

Press Release

A new collaboration to advance 3D printing of high-performance aerospace polymers promises vast benefits to advanced manufacturing in the UK

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For Immediate Release

Aerospace-grade polymers (such as PEEK and PAEKs) have remarkable properties: they are strong, light and can be used at temperatures where most plastics would soften or melt. This means they are increasingly being used to replace metals, reducing weight and improving fuel efficiency in the aerospace and automotive sectors.

However, their high melting point is a double-edged sword. It makes them useful yet difficult and expensive to form into shapes, particularly using 3D printing. This is a particular problem when trying to add features to customise an existing part made using conventional high-volume manufacturing processes, like injection moulding, vacuum forming or even good old-fashioned machining. This is a process called Over Moulding, and for these materials, it is very challenging to get the new 3D printed material to adhere strongly.

The OverHiPP project (£1.2m), funded by Innovate UK, brings together experts in materials, 3D printing, software, as well as companies that understand real-world needs to develop the materials, tools and processes to make the 3D printing of these materials practical.

Q5D Technology will lead the development of the robotic tools. Its novel 5-axis 3D printing tools combined with sophisticated software make it possible to scan and print onto complex curved surfaces. The 3D printed laminations can be aligned in directions that maximise strength. Q5D's technology also makes it possible to incorporate wire and printed electronics to create fully functional products.

This by itself is not enough; the consortium also includes materials and modelling experts at Victrex, Lehigh, GRM Consulting, FDM Digital Solutions and the University of Exeter, who will adapt the formulation and optimise the parameters needed to 3D print these sophisticated materials.

"High-performance polymers like PEEK and PAEK are already used in applications across multiple sectors. This project aims to find cost-effective ways

to over mould these materials using 3D printing. This will give all the companies involved in this project an important competitive edge.”, says Dr Thiago Medeiros Araujo, Global Product Management LUVOCOM® 3F and OverHiPP project leader.

Professor Stephen Bennington, CEO of Q5D, said, “It is important for us that this project leads to a commercial product. The strong interest from an impressive steering committee that includes companies like Latécoère, TvX Aero and Invibio along with a high profile lightweight commercial vehicle manufacturer and multinational aerospace company gives me confidence that this will lead to sales.”

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Peter Todd

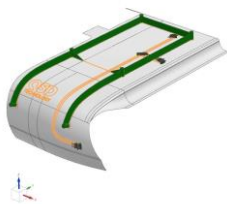
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Sample Images:



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About Innovate UK

Innovate UK drives productivity and economic growth by supporting businesses to develop and realise the potential of new ideas. We connect businesses to partners, customers and investors that can help them turn ideas into commercially successful products and services and business growth.

We fund business and research collaborations to accelerate innovation and drive business investment into R&D. Our support is available to businesses across all economic sectors, value chains and UK regions.

Innovate UK is part of UK Research and Innovation. For more information, visit www.innovateuk.ukri.org

About Q5D

Q5D Technologies Limited is an innovative company with a mission to automate the manufacture and assembly of wiring looms. We develop machinery and processes for the Automotive and Aerospace industries to gain the highest level of accreditation. The combined outputs of this project with our unique capabilities will be clearly visible in vehicles and consumer products of the future.

Our technology allows wiring looms to be integrated with existing cosmetic or structural parts already in the assembly, removing the need for fasteners and features that keep the wire in the correct locations. In addition, solving the complex task of automated wiring has driven our development to new FFF additive methods which allow printing onto non-planar surfaces. This integration allows savings in weight, assembly time and gives greater design freedom perfect for this project.

Please visit our site www.q5dtechnology.com, find us on [LinkedIn](#) or contact us directly via info@q5dtechnology.com with a project or for more information.

About LEHVOSS Group

The LEHVOSS Group, under the management of Lehmann&Voss&Co. is a group of companies in the chemicals sector that develops, produces and markets chemical and mineral specialities for various industrial clients.

Lehmann&Voss&Co., Hamburg, was founded in 1894 as a trading company. Since that time, the owner-run company has evolved into a powerful global organisation – with long-standing connections to prominent, mainly foreign suppliers and with its own production sites. Established in 1990, LEHVOSS UK is a technical sales organisation supplying raw materials to a variety of industries in the UK: Plastics, paint and coatings, rubber, lubricants, nutrition and personal care.

With the 3D printing product lines LUVOSINT® and LUVOCOM® 3F, the LEHVOSS Group offers innovative and customised polymers for 3D printing.

Further information visit: www.lehvoss.com and <https://www.luvocom.de/en/products/3d-printing-materials/>

About University of Exeter – Centre for Additive Layer Manufacturing (CALM)

CALM is a leading centre of excellence in polymeric Additive Layer Manufacturing (ALM), specialising in the use of high-temperature and high-performance polymers and composite materials for Additive Manufacturing. The centre offers independent research and technical support, working with both academia and industry worldwide to develop the knowledge required to produce the next generation of AM materials and systems. As the UK's leading centre of excellence in the high temperature AM sector, CALM is conducting pioneering research on additive manufacturing technology, examining how it can enable and speed up the widespread adoption and use of this technology in industrial production.

For more information, contact calm@exeter.ac.uk

About Victrex

Victrex is an innovative world leader in high-performance PEEK and PAEK polymer solutions focusing on the strategic markets of automotive, aerospace, energy (including manufacturing and engineering), electronics and medical. Every day, millions of people use sustainable products and applications containing our materials – from smartphones, aeroplanes and cars to oil and gas operations and medical devices. With over 40 years' experience, we are developing world-leading solutions with PEEK and PAEK-based polymers and selected semi-finished and finished parts which shape future performance for our customers and our markets, deliver environmental and societal benefits, and drive value for our shareholders. Find out more at www.victrex.com

About FDM Digital Solutions

Formed in 2012, FDM Digital Solutions has been at the forefront of 3D printing, the latest revolution in manufacturing, which has grown to be one the largest Additive Manufacturers in the UK. With many combined years of experience in the fields of additive and design for process manufacturing, FDM is best placed to help your company add real value and cost savings to its manufacturing process.

With the largest commercially available FDM (Fused Deposition Modelling) build envelopes and capacity in the UK, also providing Roboze technology and now has the UK's only commercially available HP Multi Jet Fusion (MJF) 3D printer – FDM Digital Solutions offer a wide range of engineering solutions in sectors as diverse as Aerospace, Motorsport and Healthcare.

Find more at <http://www.fdmdigitalsolutions.co.uk/>

About GRM Consulting

GRM Consulting is a design engineering consultancy providing product, analysis and software solutions. Within its core is the development and application of design optimisation methodologies to solve complex engineering problems in the most efficient, cost-effective way. Our support of the OverHIPP project will allow us to greater reflect additive manufacturing opportunities within our various software products. By deploying our optimisation methods, we expect to be able to guide the placement of material to deliver the ultimate in lightweight, efficient and structurally robust design.

OptiAssist is GRM's most comprehensive AI-Driven design optimisation software tool, allowing the ideal material placement to be determined in Simcenter 3D, Abaqus or Genesis. Visit our website www.grm-consulting.co.uk, or contact us at info@grm-consulting.co.uk to find out more.