

Finland's VTT makes fiber out of worn cotton



VTT Technical Research Centre of Finland has been able to dissolve worn and discarded cotton and use it as a raw material for new fiber. The first product models show that recycled fiber can be transformed into a yarn and pleasant fabric. The first batch of recycled fabric has been produced in a pilot facility based on a carbamate dissolution process.

The fabric made from the recycled fiber meets the researcher's expectations: it is smooth with a subdued matt finish and drapes nicely. Ali Harlin and Pirjo Heikkilä of VTT say that the fiber feels natural.

The method is much friendlier to the environment than the viscose process, in which carbon disulphide is needed for dissolution. In addition, polyester residues are removed from the cotton material using methods familiar from the pulp industry.

According to calculations during the technology commercialisation project, the carbon footprint of recycled fiber produced using carbamate technology is about a third smaller than for cotton and in the same category and as the most environmentally friendly viscose. The water footprint of the recycled fiber is around two per cent of that of virgin cotton and 10 per cent of viscose.

Yarn was spun at Tampere University of Technology from discarded cotton turned into fiber in VTT's laboratory. The fiber's characteristics rivalled those of commercial yarns when being spun. Following this stage, the first model products, gloves and flat-knitted fabrics, were made by knitwear company Agtuvi.

Research and development is still required in order to achieve process reliability. The Infinited Fiber Company startup has been established to advance the process design and licensing of the technology.

The spinning process is being developed towards industrial production through collaboration between VTT and the Infinited Fiber Company at VTT's Bioruukki pilot centre. A range of cellulose fibers may be developed at a spinning unit built at Bioruukki this summer.

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VTT's method forms part of the TEKI project, which was launched internationally with the title of The Relooping Fashion Initiative. The project involves piloting and modelling a closed-loop ecosystem in line with circular economy principles; the ecosystem will enable new industrial applications of previously unusable textile waste. VTT, Ethica, the Helsinki Metropolitan Area Reuse Centre, Seppälä, Remeo, Pure Waste Textiles, RePack, Touchpoint and Lindström are involved in the project. The project is funded by Tekes and the participating businesses.

The collection and sorting of discarded textiles is also being developed via the Telaketju project jointly funded by Tekes and the ministry of the environment. This involves the creation of an ecosystem of companies and other actors, with the aim of taking Finland's textile circular economy to the next level.

Provided by Fiber2Fashion.com

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