

**Effect of the Reuse of Powder on Material Properties of Ti6Al4V processed by SLM**

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The repeated reuse of excess powder is an essential part of the economics of powder-bed additive manufacturing processes. For selective laser melting (SLM) many studies cover the topics of material properties at micro and macroscale, however, little is known about the influence of the multiple reuse cycles of powder.

Titanium alloys, in particular, are sensitive to chemical contamination. Especially oxygen and hydrogen are an issue that leads to inferior material properties. Furthermore, grain size distribution and form change over time with an influence on build quality.

In this study the influence of used powder on the quality and material properties of the widely used titanium alloy Ti6Al4V is investigated with focus on porosity, surface quality, microstructure and tensile strength.