


Project title: Starch-based Textiles: Cost-effective Textiles from Biopolymers (Star-Tex)

Partners: Fraunhofer-Institut für Chemische Technologie (ICT)
Tecnaro GmbH
warmX GmbH

Run-time: 10.2015 - 09.2018

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Mission Statement

In this research project, native starch is converted into a melt-spinnable polymer by various modification concepts from which filaments are produced which on the other hand are further processed into textiles.

Solution

Through chemical modification, a significantly improved property profile is achieved compared to the destructured starch.

- Setting a thermoplastic processability
- Increasing the melt strength of the material
- Improvement of the resistance of starch to water through hydrophobing

Compounding the thermoplasticized starch with biopolymers gives the following advantages:

- Control of the viscoelastic flow behavior and thus the spinnability
- Improvement of the physical-mechanical properties of the spun filaments
- Possible "counter-steering" in case of quality variations of the native strength used
- Control and defined setting of the biodegradability taking into account the requirements from the respective application areas

The chemically modified starch and the corresponding starch compounds are spun by melt spinning. The focus of melt spinning is as follows:

- Investigation of the melt spinnability of modified starch and starch compounds with biopolymers
- Development of a pilot-scale melt-spinning process
- The optimization of process parameters that allow the desired properties of the filaments.

The spun multifilaments are used for the production of a nonwoven fabric (e.g., for the application in geotextiles and sanitary textiles).

- Texturing of the filaments
- Production of staple fibers
- Production of a nonwoven fabric by carding, airlaying, scribing or thermofixing

The spun filaments are also used for the manufacture of knitwear.

- Layout research and production of knitwear
- Packaging and production of clothing
- The optimization of product properties

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