

## Influence of Process Conditions on Additive Manufacture of Ti6Al4V Alloy by SLM Technology

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Selective laser melting (SLM) is the most widespread method of additive manufacture of metallic materials. Products are built up by selective melting of input powder material and joining it together successively in thin layers. The additive approach brings along many advantages of which the geometry freedom is the most outstanding and the most appreciated. Nevertheless, despite intensive research in the domain of additive manufacture, there are still some problems, such as insufficient shape precision and surface quality or occurrence of internal defects. These imperfections are related to a high number of variables entering the production process. Present paper thus deals with the influence of various process conditions on final product quality. Specifically, it is focused on preparation of tensile test samples of titanium alloy Ti6Al4V in three different orientations – horizontal, vertical and inclined. Mechanical properties documenting part quality along with microstructure analysis have shown that especially the material plasticity is strongly affected. Porosity, microstructural anisotropy and surface quality are all contributing factors.

**Keywords:** Titanium alloy, Ti6Al4V, Additive manufacture, SLM, process conditions

### Acknowledgement

*Authors wish to thank the Czech Science Foundation (project no. P108/12/G043) and specific university research (MSMT No. 20-SVV/2017) for the financial support of this research.*

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**Paper number: M2017125**

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