

Learnings ISAM 2019

29 to 31 January 2019

The **International Symposium Additive Manufacturing 2019 (ISAM)** brought together **300 industry representatives, scientists and press representatives** in Dresden to discuss the latest findings and development perspectives in **additive manufacturing** during three densely clustered symposium days. In spite of the competitive competition, **outstanding speakers** presented themselves in Dresden. In particular, they showed their appreciation for presenting themselves at this **performance show** of additive manufacturing.

- **Materials** are absolute key to success:
 - As the contributions at ISAM 2019 showed, a thorough understanding of the materials is necessary in order to be able to drive forward further development in conjunction with the increasing demand for diversity.
 - The development especially for the additive production of designed materials is gaining enormous importance.
 - In additive manufacturing, material and component are created simultaneously, so knowledge of the interaction of process and material is key to manufacturing high-quality and reliable products.
 - Post-treatment processes after the AM process can be decisive for the mechanical properties. They offer great potential without the actual AM process having to be changed and this could possibly result in a loss of productivity. If it is possible to tailor properties in post-treatment (essentially by heat) without intervening in the process, economic advantages will result.
 - New materials require adapting the process technology (e.g. use of blue or green lasers for the production of AM building materials from copper).

- **Processes** such as powder bed and powder nozzle systems are established:
 - However, they are still challenged by processes such as binder jetting and the wire process. Message: There are alternatives!
 - It is not yet clear which processes will prevail in future. This is strongly application-dependent and driven by component qualities.
 - Current structural sizes range from the ten-micrometer scale to meter-sized components.
 - Complex system configurations (e.g. use of several laser sources) improve process efficiency and simultaneously optimize technological properties such as distortion.

- **Approval** still involves major hurdles that need to be overcome:
 - Especially for aviation.
 - There are still too many unknowns (in terms of material properties, reproducible manufacturing processes or defect influences) to allow "simple" (time/short-term) approval.

- **Interest** in additive manufacturing continues unabated:
 - Best practices in industrial implementation are followed by imitators (example: aviation).
 - Implementing the "GE-Nozzle" in the industrial series has led to both airframe manufacturers and engine manufacturers including additive manufacturing as a key technology in their technology portfolio.

- The big question is still the same: How can you earn money with AM? > Answer: By focusing on products that are so geometrically and/or functionally complex that they cannot be manufactured using conventional manufacturing processes or can only be manufactured at an unacceptably high cost (example: optical bench of the Advanced Telescope for High-Energy Astrophysics Athena for ESA).
- **Standardization** is important and will remain important, but it can
 - be an obstacle to innovation.
 - not replace knowledge.
- Position of the **Additive Manufacturing Center Dresden (AMCD)** of Fraunhofer IWS, TU Dresden, Agent-3D and DRESDEN-concept in the international concert:
 - AM is being promoted particularly in the industrial nations (Europe and USA; increasingly in China, where large funding programs are driving technology development).
 - AMCD is the core and starting point of the largest national initiative for additive manufacturing, Agent-3D, which marks the leading position in Europe-wide comparison in research and development of additive manufacturing towards a serial production process. Due to its bridging function between basic research, application-oriented research and industrial application, the Center is a pioneer in Europe.
 - In addition to public funding, there is now extensive industrial project funding.
 - It can be seen that the work of the AMCD leads to implementable product ideas.
 - AMCD addresses the entire process chain and spans the degree of technological maturity from laboratory scale to production introduction (TRL 1 to 8).
 - Hotspot Dresden: ISAM 2019 underlined the size of the R&D activities at the site. The guests experienced first hand the research fields' breadth (aviation, aerospace, medical technology, automotive, toolmaking and energy).
 - 100 scientists, technicians and students are dedicated to additive manufacturing at AMCD.

Facts and Figures

- Participants
 - Total: 300
 - Business Forum: 183
 - Open Lab: 198
 - Evening event: 183
- Speakers/Chairs: 38
- Pitch Presenter: 10
- Poster contributions: 40
- Exhibitor at accompanying fair: 24
- Sponsors: 5