

Comparative study of micro powder injection-molding (μ -PIM) and simultaneous micro powder injection compression molding (μ -PICM)

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Abstract

The aim of this work is to investigate the powder injection compression molding (μ -PICM) by use of full factorials Design of Experiments (DoE) and to compare the accurate replication of micro structure with the micro powder injection molding (μ -PIM) process. The investigation was focused on simultaneous μ -PICM processing. The influence of compression force, compression speed, compression starting time and holding time of compression force was investigated by use of zirconia feedstock on a commercial injection molding machine including a micro structured mold insert. The results show that in comparison to μ -PIM an improved replication was produced with simultaneous μ -PICM process. The compression force and compression speed show a significant influences of the replication. Furthermore the position of the structure to the gate is relevant. The comparative research of μ -PIM and μ -PICM were carried out on green bodies and sintered parts.