

Yamazaki Mazak – Aerospace Manufacturing Q&A

Answers bylined to Alan Mucklow, Managing Director UK, Eire and National Distributors at Yamazaki Mazak UK Ltd.

1) Please provide an update on your company's latest news, i.e. appointments, new model introductions, facility upgrades, etc.

We've made a series of investments at our European manufacturing facility over the past five years to improve our machine production capabilities. This includes additional cylindrical grinding machinery to support the highly precise grinding of a wide range of components with demanding geometric and surface finish specifications, such as spindles. It follows a multi-million-pound investment in a twin-pallet VERSATECH V-140N/280 and two automated INTEGREX i-series cells, and we are also in the process of installing new laser processing and automation cells in the sheet metal area. As you can see, we believe in the quality, efficiency and reliability of the machines we are producing and that is why we are using them throughout our factories.

From a team point of view, it has been a very busy 12 months for Mazak. We implemented a new sales structure in the north and south of England to make sure we are as close as possible to our customers, and have recently hired a new Area Sales Manager for Southwest England. Mazak's Scottish distributor, ScotMaz, has also strengthened its presence by appointing a new Sales Manager.

2) What are the types of machine tool performance demands placed on your company by today's aero customers: price, quality and delivery are a given, but is there anything else such as customer relationships, flexibility, after-sales support, the personal touch for example, faster spindle speeds?

Overall, I think aerospace companies are looking to us for solutions that can meet their demanding material and tolerance requirements, coupled with outstanding aftersales and application support.

The ability to integrate automation has also become increasingly important to our customers in the aerospace industry. Both our UK-designed and built CV5-500 5-axis machining center and our most recent INTEGREX Multi-Tasking range, the i-H series, have been designed to allow for easy integration with automation systems. For companies working in the supply chain or on prototyping and R&D work, we have had significant interest in our VARIAXIS i-300 with Auto Work Changer, which is intended to support high-mix/low-volume manufacturing.

Reducing material wastage also remains high on the industry's agenda and we're very conscious of the need to support our customers with 'buy to fly' ratios. Mazak has heavily invested over the past decade in its hybrid machining portfolio, which includes machine tools with both additive and subtractive capabilities, and more recently our new FSW-460V friction stir welding machine, which was unveiled to the European market at EMO 2023.

3) And (obvious question), what are the key benefits of supplying UK-built CNC machine tools to your aero customers? Lower order lead-times – anything else?

The biggest benefit of having a manufacturing facility in the UK is it allows us to understand and get closer to our customers. There's also that level of confidence that comes from having a manufacturer in the market, rather than a distributor-based sales organisation. It means we can reflect the manufacturing processes our customers require in our products, which is invaluable from an R&D perspective.

A key example of this is our VTC series – particularly the SDR models. The range was designed to combine 5-axis machining with large trunnion capacity and optimised swarf extraction, which is ideally suited to the machining of large structural components such as those used in the aerospace industry.

The CV5-500 also stands out in this respect, having been designed to provide a compact, fully simultaneous 5-axis machining center for use throughout the supply chain. The fact three of the four product ranges built here were UK designed really speaks for itself.

4) What kinds of aerospace-related components are your products used for? Engine parts? Landing gear? Aerostructures, etc.?

Our machine tool portfolio enables us to support both OEMs as well as tier-one, two or three suppliers. We have customers who touch on pretty much every aspect of the aircraft, from engine components and control parts to aerostructures and landing gear, as well as interior products such as seating.

5) Any thoughts on rising popularity 3D printing/additive manufacturing – do you plan to launch your own machines?

Aerospace is ever-evolving, with the industry constantly looking for ways innovate. Additive manufacturing is a very attractive proposition to aerospace manufacturers, especially when it comes to deweighting components and improving 'buy to fly' ratios. We offer three INTEGREX models and one VARIXIS model, which deploy a laser metal deposition head alongside a high-rigidity spindle for true Done-In-One hybrid manufacturing. These machines

can also enable both OEMs and suppliers to remanufacture high value components in a cost-efficient way.

6) Many years ago, Mazak asked me whether it should launch a CNC machine tool specifically aimed at the composites sector, i.e. capable of machining modelboard (patternmaking), as well as milling/trimming near-net shape CFRP components. Are there any plans to follow this through or does the company think that it's already a too competitive market with the likes of CMS, Breton, Biesse, and Belotti?

While most of our customers focus on more heavy-duty machining, we do have several UK customers who operate in the ceramics and composites industries given the tight tolerances our machine tools are able to work to.

This typically involves the use of a graphics package, which is effectively a filtration and exhaust package that allows the user to take away material at the point of cutting. Outside of this, our machines are also used in composite-adjacent applications such as producing the patterns that are used to lay up the composites themselves.

7) Is there a particular aero customer or component machining success story you can briefly talk about without breaking NDAs?

Two particular projects come to mind, which display the breadth of our aerospace capabilities. First of all, we worked with a vintage aeroplane restorer in Eastleigh, Kennet Aviation, which had traditionally run into scarcity issues when sourcing parts to refurbish historic planes.

Until we supplied them with Mazak machinery, the Kennet team didn't have the facilities to make their own parts without engaging expensive subcontractors. Now, they can produce all parts in-house to Civil Aviation Authority standards and even have the capacity to pick up added general subcontractor work.

Another very different success story was our work with Beverston Engineering, a precision engineering company manufacturing safety-critical aerospace parts. We implemented an Industry 4.0 network connecting all its Mazak machines and providing real-time data.

Being able to see all machine information in the office and factory floor has really helped the company improve machine utilisation, while also markedly reducing setting time and downtime. These savings undoubtedly add up, and Beverston has been able to pass them on to their customers.

8) The knowledge and expertise you've gained through working with customers must be invaluable as it can be used to solve challenges in other applications within the

industry – which in turn help you to continuously review and evolve your products.

Would you agree, and do you have any examples?

Yes, I would agree. Yamazaki Mazak works across multiple sectors that cut very similar materials to companies in the aerospace sector, to a similarly high level of precision – for example, the medical and autosport industries. There is undoubtedly an advantage in supplying machinery to so many fields. We can take learnings not just from our wider work in aerospace, but apply knowledge gained from these other industries to support our aerospace customers too.

9) What do you feel are the most important assets of a company: a defined strategy, its people, its experience, its use of technology, its location(s), or a combination of all these points?

It is important to mention that Yamazaki Mazak is family-owned. This enables us to work towards a defined, long-term strategy focusing on customer centricity and continuous investment in both technology and people.

A good example of this is our ongoing work with the company's apprenticeship programme. We have trained over 250 apprentices at our Worcester plant alone, many of whom have gone on to hold senior positions within the company, and have long been recognised as one of the top employers in the county.

This long-term view also informs our investment in the Worcester plant itself. We are constantly looking to the future, and improving our own machining capacity and capabilities is very much a part of that. Our ownership model has allowed us to further expand production of a diverse range of homegrown machine tools, which will be vital to meeting the aerospace industry's future needs.

10) What differentiates your company from the competition – why should a customer use you over your nearest rival?

Again, Mazak's ownership model differentiates us from our competition, as we can work to a long-term strategy in a way our competitors sometimes can't. The fact we are a UK-based manufacturer is also a key differentiator. This proximity to our customer base has obvious R&D benefits, as having such immediate feedback available is clearly beneficial when it comes to developing new products.

Alongside this, we also operate the industry's largest UK-based service and support team to assist our customers at the point of purchase and beyond. Complemented by our European

Parts Centre in Belgium, we can ship the vast majority of parts on the same day, which is absolutely vital to keeping industry moving.

11) What kinds of machine tool developments will we be seeing in the future? Smaller footprint, higher spindle speeds, higher reliability, lower cost, faster time to market?

I am expecting more machine tool developments around added value servicing, which is a key aspect of our current strategy. For instance, like most sectors, the aerospace manufacturing industry is looking to decarbonise operations and implement sustainable and environmentally aware manufacturing.

This why we are continuing to promote our “Mazak Go GREEN” activities to reduce carbon emissions throughout the lifecycle of our products. The Go GREEN initiative can be seen in all aspects of our operations, from machine design to the creation of energy saving tools and technologies.

The ongoing skills shortage is also sure to inform future machine tool developments, and manufacturers need to update their service offering to reflect this. With this in mind, we have developed the Mazak iCONNECT system for remote servicing and analysis from our engineering team.

We are also making use of software to transition required skills from the person to the process. This can be seen with our new MAZATROL DX software, which automates previously manual, time-consuming processes such as quotations and machinery set-up.

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