

Additive Manufacturing for innovative aerospace parts - process route and characterization

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Additive Manufacturing (AM) is a beneficial extension of conventional production engineering. Especially, aviation and space are driving branches caused by the need for improved part designs yielding mass reduction as well as optimized functionalities. The AM process is only one step in the whole process chain of a fully useable part. Hence, attention will be also paid to pre- and post-processing. If the worst comes to the worst, an unfavorable finishing approach can fully destroy beneficial effects of the AM process. The right material usage, process parameters or heat treatment conditions also strongly influence the resulting part performance.

Powder bed-based and nozzle-based (wire and powder) AM processes can be used to build up parts ranging from a few millimeters to several meters. In most cases, high accuracy or high productivity can be achieved, whereas a combination is very difficult. Within this presentation, various parts and associated processing routes are discussed. Depending on part dimensions, the corresponding process chain has to be adapted to meet the requirements. The presentation will also highlight the importance of a suitable characterization. The latter includes material testing of small samples as well as analysis of finished aerospace parts.