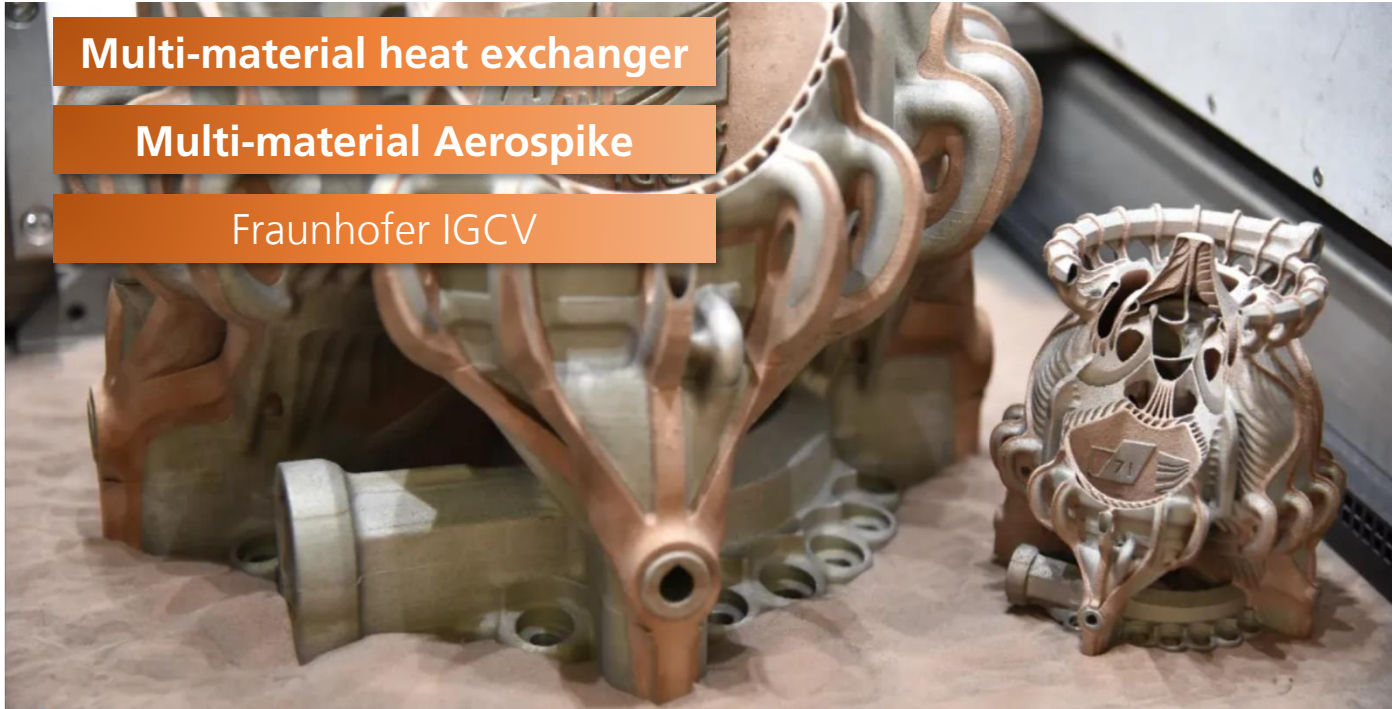


Multi-material heat exchanger

Multi-material Aerospike

Fraunhofer IGCV



Power bed fusion of metals using a laser beam (PBF-LB/M) offers unique possibilities to manufacture functionally graded materials (FGM) consisting of different alloys. These so-called multi-material parts enable their material properties to be tailored to local material requirements. In this paper, a new methodical approach for the production of metal FGM with transition zones oriented in different directions and manufacturing sequences of the different materials is investigated. Existing approaches for the manufacturing of these transition zones were enhanced with graded parameter variations, spatial laser movement modulation techniques (wobbling), and geometric approximations using a step-structure. For the validation of the approach and the characterization of the transition zones, the manufactured samples were investigated and characterized using optical microscopy and hardness profile measurements. Furthermore, the density of the transition zones was analyzed by image data processing. The feasibility of the presented methods was shown and the production of defect-free transition zones with controlled expansions for functionally graded materials via PBF-LB/M was achieved.

More information at the FhG forum:

- 📅 Donnerstag, 16. Mai 2024
- 🕒 12:05 - 12:35
- 📍 CongressCenter, Panoramasaal, 3 OG

Contact:

Timo Schröder
Tel. +49 821 90678-137
timo.schröder@igcv.fraunhofer.de

