Five axis machining halves moulds production time

A DMG (UK) product story
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Investing in a DMU60P 5-axis machining centre from DMG has enabled Beaubury Precision Moulds to produce moulds in four-six weeks, and sometimes two, compared with 12 weeks before.

Investing in a DMU60P 5-axis machining centre from DMG has enabled Beaubury Precision Moulds of Aylesbury to completely re-think its production strategy, reducing lead times, improving product quality and creating new business opportunities.

As specialists in the manufacture of blow moulds for 'Blue-chip' companies in the cosmetics, household products and automotive industries, competitive pressure ensures that Beaubury Precision Moulds (BPM) is continually evaluating new product developments and production technologies.

Paul Matthews, production manager, explains that while BPM has an enviable reputation for quality, it is not enough to maintain a strong competitive position.

The market's demands for the shortest possible lead times and continual price reductions places constant pressure on the manufacturing operations.

'People don't want to wait 12weeks any more,' he says.

Now, using the DMU60P's five-axis positioning and wide arc of access on five faces, BPM typically takes 4-6 weeks to produce a mould but has done it in as little as two.

This has been achieved in two ways.

First, by using the Erowa pallet system to allow five-face machining - the cutting and grinding of blanks has been reduced to a single set up on a vertical machining centre.

The rough cut blank only needs to be faced-off and drilled for attaching the pallet explains Matthews, while machining the remaining faces is done on the DMU60P, saving four set-ups.

Additionally the distortion caused by roughing the cavity can now be rectified without re setting - saving more time.

Secondly, since blow moulds require a lot of water cooling for maximum heat extraction (reducing cycle times) during production - a lot of drilling is required to produce the coolant channels.

Matthews points out that for the size of machine (600 by 700 by 600mm in X, Y and Z respectively) the DMU60P is particularly well suited to deep-hole gun-drilling.

The exceptional length of the Y-axis travel, and the 40Bar through-tool coolant meant that BPM can meet all the coolant channels in a single operation with no restrictions due to setting or fixturing.

Also as a further benefit, BPM no longer needed to consider the purchase of a dedicated deep-hole drilling machine to do the job.

BPM also finds that the DMU60P enables the company to make more use of its existing 3-axis high-speed machining centre.

Since blow mould cavities are in general quite shallow and rarely have any requirement for under-cuts, most of the time saving benefit is gained on activities other than profiling, (including such tasks as engraving serial and part numbers).

Therefore transferring profiling activity to the other machine has very little time penalty and ensures that BPM gets maximum value from its 5-axis capacity.

With such a wide variety of parts being processed on the machine BPM has completely filled the 60 station toolchanger but changing tools in the magazine can be done using a convenient access panel at the front of the machine.

Matthews raises an interesting point on how the new machine has saved a lot of work on the shop floor but, in the process, has created the need for more expertise in programming.

BPM uses a combination of PowerMILL and EdgeCAM to create tool paths that are sent to the DMU60P's Heidenhain 426 controller via a DNC link.

'It is now very important for Beaubury to remain competitive with the software that it uses,' says Matthews explaining the best software reduces the time required to develop five-axis tool paths - maintaining a competitive advantage.

The spare five-face, five-axis capacity created is now available on a subcontract basis.

BPM is already working with high technology industries, such as Formula One, and expects to develop more business as its expertise and reputation in using 5-axis technology grows.

Summarising, Matthews notes that although the DMU60P has simultaneous five axis capability the real benefit to BPM has been the five face machining and wide arc of access.

The result has been an overall improvement in manufacturing efficiency reducing lead-times and releasing capacity that can be used to generate new revenue streams.