to composite strength and durability.

### **Economics**

Polypropylene and polyethylene materials are very economic materials due to their large use in the plastics industry.

The low density of the materials provides the capability to ensure lightweight constructions.

The trends toward the use of natural or renewed resources such as natural fibers require new ways of bonding.

Lightweight fibers of polypropylene and polyethylene give opportunities for

- large number of fibers per kilogram of material
- large number of bonding points to deliver stronger composites
- weight reductions compared to traditional binder chemicals
- production cost savings

Example Binder Fiber Properties



**FiberVisions®  
PP Binder Fibers**

	Property	Nonwoven Process		
		Air Lay	Air Lay	Carded
 10km	Titer (dtex/fil)	6.6	6.6	6.6
	Tenacity (cN/dtex)	1.8	2.6	1.9
	Elongation at break (%)	400	270	290
	Fiber Length (mm)	19	38	76
 10 cm	Crimp Frequency (/10 cm)	47	51	55
	Finish level (weight %)	0.40	0.40	0.60

The properties of FiberVisions® Binder fibers can be customized to the customer requirements as necessary.

100% PP fibers soften at 140 - 150°C and melt at 162 °C.

Polyolefin fibers consist of 99% carbon and hydrogen. The remaining 1% consists of water and applied spin finish. The fiber bales are protected with polyolefin foil and closed with polyester straps. The product and the packaging materials are suitable for recycling and combustion. Inhouse waste should be kept clean to facilitate direct recycling. In disposal of any waste, ensure that all applicable regulations are met.

**Performance profile of polypropylene fibers**

FiberVisions® fibers have a number of advantages over other man-made fiber types:

**Robust.** Polypropylene binder fibers can be customized for excellent runnability on a variety of nonwoven processes. Example fiber properties are seen in the table at the left.

**Density.** The density of polypropylene is 50% lower than polyester and 25% lower than polyamide. This means that lightweight composite structures can be produced.

**Insulation.** Polypropylene has the lowest thermal conductivity of all textile fibers, and it absorbs no moisture.

**Resistance.** Polypropylene is inert to acids, alkalis and other chemicals. It is resistant to rot, mildew and bacteria. Polypropylene fiber is highly resistant to abrasion and has a toughness superior to most fibers.

**Technical Service.** FiberVisions believes in offering extensive technical service to its customers. This includes fiber innovation programs, exclusive fiber development, color matching and fiber quality enhancements.

Request a trial for your next application!



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