



Dibella Textile knowledge

Fibre gauge

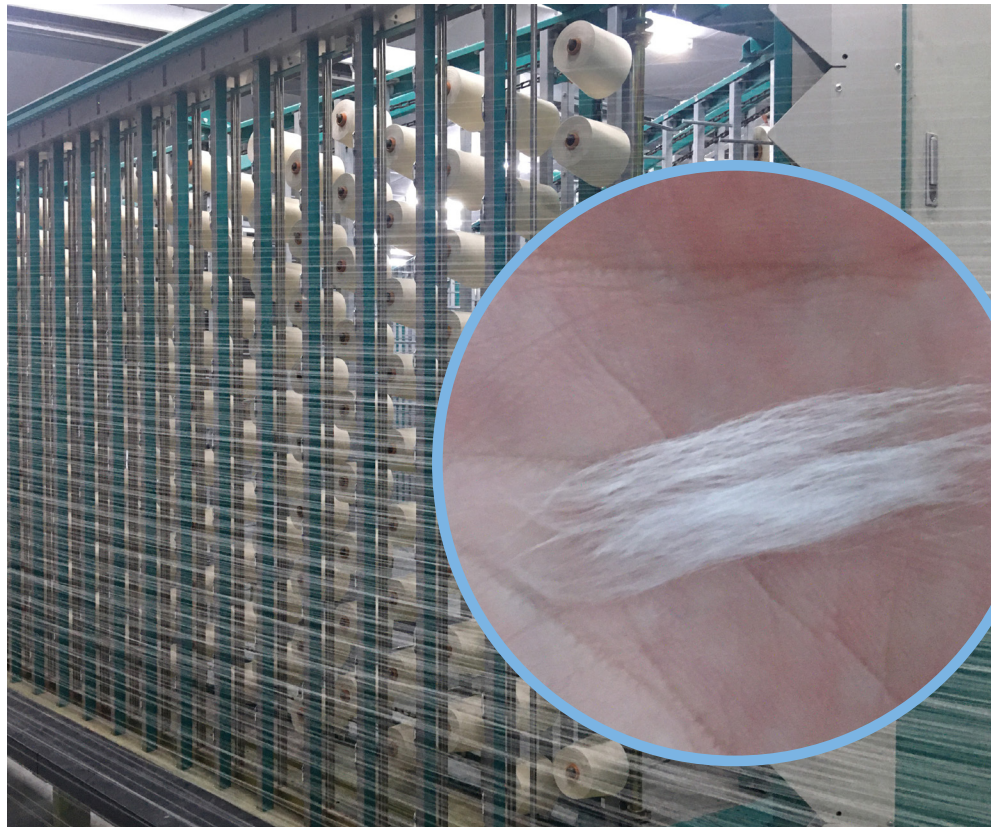
The properties of a textile are largely determined by the fibre materials it contains. Only three raw materials are used for our durable, skin-friendly textiles: Cotton, Tencel and polyester.

Cotton

Cotton is a natural product and belongs to the cellulose fibres. Depending on the country of cultivation, the fruit capsules of the cotton plant produce fibres with different lengths, fineness and colours; these range from white to yellowish to brownish. In cross-section view, the fibre resembles a bean. This structure is the reason for the low sheen of the cotton: Unlike silk, incident light is not reflected but partially absorbed. Nevertheless, there is no need to do without the noble shimmer. Mercerising irreversibly swells the fibre and it takes on an almost round shape that can reflect light very well.

From an application point of view, cotton is almost an optimal fibre for us:

- Due to its internal structure, it has a high dry strength and an even better wet tear resistance. This means that cotton textiles can withstand high mechanical stress in the wash, during moisture extraction, ironing or tumbling.
- The high abrasion resistance of the natural fibre is important in use. So even the toughest stubble can't harm our pillowcases and bedcovers.
- Thanks to their high heat resistance, cotton textiles can withstand high temperatures. They are fast to washing at the boil and suitable for tumble dryers and mangles.
- The natural fibre has a good moisture absorption capacity. Bed linen with or made of cotton therefore supports a pleasant sleeping climate; a bathrobe quickly ensures dry skin.
- The cellulosic fibre has a low elasticity, which results in a high tendency to crease. Bed linen and table linen made of or with cotton must therefore be ironed after washing.



- The chemicals commonly used in industrial laundries cannot harm the cotton fabric. The fibre is resistant to alkalis – these even give the textiles greater strength and a noble shimmer –, to many enzymes as well as oxidising agents. Care only needs to be taken with acids and hypochlorite: they cause holes to form in the textile when applied in high concentration.

Polyester

Polyester was invented in 1947. This plastic is known as a thermoplastic that can be spun out into fibres at high temperatures: at 256°C, the synthetic material melts, can then be pressed through



nozzles and processed into fine filaments. The fibres then have a high thermal stability and are heat resistant even at continuous temperatures of up to 200°C. At 230°C, however, a softening process begins to set in. In order to maintain the dimensional stability of the textiles, mangle temperatures should therefore always be below this temperature.

The synthetic fibre has other advantages that qualify it for use in our contract textiles suitable for textile leasing:

- Their high dry and wet tear resistance gives the textiles good mechanical stability, which is important for industrial washing, moisture extraction, ironing and tumbling.
- Polyester absorbs very little moisture and therefore dries extremely quickly. Thanks to this property, blended fabrics bring a lower residual moisture after the moisture extraction process and can be dried with lower energy input
- The synthetic fibre has a good elasticity, which results in a low tendency to crease.
- Polyester is resistant to the chemicals commonly used in the laundry industry (acids, alkalis, oxidising agents, enzymes). Caution is only required with concentrated alkalis and higher temperatures: The combination leads to the degradation of the fibre.

TENCEL™

The lyocell fibre TENCEL™ is – like cotton – a cellulose fibre. However, it does not grow in the field, but is obtained from wood – usually FSC-certified beech or eucalyptus wood. This is converted into what is termed a regenerated fibre in a closed process in which the chemicals used are almost completely recovered. This regenerated fibre has cotton-like properties, but also surpasses the natural fibre in some respects.

- TENCEL™ has good strength values in dry and wet condition and withstands the high mechanical stresses involved in industrial laundering.
- TENCEL™ exhibits optimal moisture management due to the unique microfibril structure of the fibres. Within this structure, moisture is distributed over a wide area, which on the one hand results in good moisture absorption, but at the same time also in rapid moisture release. TENCEL™ textiles are therefore more absorbent than those made of



cotton and dry faster. Under these conditions, no bacterial growth – and thus no odour or mould stain formation – takes place.

- In the spinning process, the Lyocell fibre is given a smooth surface, which is the reason for the noble sheen on the one hand, and the pleasantly cool grip and soft feel on the skin on the other.
- The regenerated fibre has a higher elasticity than cotton and is therefore less susceptible to creasing.
- The temperature resistance of the fibres is good, but at temperatures above 130°C a shrinking process sets in, which leads to shrinkage of the textiles. For this reason, we recommend – unlike with cotton textiles – a maximum washing temperature of 70°C and a chest temperature of the ironer of 180°C at the most.
- TENCEL™ is stable to the chemicals commonly used in the laundry industry. However, highly concentrated solutions should be avoided – they destroy the fibres.

A textile fibre component alone cannot cover the high demands placed on durable textiles for the textile rental service one hundred percent. Skilful combinations of polyester and cotton or TENCEL™, on the other hand, result in products that have an optimum property profile for the respective application.

Property profile of cotton, Tencel and polyester

	Cotton	Tencel™	Polyester
Mechanical properties			
• Tensile strength, dry	++ ²	+++	+++
• Tensile strength, wet	++(+)	+++ ³	+++
• Abrasion resistance	++	+	+++
• Elasticity	+	++	+++
• Heat resistance	++	+	+++
• Flammability	+++	+++	+
Chemical properties			
• Resistance to alkalis	+++	++	+
• Resistance to common laundry acids	+	+	+++
• Resistance to oxidising agents	++	++	+++
• Resistance to bacteria/mould	+(Stockfleckenbildung)	+++	+++
• Sweat resistance	++	++	+++

¹ https://www.researchgate.net/publication/223891278_Thermal_behaviour_of_lyocell_fibres

² Y. Yan *Developments in fibers for technical nonwovens, Advances in Technical Nonwovens, 2016*

³ <https://www.sciencedirect.com/topics/engineering/lyocell-fiber>

