Project title:	ELowPro - Herstellung von Geweben für ultra-low-profile Stentgraftsysteme mittels elastischem Schusseintrag
Partner:	Fritz Moll Textilwerke GmbH & Co.KG
Duration:	03/2021 – 02/2023
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Mission Statement

The most important field of application for thin medical tissues is the minimalinvasive therapy of aneurysms of the abdominal aorta (**e**ndo-**v**ascular **a**ortic **r**epair "**EVAR**") with stent-graft systems. In this procedure, the implant is advanced to the aneurysm in a folded state via a catheter. The stent graft is then deployed. A small diameter of the catheter system is decisive for the success of the therapy and the applicability of the therapy even in challenging aneurysm anatomies. The size of the catheter is limited by the profile thickness of the folded textile implant.
Thinner textiles made of fine yarns are needed to produce stent graft products with a particularly compact catheter system. First fine medical grade multifilament yarns with a titer ≤ 20 dtex are commercially available. The current deficit is that such fine multifilament yarns cannot be processed into tubular fabrics.
The aim of the project is a stent graft made of a tubular fabric with a yarn titre ≤ 20 dtex (multifilament) in order to make EVAR accessible to up to 15% more patients by using smaller system profiles (14F ≤ system profile ≤ 18F).

Approach

The combination of PET multifilament yarns with a fineness of 10-30 dtex as warp threads and elastic threads made of medical grade thermoplastic polyurethane (TPU) developed at ITA as weft threads is intended to enable the processing of fine yarns into dense fabrics. The weft thread is woven under tension so that the warp density during shedding is lower than in the final product. This should reduce the fibre-fibre friction in the weaving process.
Within the research project, the production of multifilaments from TPU with a fineness of less than 50 dtex is being investigated. On the other hand, the influence of the weft yarn tension on the fabric position and the fabric properties (fabric thickness, blood tightness) is being researched. Machine modifications to ensure uniform fabric production are being developed.

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