



Process chain powder-based Additive Manufacturing

Sustainability potential of metal-based Additive Manufacturing

Powder-based Additive Manufacturing technologies have a high potential as a sustainable production process for a group of applications with complex design, small batch production, and/or material novelty. The sustainability impact of AM manufacturing is key for further application and development.

Aim

Assessment of the powder-based AM process from a sustainability and life cycle perspective.

Tasks and objectives

- Perform a scientific literature study covering the powder-based AM process chain, the group will be divided in two: (i) materials and (ii) manufacturing processes.
- Review known benefits and challenges for those materials and processes and test different approaches to systematically assess the sustainable impact of powder-based AM process.
- Compare different materials and processes, focused on metal powder and powder-based AM process (laser and electron beam). This part will be carried out considering end of life (i.e. waste generation, critical raw materials extraction)

Litteraturförslag:

Ford, Simon., and Despeisse, Mélanie. "Additive manufacturing and sustainability: an exploratory study of the advantages and challenges." *Journal of Cleaner Production* 137 (2016): 1573-1587.

Ribeiro, Inês, Florinda Matos, Celeste Jacinto, Hafiz Salman, Gonçalo Cardeal, Helena Carvalho, Radu Godina, and Paulo Peças. 2020. "Framework for Life Cycle Sustainability Assessment of Additive Manufacturing" *Sustainability* 12, no. 3: 929.

Målgrupp

T.ex. M, TD, Z, I

Gruppstorlek

Mellan 4 och 6

Speciella förkunskaper

basic knowledge in materials technology and manufacturing technology.

Förslagsställare

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Kan det dubbleras?

Ja / Nej