

## BROOKHOUSE – A new role of total solutions suppliers to the Aircraft Industry, with the help of CMS ARES



At the 2005 JEC show CMS were approached by Representatives from Brookhouse Composites (the largest independent composites manufacturer in the UK) to specify a machining centre to provide 5 axis machining capacity in line with its strategic plans to provide not just materials but also total composite solutions. Following the meeting CMS UK personnel visited the premises to look at the production set up and establish the specification for the machine. This was to be a new venture by Brookhouse and they were determined to find a suitable partner with the right knowledge and experience to ensure a smooth transition into a very demanding venture. In order to establish the best machine for the job, Vincent Shaw commercial Director supplied a complex part to various manufacturers, in order to obtain time studies, tooling recommendations and method studies. This would enable him to judge the level of competence available. From this, CMS were selected as one of three potential suppliers of CNC machining centres with the necessary competence, capability and competitiveness. The ARES machine proposed by CMS provided all the characteristics necessary to machine the advanced aerospace components that Brookhouse were producing and following many discussions, Brookhouse decided that CMS was the company that could provide the necessary technical competence and knowledge combined with the advanced technical features necessary to machine Carbon fibre based composites to the accuracy and quality required.

Another major benefit to Brookhouse was that CMS UK Ltd were able to provide the complete package including – Fully enclosed machine with 24000 rpm spindle designed for cutting Carbon Fibre, High velocity extraction system again designed for the removal of the fine dust created, a tooling package plus software capable of taking the Catia generated models supplied by the customers and converting them into machine code. Another vital factor was the comprehensive training package included, which would be carried out by specialist engineers to ensure that the personnel at Brookhouse were up and running within the demands of the contracts acquired. The machine purchased was the CMS Ares 3626 APC, 5 axis machining centre. This machine has a 3.6 m X axis x 2.6 m Y axis and a 1.2 m Z axis and is equipped with two 1560 x 2020 mm tables that can be electronically linked to provide a large 3120mm x 2020 mm table.

This system allows for tandem or single table working and the tables come out of the working zone for load /unload operations. Automatic doors with interlock ensure the operator is completely protected from the cutting area. A sophisticated vacuum holding system compliments Brookhouse's state of the art tooling concepts and provides a very effective and unobtrusive part holding solution. The two rotational axes complete with a powerful 12 KW, 24000 rpm spindle, HSK tool connection and 8 station automatic toolchanger, ensure a heavy and flexible cutting capability.

The machine has the added benefit of CMS's experience in the industry-providing effective protection against the ingress of carbon dust to the slideways and electrics as well as an efficient extraction hood that rotates with the axis movements. A radio probe completes the flexible requirements of the package. Following order placement a comprehensive project plan was created by CMS UK Ltd to ensure all parts of the project were delivered and installed in the correct sequence and at the right time to meet the project deadlines including a detailed training package on the offline software.

The bulk of this training was carried out offsite before the machine was delivered, to ensure the Brookhouse engineers had the necessary time to get to grips with its capabilities without the pressure of the production environment. As the machine delivery drew closer, Brookhouse announced that they had won a major order from a large Aerospace company that involved the cutting of new types of materials and required a rethink of the fixtures and methods planned.



The machine was now required to produce a new range of components to very high levels of accuracy within the same tight deadlines. Following a number of further meetings it was established that due to the flexibility of the machine and the foresight of the purchasing team the machine could cope with the new challenge. At the same time new personnel were joining the Brookhouse team making the training aspect of the project even more critical. As per plan the machine and all ancillary components were delivered installed and commissioned within the required deadlines and production was underway within a few weeks of delivery. Inevitably due to the nature of the new work and the steep learning curve involved there were a number of issues that needed close collaboration and some hard thinking to produce the necessary quality and production levels required by the customer but thanks to the team work between the two companies, these issues were resolved effectively and efficiently allowing the production levels to be achieved.

Brookhouse continues to develop their CNC processes to meet the demands of the industry and are thriving in their new role of total solutions suppliers to the Aircraft Industry.

Brookhouse are currently in discussion with CMS for a second machine as per the original contract of supply.

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