

Processing Technology | Technology Offer

## „Heat Forming with Innovative In-situ Heating of Inserts“

### Application

Fabrication of thermoplastic molded parts, in particular fiber-reinforced composites from semi-finished goods (organic sheets), by means of an innovative heat forming process and associated equipment.

Light weight design and therefore the use of fiber-reinforced composites is becoming more and more important because of the request to reduce greenhouse gas emissions. The growth of carbon fiber reinforced composites has reached double-digit figures.

### Current State of Technology and its Shortcomings

To allow forming, organic sheets are generally heated using infrared heating, air heating or contact heating. In order to avoid a subsequent cooling of the parts between the heating and the forming operation, it is necessary to apply a temperature as high as possible but simultaneously to reduce the heating time as much as possible. Both of these conditions are not easy to achieve and the process often delivers defective parts. Too high temperature results in a thermal degradation on the surface, whereas a short cycle times enable a part buffering in case of delays. These problems are currently solved by separating the heating cycle into on and off sequences or by a heating of the forming tool itself. This however requires a lot of energy.

Therefore there is a need of an improved automated process chain, which allows a more economical forming of parts with high productivity and reproducible quality.

### Innovation

An innovative method has now been developed at the University of Stuttgart, which allows a heating of semi-finished parts with less surface degradation. Also by this “in-situ” heating of the organic sheets a more effective heating process is achieved.

Simultaneously, it is possible to achieve a process-integrated quality assurance, a documentation of the quality – e.g. the mechanical strength – of the semi-finished good and the molded part, as well as an individual quality assessment.

### Your Advantages/Benefits at a Glance:

- ✓ Shorter cycle times, respectively higher throughput rates
- ✓ Energy savings (efficiency of the in-situ heating of up to 90%)
- ✓ Reduced production space requirements
- ✓ Reduced thermal strain on semi-finished goods
- ✓ Ability to control the heat distribution (homogeneity)
- ✓ Increased production effectiveness
- ✓ Process-integrated quality control and quality documentation of semi-finished goods and molded parts.

### Patent Portfolio

A German patent application has been lodged.

The Technologie-Lizenz-Büro GmbH is charged with the commercialisation of this technology and now offers companies an opportunity to enter into a cooperation and/or licensing arrangement.

For further information regarding this technology, please contact:

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