



AEROSPACE ADDITIVE MANUFACTURING SUMMIT

First additive manufacturing event dedicated
to the aerospace industry



TOULOUSE | DECEMBER 3-4, 2019

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WORKSHOPS

WEDNESDAY, DECEMBER 4, 2019

Morning session

09:20 – 09:50 GD TECH: A New design cycle thanks to additive manufacturing. Illustration based on a T-piece, part of a wing leading edge de-icing system

- Benoit GICQUEL, Director
- Sébastien GOHY, R&D Project Manager in charge of Additive Manufacturing

In the last few years, GDTech was part of several research projects dedicated to Additive Manufacturing. One of them, FASAMA, more specifically addressed the design of aerospace parts, and allowed the definition of a proper design cycle. We will present and illustrate this new concept using a challenging application: the redesign of a connecting T-Duct, part of the de-icing system of a wing leading edge. Commercial numerical tools, their strengths and their shortcomings will be discussed in light of this project. Topology optimization, Design for Additive Manufacturing and Process Simulation, all were major tools that enabled GDTech and Sonaca to successfully produce an enhanced AM version of this part.

09:55 – 10:25 PRINTSKY: Develop Heat Exchangers in Additive Manufacturing

- Nicolas CORREGE, 3D Impression Manager

At a time when environmental issues are at the heart of concerns, industrial players in the aeronautic sector are evolving toward the development of more electrical products. The performance and the volume constraints of these equipment have to be taken into account, and the current technologies are not answering fully these new requirements. Additive manufacturing, an innovative technology, is very relevant for thermal applications. PrintSky (joint-venture between SOGECLAIR and AddUp) will present its revolutionary heat exchanger in metallic additive manufacturing, developed in partnership with Temisth. It has an innovative geometry that allows optimized integration in a constrained environment and allows to meet the challenges of tomorrow.

10:30 – 11:00 EOS: Latest Developments with Major Aerospace OEM's and Airlines regarding adoption of Additive Manufacturing for flightworthy parts

- Vinu VIJAYAN, Global Business Development Manager

The value provided by Additive Manufacturing (AM) has been found to be immense by the Aerospace industry, despite the sophistication of the technology,. AM is being, step by step, integrated into the product development as well as manufacturing strategies in the aerospace industry. EOS' presentation will showcase the latest status of AM adoption in Aerospace. It will focus on 2-3 of the most mature applications, in terms of criticality & business case, both in Polymer & Metal based AM for Aerospace. The key success factors for these applications & projects will be highlighted.

11:05 – 11:35 LISI AEROSPACE Additive Manufacturing

- Jules BAROT, Key Account Manager

For years, DASSAULT AVIATION and LISI AEROSPACE ADDITIVE MANUFACTURING have worked together in order to develop the range of serial flying parts made by Additive Manufacturing (AM). The first parts identified as candidates to be manufactured with AM were in stainless steel, which led to the qualification of a dedicated machine. Different aircraft programs are concerned and problems to be solved are various : small serial quantity of complex parts for the RAFALE, highly-finished products on F8X, ATL2 retrofit or customization products for F2000 MRA. On each of these aircrafts, LISI AEROSPACE AM supports DASSAULT AVIATION by providing its know-how to manufacture high value added products that benefit the most from the technology and works closely with the design teams to optimize the design of the products. In order to further enlarge the range of products, DASSAULT AVIATION has decided to qualify our Concept Laser X LINE 2000R on AISi7Mg0.6. Goal: manufacture in 2020 the demisting tubing for the RAFALE in one component rather than welding different ones. Others parts will be progressively be added to the list of serial flying parts.

11:40 – 12:10 IRT SAINT EXUPERY: Design of "lattice" structures in additive manufacturing: a multi-scale approach

- Ludovic BARRIERE, Research Engineer

The "lattice" structures are likely to provide considerable added value for the aeronautics and space industry. The exploration of the potential of those structures by engineering offices is currently limited by the knowledge, tools and models available for their design and in-service behaviour. Through a multi-scale experimental and numerical approach, the IRT Saint Exupéry in collaboration with the IRT SystemX will present an original scientific and technological method to measure and quantify variabilities inherited from geometric, metallurgical and mechanical scattering. This method has been used to develop more robust industrial design tools for lattices structures.

12:15 – 12:45 Financing of Innovation an Industrialisation Projects : Overview and Trends

- Hanna-Kaisa SAARI, EIT & DIH Program Manager, AEROSPACE VALLEY
- Irène MAILLET-LESTRADE, Project Manager Innovation Aerospace, LA REGION OCCITANIE PYRENEES MEDITERRANEE
- Claire MARTRET, Business Manager Innovation, BPI France

The development of Additive Manufacturing requires the support of official organizations. This session involving representatives of these organizations will summarize past actions and explain the upcoming devices to accelerate the integration of Additive Manufacturing by the Industry.

Afternoon session

14:00 – 14:30 BEAM: Towards the industrialization of the DED technology

- Frédéric LE MOULLEC, Business Development Director

The Directed Energy Deposition technology developed by BeAM is an Additive Manufacturing process where focused thermal energy is used to fuse materials by melting them as they are deposited. It opens a whole new range of applications for the repair, manufacturing and hybridization of parts, especially in the aerospace industry. The industrialization of this technology is accelerating with the design of specific machines, the extensive work of R&D platforms and the integration of advanced process monitoring systems.

14:35 – 15:05 NORMANDIE AEROESPACE: Standardization in the field of Additive Manufacturing – Scope and Progress

- Stéphane BOILEAU, R&D Engineer at Analyze and Surface, Expert Powder UNM 920

Additive manufacturing Technology proliferated this last years because its usefulness in building prototypes and finds industrial applications in several sectors. The Additive Manufacturing Standards are designed to ensure products, services and systems are safe, reliable and consistent. Lots of works have been done this past years to define this standards in collaboration between all organization involved such as : UNM920, ISO, CEN, ...

These standards are intended to promote knowledge of the industry, help stimulate research and encourage the implementation of the technology. This workshop will introduce you the scope of these activities and will inform you on the national and international main projects in progress in the standardization committees (ISO, CEN, ASTM ...) in order to anticipate the next evolutions.

15:10 – 15:40 NOVITOM: Synchrotron X-ray microtomography, a powerful tool for advanced NDT and 3D material characterisation adapted to additive manufacturing

- Olivier GUIRAUD, Sales Manager

X-ray microtomography is a powerful imaging technique that has proven to be an effective tool for non-destructive 3D inspection. Nowadays, it is more and more employed as a standard characterisation method in R&D applications as well as a means of control in production line. It can be applied to nearly all kinds of materials and types of parts. The use of X-ray synchrotron sources pushes back the limits of the technology and offers the possibility to inspect at high resolution large parts without cutting them. It provides outstanding image quality and enhanced phase segmentation capability thanks to phase contrast imaging mode. In addition, the high brilliance of sources allows ultra-fast acquisition for the follow-up of process in real time. The presentation will be based on concrete examples such as the rugosity characterisation of surfaces in AM parts inaccessible with conventional techniques, the dimensional control by 3D mapping the geometrical deviation from CAD files, or even the detection and analysis of cracks inside metallic components.

15:45 – 16:15 MSC SOFTWARE HEXAGON – FUSIA AEROADDITIVE: From design to manufacturing – Real industrial feedback on the use of simulation tools in Additive Manufacturing

- Matthieu PERENNOU, Sales and Business Development Director EMEA Region – Simufact
MSC SOFTWARE HEXAGON
- Arnaud VOTIE – Director Research Development and Innovation - **FUSIA AEROADDITIVE**

Fusia – one of the pioneer of metallic AM printing in France – and MSC/Simufact will present pragmatic, state-of-the-art AM-dedicated numerical solutions from AM-specific generative design to SLM process simulation and cost estimation, as well as real life, practical examples and feedback on the use of simulation in the frame of industrial projects and applications.

16:20 – 16:50 BURLOAK TECHNOLOGIES: Delivering serial production flight components using additive manufacture – A Challenge that is not for the feint of heart

- Peter ADAMS, Founder and CEO

In today's market it seems that every day another company is announcing how they used AM to make a pretty looking organic shape and explaining how it can change the way parts are made. The reality though is that making these prototype parts is not that difficult in and of itself, but there remains a "reality chasm" to be bridged on the journey to true serial production of flight parts and this is a much more challenging proposition. In this talk, Peter Adams will explain the journey and the challenges that his team have had to overcome in developing serial components for space and aerospace that capitalize on AM technology using multiple materials and multiple AM modalities. In the discussion Peter will explain Burloak's journey to qualification and what they are doing to grow their position as a major supplier of AM production components in aerospace.