

Project title: **MicroCoat - Development of a machine concept for microwave drying in wet coating processes of textile processing**

Partner: Fricke und Mallah Microwave Technology
Jakob Weiß & Söhne Maschinenfabrik
Institut für Textiltechnik der RWTH Aachen University

Duration: 09/2020 – 8/2022

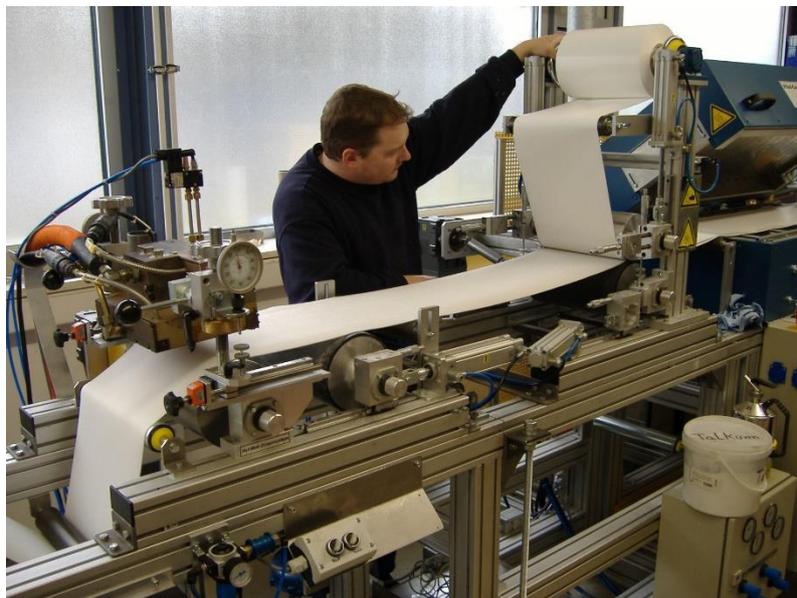
Funding Agency: BMBF KMUi Produktionsforschung

Univ.-Prof.
Prof. h.c. (MGU)
Dr.-Ing. Dipl.-Wirt. Ing.
Thomas Gries
Direktor

Andreas Bündgens, M.Sc.
Scientific researcher

Ref.: AB
20.10.2020

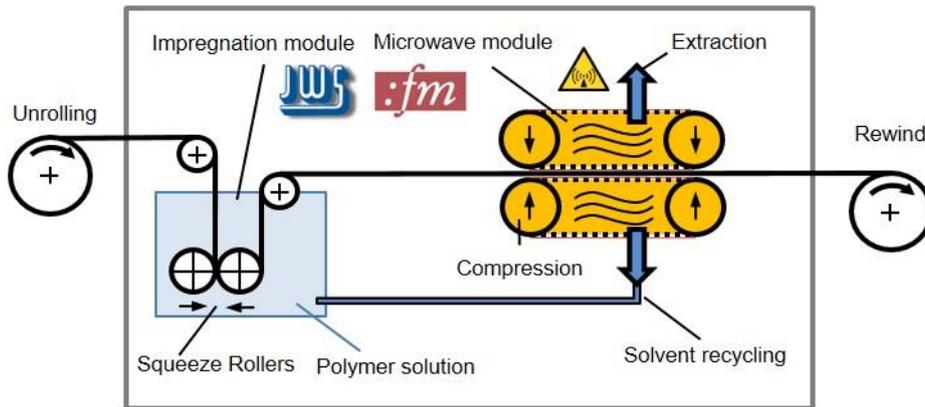
Thermoplastic organo sheets and tapes are experiencing high market grow rates. Beside melt impregnation or film stacking the use of solvent impregnation is a suitable technique aiming for best impregnation results. The costs for a coating plant for solvent-based thermoplastic impregnation for composite production, are approx. 30% allotted to the drying section. The main part of the variable costs of the production process is energy input and auxiliaries. The production speed of such a plant is mainly determined by the required residence time of the impregnated semi-finished product during evaporation of the solvent in the convection oven.



© Jakob Weiß & Söhne Maschinenfabrik GmbH

In the project “MicroCoat”, a novel process chain for the production of thermoplastic impregnated semi-finished products is being developed. The innovation consists of applying microwave technology to improve the distribution of matrix material in the fabric and for drying, as well as in the simultaneous application of surface pressure on the semi-finished product. This means that the semi-finished fiber composite product is simultaneously consolidated (solidified) during the drying process. This enables the production speed to be increased by 20 %, with a simultaneous reduction in production costs of 10 % in relation to the total product, as well as a reduction in energy

consumption of 30 % compared to machine setups relying on melt impregnation and a double belt press.



© ITA – Institut für Textiltechnik

With microwave drying, the heat can be applied homogeneously, with the semi-finished product being dried from the inside. Microwave drying is equipped with a press for consolidation and also has an extraction and recycling system for the solvent that evaporates during the drying process. The implementation is to take place in the form of modular components to be developed, to also enable the retrofitting of existing production plants.

Acknowledgement

The ITA would like to thank the Federal Ministry of Education and research for its support in the project MicroCoat. We also want to thank our project partners **Fricke und Mallah Microwave Technology** and **Jakob Weiß & Söhne Maschinenfabrik** for the good collaboration.

Contact

Andreas Bündgens, andreas.buendgens@ita.rwth-aachen.de, 0241 80 23260