Mission Statement

With the prohibition of environmentally hazardous solvents currently being discussed more and more in the EU and the reduction of limit values for hazardous substances in products, there is a need for improved systems that make it possible to further reduce the residual solvent content (RSC) in fibers. This plays an important role in the production of polyacrylonitrile (PAN) fibers. According to the Technical Rules for Hazardous Substances (TRGS) 401 "Risk of skin contact", the upper limit value of the solvent dimethylformamide (DMF) is 10 mg/kg [TRGS08]. The purification of the fibers required for this in the spinning process is very complex and increasingly reduces the economic efficiency of the spinning processes. Thus, there is a need for innovative plant technologies that can achieve lower solvent contents in the fiber by means of more efficient washing processes and at the same time require less effort than before.

Solution

The aim of this project is to develop an innovative washing system to increase the efficiency of the washing process and the reduction of the RSC in the production of wet-spun man-made fibers. At Institut für Textiltechnik of RWTH Aachen University (ITA), various influencing factors and parameters for the targeted opening of multifilament yarns with the aid of turbulence in liquid media have already been determined and developed. Based on these findings, design concepts are developed with the aid of flow simulations and converted into a prototype. The prototype will be integrated into a wet spinning plant at the ITA and validated with regard to increased efficiency and possible fiber damage. This project is carried out in cooperation with Fourné Maschinenbau GmbH and the Institute for Textile Technology of RWTH Aachen University.
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Contact

Institut für Textiltechnik der RWTH Aachen University
Otto-Blumenthal-Str. 1
52074 Aachen

Sascha Schriever  
Tel.: +49/(0)241/80 232 76  
Sascha.Schriever@ita.rwth-aachen.de

Musa Akdere  
Tel.: +49/(0)241/80 234 78  
musa.akdere@ita.rwth-aachen.de