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ELECTRONIC MEDIA PRESS RELEASE

***YCI Supermax/3D Solutions
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***Staying Ahead of the Curve in Mold Manufacturing
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"If you can quote it, 3D Solutions can cut it."

3D Solutions Inc., located in Mounds View, Minnesota, specializes in complex molds requiring extensive engineering within short lead times. According to CEO and owner Kelley Andreasen, "This focus has fueled an impressive growth rate over the past three years."

3D Solutions' success can be attributed to its approach to mold manufacturing. From aluminum prototype molds to high-performance, close tolerance tooling, the company is realizing a 35-percent cycle time reduction through high-speed machining with equipment such as the YCI Supermax FV56T vertical mill and Supermax Rebel 3 high-speed vertical machining centers. Each machine is equipped with a video camera so one does not have to leave the CAD room to view the machines while they are running. Customers can view the machines as well, allowing them to check the status of their orders.

Accelerated cycles

The need for accelerated cycles is an "absolute must" at 3D Solutions. "A mold's design is one-tenth of its overall cost," observed Andreasen. "Since projects typically have an average eight-week delivery, engineering has less than eight days to complete the necessary project programming and ramp up." In order to meet this ambitious schedule, 3D Solutions gets its teams of designers and CAD/CAM programmers involved as early as possible in the customer's conceptual design stage. "Our major customers have us review multiple design concepts during the product development phase so we can provide tooling feasibility input," explained Andreasen. "This helps us design the best possible mold for the product."

The company gets the shop floor cutting as quickly as possible. "I've put out an ABS plastic prototype in as little as three hours," said Andreasen. "We cut a plastic prototype so the customer can evaluate the tool marks, without any polishing, and the true surfaces supplied by their databases. This ensures that we're using the proper tolerance for the cusp heights."

High-speed machining

The company utilizes high-speed machining to provide the accuracy and superior finishes that customers require, while cutting about 35 percent off time-to-market on molds across the board. As noted previously, 3D Solution uses two Supermax Rebel 3s for metal removal. One Supermax FV56T vertical mill is used for graphite machining. Both machines are manufactured by Yeong Chin Machinery Industries, located in Taiwan and represented in North America by YCI Supermax, located in Santa Fe Springs, California.

On a typical steel mold, Supermax's Rebel 3 operates at 10,000 rpm on hardened H13 tool steel using a 40 taper spindle and a variety of high-speed ALTiN inserts. "We take a level cut, starting from the top and working its way down," explained Andreasen. "Overall machining time has decreased dramatically – we're making molds ten times faster than before. And the Supermax Rebel 3 machines have such a high accuracy that bench time is cut to a minimum. This extra time allows us to focus on electrode detail and get the mold out the door faster!"



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Fewer sets of electrodes

Using the Supermax FV56T for graphite molding allows 3D Solutions to reach these tolerances in less time. More time can be spent doing finer picks on the corners with smaller cutters for less bench polishing. It also allows more detail on one electrode. In the past, the same type of setup might have required 35 to 40 different sets of electrodes. Now, 3D Solutions incorporates everything into fewer sets of electrodes and does it nearly eight times faster.

This is due to the FV56T's high-speed feed rates and rpms, as well as programming capabilities. The machine's rigidity and consistent accuracy have also enabled 3D Solutions to cut ribs 0.014" wide by 0.700" deep without snapping them off. "I attribute the FV56T's thin-rib capability to the 18M Fanuc CNC controller and balanced holders and high-end tooling," remarked Andreasen. The Fanuc controller features extended memory, AICC (basic high-speed software), a full alphanumeric keyboard, and 4,000 rpm high-speed rigid tapping, eliminating the need for expensive floating tap holders. An RS232C interface is convenient for uploading and downloading CNC programs.

Supermax FV56Ts are especially built for high-production shops with limited floor space allowance. Its compact footprint, roomy working envelope and high-speed, high-precision capability make it ideal for mold/die operations. Included among the standard features are full chip guards, a spindle air curtain, an automatic central lubricating system, and precision hardened and ground ball screws. The entire base is made from a one-piece Meehanite™ casting that provides optimum structural stability and exceptional vibration damping.

Staying ahead of the curve

From engineering through tooling on the shop floor, 3D Solutions plans on staying ahead of the curve through continuous upgrading. As much part geometry as possible is incorporated into one electrode, and user overburn is always in the customer's favor when programming with the FV56T. For example, if the control document allows a 0.010" maximum radius around an internal part feature, finish passes are created around the electrode using a 0.032" ball cutter, when possible. Factoring in a 0.008" side overburn in a spherical orbit will create a 0.008" inside and outside radius for the part detail. By using overburns in their favor, one can maximize the bulk of the part detail in just one electrode. This minimizes electrodes and graphite costs while increasing electrode surface area for a faster overall cycle time with less setup.

3D Solutions strives to stay current with new technology - machines, software and hardware. Through intense evaluation of the machine tools that are available, the company has concluded that YCI Supermax delivers the biggest bang for the buck comparatively in the market place. They also stress the fact that their dealer is able to provide the service and support they need. As Andreasen concludes, "When moving forward in this millennium, not having the necessary service and support is like driving a car without the steering wheel!"

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