GARPA Column

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The 12th 'Assises Européennes du Prototypage & Fabrication Rapides' (European Forum on Rapid Prototyping and Manufacturing) was held recently at Ecole Centrale Paris (ECP), in France. ECP houses the pioneering French rapid prototyping centre CREATE (Rapid Prototyping European Center for Assistance, Transfer and Experiment), which was originally founded in 1991 by Prof. J.C. Bocquet, Dr. C. Mony and myself. I should also state that I am currently Vice President of the French Rapid Prototyping Association (AFPR), which was one of the founding members of GARPA. As such, Mr G. Taillandier, President of AFPR, proposed that ECP played host for the 2008 event in France. And so it was, the event took place 4–6th March 2008. It was a very productive event with 15 exhibitors consisting of machine and software vendors; service bureaux; and technical centres. 120 attendees participated in the three-day conference, which was primarily dedicated to the direct fabrication of metallic and plastic products (parts and tools) and also reverse engineering with a demonstration of HandyScan sensors from Creaform3D. As is traditional at this event, AFPR made a series of awards for works of excellence within this sector and details are presented here.

Best Part: BV Proto, France
Direct Fabrication by SLS of a Bronze Complex Part

BV Proto is a young company specialised in the direct manufacture of metal parts. The part is a demisting tube for the pilot station of the two-seat Rafale from Dassault Aviation. Requiring 30 parts per year, the client previously manufactured it in two parts: the upper part in Kevlar, the lower part was machined in aluminium. BV Proto undertook this project, manufacturing it in bronze alloy, in layers of 20 μm, on its EOSINT M270 machine. The positioning of the piece to optimise the supports, honeycomb in nature to ensure best results was key to the success of this project. BV Proto manufactured 30 parts in 10 days compared with four months previously, at half the cost and with a better dimensional accuracy.

Best Study: Auckland University of Technology - NZ
The Spengler Cardiovascular Lab: A Case Study in RP as Design

Time-to-market is a critical factor for the development of hi-tech products, which often include mechanical, software and electronic sub-systems. The use of true concurrent engineering and the 'rapid prototype as design' (RPaD) methodology, combined with the ability to effectively integrate virtual and physical RP technologies into the development process increases the potential of producing new products in shorter timeframes. This case study presents a complex project involving a variety of technologies, including electronic, physical, mechanical and software prototyping. The study was developed for the French medical instruments manufacturer, Spengler, and enabled the Auckland University of Technology to demonstrate that it is possible to significantly reduce time-to-market using additive technologies for the manufacture of its products.

Best Application: AGTX RP - France
Qualification of Direct Fabrication for the Aeronautic Sector

AGTX acquired its first laser sintering (LS) machine — an EOSINT P700 — four years ago. Today, the company has four LS machines and a Vantage SE. The motivation behind this machine line up originated from the investigation into producing direct composite work pieces, which traditionally required tools, a draping and a complete steam curing cycle. Initial test parts made from fireproof powder, proved the veracity of the process. After a year of tests and development in collaboration with Dassault Aviation and EOS, AGTX obtained qualification for its direct manufacturing process for the civil and military aviation industries. From the 3D CAD data provided by Dassault Aviation, AGTX now manufactures series Class 3 parts for the Falcon 7X, reducing delivery time and manufacturing costs.

Special Award: Irepa Laser - France
Fabrication of Mechanical Components by Direct Additive Laser Manufacturing

Laser micro-rebuilding is a process of surface treatment obtained by laser metal powder projection that allows the development of dense and low-size deposits. The process offers excellent mechanical characteristics and can be employed for the realisation of small 3D objects. A coaxial tube of micro-rebuilding was developed in order to carry out fine walls (500-600 μm) or thicker (1500 μm) in an omni-directional way, with low power using a laser with a fibre. From test results and for digital simulation tools, the process was optimised and currently allows the construction of small machine elements with deposition output reaching 55%. Parallel to these developments, work implementing a tube based on the same principle, but with more power made it possible to validate the process for the realisation of larger parts, specifically from a technical-economic point of view. This special award was presented to Irepa Laser to acknowledge the promising progress made, indeed, these developments point to multi-material manufacture under conditions of manufacturing productivity.

For more information: www.afpr.asso.fr /content/assises/2008/AN/v_index.htm

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