



Rapid.Tech (14 – 16 June 2016), Messe Erfurt

**Additive Manufacturing in the medical and dental technology industries
Shifting the focus to process and quality control and risk management**

Erfurt, May 2016: In fields from orthopaedics to implantology and dental technology, the huge amount of design and manufacturing freedom provided by Additive Manufacturing (AM) and industrial 3D Printing processes enables products to be customised for individual patients. So it is perhaps no wonder that the medical and dental technology sectors are two of the areas in which AM has already become widely established. As it grows, aspects such as process and quality controls, licensing and risk management are starting to come more to the forefront. These topics will be discussed as part of the “Medical Technology” and “Dental Technology” trade forums at the 13th Rapid.Tech. The international Additive Manufacturing trade show and conference will be held in Erfurt from 14 – 16 June 2016.

Every person’s body is unique. Which is why custom-manufacturing implants, orthopaedic technologies and dental care products for individual patients is such a challenging process. We need perfectly tailored individual or small batch products that are cost-efficient and quick to manufacture, and that fulfil the highest quality demands both in terms of materials and of processing methods. One process that can meet these demands is Additive Manufacturing, which is becoming increasingly widespread in the medical and dental technology sectors.

“In recent years, the various industrial 3D Printing processes for manufacturing implants have been become increasingly popular. Now the discussion is more about topics such as risk management and process and quality control,” says Ralf Schumacher, Head of the Medical Additive Manufacturing Laboratory at the University of Applied Sciences and Arts Northwestern Switzerland, and the convenor of the “Medical Technology” trade forum (15 June 2016) at this year’s Rapid.Tech. One of the talks at the forum will consider the 200 or so risks which have to be managed in the manufacture of metallic implants using laser melting processes, including repeat



accuracy and contamination. It will describe how to design counter-measures and create a quality assurance process. Options for cleaning and mechanically testing titanium mesh structures will be discussed in another of the talks. The influence of structural orientation on the mechanical properties of open-pore, selective laser melted structures made from the titanium alloy TiAl6V4, often used to replace bone, will also be covered. Another topic being presented at the “Medical Technology” forum will be the results of, and outlook for, the development of patient-specific orbital floor implants using industrial 3D Printing processes. The forum will also provide insights into new applications, with talks on the use of Additive Manufacturing for customer-specific lenses and customisable feet for prostheses. The programme will conclude with a report from a company specialising in the additive manufacture of serial implants and custom made devices, as well as surgical instruments and tailored prostheses, using titanium and stainless steel.

Innovations to optimise quality in dental technology

“Most of the processes within the field of dental technology have already been digitised. However, there is still the challenge of quality control to contend with”, explains Antonius Köster, CEO of Antonius Köster GmbH & Co. KG and the convenor of the “Dental Technology” trade forum (16 June 2016) at Rapid.Tech. This topic will be a key area of focus at the event. Amongst the highlights of the forum will be the presentation of a prototype developed as part of a sponsored research project, HybriDentCT. The innovative hybrid computer tomography device combines optical and CT scanning technologies in a single machine, merging the two sets of data. It is the first device to provide a complete, uninterrupted assessment of dental prostheses manufactured using CAD/CAM processes. It can not only visually check whether the prosthetic has the correct dimensions automatically, but can also identify cavities, tears and material imperfections inside the object itself. Until now, there has not been a testing method available that could cope with the degree of intricate design made possible by using additive and combined manufacturing processes to create dental prosthetics. Participants can also look forward to the unveiling of a new metal printing technology by Israeli company XJET. Its latest innovation enables metallic components to be 3D printed at high resolution using special inkjet printing processes, which also



have the potential to be used with other materials such as ceramics. Another of the forum's talks will focus on quality assurance and control in laser melting for the dental technology industry. Aspects covered will include powder quality, graining, energy inputs and processing temperature. CAD/CAM and Additive Manufacturing have led to new processes and procedures that will require qualified specialists. Which is why the Technical University of Cologne is introducing a new course entitled "Additive Manufacturing and CAD/CAM Processes". Its talk will provide information on the content of the qualification. The trade forum will also explore how a traditional dental technology task – manufacturing a full denture – can be optimised using an innovative process. Dental work and laboratory-based processes can now be combined into a single, digital workflow to ensure higher productivity, reproducibility and cost-effectiveness. An overview of the processes, raw materials and what can be produced, will also be on the programme.

"There are very few other technologies that are spreading and developing as rapidly as Additive Manufacturing. To reflect this, we have added the "3D Metal Printing", "Additive Contract Manufacturing", "Electronic Engineering" and "Automotive Industry" forums to the established Rapid.Tech programme. We have also added a third day to the event to help us explore these areas in greater depth", explains Wieland Kniffka, CEO of Messe Erfurt GmbH. The complete conference programme is available at www.rapidtech.de. All presentations will be simultaneously translated (German<>English).

Thanks to its unique combination of trade show and specialist conference, Rapid.Tech in Erfurt is amongst the world's foremost events in the field of Additive Manufacturing. For the fourth time, FabCon 3.D Germany's 3D printing fair for semi-professional users and prosumers, will be held in parallel with the event.

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