

# A proven track record



**T**he impressive machine shop at Foley Patterns and Technologies has recently taken a giant leap forward with the installation of the UK's first Belotti Navy advanced 5-axis CNC machining centre. This latest investment by the Stourbridge company will support existing customers looking to increase component size and complexity, while allowing the business to also venture into new sectors.

Foley Patterns and Technologies Technical Director, Jonathan Woodward, and Technical Sales Director, Matt Woodward, are not siblings. However, they have known each other for three decades, most of their working lives, having both started as apprentice pattern makers working for a Tooling and Foundry supplier to the motorsport sector.

As Jonathan Woodward recalls: "Originally, Foley had been established by two engineers to manufacture foundry patterns, with conventional and then CNC machine tools. I joined back in 2005, becoming employee number six, closely followed by Matt. We had worked with the company with Foley supplying Pattern tooling to produce cast parts for our foundry and knew the reputation and

quality of the business to be first-class."

Today, the precision engineering company specialises in large 3- and 5-axis CNC machining, tool design with manufacture and complete supply of ferrous and non-ferrous raw and machined castings. With the added envelope of two large 5-axis machines supporting prototype full size car exterior and interior design builds and complete mock-ups of first-class cabins and seats for major airlines.

"Foley Patterns provides an exceptional level of service and expertise in tooling design and in-house CNC machining for all levels of manufacturing, combined with traditional patternmaking skills,"

explains Matt Woodward. "Listening to customers feedback and their time wasted trying to coordinate with different suppliers, we have successfully aimed to manage all this in-house so effectively for them it is just one phone call to check on progress throughout the complete manufacture, we have invested in the people skills and equipment to provide a 'one stop shop'.

"We help with the design, make it manufacturable and even take product to market for customers, in metal or composite materials. We manage the whole project if necessary, and customers appreciate that. As an example, we currently have for one customer, with



various casting components going through the workshop in small batches. This started as a prototyping project then we received a 12-month contract to make 700 sets. However, because the overall quality and satisfaction from the customer was so good we were asked to extend by another 12 months to more than double the quantity to 1,500 sets.”

Customers for the company’s casting capabilities regularly come back with more work, due to the skills and expertise of Foley’s staff. “We have shifted our position in the turn-key process, because of the knowledge of our staff we are now at the front of most projects. Here, we can downstream manage it, designing the flaws out of the job. Solving problems is what our customers expect, we are effectively doing the work of three people,” Jonathan Woodward says.

Given both of their histories with the motorsports industry it is no surprise that it is an area that remains close to the heart of the business. Matt Woodward adds: “For 21 years we have been doing composites for Formula One teams, and now we are supporting prebuild, mock-up models, carbon fibre tools, one of which



we have designed for the customer. And, a hydroforming company we work for has recently seen benefits when we reduced their tooling price by 75 per cent because we created a cost-effective method of achieving their goal.”

Customers looking for quotes for large parts was one business trend that highlighted the need for a large capacity machine tool, perfectly emphasised by the Dubai Eye project that essentially is 1.5 times larger than the London Eye. Foley lost out on this project for the pods because the company did not have a machine large enough for the job.

A thorough investigation of the capabilities of the large 5-axis machining centres available on the market pointed the company in the direction of Belotti. “We are not shy about asking technical and performance specification questions,”

states Jonathan Woodward. “The answers provided by everyone at Belotti inspired us, and we selected a machine from the Navy range. It has the cutting power we wanted at the rotary/tilting head, but also has Hirth couplings to lock the head in position for rigid machining. The head alone weighs around 250 kg and the whole machine’s structure has been designed to move that mass around quickly and, more importantly, accurately.

“We looked at some suppliers who suggested the same head design, but fitted to lightweight machine structures. There is no way we could see that working, all that mass swinging around like a pendulum on a structure not designed for it cannot be good for accuracy or longevity. Belotti showed us a list of European high-end customers already using the head/machine combination we selected, proving a track record.”

Some machine suppliers could not offer enough Z-axis height for the projects that Foley are looking to fulfil. The X- and Y-axis travels are easily achieved, and Foley’s new Navy 6250 machine has 6 m by 4 m respectively. However, the 2 m Z-axis offered by Belotti was unmatched. “Many



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We are a Precision Engineering company who specialize in large 5 axis Composite and 3 axis machining.

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### **Foley Patterns Ltd & Foley Technologies Ltd**

are pleased to announce the arrival of the first Belotti Navy 5 Axis CNC machine to be installed in the UK at its West Midlands headquarters.



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state similar Z-axis travels but on closer investigation the real figure is often under 1,000 mm. That was not enough for us and the plans we had for the new machine," recalls Jonathan Woodward.

Matt Woodward continues: "We do not know what the next project will be and we often only see it once, so we have to have speculative capacity to cope with varied customer demands. We work on a four-week turnaround from receipt of software models to delivery to the customer, so each element has to be able to deliver on this promise."

Available with X-axis travels of 4 up to 60 m and Y-axes between 4.2 to 8.8 m, the Navy machining centre range was originally developed to meet the demands of the marine sector and can be specified with Z-axis travels of 2 up to 6 m. Although the Belotti Navy 6250 is one of many machines in the range the Italian company had to re-engineer the machine to fit within the factory constraints on Foley's 10,000 ft<sup>2</sup> shopfloor. An apex ceiling required the machine bed to be lowered, but all factory modifications were carried out with rigidity in mind.

Foley selected the Heidenhain iTNC530

control system as it is familiar to all the staff on the shopfloor, although Belotti also offer the Siemens 840D and Fanuc 31iA5 NC systems. Spindle power offered is 15 kW or 22 kW with automatic tool changer capacity of 8- to 48-station available.

With customers lining up for the extra machining capacity the Belotti Navy will be pressed into service on numerous projects. "We are working on automotive projects that due to the freeform nature of the vehicle requires large tooling," says Matt Woodward. "And, we are receiving RFQ's for marine and Green energy applications for machining of large composite

mould tools"

Jonathan Woodward concludes: "People always think it is price that dictates decision but it's just a factor, knowing the machine, the company, these are things we focus on. The UK can't survive on price in the world economy, we work on exceptional engineering skills and world-class design. Lower volume, higher quality, that's the UK markets strength and we need machine tools, like the Belotti Navy to be able to deliver on these fronts."

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