



Deposition of particles on powder-based Additive Manufacturing

Quality of powder-bed systems by thin (powder) layer application

Powder-based Additive Manufacturing (AM) technologies (electron beam and laser) are widely used to produce complex parts. Quality of the manufactured parts depend on each process step to work correctly: from speed of powder layer application to melting. Resource efficiency and consequently sustainability relies of optimization of these parameters.

Aim

Assessment of potential increase in resource efficiency and sustainability by study of the powder layer application step.

Tasks and objectives

- Perform a scientific literature study to connect process efficiency to powder rheological properties in powder-based additive manufacturing. Identify improvements in the process.
- Test and review data of novel powder characterization techniques such as Revolution Powder Analyzer and FT4 to correlate with AM process.
- Compare properties of different materials for further optimization and conclusion on sustainability impact of the optimization via process speed.

With this project you will learn about metal AM processes and materials (powder) properties.

Litteraturförslag:

Zegzulka, J., Gelnar, D., Jezerska, L. et al. Characterization and flowability methods for metal powders. Sci Rep 10, 21004 (2020). <https://doi.org/10.1038/s41598-020-77974-3>

Cordova, L., Bor, T., de Smit, M., Campos, M., Tinga, T. Measuring the spreadability of pre-treated and moisturized powders for laser powder bed fusion, Additive Manufacturing, 32 (2020). <https://doi.org/10.1016/j.addma.2020.101082>

Målgrupp
M, TD, Z, I

Gruppstorlek
Mellan 3 och 6

Speciella förkunskaper
basic knowledge in materials technology and manufacturing technology.

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Kan det dubleras?
Ja / Nej