ICAM26

International Conference on Advanced Manufacturing

Research to Application through Standardization

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Industrial Sector: Aviation, Aeronautical Systems for Crewed & Uncrewed Aerial Vehicles

The aviation industry, including crewed aircraft and the rapidly growing field of uncrewed aerial vehicles (UAVs), is increasingly adopting advanced and additive manufacturing (AM) technologies. Despite this momentum, significant opportunities remain to fully realize the benefits across all applications. The potential is undeniable, with key drivers including cost savings, schedule optimization, functional improvements and weight reduction particularly as manufacturers seek to redesign existing components, consolidate part counts, introduce new design concepts, meet environmental sustainability goals and enable the on-demand manufacture of spare parts.

Progress in material developments, process stability, digital process controls, and data-driven design methodologies are accelerating adoption and demonstrating its potential for both emerging and legacy aviation applications. Despite this progress, challenges persist. While the industry works to integrate AM into high-criticality structures and flight-critical applications, central barriers remain, such as qualification and certification, supply-chain readiness, economic viability and industry-wide acceptance across crewed and uncrewed systems alike.

As technology and applications mature, it is essential to evaluate the effectiveness of current practices, identify gaps and determine where standards, regulatory guidance and digital manufacturing frameworks need to evolve. This will support safe, consistent and cost-effective implementation of advanced and AM technologies across aviation, including UAV operations and autonomous air systems.

Topics of interest include but are not limited to:

- Role of public standards in Q&C frameworks.
- Airworthiness considerations, regulatory requirements and qualification and certification strategies for advanced manufacturing technologies on aviation and UAVs.
- Testing and quality assurance of AM parts, processes, and feedstock materials, including in-situ monitoring and digital inspection methods.
- Industrialization of AM in Aviation and UAV production.
- Success stories and lessons learned from failed or challenging AM implementations in high-criticality applications.
- Aviation and UAV business cases and cost-benefit considerations.
- Supply chain readiness for Aviation.
- Acceleration of AM adoption across the lifecycle through computational and model-based approaches.
- Qualification of non-fixed parameter processing.
- Introduction and validation of new materials (alloy modifications, novel materials, functional grading and material allowable development).
- Impact of AM on maintenance including repair, replacement and overhaul.
- The role of AM in aviation to support environmental sustainability goals.
- Impact of AI on design, development and quality assurance for AM.

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