

# Two Component Injection Moulding of Thermoplastic/Rubber Parts

*Adhesion Optimization and Process Understanding*

## Motivation

The production of thermoplastic/rubber composite parts is usually realized in an expensive multistage process. The thermoplastic component is prefabricated by injection moulding, afterwards either bonding agents or activation treatments are applied to the surface to achieve the required adhesive strength between the thermoplastic and the rubber. Finally the rubber is added by a second injection moulding step. To reduce the high production costs caused by these different steps, a single-stage process of two component injection moulding has been developed.

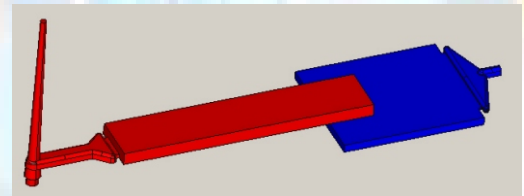


During this process, thermoplastic/rubber composite parts are produced in a two component injection moulding machine without using bonding agents or activation treatments. The adhesive strength between the components is achieved by the diffusion of polymer chains or chemical reactions in the interface. Therefore, a system of corresponding thermoplastic and rubber types with specific properties is required as well as the knowledge of the corresponding injection moulding parameters.

## Research Opportunities

The department Process Engineering at the DIK does research in the field of two component injection moulding and adhesion optimization between thermoplastic and rubber materials for a long time. Therefore, experience and excellent equipment is available for customer requests.

A two component injection moulding machine ENGEL Combimelt Victory 200H/200L/80 with exchangeable thermoplastic and rubber cylinders for each component and a two stations rotary table tool can be used for adhesion investigations for almost all material combinations. Even combinations with thermoplastic elastomers or with a metal component are feasible.



In addition to the great variety of applicable materials and material combinations, important process data can be measured and all relevant injection moulding parameters can be varied corresponding to the materials. In this way, an optimal adhesion for each combination can be achieved.

In co-operation with the Chemistry department at the DIK, further analytical investigations with regard to the interactions and bonding mechanisms in the interface between the different polymers can be realized.

If we piqued your interest, don't hesitate to contact us!

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