MODAL FIBER – PART II

REF: TT/ JUNE 2019 / WK 1

Manufacturing Process of Modal



- **Steeping and Pressing** - The pulp is steeped in an aqueous solution of sodium hydroxide 17%, causing fibres to swell and converting cellulose to sodium cellulosate. The slurry so obtained is pressed to remove excess soda.
- **Shredding** - Alkcell slurry is opened to facilitate the penetration of oxygen and CS2.
- **Mercerizing** - Modal can be mercerized, like cotton, for increased strength and lustre.
- **Xanthation** - Here mercerized alkcell reacts with CS2 vapour, under vacuum, to form sodium cellulose xanthate.
- **Filtration and Deaeration** - The impurities present must be removed prior to spinning to prevent blockage of spinneret holes.
- **Spinning** - Very high modulus and tenacity is achieved when cellulose is spun from liquid crystalline solution. Unlike viscose rayon, the use of zinc in the spin bath is eliminated completely, and only short period immersion in cold low acid-low salt bath is followed.
- **Coagulation Bath** - In Modal process, coagulation and stretch occur together and are followed by regeneration, leading to high wet modulus. Unlike viscose rayon, filaments in the bath are stretched times their spun length before regeneration, thus forming a structure with fibrillar texture.
- **After Treatment** - Modal fabric is given a clean soft touch finish by impregnating the fabric with an acid donor, heat treating in gaseous atmosphere to activate the acid and subsequently dyeing, washing and drying it.

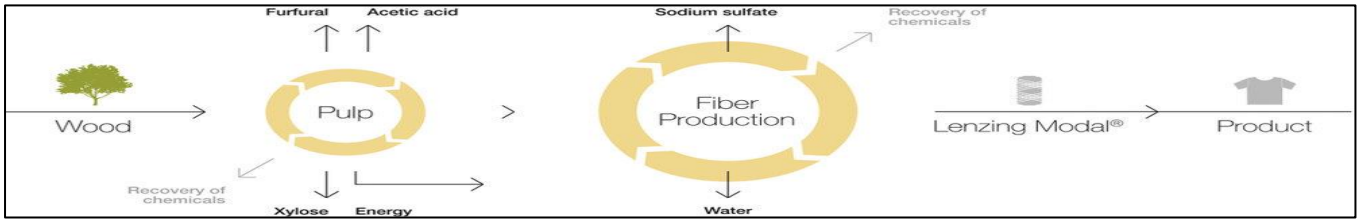


Fig 1.1 – Modal Fiber Manufacturing process flow chart

Characteristics and Advantages of Modal Fiber

Modal possess lower elongation and higher wet modulus as it has high rate of polymerization. Its exceptional similarity to cotton/silk in terms of lustre and sheen results in a surface smoother than mercerized cotton.

- **Dimensional Stability** - Modal displays high dimensional stability. This property of Modal helps the garment to retain their shape.
- **Absorbency** - It is hygroscopic in nature. Modal fabric is 50% more absorbent than cotton so more moisture is absorbed into the fabric. Therefore, allows the body to stay dry and comfortable.
- **Breathability** - Modal is made from Beechwood pulp. Its natural properties allow breathability Hence sweat and moisture are quickly released and not trapped next to the skin.
- **Aesthetic Appeal** - Garments made from Modal fabrics gives a desirable clean and soft touch finish. Its smoothness makes hard water deposits less likely to adhere to the surface, so the fabric stays soft through repeated washings.
- **Anti – Bacterial Property** – On Modal fabric, the growth of bacteria is lesser as compared to cotton. If both stored for the same period of time; Modal fabric doesn't age like cotton.
- **Pilling** - Modal has an advantage that it is less likely to form pills due to friction.
- **Durability** – Modal retains its appearance after several washes. They maintain anti-crease properties (in blends) and have relatively easy care.
- **Blends** - It blends well with almost all textile fibres, like Cotton, wool, silk, synthetics and elastane fibres.

Fiber type	Fiber length (mm)	Fiber fineness (dtex)
Tencel (LF-STD)	38	1.3
Bamboo	38	1.6
Modal	39	1.3
Micro modal	39	1

Fig 1.2 – Comparative fibre length and fineness of few regenerated fibres

To be continued….

Wishing you a great week ahead!

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