

Leading the way in 3D metal printing for industry

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The University of Adelaide is working with local companies to investigate 3D metal printing for the development of prototype and operational manufacturing parts.

The University's Institute for Photonics and Advanced Sensing (IPAS) has installed a metal and ceramics 3D printer – the first to be open for use by industry and other research organisations in the State.

"3D printing offers a great opportunity for local manufacturers and industry to gain a competitive edge in the development of new products or to make improvements in existing parts or existing products," says IPAS Director Professor Tanya Monro.

"3D printing allows rapid prototyping direct from new designs – producing the new part in hours rather than days or weeks, ready for quick feedback and refining of designs. It can also be used to improve parts – making them lighter or stronger than is often possible through traditionally machined parts. This offers great benefits to both industry and researchers.

"IPAS is using 3D printing for manufacturing of the parts (extrusion dies) that produce the intricate patterns for the production of our optical fibres. These dies can sometimes only be made in multiple pieces through normal machining, and some structures are just not possible. 3D printing allows the dies to be made in one part – making them much stronger – and the possibility for different patterns is almost limitless."

Published in *Optical Materials Express*, this groundbreaking demonstration of the ability to extrude glass through printed dies has been led by Associate Professor Heike Ebendorff-Heidepriem.

The first company to use the IPAS 3D printer is global mining technology company Maptek, which

has its headquarters in Adelaide. This project has been supported by the Manufacturing Works Photonics Catalyst Program – a joint SA Department of State Development and University of Adelaide initiative.

Maptek is investigating the potential of 3D [printing](#) to manufacture the optical chassis for the I-Site laser scanner – one of their key mine survey products.

"Maptek are world leaders in this field. We are really glad to have an opportunity to work with them to support innovation in product development," says Professor Monro, who is also a member of the Economic Development Board of SA.

IPAS's Phenix PXM selective laser melting 3D printer uses a wide variety of metals and ceramic powders for the production of parts directly from Computer-Aided Design (CAD) drawings. The printer can make parts up to 140mm length x 140mm width x 100mm height.

More information: 3D-printed extrusion dies: a versatile approach to optical material processing, *Optical Materials Express*, Vol. 4, Issue 8, pp. 1494-1504 (2014)

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