Viscose fibres
with new functional qualities

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Head of R&D, Kelheim Fibres
Overview

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2. What are Viscose fibres?
3. Viscose fibres – a very special material
4. Toolbox for the fibre modification
5. Viscose fibres and the Italian Art
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8. Summary
Kelheim Fibres, as the leading speciality Viscose fibres manufacturer, is located in Kelheim, at the river Danube, amidst of one of the most beautiful landscapes in Germany.

Kelheim Fibres produces 75,000 t of Viscose fibres in form of staple fibres, wet & dry short cut fibres, wet & dry filament tow.

The history of Kelheim Fibres starts in 1936, around 40 years after Viscose fibres had been invented.

In the following decades, several owners contributed to the technology and knowledge at Kelheim Fibres.

It is a haunting story, but also a big heritage used for the development of our fibres. We have access to the knowledge of the most important Viscose fibres manufacturers in the past.
Kelheim Fibres – The leading speciality viscose fibres manufacture

Head Office Kelheim Germany
Capacity 75,000 t/year
Staff 500 people
Turnover 150 Mill. Euro
R&D Background of most historically leading viscose producers

1936
Süddeutsche Zellwolle AG
Kelheim, start-up of viscose fibre production

1968
Hoechst AG
Acquisition of a majority shareholding

1974
Hoechst AG Werk Kelheim

1994
Courtaulds European Fibres
Joint Venture Hoechst and Courtaulds

1999
Acordis Kelheim GmbH

2004
Kelheim Fibres GmbH
Take-over by EQUI- Fibres GmbH
Cellulose – The most important organic polymer

Provides structure to the world of plants

- the fibre component in the high-performance composite wood
- multi-functional molecule, polymorphic
- no synthetic polymer offers the spectrum of structures and properties
- renewable, ecologically worthwhile
- wood, a raw material for chemicals – only 0.3% are used for dissolving pulp
What are Viscose Fibres? – Chemistry made by nature

Transfer of inhomogeneous cellulosic pulp fibres into tailored cellulosic viscose fibres with homogenous qualities
Unrivalled properties for various applications

- physiologically neutral, skin-friendly
- hydrophilic, perfect moisture management
- restricted growth of micro organisms
- chemical stability
- chemical reactivity (triggered for dying, functionalisation, …)
- superb next-to-skin comfort, soft to touch
- brilliant colours
- not-melting
Viscose Fibres – Tool box for the fibre modification

- Titer
- Staple length

Incorporated additives

Chemical bonding

Hydrogen bonding

Coating

Cross section
Famous Italian artists are the godparent of Kelheim Fibres new functional fibres

Verdi  
Composer  
1813 - 1901

Bramante  
Master-Builder  
1444 – 1514

Dante  
Poet  
1265 - 1321

Bellini  
Composer  
1801 - 1835

Alloy Fibre  
Segmented Hollow Fibre  
Alloy Hollow Fibre  
Flat Fibre
### New functional qualities

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New functional qualities - Absorbency

Water imbibition

Danufil | Bellini | Verdi | Bramante | Dante

- Danufil
- Bellini
- Verdi
- Bramante
- Dante

Kelheim Fibres
New functional qualities - Absorbency

Syngina Absorbency of tampons

Danufil

Verdi

Bramante

Dante

60%  80%  100%  120%  140%  160%  180%
New functional qualities - Dispersability

Dispersability of fibres in water without agglomerations

Fibre quantity

Danufil

Verdi

Dante

Danufil Verdi Dante

New functional qualities - Dispersability

Danufil Verdi Dante

New functional qualities - Dispersability
New functional qualities – Self-bonding

Tear resistance of a 100% viscose fibres paper without any additive

[mN]

Danufil  Bramante  Verdi  Dante  Bellini

writing paper
New functional qualities

Tear length of a 100% viscose fibres paper

Danufil  Bramante  Verdi  Dante  Bellini

[m]
New functional qualities

Burning test

Standard Viscose fibre

Verdi & Dante fibres

… after 5s …

… after 10s …

… after 25s …
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- Ultra high absorbency
- Self-bonding
- High dispersability
- Gel Effect
- Self-extinguishing
Summary

1. Cellulose is a renewable, organic polymer with a broad spectrum of properties

2. Viscose fibres are tailored cellulosic fibres with unrivalled, intrinsic qualities

3. The chemical structure of Viscose fibres opens various opportunities for new fibre properties, additionally to standard fibre modifications

4. Kelheim Fibres, as a speciality fibres producer, has developed new Viscose fibres with unique characteristics

5. These new fibres Verdi, Bramante, Dante and Bellini show ultra-high absorbency, self-bonding behaviour, high dispersability in water, a gel-effect and self-extinguishing properties

6. Viscose fibres properties can be combined and offer the possibility to enter into new applications and to maximise properties of existing products
Thank you for your attention!