

Project titel: InnoSpin
Partner: Sossna Spinnerets, Fourné Maschinenbau, Ianus Simulation
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Mission Statement

Deficit: In the production of wet-spun technical fibers, spinnerets with a maximum count of 12,000 filaments per spinneret are used to ensure uniform fiber properties. This limits the economic efficiency of the process. After extrusion of the polymer solution into the spinning bath, the solvent diffuses out of the forming filaments and the polymer solidifies in filament form. If the filaments are close together, the out-diffusing-solvent is trapped between the filaments and the solvent concentration increases locally. Thus, if there is a large number of filaments, the filaments inside the bundle have different properties than those in the outer part of the bundle.

Aim: The aim of the project is to homogenize the filament properties of wet-spun man-made fibers and to increase the maximum number of filaments per spinneret to increase the efficiency of the wet-spinning process. The aim is to increase the number of filaments by 20% per spinneret plate. The new spinneret concept could replace about 3000 nozzles in the PAN market and over 4000 nozzles in the other man-made fiber market.

Approach: In the project, a spinneret is developed which introduces coagulation liquid into the interior part of the fiber bundle to remove the solvent trapped between the filaments. The coagulation liquid is extruded through additional extrusion capillaries parallel to the spinning solution and thus create a uniform flow in the surrounding of all filaments.

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