

Lyocell Technology

Cellulose Fiber made from dissolved, regenerated pulp

IDEAS INSIDE



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The EPC Group is certified according to DIN EN ISO 9001:2008

Natural Fibers – From Forest to Designer Shop.

EPC Group as part of the German Lyocell Alliance offer a turn-key solution for environmentally and economically sustainable Lyocell production plants. The Lyocell Alliance offers the opportunity to produce Lyocell for textile as well as technical applications e.g. as raw material for the Carbon Fiber Production.



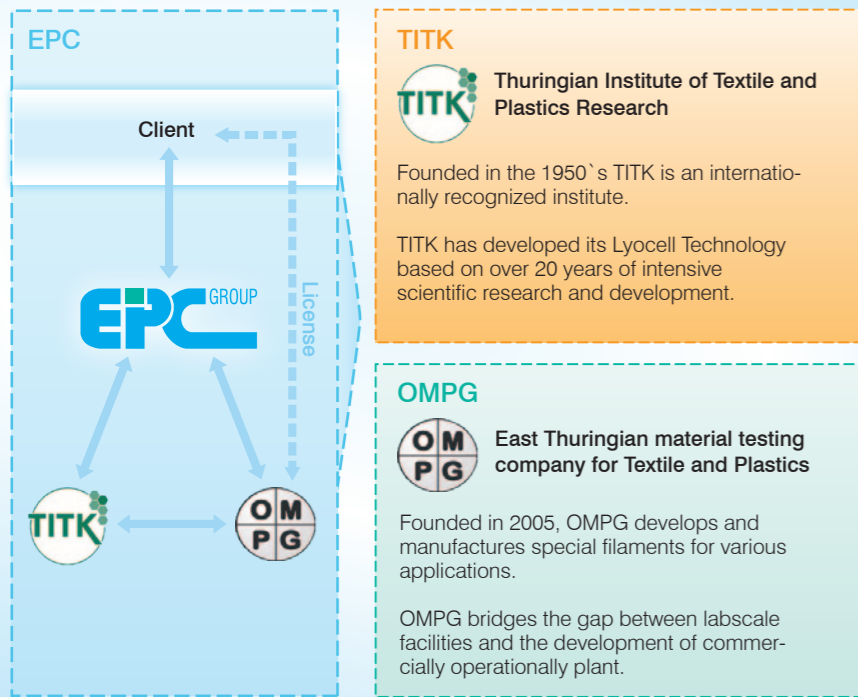
Made from Wood - General Properties of Lyocell Application of Lyocell and a short overview of the Lyocell Industry

Lyocell is an eco-friendly fiber widely used in the apparel market. It is made from naturally occurring cellulose obtained from sources such as eucalyptus, spruce or bamboo. Material produced from Lyocell is popular for many textiles due to the attractive properties it possesses, e.g. high strength and good moisture absorbance. EPC together with its partner 'OMPG' form the German Lyocell Alliance. The alliance has

proprietary know-how and experience in the design and build of efficient and environmentally responsible Lyocell production plants. EPC works together with each client to ensure that the desired Lyocell specification can be achieved. The Lyocell production plant will be designed to operate as efficiently and economically as possible and to surpass all environmental requirements.

THE GERMAN LYOCELL ALLIANCE

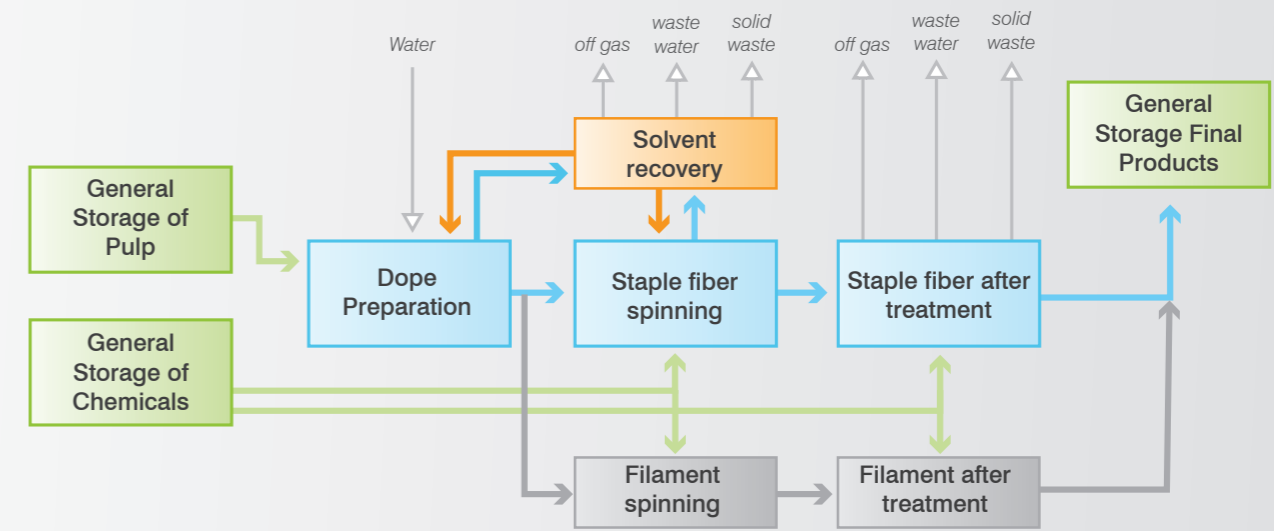
EPC together with OMPG and TITK found the German Lyocell Alliance and can offer a turnkey solution for Lyocell plant construction



History of Fabrics derived from Cellulose:

- 2012**
EPC join the German Lyocell Alliance
- 2005**
OMPG Lyocell project | China | 1000 T/A
- 1999**
TITK Lyocell project together with EPC engineers | Germany | 500 T/A
- 1980**
Lyocell R&D begins at TITK, Germany
- 1950**
TITK Research Institute is established in Germany
- 1889**
Lyocell is commercially produced in France as artificial silk
- 1855**
Swiss chemist George Audemars is granted a patent for cellulose fabric

LYOCELL PRODUCTION PROCESS



Advantages of EPC plant design and OMPG Lyocell Process

- Process safety – Low temperature: $\leq 100\text{ }^{\circ}\text{C}$
- Increased efficiency in energy consumption
- High solvent recovery rate (up to 99,5 % possible)
- Adjustable Plant capacity (50 -100%)
- Flexible Design – variable staple fiber lengths and fineness or Filament yarns
- Enzyme preconditioning step – Purification, smooth system operation

Attractive properties of Lyocell

- Environmentally sustainable
- Moisture absorbent
- High dry tenacity (strength) - Close to that of polyester
- High wet tenacity - Retains 85% of its strength when wet
- Low shrinkage after washing
- Non- fibrillating versions of Lyocell are also available
- Special applications/ filling of Lyocell fibre available

Lyocell raw materials

Cellulose Pulp obtained from:
Bamboo, spruce, pine, eucalyptus, beech, etc.

Process for pulp manufacturing
Sulfite-, pre-hydrolysis-sulfate process

The key solvent used in the process is NMMO
(N-Methylmorpholine-N-oxide)

Other stabilizers & additives
Required for solution stabilization / bleaching & finishing

Type of packaging
Bale or bobbin