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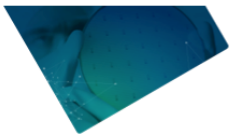


Hyb-Man to transform production of smart electronic systems using 3D manufacturing methods

A project within the EUREKA PENTA programme

Paris, 5 April 2018 – The EUREKA PENTA funding programme, managed by AENEAS, today highlights the Hyb-Man project. The Hyb-Man (Hybrid 3D Manufacturing of Smart Systems) project is developing additive manufacturing methods (also known as 3D printing) to enable flexible, first-time-right production of smart systems for lighting and automotive applications. Partners in Hyb-Man aim to develop 3D manufacturing as a core production technology. This will be combined with automated assembly and integration of electronic parts, design rules, in-line testing and quality monitoring. Together, these will make the entire production process more flexible. Manufacturers will be able to respond rapidly to changing market demand, expand their product diversity, offer cost-effective manufacturing of small product runs, and produce designs and form factors currently not possible.

The market for electronic products is evolving, with growing demand from manufacturers for customised and semi-bespoke solutions. However, up to now, the emphasis has been on mass production of standardised components and assemblies. Electronic products are made from separate devices and components, in a series of semi-automated processes, and then tested as a complete assembly. This requires dedicated production lines and specialised tooling. In addition, such manufacturing often relies on low-wage economy labour and transportation of parts around the world. Hyb-Man will transform this situation by basing core production on the digital processes of 3D printing which eliminate the need for dedicated manufacturing lines and product-specific tools.

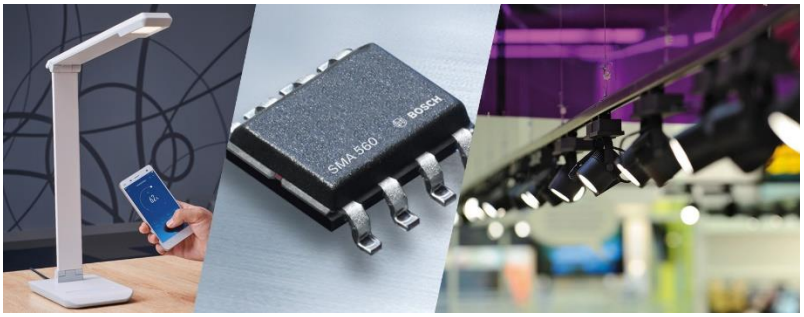


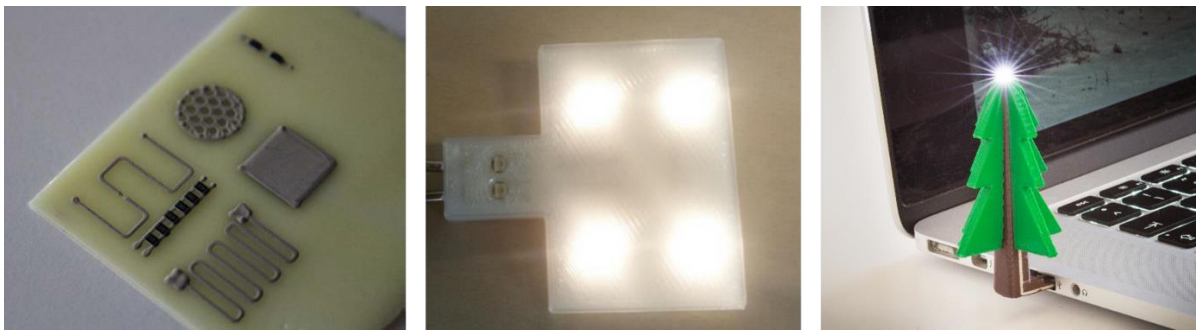
Photo credit: Philips Lighting and Bosch

The project has major potential for European industry and involves partners from across the entire electronic components and systems value chain. Hyb-Man methods will boost Europe's ability to compete in the global market for electronics manufacturing services, which was worth €1,200 billion in 2014 and is expected to grow to €1,600 billion in 2019[1]. They will enable European industry to bring back production from others part of the world, as well as reducing environmental impact and increasing opportunities for recycling. Europe's manufacturers will also be able to respond to the increasing demand for embedded electronics[2], and the emergence of printed electronics and hybrid systems (printed and silicon-based

[1] http://www.researchandmarkets.com/reports/3340028/the-worldwide-electronics-manufacturing-services
[2] http://www.rm-platform.com/linkdoc/AM%20SRA%20-%20February%202014.pdf

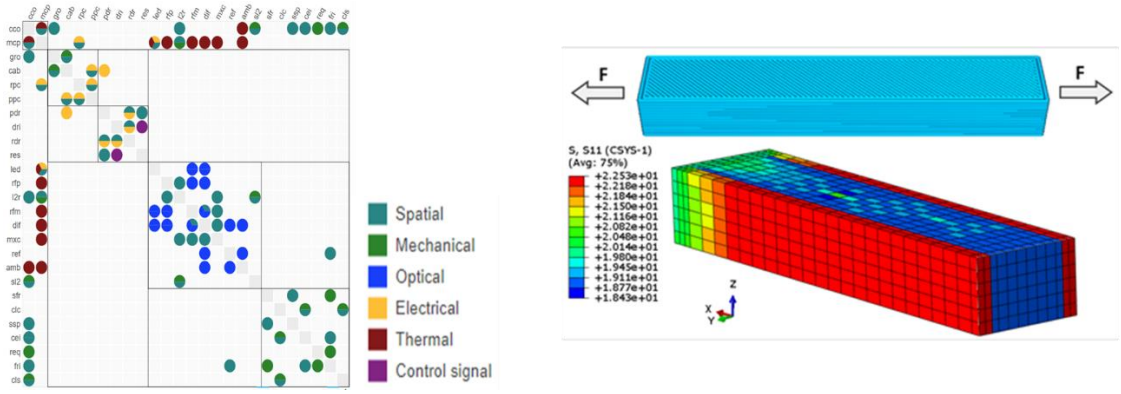
components). These benefits are likely to be significant: just 1% of the additive manufacturing market is predicted to be worth €200 million in 2020.[3]

The benefits from the cross functional cooperation between different organisations in Hyb-Man is already clear in the first year of the project. Product specifications from end users were translated to technology requirements and first demonstrators are produced to investigate hybrid manufacturing challenges.



Examples of hybrid manufactured electronic structures: in-plane, embedded and 3D structures
Photo credit: Bosch, Philips Lighting and Neotech

An important aspect of the project is to increase product and process understanding by modelling and experimental validation. A Design Structure Matrix approach is used to visualise and optimise the relations between product properties, components and functionalities. For a more detailed understanding of process influences on product properties, a method has been developed to create simulations models automatically from the code used to drive the FDM (Fused Deposition Modeling) printer. The created models have demonstrated that in a FDM process, the orientation of the filaments have a significant effect on the local stiffness.



Design structure matrix and stress models - Photo credit: TU Eindhoven and Reden

[3] http://www.wohlersassociates.com/2015report.htm

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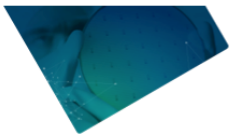

About the PENTA programme (managed by the AENEAS Industrial Association)

PENTA is a EUREKA cluster whose purpose is to catalyse research, development and innovation in areas of micro and nanoelectronics enabled systems and applications - where there is shared national and industrial interest. Based on three key application areas, Transport & Smart Mobility, Health & Well-Being and Digital Industry for the first 3 calls, PENTA programme contributes to the development of electronic solutions with the opportunity for rapid competitive exploitation and a strong impact on European societal challenges. The PENTA project team is supporting SMEs, large corporations, research organisations and universities by facilitating access to funding, fostering collaborative work and creating consortia.

PENTA is managed by AENEAS, the European industry association

About PENTA: http://www.PENTA-eureka.eu

About AENEAS: https://aeneas-office.org

About Hyb-Man

Hyb-Man is a RD&I project consortium involving 11 partners from 2 countries. The project partners are: Philips Lighting B.V (project leader), Eindhoven University of Technology, Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V, Henkel AG & Co, KGaA, Neotech AMT GmbH, Reden BV, Robert Bosch GmbH, Technolution BV, TNO - Nederlandse Organisatie voor Toegepast Natuurwetenschap, VSL, XENON Automatisierungstechnik GmbH. National funding support is provided by Germany and the Netherlands.

About Hyb-Man: http://hybman.eu/