



CMS
Industries

newsletter

2007 March

- .01** BROOKHOUSE. A new role of total solutions suppliers to the Aircraft Industry, with the help of CMS ARES.
- .02** SPS. High flexibility and productivity in the processing of sheet aluminium parts for the Aerospace Industry, with CMS FXB.
- .03** Asia not so far away from CMS.
HINDUSTAN A.L. trusted in CMS high speed technology.
- .04** FIAT Bravo. Interiors in Bergamo style.

newsletter

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.WELCOME



CMS continues to grow

CMS continues its steady, exciting growth in quality, company size, financial returns and success in the various markets it operates in.

The important organizational and structural changes brought about in the past few years will culminate this year with the launch of a big new manufacturing plant of over 25.000 square metres, strategically situated at Levate in the province of Bergamo.

This level of performance, and the significant structural and organizational investments that have made it possible mean the time is also ripe for CMS and its associated brands to adapt the way they interact with their customers and suppliers.

This has led to a restyling of CMS's image and revitalization of all its communication and customer care activities to make a further contribution to the success of this historical "high quality" brand name.



advanced materials technology

AEROSPACE INDUSTRY

Case History.01

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 Brookhouses 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.

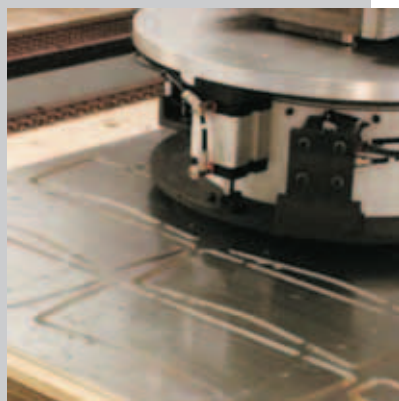
The bulk of this training was carried out onsite before the machine was delivered, to ensure the Brookhouse engineers had the necessary time to get to grips with its capabilities without the pressure of the production environment. As the machine delivery drew closer, Brookhouse announced that they had 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 continue 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.





SPS. High flexibility and productivity in the processing of sheet aluminium parts for the Aerospace Industry, with CMS FXB.

In 2005 SPS won a large aerospace order for the supply of sheet aluminium parts to the Aerospace Industry. To achieve the volumes required they needed to invest in new equipment, as a result Gary Hemmings, Manufacturing Engineering manager was given the task of finding the necessary equipment to achieve the huge increase in volume required. Gary spent many months investigating the various options for producing the blanks, including Laser cutting, Water jet cutting as well as the traditional routing. It was soon established that routing was the only solution that achieved the necessary edge finish without damage to the material structure. Following further investigations with various manufacturers a short list of three potential suppliers of CNC machining centres with the necessary capability were selected and the process of establishing the best value /performance was started. Each supplier was asked to provide sample parts for evaluation and this was compared against the cycle time, quality of finish and accuracy.

The sample parts supplied by CMS were of exceptional quality and had been produced on a similar machine from a customer in France. These parts would be used as glass case samples of the standard required by SPS. The CMS solution was to use a pressure foot system which would hold a stack of parts up to 12 mm thick onto a spoil board of MDF. This patented system allows to get, without compromises, an excellent edge finishing quality of parts at a very high cutting speed, without leaving marks on the surface and avoiding the extremely time-consuming operation of screws insertion to hold the stack.

Another major benefit of the CMS proposal was the twin table solution. This solution is based on the machine being supplied with two cutting heads each with its own toolchanger and independent control so that the machine could be used in the following way.

First table one would be loaded with the stacked aluminium sheet and the program started. Table one and head one would start producing the necessary nest pattern required.

Then table 2 would be loaded and a different nest pattern selected this would also be started. The result is that the machine can be working on two different nested patterns at the same time and each table could be unloaded and loaded while the other table carried on working.

This facility gives an incredible benefit; high volumes of parts can be produced with the flexibility of having two separate nests running at the same time.

Based on the capability offered and the edge quality of the samples supplied plus the competitive position of the machine, SPS decided to put their faith in CMS and drew up a demanding contract of supply for two machines. The contract demanded that the machines would only be accepted subject to a strenuous acceptance test at the CMS factory in Bergamo in northern Italy. The nesting software was to be supplied by Alphacam and to ensure the necessary result, technicians from Alphacam and CMS UK Ltd went to Italy to work with the CMS applications engineers to write and test the necessary routines before the arrival of the SPS team.

The acceptance test required that a stack of 12 mm thick 2x1 m sheets of aluminium be loaded onto each table and a separate nest produced including all the de tagging, with a surface finish equal to the original samples supplied. The results were even more impressive than originally anticipated. The machines were able to produce 1100 parts in an 80 min cycle time with a superb edge finish and a high quality blend on the de tagging.

The machines have now been in production for more than 8 months and SPS are delighted with the quality, output and flexibility of the CMS machines.



Asia not so far away from CMS. HINDUSTAN AL trusted in CMS high speed technology.

Hindustan Aeronautics Limited (HAL), Asia's premier aerospace company, having 16 productions units, 9 Research centres at 7 locations across INDIA, envisages a road map to establish state-of-the-art manufacturing facilities to cater to increasing demands of their internal & International aerospace customers.

The Company has an impressive product track record - 12 types of aircraft manufactured with in-house R&D and 14 types produced under license.

HAL has manufactured 3550 aircraft (which includes 11 types designed indigenously), 3600 engines and overhauled over 8150 aircraft and 27300 engines.

HAL has been successful in numerous R&D programs developed for both Defence and Civil Aviation sectors.

HAL has made substantial progress in its current projects:

- Dhruv, which is Advanced Light Helicopter (ALH)
- Tejas - Light Combat Aircraft (LCA)
- Intermediate Jet Trainer (IJT)
- Various military and civil upgrades: Sukhoy m30 MKI, MiG 27M, MiG 21 Variants

HAL Aircraft Division is also involved for production of components for different aerospace programs:

- BOEING, USA
Uplock box assy. for Boeing 777
Over wing exit doors for Boeing 757
To MHI Japan Bulk cargo door for Boeing 767
- AIRBUS, FRANCE
Forward passenger doors for Airbus A320
- BAE SYSTEMS, UK
Jaguar airframe spares

Considering their long experience in aerospace activities, they are considered leader company in this market. Its long experience in this field, let them be a leadership company for the construction of components for aerospace applications HAL devises their specifications of CNC machine to High dynamics, High acceleration, and Simultaneous 5 axes machining capabilities, better accuracies, and surface qualities. More critically, TWIN ram with each ram housing two axes spindle for their specific needs of machining of identical or mirrored aerospace structural components. HAL emphasised the need for prominent features such as High speed machining, high degree of flexibility, higher economics in cost per component.

CMS responded with top-of-the line Poseidon series in the concept of Gantry design with TWIN ram, each housing powerful 2 axes spindle, with spindle characteristics of 30 KW, 70 Nm, faster feed rate with Higher acceleration, ideally suiting to high volume materials removal associated aerospace Industries worldwide.

The machine virtually has 9 servo controlled axes thus offering complete flexibility, in handling any production exigencies of aerospace customers.

After careful evaluations on other competing machining solutions, HAL unanimously conferred the decision in favour of CMS, for design, supply of 7 CNC 5 axis machine along with proving of aerospace structural components on each machine to their satisfaction.

In a strict time schedules, CMS has manufactured and installed 7 CNC profilers and also actually machined HAL components at the customer premises. Since the installation in January 2006, HAL witnessed drastic reduction in machining time of most components, some to the extend of 70-80%, while machining complex structural components, which previously required multiple set ups, on multiple machines.

Main characteristics of the CNC machine:

Nr. 2 Five axis machine X=10.000mm Y=3.800mm Z1/Z2=1.100mm twin independent spindle

Nr. 3 Five axis machine X=6.000mm Y=3.800mm Z1/Z2=1.100mm twin independent spindle

Nr. 1 Three axis machine X=6.000mm Y=3.800mm Z1/Z2=1.100mm twin independent spindle

Nr. 1 Five axis machine X=4.500mm Y=2.600mm Z1=1.100mm single spindle

Dedicated T slot table up 10m x 3m and customized vacuum overtable with pin references for correct clamping and alignment of the components. High capacity chips removals along the working table

All the machines are equipped with latest Fanuc 31iA5 full digital configuration and interfaced with CMS technical service via remote diagnostic. Following this collaborative efforts of CMS and HAL, HAL have confirmed repeat business, which is under execution now, besides CMS delivering machining solutions for variety of HAL components on a regular basis in order to take this experience to new levels.

FIAT Bravo. Interiors in Bergamo style.

CMS Plast, a Bergamasc company that produces cutting robots and is a part of CMS Industries, has become a link in the FIAT Group supply chain. Production of passenger compartment parts for the **FIAT Bravo**, a model that is contributing prominently to the Turinese car manufacturer's present success, avails itself of technological treasures designed and constructed by CMS Plast.

SINTESY 2 TU2 has been adopted for cutting and finishing dashboards in polyurethane foam, having a reinforced glass ABS base covered with PVC upholstery. **SPEED 6 2R WJ** is used for cutting the car floors, which are produced for FIAT by ROI Automotive Technology, part of the Bergamo Gruppo Radici. Both systems contribute to sustain the requested production rate of 7-800 cars a day.

The choice of CMS Plast as a partner was justified by the company's experience in cutting and finishing automotive components acquired by the Bergamasc company, as testified by numerous other installations at prestigious companies operating in the sector, for example the SELMAT Group and SG Plastica. This know-how has required considerable investment in research and development over time and today has permitted the achievement of objectives for the construction of plants and production startup in relatively brief times.

SINTESY 2 TU2 is a cutting robot equipped with two independent electrospindle operating units and a rotating table for piece loading/unloading during processing. It has already been proven a success in the production of the Cromia. Day after day, **SINTESY 2 TU2** has revealed itself to be a highly competitive solution, superior to traditional cutting and finishing technology using a shearing machine and cell of anthropomorphic robots. For its flexibility, allowing processing of both left and right-hand dashboards on the same machine; for its cutting precision and quality, equal to that obtained from a shearing machine and such as to eliminate all manual finishing of pieces; for its economic advantage, with decisively inferior investment requirements.

SPEED 6 2R WJ is a cell equipped with two anthropomorphic robots, waterjet operating units and a rotating table, designed for cutting several car components such as carpets, car floors, headliners, parcel shelves, trunk modules, door panels and engine housing parts. **SPEED 6 2R WJ** can process different materials, from reinforced glass polypropylene to

PUR RIM: the machine in operation at ROI cuts FIAT Bravo car floors made of polyurethane foam EPDM.

The cell is equipped with FANUC anthropomorphic robots, and combines a high-level specification product with excellent supplier service. A particular feature is the ability to define variable areas of anti-collision, which substantially simplifies programming for this type of application.

The cutting technology used on materials cut by **SPEED 6** – water jet – ensures an unrivalled combination of speed and cutting quality, completely eliminating dust. Another important factor for the process is the precision of the cutting, which allows for a precision mechanical fit and a quality end product, reducing manual intervention to a minimum.

At the core of the system are its unique pressure intensifiers, designed and produced entirely by **Tecnocut**, a company which is highly specialised in water jet technology and is also part of CMS Industries. Founded in 1992, Tecnocut is now an established international point of reference in this sector, with state of the art systems, both standard or with the opportunity for personalisation, for the cutting of metals, marble, glass, plastic and composite materials.

The partnership of CMS Plast and Tecnocut in the installation of the plant for ROI is a positive result for CMS Industries strategy, and one which places the Bergamasc group in an excellent position on many markets. This brings with it undeniable advantages for clients too, who can frequently find a highly competitive solution for a relatively modest level of investment.

