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GKN Aerospace

Topic

Additive Manufacturing in Aerospace: Emerging Trends and Technological Challenges

GKN Aerospace is a leading supplier of products and services to both commercial and military aircraft manufacturers being also a partner in the European Space. We aim to cover the high demand for commercial airplanes by manufacturing components with high performance via Additive Manufacturing. This presentation explores the latest advancements in AM technology development, in Additive Manufacturing, highlighting the significant progress made in materials, processes, and design methodologies at GKN Aerospace for shaping the future of aerospace technology.

Additive manufacturing (AM) has potential to revolutionize the aerospace industry by enabling the production of complex, lightweight, and high-performance components to cover the demands of both commercial and military aircraft components.

Despite these advancements, several challenges remain, including issues related to material properties, process reliability, and quality assurance.

The presentation also examines emerging trends in AM, such as the integration of artificial intelligence and machine learning for process optimization, the development of new materials tailored for AM, and the adoption of hybrid manufacturing techniques. By addressing these challenges and leveraging new trends, the aerospace industry can fully realize the potential of AM to enhance the performance and efficiency of aerospace components.

While AM allows for the use of a variety of materials, which may not be suitable for aerospace applications. The development of new materials that can withstand the extreme conditions of aerospace environments is ongoing, but it remains a challenge to find materials that offer the necessary performance characteristics.

Ensuring consistent quality and accuracy in AM-produced parts is a significant challenge. Variations in material properties and microstructure can lead to inconsistencies that are unacceptable in aerospace applications, where safety is dominant.

The aerospace industry has strict certification and regulatory requirements. Developing and validating protocols to ensure that AM components meet these standards is a complex and time-consuming process. Regulatory bodies and industry stakeholders must work together to establish these standards.

About the Speaker

Education:

- BSc. Metallurgical engineer, UAM México City
- MSc. Advanced Materials Science and Engineering
Double degree by UPC, Barcelona and LTU, Sweden
- Ph.D. Materials Science
Luleå University of Technology, Sweden
Engineering Sciences and Mathematics Department
The thesis focused on hot cracking of micro alloyed steels during continuous casting.
Collaboration between Swerim Research Institute and SSAB Europe

Professional Experience:

- Actual position: Senior Research Engineer, Specialist Materials & Processes
GKN Aerospace, Sweden
Working in the Technology development for Additive Manufacturing for aero-engine components
- Other experience: Product development and process optimization with expertise in continuous casting, forging, and hot rolling components for automotive and aerospace.
Project management in National and International (EU and Swedish) projects.