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## Green-Conscious Ceramic Injection Moulding

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Injection moulding provides an opportunity to produce complexly shaped micro components. The advantage of this technique is most of all the possibility to manufacture in high numbers of pieces with near-net-shape geometries without any post-processing steps. The present work focuses on the development of an alternative binder system for the application in micro ceramic injection moulding consisting of environmentally friendly polyethylene glycol (PEG) and polyvinyl butyral (PVB). In comparison to conventional binders based on wax this new combination has an important profit that the liquid pre-debinding step takes place in water and not in a toxic organic solvent such as hexane. In addition, these compounds allow further process simplifications by its economic and timesaving benefits. The results presented here cover all process steps from feedstock preparation to sintering of final micro parts. In comparison to literature significantly higher filler loadings with zirconia powder (TZ-3YS-E) of 55 vol% were achieved and reproducibly injection mouldable. The solvent debinding experiments showed that the best dimensional stability was found at room temperature where about 94% of the PEG-content was extracted after only 2 hours. Furthermore, removal of polymers can be performed just thermally without any deformation. A concluding sintering at 1450°C led to final defect-free products with a high density close to 100%.