

Measures and tools for quality assurance in metal AM throughout the entire manufacturing process

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In recent years, the use of metal Additive Manufacturing in materials processing has expanded beyond its early application in prototyping. Production approval has been granted for a variety of different materials in quality-sensitive industries such as aerospace and medical devices. The placement of quality measures throughout the entire manufacturing process is crucial in order to achieve the requested and specified quality assurance of the finished product.

Quality measures include: the inspection and certification of the powder; the analysis of defined test parts for every batch; powder transportation and handling (e.g. controlled inert gas atmospheres); the usage of proven and validated machine parameters for each material and layer thickness; online and real-time monitoring tools in the AM system including output, analysis and storage of the quality relevant data; and defined post processing steps.

The presentation will give an overview of different quality measures available, with a focus on the monitoring tools inside the system during the manufacturing process. Four different elements are available including System Monitoring, Powder-bed Control, Melt-pool Monitoring and the new Exposure OT (optical tomography) unit that ensures consistent build quality.