

In-mold Labeling Micro Powder Injection Molding: Large Scale Production of Micro Structured Two-component Parts

E. Honza*, V. Piotter*, K. Plewa*

**Karlsruhe Institute of Technology –KIT, Institute for Applied Materials - Material Process Technology, Germany*

Abstract

The treatment of nano-scaled powder at powder injection molding (PIM) process is limited because of high viscosity at injection. By combining two shaping methods like tape casting with powder injection molding - the so-called In-mold Labeling Micro Powder Injection Molding (IML- μ -PIM) method enables to process nano- and micro-scaled powders in micro structured two-component parts. By this method a tape containing metal or ceramic powders is fixed in an injection mold insert and the PIM-feedstock is injected backwards. For the first investigations two zirconia powders, nano-scaled in tapes and micro-scaled in feedstock, were chosen. Different process parameters (tool temperature, injection speed and back pressure) were evaluated and the influences of these parameters on replication accuracy of the micro structure were investigated on green bodies. Furthermore the cross section of IML- μ -PIM-parts after adjusted co-debinding and co-sintering route show a defect free connection between the former tape and feedstock.