

ABSTRACT

In the last decade, Additive Manufacturing (AM) represents the strongest revolutionary technology in manufacturing. This technology provides smart solutions to manufacturing issues that have so far limited the imagination in mechanical design. Design Freedom, lightweight structures and independence from economies of scale are just few of the benefits provided by AM.

However, the adoption of AM requires radical changes in approaching design and production. New concepts and rules should be introduced throughout the whole product life cycle and critical issues should be assessed to maximize its exploitation.

The seminar aims to increase confidence in Additive Manufacturing potential and to face the challenges that still characterized these technologies, such as the creation of a continuous process between the AM process and the subtractive post-process, a secure data transfer and the new materials potential.

AGENDA

1:45 PM Participant Registration

2:00 PM Giulia Brogna, CRIT, Introduction

2:10 PM Edwin van den Eijnden, TNO, "Industrial AM for functional polymer parts"

2:50 PM Martin Holland, PROSTEP "IP-Protection and Licensing of 3D-Printed Processes with Blockchain Technology"

3:30 PM Coffee Break

3:45 PM Paolo Veronesi, UNIMORE "Materiali metallici e trattamenti termici per l'AM"

4:25 PM Further (Q&A)

5:00 PM End and short buffet



NUCLEI

The seminar is included among the activities carried out by CRIT within the European Project NUCLEI. The NUCLEI project, of which CRIT is the coordinator, gives the chance to companies to be involved in:

- Working tables and cross-national comparison on technological / organizational / management issues
- Thematic seminars on research and development activities, which may also support technology transfer activities.
- Network of companies sharing resources, strategies and competences



CRIT is a private company specialized in collaborative innovation and in the research and analysis of technical and scientific information.

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In collaboration with



Tips and Tricks of Additive Manufacturing

6th December 2017

Aula 216—CNR

via Gobetti 101, Bologna

Industrial AM for functional polymer parts



TNO is developing equipment for printing functional polymer products. In order to industrialize the Additive Manufacturing process for producing functional polymer parts, high demands are put on equipment, process and material. Aspects that become more important are among others: cost per part, the quality/reproducibility of the parts and interfacing with other processes. TNO has developed innovative solutions for these aspects. In the presentations the different aspects are highlighted and further discussed.

TNO innovation
for life

TNO (Netherlands Organisation for Applied Scientific Research) is one of the major contract research organisations in Europe, staff of approximately 3000 and an annual turnover of 500 million Euros. TNO functions as an intermediary between basic research organisations and industry. TNO's department of Additive Manufacturing focuses on AM processes, materials and AM equipment manufacturing. Twenty three FTE's are dedicated to AM related research whereas another fifteen are in supporting technologies (software, machine shop, AM fab lab). Successful IP track record (20+ granted) and AM machine exploitation examples (e.g. Printvalley AM machine).



Edwin van den Eijnden received his MSc. in Mechanical Engineering from the TU Delft in 1998 after which he joined TNO as a control engineer. The past 5 years he worked in the department Equipment for Additive Manufacturing and focused fully on Additive Manufacturing. The main focus here is on research and development projects for industrial polymer AM equipment.

IP-Protection and Licensing of 3D-Printed Processes with Blockchain Technology

3D printing has the potential to revolutionize value added chains such as prototype construction and spare parts management. When it comes to the globally distributed manufacture of components, it must be guaranteed that only authorized persons have access to the data, that only the original data is printed, and that this data cannot be misused to manufacture pirate copies following its authorized use. This is particularly important when security-critical components are involved. PROSTEP is therefore developing a secure additive manufacturing platform (SAMPL) together with different partners based on the data exchange solution OpenDXM GlobalX and using blockchain technology. These development activities are part of the PAiCE funding program. PROSTEP expects this to open up new markets in the field of additive manufacturing and other areas of application in which the authenticity of product data has to be ensured.

PROSTEP
integrate the future

PROSTEP AG is recognized as a partner to the leading manufacturing companies worldwide. We count the top companies in this industry among our customers. PROSTEP is an independent consulting and solution development company, but also supplies ready-made product solutions. Our strength lies in a combination of industry-specific expertise, process know-how and technological competence. We offer our customers competent consultancy services, a comprehensive range of other services, and innovative solutions covering every aspect of product lifecycle management.



Dr. Martin Holland, who was born in 1961, was head of sales at PROSTEP from 2001 to 2015. Today, as a member of the management board, he is responsible for strategy and business development at PROSTEP AG. It is in this capacity that he is driving forward the topics Industry 4.0 and IoT

Materiali metallici e trattamenti termici per l'Additive Manufacturing

Metal Additive Manufacturing is today wide employed in several industrial sectors. However, 3D printing has been sometimes mistrusted, due to the instable outputs obtained by the use of different powders, different constructive strategies or post-treatments. The presentation will provide the metallurgical point of view to Additive Manufacturing, highlighting how the conventional heat treatments are not always suitable for this innovative technology. Other questions that the presentation want to answer are:

- the effective degree of powders recycling;
- the influence of metal powder production on the final 3D printed part;
- the expected properties of a metal component obtained by additive manufacturing;
- The effect of porosity on the expected properties;
- how heat treatments can mitigate any critical issues without the decline of other mechanical properties



The "**Enzo Ferrari**" Department of Engineering was founded in the Academic Year 1990-91. The Department regularly cooperates with renowned firms in the car manufacturing, chemical, mechanical, ceramics and biomedical fields, as well as enterprises in the sectors of information technology, telecommunications and industrial electronics. The Department has benefited from this productive network, and over the years it has improved and has further developed the high quality level of its research and technological application.



Prof. Paolo Veronesi received his Ph.D. in Materials Engineering at the University of Modena and Reggio Emilia. His research activity is mainly focussed on the thermal applications of microwaves, trying to develop new processes or to enhance materials properties.