

Silicone Mold Accuracy in Polyurethane Vacuum Casting

M. Wortmann^{1,*}, N. Frese², J. Brikmann¹, A. Ehrmann¹, E. Moritzer³, B. Hüsgen¹

¹ *Bielefeld University of Applied Sciences, Faculty of Engineering and Mathematics, Interaktion 1, 33619 Bielefeld, Germany*

² *Faculty of Physics, Bielefeld University, Universitätsstraße 25, 33615 Bielefeld, Germany*

³ *Faculty of Mechanical Engineering, Paderborn University, Warburger Straße 100, 33098 Paderborn, Germany*

* *martin.wortmann@fh-bielefeld.de*

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Abstract.

Vacuum casting of polyurethanes (PUR) in silicone molds is used industrially for the production of prototypes and small series as well as in various non-commercial research areas. This includes the reproduction of archeological findings, biological samples or electronic devices. In this study, we investigate the molding accuracy of different commercial silicones and PUR casting resins both on microscopic and macroscopic scales. For this, we used master forms produced by different 3D printing methods to generate silicone casting molds. The resulting PUR castings were investigated by helium ion microscopy, confocal laser scanning microscopy and optical 3D-scanning.