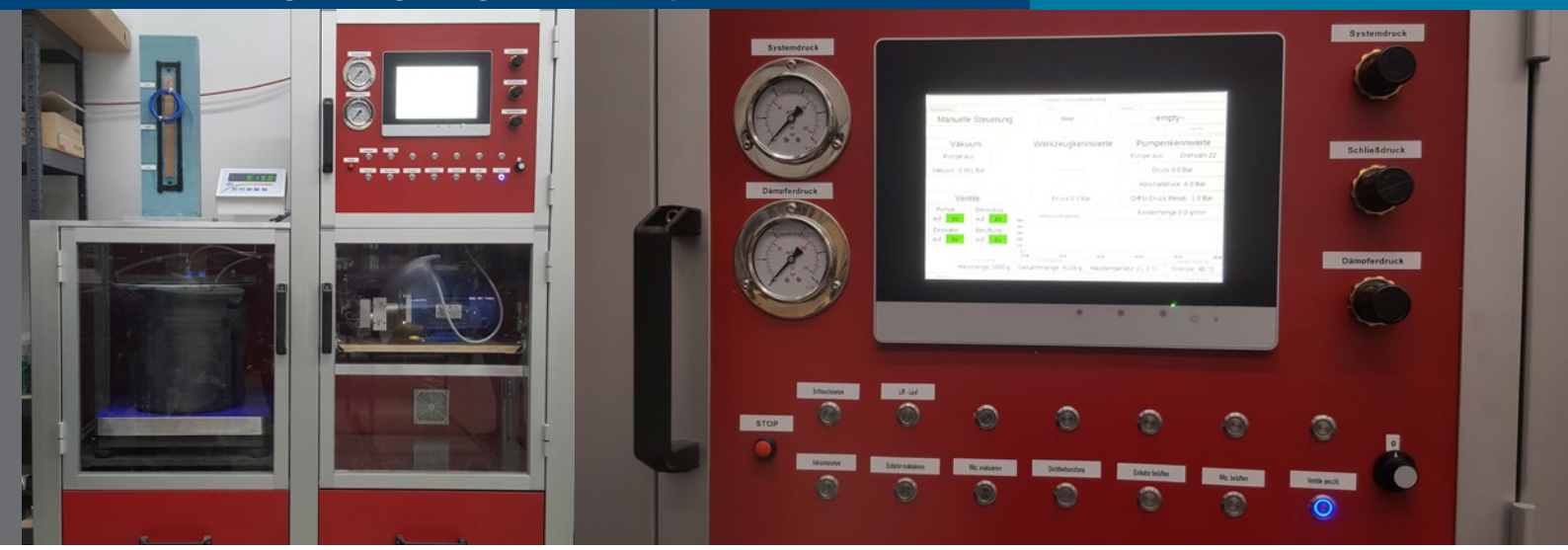
Federal Ministry
for Economic Affairs
and Climate Action

Best practice example

for lightweighting in Germany

RTM-controlled infusion unit



RTM-controlled injection equipment

RTM plant technology for an autonomous infusion of construction parts

Fields of application

Machinery and plant construction

Medical technology

In this example, lightweighting allowed for the following reductions compared to a conventional model:
The rates vary depending on the use case.

Application

This plant technology, complete with the newly developed, low-price sensors, allows for fully automated control of all technological parameters involved in the process.

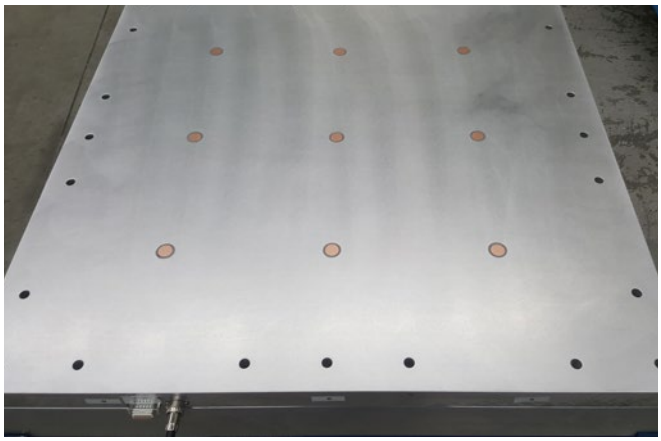
Challenge

The objective was to develop a low-cost sensor technology capable of localising the flow front in a resin transfer moulding (RTM) cavity and to develop algorithms for controlling this flow front to ensure an optimum infusion speed in the semi-finished fibre parts.

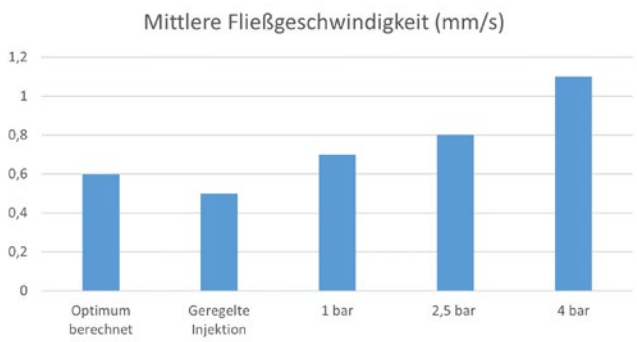
Solution

The focus was on the development and production of low-cost sensors as an integral part of the mould. The analysis unit can be connected using conventional industrial plugs (plug-and-play). It automatically self-calibrates to the relevant tool.

Best Practice Example | RTM-controlled infusion unit



Prototype tool



Comparison of flow rates within the tool with and without controls activated

Other potential applications

Automotives | Commercial vehicle manufacturing | Railway vehicle manufacturing | Aircraft construction | Optical devices | Shipbuilding

Sensors integrated into the cavity make it easier to ramp up serial production more quickly whilst ensuring a high and consistent level of quality of the parts through reproduceable infusion.

The sensors make it possible to visualise and manually or automatically control the grey area between the sprue and the riser. The reject rate caused by trapped air or dryspots can be minimised or even eliminated. The process makes it possible to easily work with several sprues.

The plant is currently being tested.

Compliance with all requirements relevant for the sector is being ensured. Research activities are being conducted so as to further improve health and safety, environmental protection and recycling.

The LIGHTWEIGHTING ATLAS

The LIGHTWEIGHTING ATLAS is an interactive web portal that pools information on those active in lightweighting and their skills across different industries and materials. The atlas is free to use and entries into the atlas are also free. You can find the LIGHTWEIGHTING ATLAS at www.leichtbauatlas.de

The Lightweighting Initiative

Modern lightweighting is of pivotal importance for German industry and its competitiveness. Federal Ministry for Economic Affairs and Climate Action has established the Lightweighting Initiative to support lightweighting in Germany. The Lightweighting Initiative Coordination Office in Berlin, which is financed as part of the initiative, pools all activities relevant to lightweighting and supports German companies, especially SMEs, as they implement lightweighting.

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Publishing details

Published by
Federal Ministry for Economic Affairs and Climate Action
11019 Berlin
www.bmwk.de

Current as of
June 2021

Picture credits
Title page, pictures 1 and 2: Schmuhl Faserverbundtechnik GmbH & Co. KG, picture 3: BMWK