

# Bachelor- / Masterarbeit bei NMF

**Topic:** Influence of layer thickness and large deflection angles on electron beam melting of Ti-6Al-4V

**Commencement:** October 2022 (Language English or German)

**Abstract:**

The *Neue Materialien Fürth GmbH* is a research institute of the state of Bavaria at the border between science and industry. Together with the *WTM* we take the state-of-the-art EBM knowledge and transfer it to an industrial process.

One of these projects is the prototype EBM machine HELIOS, developed in cooperation with the chair *WTM* and the *probeam GmbH*. Currently, it is the EBM machine with the largest build tank worldwide. Further, an acceleration voltage of up to 150 kV and power up to 15 kW enables larger built areas than ever before. Additionally, an ELO detector system is available for in-situ process monitoring.

The scope of the thesis is to understand the influence of layer thickness and large deflection angles on the EBM process of Ti-6Al-4V. Due to the higher acceleration voltage, the electron beam can penetrate deeper into the material, which is beneficial for the process. Therefore, the influence of layer thickness could deviate from literature experiments conducted on conventional EBM machines. Secondly, the influence of large deflection angles is a focus of this investigation. This is important to make the whole build tank available for melting and consequently increase the productivity and enable the production of large parts via the EBM process.



Figure 1: Prototype EBM machine HELIOS.

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