

# Exploitation of Forming of the 3D Printed Materials

K. Mäntyjärvi<sup>1, a)</sup>, T. Iso-Junno<sup>1, b)</sup>, A. Mustakangas<sup>1, c)</sup>, T. Jokelainen<sup>1, d)</sup> and  
M. Keskitalo<sup>1, e)</sup>

<sup>1</sup>*University of Oulu, Kerttu Saalasti Institute, Future Manufacturing Technologies (FMT), Pajatie 5, FI-85500  
Nivala, Finland.*

<sup>a)</sup>kari.mantjarvi@oulu.fi

<sup>b)</sup>terho.iso-junno@oulu.fi

<sup>c)</sup>aappo.mustakangas@oulu.fi

<sup>d)</sup>tero.jokelainen@oulu.fi

<sup>e)</sup>markku.keskitalo@oulu.fi

**Abstract.** This study explores the possibilities of exploiting forming operations of the 3D printed materials manufactured using selective laser melting (SLM) and fused filament fabrication (FFF) 3D printing methods. The exploiting of the forming operations has been examined in accordance with the following considerations: Joining by forming, security features based on the designed deformations of the construction, changing the local properties of the material by forming and design of the parts and constructions for easy manufacturing and assembly. The study was conducted by using exemplary structures to determine the possible benefits of the forming in different applications. The possibilities of the forming in the Design for Additive Manufacturing process were also taken into account and reflected on while conducting the investigation. Based on the results of the examination, it is recommended that the forming possibilities and limitations are acknowledged already preparation phase of the printing. The study also suggests that there is a need for more information and wider studies on the formability of the 3D printed materials.