SUCCESS STORY

**WOOD**
**next generation materials and processes – from fundamentals to implementations**

Program: COMET – Competence Centers for Excellent Technologies

Program line: COMET-Center (K1)

Type of project: Novel ways to speciality fibers, 01/2015 – 12/2018, multi firm

# TEXTILE CHEMICAL-MODIFIED VISCOSE FIBERS HAVE BEEN SUCCESSFULLY DEVELOPED

## METHODS FOR EQUIPING VISCOSE FIBERS WITH OPTICAL BRIGHTENERS AND SPECIAL WET CHEMICAL FUNCTIONALIZATIONS, LIKE HYDROPHOBIZING, DEVELOPED IN THE LABORATORY AND UPGESCALTED IN THE INDUSTRY. THE PHYSILAL CHEMICAL PROPERTIES OF THE PRODUCTS HAVE BEEN DETERMINED.

The functionalization of textile materials is usually carried out on the textile product, but hardly on the fiber. The upstream stage of wet chemical modification on the never dried viscose fiber during the manufacturing process or offline on the wet cable opens up new applications. Thus, the focus of the project was to develop special modifications for the areas of permanent waterproofing, heat sealing, permanent flame retardant equipment, permanent cationization and optical brighteners in direct connection with the production of the viscose fibers. The process development took place in the Wood K plus laboratories with the focus on subsequent upscaling in the industrial modules of the viscose manufacturer Kelheim Fibres. In the following, 2 selected development examples (1) optical brighteners and (2) permanent hydrophobization are briefly presented.

### 1. Optical brighteners

In the project, various bluish optical brighteners for the viscose fiber could be tested, which should not lose their effect over several seconds at temperatures of 210 °C. The influence of solar radiation on the products was excluded in Xenotester tests. The influence of temperature on

Federal Ministry Republic of Austria Climate Action, Environment, Energy, Mobility, Innovation and Technology

Federal Ministry Republic of Austria Digital and Economic Affairs

Version 01/2020

the fibers was tested in thermal tests and quantified using color measurements.

UV light recordings of optically brightened viscose samples after 10s at 210 °C (©Wood K plus)

The stability of the optical brighteners in different media was examined and the washing stability was determined. The upscaling tests at Kelheim Fibres were carried out in the finishing sector of the pilot plant by spraying with the new optical brightener and then in a scale-up on a production scale.

**2. Permanent waterproofing**

Environmentally friendly means were identified and concepts for their application by means of sprinkling were developed. This was followed by laboratory tests with optimizations of the process parameters with a view to achieving a high level of effects with good washing durability. The fine tuning mainly concerned the recipe components, the application concentration and the drying and fixing conditions. experimental instructions for compared to untreated fiber, the development of the new process can achieve 10,000 times higher hydrophobicity. This enables the development of completely new fields of application for special textiles, e.g. sport textiles.

left: hydrophobic stable fiber, right untreated fiber (©Wood K plus)

**Impacts and effects**

The project makes a contribution to the economic and ecological provision of functionalized fibers. Linking viscose fiber production and direct modification, closes a gap in the value chain of the manufacture of textile and non-textile environmentally friendly viscose products.

**Project coordination (Story)**
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**Project partner**

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- DITF, Germany

This success story was provided by the center management and by the mentioned project partners for the purpose of being published on the FFG website. Wood K plus is a COMET Center within the COMET – Competence Centers for Excellent Technologies Program and funded by BMK, BMDW and the provinces of Carinthia, Lower Austria and Upper Austria. The COMET Program is managed by FFG. Further information on COMET: www.ffg.at/comet