Precision subcontractor gears up for new project

A leading precision subcontract specialist has invested in three new Doosan machining centres and a Doosan cobot to fulfil a new machining contract. PES reports.

Mills CNC has recently supplied precision engineering specialist Cambridge Precision Ltd (CPL) with three new Doosan machine tools and a new high-performance Doosan collaborative robot.

The machines, comprising a 5-axis DVF 5000, a DNM 6700 vertical machining centre supplied with a Nikken 5-axis rotary table and a DNM 4500 vertical machining centre, were all installed, along with a heavy-duty Doosan H2017 cobot at CPL's 24,000ft² production facility in St Neots in February 2021.

The H2017 cobot, with its 1,700mm reach and 20kg payload capacity, has been integrated with the new DNM 6700 machining centre to create a flexible, automated manufacturing cell.

All three machining centres and the cobot were acquired by CPL to fulfil a new machining contract from an existing customer to machine, in relatively high-volumes and to high-precision, a range of innovative and highly-stylised enclosures for a high-end technical product.

Following initial prototyping and pre-production work occurring and being completed in the late Summer and Autumn of 2020, CPL (at the same time) audited its existing machining capacities to identify if, and where, any pinch points and bottlenecks could occur once in full production.

"The audit revealed that we needed to significantly increase our milling capabilities and capacity in double quick time, and that a whole new dedicated machining resource would be required for the contract," says Nick Raven, CPL's general manager.

"Having scoped out the project in full taking into account volumes required, machining operations, part set-up and cycle times, we decided that a high-performance 5-axis machining centre, using its five-sided machining capabilities would be ideal to machine the solid aluminium enclosures, and that a VMC integrated with a cobot plus another standalone machining centre would enable 24/7 continuous production."

CPL, with its well established relationship with Mills CNC, approached the company

to discuss the new contract and the likely machining requirements. The discussions resulted in the following new technology package being agreed upon:

DVF 5000 5-axis machining centre

The Doosan DVF 5000 is a bestselling simultaneous 5-axis machining centre. Despite its compact size the machine is a productivity powerhouse and is equipped with a directly-coupled 17.5kW/12,000rpm spindle and a 40 tool position ATC.

The machine is able to get down to business fast with its 40m/minute rapid rates and, through its integrated thermal compensation systems and rigid construction, is also able to maintain high-accuracy and repeatability during long machining runs.

"We are no strangers to 5-axis machine tools and have invested in a number of these machines in recent years," Mr Raven comments, "We are always interested in new technologies that can make us more productive and efficient and, being a longstanding customer of Mills CNC, already knew about the DVF 5000 and its capabilities."

As far as the new machining contract was concerned the DVF 5000, situated in CPL's milling department, would be used to machine the unit enclosures made from solid aluminium billets – each one having a cycle time approaching two hours.

DNM 6700 3-axis vertical machining centre

The Doosan DNM 6700 is a large-capacity 3-axis VMC equipped with a 1,500mm x 670mm table, a 18.5kW/12,000rpm spindle, a 30-position ATC and the Doosan-Fanuc 0iMP control. With its roller LM guideways and thermal compensation systems the machine is capable of consistent, high-accuracy machining.

"We are familiar with Doosan's DNM series of machining centres and with the DNM 6700 machine in particular, Mr Raven explains. "To help fully realise the machine's productivity potential the machine ordered was to be supplied with a Nikken 5-axis rotary tilting table, which would enable us to undertake the five-sided machining of the fascia plate components."

H2017 Doosan cobot

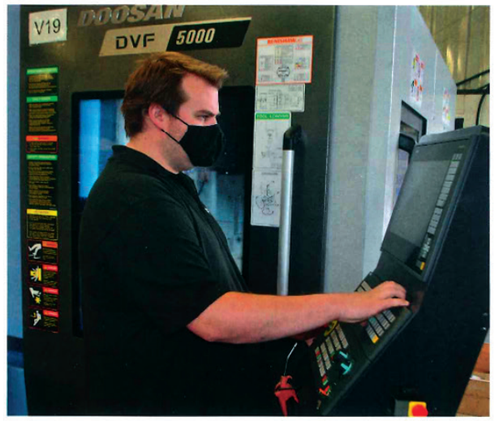
The H2017 is one of the largest cobots in the Doosan range and has a 1.7m reach radius and a 20kg payload capacity. The cobot, as mentioned previously, is integrated with the new DNM 6700 machine.

Andrew Barnard, CPL's milling supervisor explains: "The H2017 is the second Doosan cobot we have invested in over the last 18 months: the first being the smaller and more lightweight M0617 variant that we acquired in July 2019."

Similar to CPL's first cobot (Rodney), the H2017 (Derek) is integrated with a Doosan DNM 6700 machining centre set-up and programmed to perform machine tool tending operations – i.e. loading workpieces from a specially-constructed loading table into the machine and, after the machining operations have been completed, unloading the finished machined components and positioning them back on the table.

Mr Barnard explains: "The cobot and the DNM 6700 are programmed to operate unattended during the day, overnight and also over the weekends. Billets awaiting machining are positioned on the table, 24 at a time, and cycle time per part is between 45 and 60 minutes, depending on the required features and details.

"Cobots help free-up skilled labour by handling repetitive and less profitable tasks. Rodney (our first cobot) and Derek (the recent arrival) have been welcomed by the team, and the arrival of both has enabled team members to focus on other manufacturing and assembly tasks whilst also ensuring accuracy and allowing us to plan machine operation times accurately."



DNM 4500 3-axis vertical machining centre

The DNM 4500 is a relatively small 3-axis vertical machining centre equipped with a 12,000rpm spindle, a 30 tool position ATC and the Doosan-Fanuc 0iMP control. The machine, situated within a stone's throw of the DNM 6700 and the H2017 cobot, is a standalone machine being used to finish machine the products.

A time for reflection

Since September 2020 CPL has been exceptionally busy. The expanded cobotic machining centre is now tested and ready for full production, with consideration being given to further expansion.

The company is now actively seeking new premises and is also looking to invest in more advanced machine tool technologies as customers continue to ramp up their production demands.

It's all a far cry from the situation the company, and many others like it, was in during March and April 2020: "They were difficult times. Some large and high-value orders were cancelled, and we had to change the way we operated. We had new work coming on but planning for the future was not possible with so much being unknown," Mr Raven recalls.

"We were involved in the VentilatorChallengeUK government initiative and did manufacture some pre-production parts. It's fair to say that it was a challenging period in the company's history but we always knew we would hit the ground running when the right time came to proceed with investment plans.

"It was around Autumn 2020 that we felt the uncertainties were settling and with our order book bursting we hit the switch to roll out the redesign of our production hub and the expansion of the cobotic centre.

He concludes: "We, like the UK economy in general, have bounced back strongly. The high-performance multi-axis and multi-tasking machine tools we have at our disposal, combined with the skill and dedication of our staff and the robust systems and processes we have in place have all helped us capitalise on the upturn."

Cambridge Precision
www.cambridgeprecisionlimited.com

Mills CNC
www.millscnc.co.uk

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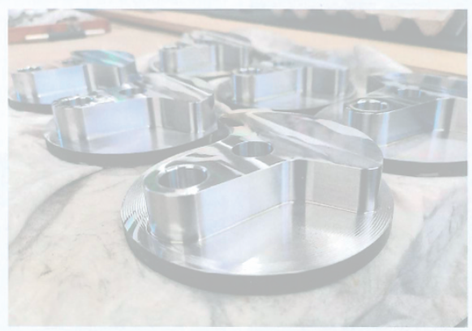
New cutting fluid is exceeding all expectations

AJ Cook Engineering is a precision subcontract engineering company based in Ely, Cambridgeshire, offering high-quality engineering solutions across a full range of materials.

The business was established in December 2015 for the purpose of restoring and building steam engines along with related projects. It quickly built a reputation and established itself in the industry.

In 2018 the decision was made to invest in CNC milling machines allowing the company to provide subcontracting services. Within a year, after further investment, mill/turning capabilities were offered for the first time.



Today, AJ Cook Engineering supplies a diverse range of high precision components to the automotive, aerospace, medical, photonics and scientific sectors. The business is regularly approached to undertake niche challenging projects.

Operationally, it makes effective use of a variety of Haas milling and turning machines and works with a wide variety of materials – including exotics such