

Selective powder binder application during the cutting procedure to optimize the preform production process



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Carbon fibre reinforced plastics are predicted to attain a yearly market growth of 13% by 2022 [1]. This will require considerable cost savings in production. For this goal to be achieved, both automatable and material-efficient manufacturing strategies are required.

This interdisciplinary research project aimed at developing a modular CNC cutting and fixing technology for optimised application of powder binder systems to achieve a higher automation level in the preform production process. This plant technology implements edge fixation to ensure the dimensional accuracy of the preform blanks and a selective structure fixation for the improved formability of complex preform geometries. The definition of suitable areas is based on the simulation results of the forming behavior for a 3D demonstrator component.

By the digital and mechanical coupling of the powder binder application unit to the cutting technology, the additional fixing step in the preform production chain is eliminated, which makes it possible to achieve considerable time savings and thus increase economic efficiency. Besides the conceptual design, the project laid the foundations for plant technology development for powder supply, selective powder application and thermal powder binder activation on the textile reinforced material as well as the potential and practicability of this technology was demonstrated.



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Funding reference:

This work (ZIM KF2048952PO4) was supported by the AiF within the program "Zentrales Innovationsprogramm Mittelstand (ZIM)" from funds of the Federal Ministry of Economics and Energy (BMWi) by a resolution of the German Bundestag.

References:

[1] M. Sauer, M. Kühnel: Composites-Marktbericht 2017. AVK, Industrievereinigung Verstärkte Kunststoffe, 2017.