

Emerging technologies

Composites machining will feature large at the GTMA Emerging Technologies Seminar. There will be updates on relevant mould and die research projects, too. *Machinery* reports

At the free-to-attend Emerging Technologies seminar, in Birmingham, on 4 February, 2009 at Delcam's Birmingham headquarters, speakers will present the very latest developments in a range of technologies critical to the mould and die sector.

The increasing use of composite materials for the manufacture of engineering components across many industry sectors potentially offers a new wave of opportunity for those SMEs who are geared up to accept the challenges.

Composites, with their excellent strength-to-weight ratio, dimensional stability and corrosion resistance – originally exploited in boat hulls – are now regularly used for Aerospace and F1 components, where their ability to be formed into complex geometric shapes also provides significant benefits

But such advantages have traditionally come at a price – the difficulty of machining the material. Using traditional cutting technology it has been prone to fibre breakout and sheet delamination, leading to high component wastage and rapid tool wear.

To overcome these issues, SGS Carbide Tool, working in partnership with a major USA aerospace OEM, has created an entirely new tooling solution which consists of the Series-20 CCR (Composite Carbon Router) 12-flute solid carbide routers designed to machine composites and create a superior cut edge.

In controlled tests on various carbon composite weaves, the new Series-20 CCR cutters have lasted twice as long as PCD (polycrystalline diamond) tooling. Furthermore, the cost of the tooling also offers a saving in the region of 80 per

cent over PCD diamond cutters – providing a solution simultaneously less expensive and more efficient.

The uncoated routers can be used to cut dry or with flood coolant to remove the fine dust which is abraded from the composite material, and are also available either with or without end cut for edge trimming or plunge machining.

TOOLING CHALLENGE

General manager of SGS Carbide Tool (UK), Jason Hutt, who will be giving the presentation in February, explains: "Working with composites is a challenging area and the preparation and tool selection must always take into account the composite system being machined, the drill material, geometry and feed and speed rates. However, the benefits provided by composite materials ensure that they will take an increasingly important place in the list of engineering materials which SMEs and others in the supply chain will need to work with.

"In aerospace, in order to reduce the overall weight and simplify the assembly operation, an ever-increasing number of traditionally machined metal components are being replaced by composite structures.

"Similarly, motorsport is constantly striving for the combination of optimum component performance with reduced weight – with monocoque carbon fibre chassis systems offering significant strength-to-weight benefits compared to metallic frame and tube designs.

"With the demand for cutting tools

SGS Carbide Tool's Jason Hutt will talk about developments in machining composites

that meet expectations sure to grow, enhanced cutting technology will provide significant benefits for both these and similar high technology industries."

In addition, attendees to the event will also have the opportunity to hear the latest update on a Research and Development project, Emold, which is set to revolutionise the injection moulding process. In the Emold concept, moulds become active networked components, complete with embedded knowledge, to each of which a PC is attached during its whole productive life, making it possible to create a local network of moulds, accessible via the web. Several local networks could even be interconnected, enabling mould makers, moulders and end-users to share data – improving the efficiency of the whole moulding process as all parameters could be interactively monitored and adjusted in real time. □

