



Injection Moulding of Precise Micro Plastic Parts for Industrial Applications

mikrotechnik Freudenreich GmbH & Co. KG



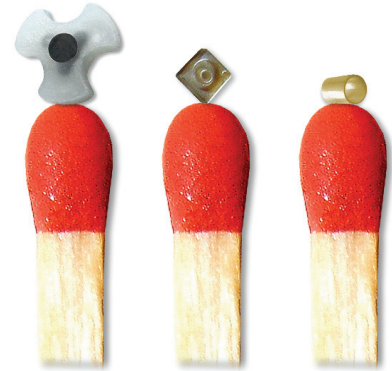
BACKGROUND and BASICS

Definition of micro plastic parts

- Part weight of a few mg (literature: < 1 g)
- Dimensions lower than 0.1 mm
- Surface structures in range of 10 µm

Why micro plastic parts?

- Miniaturization of existing plastic parts / systems
- Substitution of materials, e.g. metal, plastic
- Material properties, e.g. electrical behavior
- Reduction of production costs
- Combination of several functions or material properties



CONCEPT and SOLUTION

Fabrication of micro plastic parts

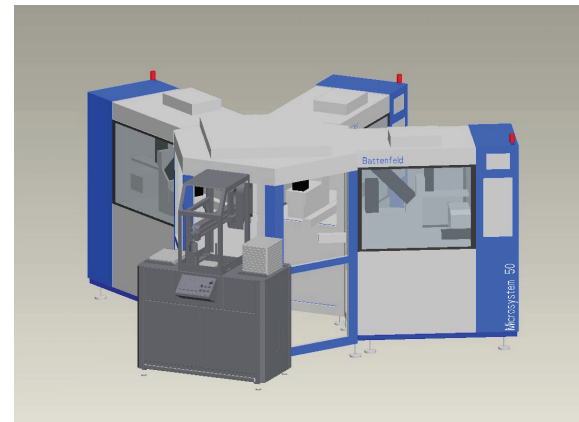
- Two injection molding machines are linked by a flexible exchange-module for the production of several kinds of plastic parts in respect of:
 - Pure plastic parts
 - Parts composed of different plastic components
 - Insert molding, e.g. inserted metal parts
- Hand-work place for small batch series
- Clean-room cell, parallel processes and automatically replacement of the parts inside the cell
- Packaging module



STATUS and OUTLOOK

Actual projects and status of development

- Micro MIM (metal injection molding) with complex structures and small wall thickness
- Reel to reel production for stamp-bending parts
- Design of production clusters to produce complete systems e.g. micro switches or sensors
 - Injection molding up to three components
 - Feeding of insert parts
 - Assembly stations
 - Test stations
 - Automatic packing station



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