



Tactical 5-axis high speed machining cell: At Hyde Aero Products' Hollygate Aircraft Components' facility

Quick off the mark

Mike Richardson discovers how technical advancements in NC CAM software and its 5-axis capabilities have enabled Hyde Aero Products to provide rapid response turnaround of time-critical machined replacement parts for aircraft on ground (AOG).

When it comes to aviation maintenance, an AOG situation can be a disaster for any airline operator – particularly if the problem is serious enough to prevent their aircraft from flying. In the scramble to quickly acquire the parts needed to put the aircraft back into service and prevent further delays or cancellations of the planned itinerary, specialist AOG parts suppliers are required to manufacture and dispatch spare parts to repair the aircraft for an immediate return to service.

As one of three divisions of Hyde Industrial Holdings, a major aerospace group based in Manchester, Hyde Aero Products provide rapid response services, including machining of replacement parts for AOG. The normal delivery time for these items can be literally hours, which can be a major challenge when the part requires modelling, programming and machining, as well as sourcing the material and in some cases, applying specialised surface treatments. Hyde's thrust means providing a quick turnaround of spare parts to AOG to get the customer's aircraft flying again.

"The cost of operating an airline is incredibly high and the potential disruption in having an Airbus A380 stuck on the ground could be extremely costly in lost revenue for the operator," begins Hyde Aero Products' business development director, Phil Hughes. "Therefore, a huge demand is placed on the speed of returning a replacement part to the aircraft. We have a skilled team, experienced in handling all levels of AOG, and our claim is that if you contact a member of our team 24-7

they will answer it immediately.

"Often, we receive an enquiry with minimal technical information, but once we build up a picture of the engineering requirements, we can decide which of Hyde's five machine shops is most suitable for the job. We try and find the basic ingredients of what's required and ensure we've the backup to provide engineers that can write the machine tool programmes and complete the job quickly and efficiently."

Decreasing the time to market

The increasing demands for rapid response machining of complex aerospace component shapes and surfaces has led companies like Hyde to invest in the latest sophisticated 5-axis software programming solutions. The company selected Delcam's PowerMILL NC CAM software specifically for its 5-axis capabilities and because the previous software couldn't handle 5-axis programming. It was the speed of programming that was the main reason for the choice.

"We needed to migrate from 3-axis to 5-axis machine tool technology," states Hyde Aero Products' technical director, Paul Mellor, "so our engineers performed a series of time studies using different CAM software solutions on the market and gave each vendor's applications engineer a component to program. The criteria for selection depended on how quickly they could produce a machining program for the test piece. We also needed confidence in the programs they produced.

"Delcam came out on top and as a result, we purchased

PowerMILL software for 5-axis machine tool programming. As we've expanded this capability across our divisions, high-speed 5-axis and 7 axis+ machining has become the norm. 10 years after selecting Delcam, we now have 21 seats of PowerMILL throughout the group, of which eight reside in our division for programming fast track AOG parts, plus some strategic work as well."

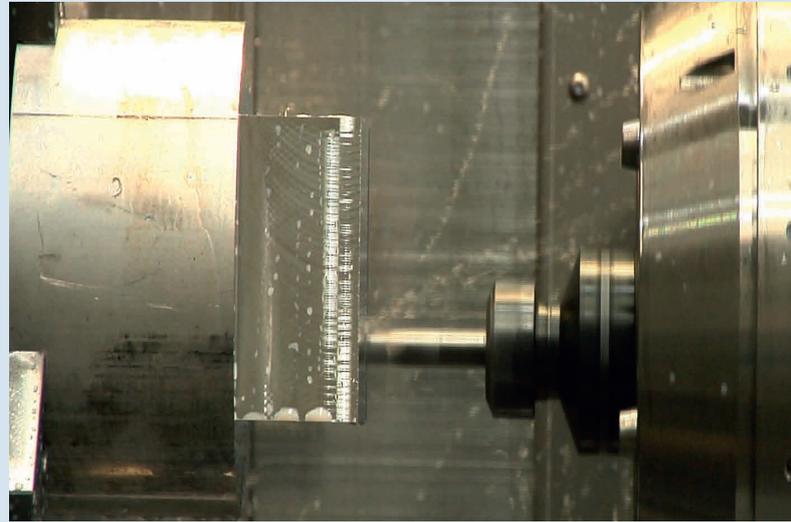
Mellor contends that PowerMILL's biggest attribute is flexibility: "There's always a solution within the software that gives us exactly what we need in order to complete the part and get it to the customer on time. Another benefit is the level of technical support we enjoy with Delcam. As we've become confident with the software, we've formed a strong relationship with Delcam, and always receive instant training and support when new software becomes available. Delcam's applications engineers visit our sites to demonstrate the latest release, which provides the opportunity to get everyone to meet and talk about common engineering problems. It's not just about using the software; it's more about us having the knowledge that we can pick up the phone and speak to somebody that can help us out."

It's Mellor's experience that in some cases, the sheer complexity of both old and new spare parts means they can't always be programmed beside the machining centre.

"Once we receive a customer's enquiry, we need an interface that will get the engineering specifications to the shopfloor quickly," he states. "Benchmarked against the other systems we've used, PowerMILL is probably 75% more productive in terms of machining the part complete. Often, we just need a programme to provide a part that meets the criteria as quickly as possible. PowerMILL rapidly generates a series of toolpaths to achieve what we require. In some instances, we can't always load the part to the most suitable machine tool because it's already being used. The adaptability of PowerMILL allows us to quickly and seamlessly move the part to a vacant machining centre."

Delcam's marketing manager, Peter Dickin notes that his customers usually fall into two categories: those that need to make prototypes or short runs of parts very quickly, and those that have the luxury of spending days or even a week programming the part because they know that if they're making thousands, the extra time spent tweaking the program will eventually give them a return on the time they have invested.

"There aren't many companies like Hyde that covers both these categories," he expands. "The key benefit here is flexibility; customers can use PowerMILL to write programs quickly, and whilst it might not



7-axis machining of AOG components: At Hyde Aero Products' Victoria Production Engineering's facility

be as effective as the one they've spent more time tweaking, if they just need to get the part started as quickly as possible then PowerMILL is ideal. It also provides many editing capabilities; customers can still write programs, view them on the computer and edit where required. This may take longer, but if they need to get machining time down to a minimum then PowerMILL provides this capability too."

Hyde Aero Products is continually passing its technical demands onto Delcam for even more bells and whistles on successive versions of their software packages. Dickin's view is that complexity is the big driver here.

"Many companies now want to produce in a single part what would have previously required an assembly of many different items," he comments. "Advancements in 5-axis machining capability now enable the creation of complex individual components in almost the same time as it would have taken to manufacture relatively simple parts on a 3-axis machining centre.

"When we first started working with Hyde, the company was at the forefront of the aerospace sector whereas Delcam was synonymous with the mould & die industry. Hyde has been pushing us for 10 years now, helping us to overcome the special challenges of aerospace manufacturing, as opposed to those from the automotive industry for example. We're finding increasing interest in our software from aerospace companies because of the experience we have gained over the past decade. This is where people like Paul and his team have been very helpful to us." |



Paul Mellor: Hyde Aero's technical director

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