

DEVIATIONS MEASUREMENTS OF SLS PA MATERIAL AT COMPRESSIVE SPECIMENS

Ivana Jevtic^{1*}, Goran Mladenovic², Milos Milosevic¹, Isaak Trajkovic¹, Aleksa Milovanovic¹

¹Innovation Centre of the Faculty of Mechanical Engineering, Kraljice Marije 16 street, Belgrade 11120, Serbia

² University of Belgrade – Faculty of Mechanical Engineering, Kraljice Marije 16 street, Belgrade 11120, Serbia

*Corresponding author e-mail: ijevtic@mas.bg.ac.rs

Abstract

SLS technology is a popular choice in various industries worldwide because of its ability to produce complex geometry components with less effort when compared to conventional methods. The technology involves using materials in powder forms, such as polyamides (PA), polystyrenes, thermoplastic elastomers, and polyaryletherketones. In this study, the research focuses on compressive PA12 specimens with CAD model dimensions selected according to the ISO 604 standard, with bulk dimensions of $\text{Ø}10 \times 20$ [mm]. The study utilizes a Fuse 1 (FormLabs, Summerville, MA) 3D printer that employs the SLS technology. This printer is capable of producing objects with different shapes and dimensions simultaneously, provided that they are printed at a minimum distance of 5 [mm] apart. The research involves producing four batches of specimens, each differing in printing orientation (i.e., horizontal and vertical) and printing location (i.e., printed on the edge and in the middle of the powder bed). The printed specimens are scanned, and the obtained scans are compared with the original CAD model in the GOM Inspect program. The highest deviations in all four specimen series are in height, ranging from 0.1 up to 0.15 mm. In the case of vertical specimens printed in the middle of the powder bed, there are also deviations in the width of the specimen.

Keywords

SLS, PA 12, compressive specimens, GOM Inspect.

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