PRESS RELEASE

AEROSPACE TOOLING MACHINED FASTER DUE TO 5-AXIS SPINDLE RETROFIT

To increase the efficiency of aircraft tooling manufacture at its Dukinfield factory, near Manchester, Hyde Tool Company has replaced the motor spindle on one of its 5-axis machining centres with a higher-speed version from Swiss manufacturer, IBAG.

Retrofitted by sole agent for Britain and Ireland, Emmaco UK, the 24,000 rpm spindle allows the tier 1 aerospace supplier to reduce cycle times by optimising cutting parameters across a variety of materials. They range from aluminium through various steels (including stainless) to titanium alloys.

Hyde Tools specialises in the design and manufacture of form tools, jig tooling for wing assembly, and lay-up tools for composite component production. Airbus, Rolls-Royce, Boeing and BAE Systems number among the subcontractor's prestigious customer base.

The complexity of many of the components together with tight drawing tolerances of typically 50 microns necessitate the use of fully

interpolative 5-axis machining. Hyde Tool operates four 5-axis machining centres, the largest of which is a Cyport CP gantry mill with 3 metre x 2 metre table from German machine tool builder, Edel.

It was this machine that required a replacement spindle, as the original spindle had failed due to internal failure of the coolant seals that seal off the water used to control the temperature of the spindle, causing corrosion and ultimately failure.

Mark Caldwell, works manager at Hyde Tool, said, “We did not want to return to the machine manufacturer for a replacement spindle, as we thought that the original was unnecessarily complicated, so we looked at various repair options and at new spindles from independent suppliers.

“As soon as we made contact with IBAG agent, Emmaco, the company’s professional approach convinced us to drop all other options and give them the task of repairing the Edel machine.

“The job was particularly challenging, as after evaluating the project, Emmaco advised that there would be difficulties with the supply of OEM parts. However, it was clear that the company was genuinely prepared to get involved and do whatever was necessary to make the project a success.”

Emmaco's managing director, Ian Baker, worked jointly with Hyde Tool engineers to resolve the problems. The retrofitted IBAG HF 170 high-frequency cartridge spindle was an off-the-shelf item, but the Edel machine needed modification to fully accept the spindle mounting and supplies for the spindle. The Z-axis travel was also extended to allow use of the existing toolchanger without modification.

Emmaco undertook turnkey responsibility for the refurbishment. The failed spindle was removed and the 5-axis head stripped down, which revealed further corrosion and failure of internal parts. Many of the parts/seals were non-standard and had to be especially manufactured.

The C-axis drive motor that rotates the head through ±360 degrees also needed repair, as it had been damaged due to failure of the rotary seals. Further remedial work involved fitting a new coolant refrigeration unit and fault switch.

Mr Caldwell continued, "Emmaco did a fantastic job in a short time scale. The spindle retrofit and associated work were successfully completed and there has been no further problem with the Edel machine since.

“Reliability is crucial to Hyde Tool, as we offer a 24/7 service with 24-hour turnaround on some orders, not only to leading commercial aircraft manufacturers but also to military aerospace customers. Frequently we are responding to AOG (aircraft on ground) calls from maintenance staff requesting urgent spares to return an aircraft to service.

“The IBAG spindle retrofit and machine repair have been exemplary and are delivering the quality and reliability that we need.”

Speaking generally of spindle retrofits, Ian Baker commented, “We are often approached by companies with old machines that are mechanically sound but which have, say, a 4,000 to 8,000 rpm belt-driven motor that is unable to take full advantage of modern tooling technology.

“We are able to fit a replacement spindle offering typically 20,000 to 45,000 rpm, so the user gets a high-speed machining centre for the cost of a new spindle.

“It is not uncommon either for a user of a fairly modern machine tool to approach a third-party manufacturer like IBAG for a replacement spindle, as the one fitted as standard is normally a compromise that allows a spread of machining applications to be satisfied.

“However, the user might want to maximise productivity by selecting a speed range and torque profile that better suits the materials being cut.

“A bespoke spindle may also enable high-torque roughing as well as high-speed finishing to be carried out in one machine, saving the cost of buying a second machine.”

IBAG is able to supply high-accuracy motor spindles for practically any requirement, not only in terms of physical size and power output but also with the motor wound to deliver the optimum speed-torque profile for any given application.

Features of the Swiss manufacturer’s HF-series of vector-controlled motor spindles include ceramic or specialist hybrid bearings, grease packed or minimal oil/air lubrication, water cooling, axial shaft displacement sensors for CNC machine compensation, thermal sensors for measurement of bearing and motor temperatures, vibration monitoring, tool position sensors - digital / analogue, and through-tool coolant. Excellent axial and radial rigidity and repeatability better than 1 micron are offered. HSK and SKI tooling interfaces are standard (optionally BT, BBT, CAT and SK) with coded connectors for power encoder signals and air / fluids for ease of installation and service.

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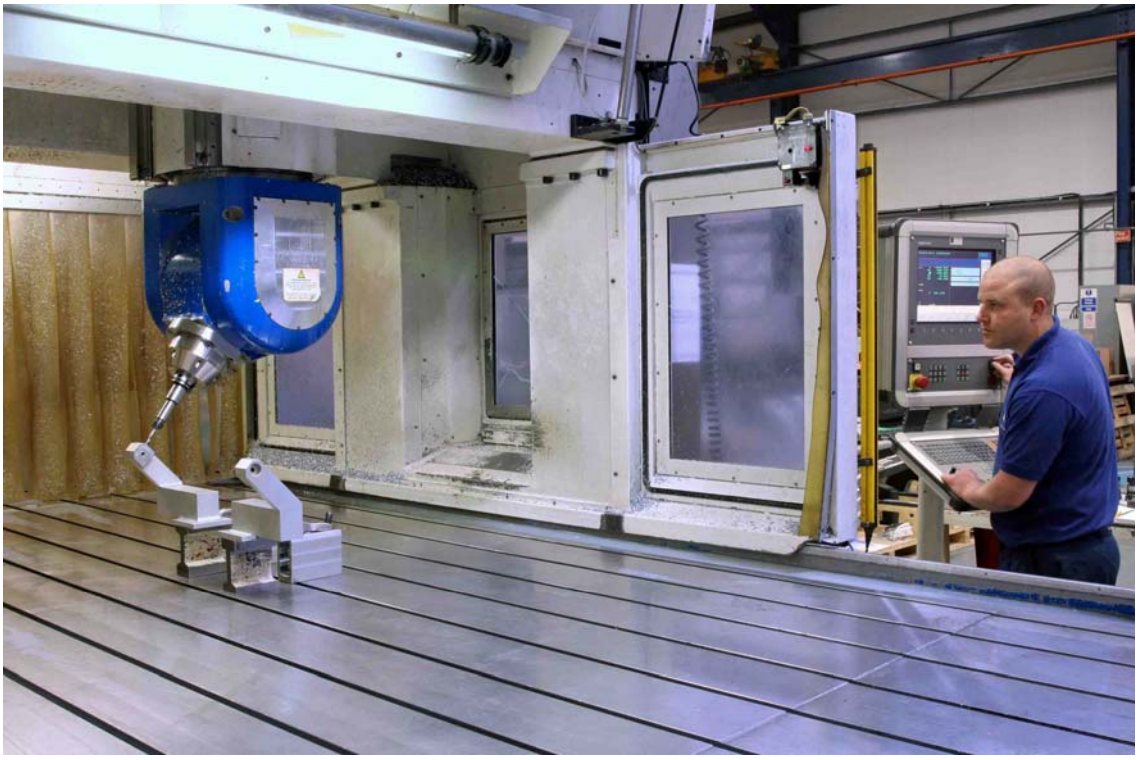


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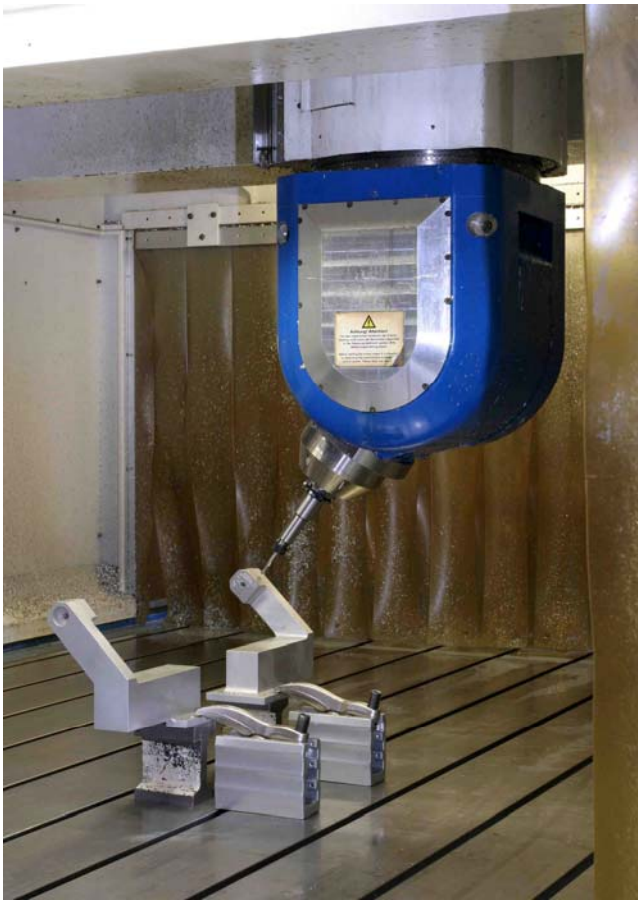

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