

Project title: DrapeFix – Automated local binder application in the production of FRP preforms

Partner: Institut für Unternehmenskybernetik e.V. (IfU) an der RWTH Aachen University

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Mission Statement

The principle of stamp forming enables the production of textile preforms with short cycle times. The process can be divided into three process steps. In the first process step, the individual layers required for forming are pre-assembled, fixed together and provided as a layer package. In the second process step, the 2D preforms are formed in a punch forming process. For this purpose, the 2D preforms are clamped by a holding-down system and formed into a 3D preform by closing the tool.

In order to ensure secure fixation of the individual layers, the desired preform geometry and the fiber orientation after the preforming process, binder is applied to the entire surface of the fabric. The binder is melted by heat before the forming process and solidifies after the forming so that the preform geometry is retained even after demolding. The use of full-surface binder application, however, makes it very difficult for the individual layers to slide off one another, so that high forming forces are required. This requires the allocation of cost-intensive plant technologies. Errors such as shifts of the forming unit, folds or thickness jumps are the result (Fig. 1).

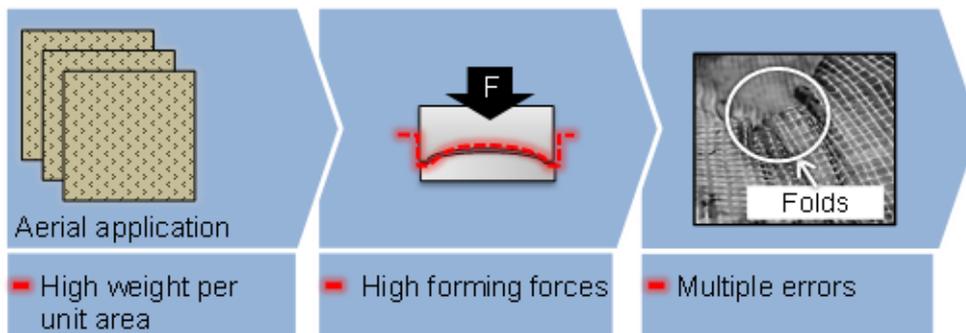


Fig. 1: Disadvantages of full-surface binder application

Approach:

The approach to achieving this goal is the purposeful local application of binder in the intermediate layers. The local binder application enables a reduction of the binder grammage and a precise forming of the intermediate layers by different friction conditions. As a result, the necessary pressing forces can be reduced and fiber displacements, folds and thickness jumps can be avoided.

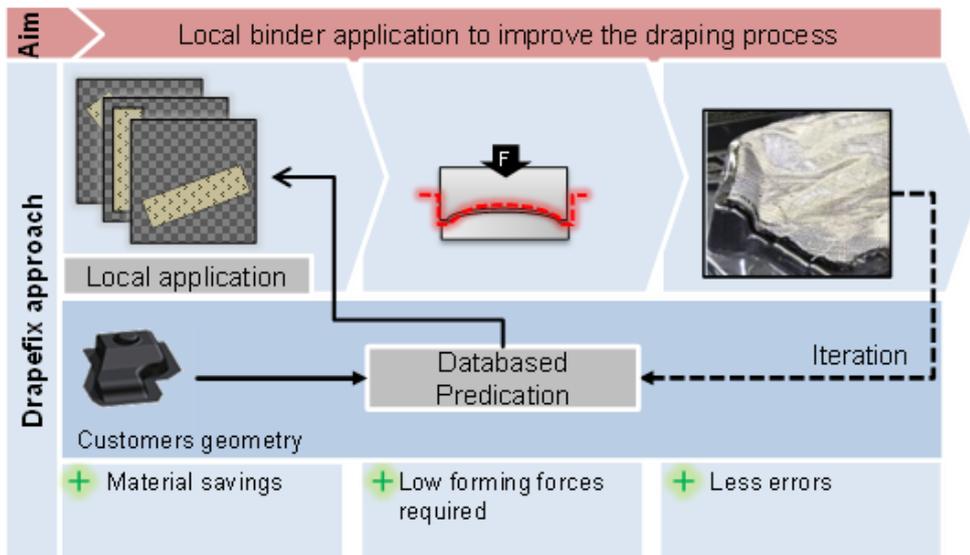


Fig. 2: Potential of locally applied binder

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