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.