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Injection Molding of Zirconia(ZrO_2) Powder Considered Sintering Shrinkage

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This study has focused on manufacturing technique of powder injection molding of watch case made from zirconia powder. A series of computer simulation process was applied to prediction of the flow pattern in the inside of the mould and defects as weld line. The material properties of melted feedstock inclusive of the PVT graph and thermal viscosity flowage properties were measured for obtaining the input data in computer simulation. Also, molding experiment was conducted and the results of experiment showed that good agreement with simulation results for flow pattern and weld line location. On the other hand, gravity and inertia effect have an influence on velocity of melt front because of high density of ceramic powder particles in powder injection molding against the polymer injection molding process. In the experiment, the position of melt front was compared with upper gate and lower gate position. The gravity and inertia effect could be confirmed in the experimental results.