

Farnborough: bigger and better than ever

The 60th Farnborough International Airshow, celebrated this year, will be the biggest ever in terms of exhibition space and exhibitor presence.

Steed Webzell sets the scene

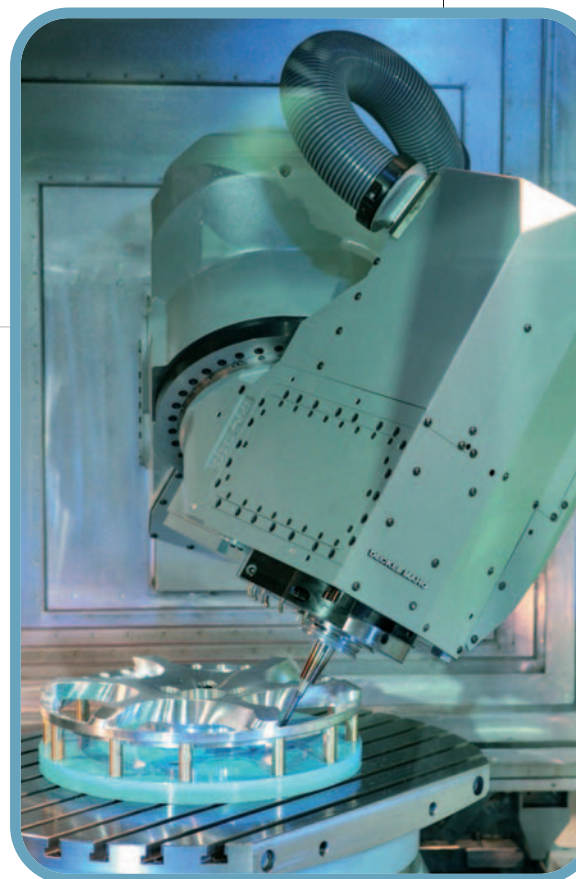
The number of exhibitors at the 2008 Farnborough International Airshow (14-20 July 2008) is expected to exceed 1,500; a 5 per cent increase on the last show two years ago. Among their number is an increasingly large contingent who will be very familiar to readers of *Machinery*, and who represent the entire spectrum of machining technologies, from machine tools and cutting tools through to coolants, CAD/CAM software, rapid prototyping and metrology.

Beginning with machine tools, among the recognisable names will be US-headquartered MAG Industrial Automation Systems (Hall 3, Stand C22), which is the umbrella company for well

known brands such as Fadal, Hüller Hille, Boehringer, Giddings & Lewis and Cincinnati.

According to MAG, the rapid growth of composite aerospace structures (see also page 6) has created a parallel demand for complex, monolithic titanium components to join them together. To this end, MAG Cincinnati supplies a high percentage of its large gantry-style vertical machining centres and high capacity horizontal machining centres for roughing and finishing titanium in aerospace applications.

Recently, MAG Cincinnati, based in Birmingham, has launched the Ti series of 5-axis multi-spindle contour milling machines, and the company will



DMG will be highlighting its aerospace centre of excellence and related technology and applications expertise

undoubtedly be keen to promote their virtues at the show. The spindles on the Ti series include an HSK 125A tool interface and generate 2,522 Nm of torque. To apply this power with stable machining dynamics, the Ti models have been engineered with new spindle support housings and extremely stiff, heavyweight machine structures providing superior damping.

Another machine tool company present at Farnborough will be Italy-based Fidia (Hall 1, Stand C20a), which has its UK service centre in Corby. On the stand representative personnel will be promoting the company's K211 and K411 high speed milling centres. According to Fidia, although the machines were originally designed for plastic injection mould applications, they have demonstrated considerable potential for machining the medium sized structural components typical of the aerospace

Measuring up

Farnborough will host a plethora of metrology equipment manufacturers and suppliers, all determined to set new standards for procedures in the aerospace industry, enabling customers to maintain high levels of quality.

Faro UK (Hall 4, Stand E4), for example, will be demonstrating a cross section of its portable 3D measuring machine range, including the Quantum and Fusion FaroArm, Faro ScanArm, Faro Gage and Gage Plus, Faro PowerGage, and Faro Laser Tracker.

Elsewhere, Blum Novotest (Hall 4, Stand E13) will be keen to promote the benefits of its new LaserControl NT-H 3D toolsetting system, which provides non-contact measurement of rotating tools as well as the mechanical measurement of non-rotating tools in five approach directions.

Also new from Blum is the TC76-N touch probe for tool and workpiece measurement on turning machines. Like the NT-H 3D, it contains Blum's recently patented Shark 360 – a measuring mechanism with face gear that increases measurement accuracy when performing off-centre probing by using cranked styli.

Touch probes will also be the theme on the stand of Gom UK (Hall 2, Stand C35), where the new Touch Probe tool is now an option on the latest generation ATOS 3D digitiser optical measuring machine.

sector. Moreover, with the Boxer solution (a modular combination of two machines facing each other), it is possible to perform simultaneous machining of large aircraft parts using two milling heads.

Cheng Du Aircraft International, Shenyang Aircraft and Harbin Aircraft are customers that Fidia has acquired in China through the sales of K Series milling centres in both the traditional and Boxer versions.

MORE BITE FROM VIPER

NCMT (Hall 4, Stand E8) will be keen to discuss the virtues of the established VIPER process for creep feed grinding of nickel alloy components. Until recently the platform used was a standard Makino A55 horizontal machining centre, but now the Japanese company claims that its new i-Grinder G5 – a dedicated 7-axis machining centre – is some 10 per cent faster. Metal removal rate is 80 cm³/min.

The improvement comes from a number of factors, including an increase in linear rapid traverse rate from 40 to 48 m/min, while faster rotary workhead speed, which has more than doubled to 100 rpm, is especially beneficial when grinding smaller components. Probably the most critical improvement, however, is in the design of the programmable coolant nozzles. They are more versatile on the i-Grinder G5 as they can be positioned by two rotary NC axes anywhere around the 360° periphery of the grinding wheel, rather than through just 180°, as was the case with the A55.

i-Grinder G5s have already been sold to a major aero engine manufacturer in Japan and one of the largest manufacturers in Europe of compressor and turbine blades.

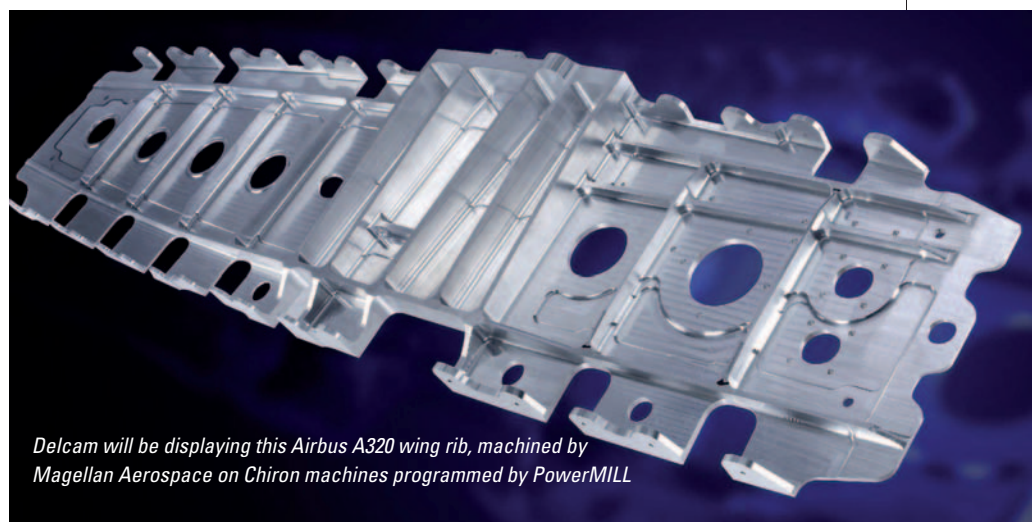
DMG UK (Hall 4, Stand E27) will also be present with a promotional stand to support some of its aerospace customers who are exhibiting in their own right. The stand will be run by Richard Watkins who has recently been promoted to key account manager of DMG's new Aerospace Europe Centre of Excellence, which is headquartered in Pfronten, Germany.

Including carbon fibre and ceramic-based derivatives, the most sophisticated titanium and Inconel alloys, the aerospace industry is investing heavily in research into new materials and their applications. Progressive cutting tool companies have been keeping abreast of this research, devising new solutions in line with rising demand.

Take Sandvik Coromant (Hall 4, Stand F12) for example, which will exhibit its CoroDrill Delta-C R846, a new drill for machining heat resistant super alloy

assisted turning. The toolholder is equipped with multiple nozzles positioned and directed depending upon the tool type and the application, to supply coolant at pressures around 70 bar. Applying high pressure coolant correctly improves productivity because of potential higher cutting speeds and longer tool life, fewer stoppages and better predictability and security.

Continuing the trend for high pressure coolant, Seco Tools (Hall 4, Stand E18) will present its new Jetstream tooling, a



Delcam will be displaying this Airbus A320 wing rib, machined by Magellan Aerospace on Chiron machines programmed by PowerMILL

(HRSA) in aerospace applications, such as the production of gas turbine casings.

The geometry of the new CoroDrill Delta-C is optimised for maximum efficiency in repeated short-hole drilling. The cutting edge has a more consistent curve for added strength in outer corners where cutting forces can be at their highest, while the deep flute shape on the drill body optimises chip removal from the cutting zone, keeping the drill free of obstructions that could damage the integrity of the component's surface.

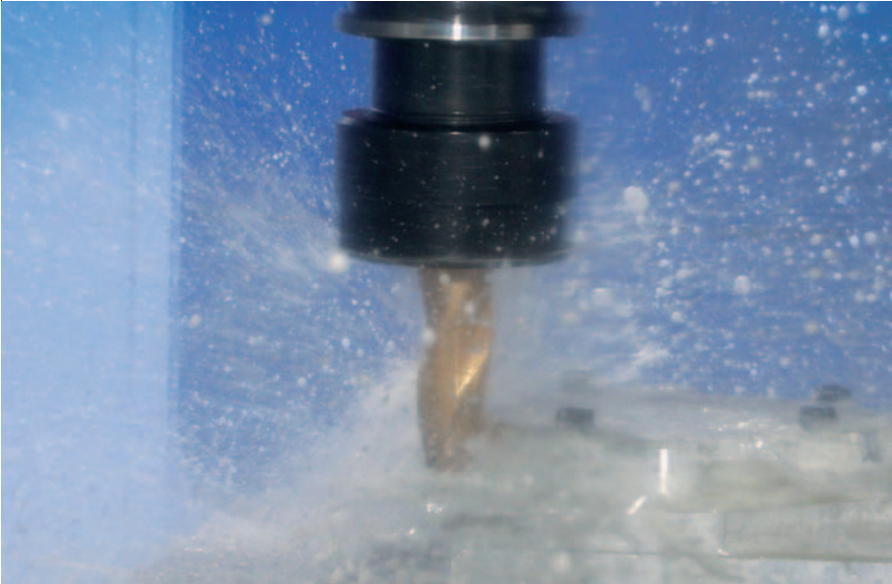
The standard CoroDrill Delta-C family has tools for 3-12 mm diameter, with a length of 3-5xD.

Another innovation on the Sandvik Coromant stand will be CoroTurn HP that provides increased cutting data and better swarf/chip control when performing high pressure, coolant-

standard range of high pressure, directed coolant tooling for turning operations. It works by delivering a concentrated high pressure jet of coolant at high velocity straight to the optimum position close to the cutting edge. The rapid cooling makes the chip brittle so that it easily lifts away from the rake face, improving chip control and tool life, and enabling increased cutting data to be applied.

The company will also present new tooling grades for aerospace machining and offers information regarding its Component Engineered Tooling service which aims to minimise customers' machining time and production costs.

Another cutting tool company with extensive experience in the aerospace sector is Unimerco (Hall 1, Stand C10), which has had its optimised cutting tool solutions selected for the manufacture of



Master Chemical's TRIM metalcutting fluids are being successfully used by aerospace firms

components for the Eurofighter (see also page 10), Joint Strike Fighter and Airbus A380, to name but a few. Tool cutting edges for applications such as these are made in carbide, PCD or veined PCD to maximise metal removal rates, improve surface finish and tool life, and provide good process reliability.

Unimerco has delivered solutions for the machining of engine components such as blisks, impellers, blades and casings, as well as airframes and structures manufactured from 'difficult' materials like aluminium, carbon fibre composite and metal matrix composite.

A COOL HEAD

At Farnborough, Master Chemical will focus on its TRIM metalworking fluids that continue to meet the demanding alloy cutting and grinding needs of many aerospace manufacturers. An important product in this regard is TRIM C270.

One leading aircraft engine manufacturer has used TRIM C270 for its VIPER and creep feed grinding operations since 1999. According to Master Chemical, the customer's usage of flocculent decreased substantially, and after 10 months of evaluation it confirmed a significant competitive

advantage in grinding performance thanks to TRIM C270 and costs savings derived from its filtering ability.

Master Chemical can be found on the stand of the North West Aerospace Alliance (Hall 1, Stands D9-12 & D14), where it will be joined other member companies including CAD/CAM system developer Delcam.

Delcam will display a range of parts made using the company's machining and inspection software. One will be a wing rib for the Airbus A320. Programs created using Delcam's PowerMILL CAM system were included in a turnkey package developed by Chiron for Magellan Aerospace. The complete package was based on the new Chiron Duo Mill machining system that incorporates twin 90 kW spindles to allow simultaneous 5-axis machining of port and starboard wing ribs.

Software company CGTech (Hall 1, Stand A4) will exhibit the latest version of its VERICUT CNC machine simulation and optimisation software.

VERICUT V6.2 features several enhancements that increase the ability of manufacturing engineers to develop, analyse, inspect and document the CNC programming and machining processes

used in the aerospace and defence industries. The stand will feature the VERICUT aerospace simulation gallery, showing simulation of aerospace component machining including turbine blades and wing ribs. In addition to 5-axis machining, the gallery will feature examples of other CNC processes including waterjet cutting.

RAPID MANUFACTURING

Rapid prototyping is of growing importance in an industry where time-to-market is increasingly vital. For this reason, EOS (Hall 4, Stand A2) will promote its latest laser sintering machines and powders at Farnborough, where components made from the latest materials will also be on show.

EOS MaragingSteel MS1 is a new, martensite-hardening steel of high strength and toughness, suited to the production of high performance parts for the aerospace industry. It is at least on a par with, or even superior to, conventional tool steels. The material's composition corresponds to US classification 18 maraging 300, European 1.2709 and German X3NiCoMoTi 18-9-5. It is easily machinable after the building process, has a tensile strength of 1,950 MPa and can be post-hardened to approximately 55 HRC by simple thermal age hardening.

EOS has also developed nickel and titanium alloy powders that open up further applications in the aerospace industry for the manufacture of solid functional components. Cobalt-chrome and stainless steel are additional metal powder materials available.

Other technology or service providers attending the event include: Allegheny Technologies which includes tooling company ATI Stellram (Hall 3, Stand A8); Kuka Automation & Robotics (Hall 4, Stand A4, and showing its Robocoaster); press manufacturer Group Rhodes (Hall 1, Stand D9-12; and Hall 1, D14); sliding-head lathe specialist Star Micronics GB (Hall 1, Stand A20); and 5-axis machining centre manufacturer StarragHeckert (Hall 1, Stand A30). □