

Title: Development of an innovative 3D-Tuftingunit for the joining of textile preforms (3D-Tuft)

Partner: EFAB GmbH, Korschenbroich, Germany

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Initial Situation

For the production of large scale composite parts using liquid composite moulding technologies, big sized near net-shape textile preforms are required. These preforms are produced by a multi stage process by combining several sub-preforms, which have to be joined in order to facilitate load transmission among the sub-preforms. This joining is presently achieved by binder application to form overlapping areas. The application of binder requires significant bonding areas thereby leading to a large overlap thus resulting in material accumulation. In order to address this challenge and improve both joining characteristics and vertical mechanical properties, sewing technologies such as single sided tufting are an alternative approach. As today, existing commercially available tufting technologies are operating with low speeds like 300 stitches per minute. In a collaborative research project, Institut für Textiltechnik of RWTH Aachen University and EFAB GmbH aim to develop a new tufting technology with speeds up to 1000 stiches per minute.

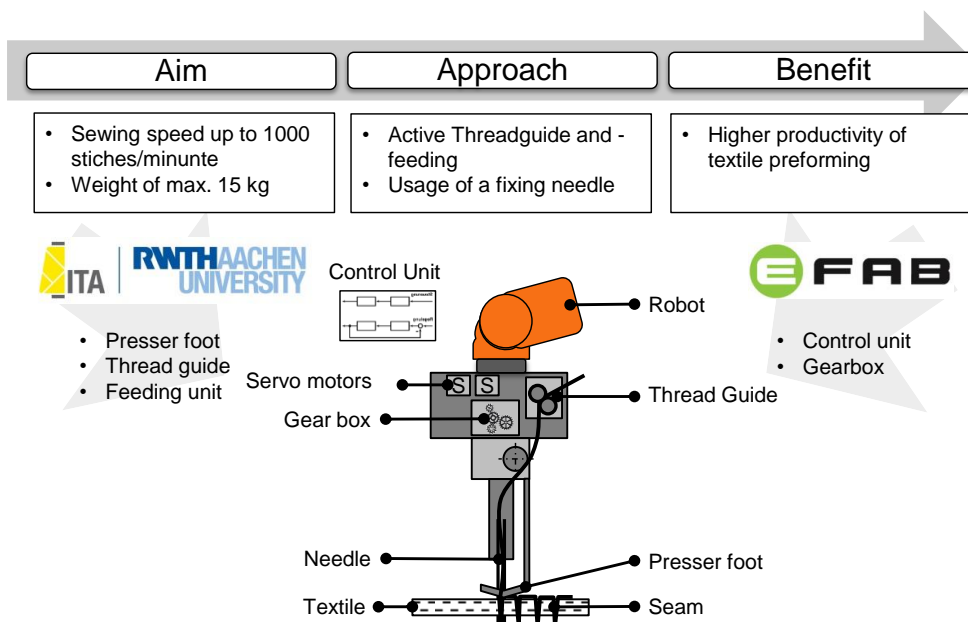


Figure 1: Central Approach in the project

Approach

In this project, a robot guided tufting unit with operating speeds up to 1000 stiches per minute will be developed. Therefor a new drive concept for the control of the moving parts like presser foot and needle will be developed. The drive concept and control system will be developed by EFAB GmbH, while ITA focuses on a thread guide in combination with a feeding unit as well as a suitable presser foot. Final testing and validation will be held at ITA Preformcenter using a demonstrator component.

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