

Hydromat redefines productivity

Innovation is never too far from CEO's planning

The concept of rotary-indexed machining is taking a next—and possibly most dramatic—step forward under the watchful eyes of Bruno Schmitter, president and CEO of Hydromat Inc., St. Louis, MO, and Martin Weber, vice president-manufacturing.

The AT Advanced Technology CNC machine that Hydromat introduced to customers, prospects and media representatives at its annual open house is its most recent product innovation. It's designed to redefine productivity for its customers.

The genesis of the AT machine, explains Schmitter, was the request by a Swiss customer for a machine to process precision parts in one chucking. "They wanted a machine that loaded the part and didn't let go of it all the way to the polishing machine," he says.

The resulting design of the AT machine is intended to extend that precision machining capability to mid- to high-volume production of such components as pumps, fuel injectors and small engine pistons, among other applications. Lower production volumes are not out of the question, either, for a system that features data carrying chips on each pallet.

The AT can handle irregularly shaped cast or forged blanks within a 4" (100 mm) cube. On the AT, each workpiece is chucked once using an Erowa ITS PowerChuck pallet clamping system. The machine's rotary table transfers the modular pallets to individual workstations where they are clamped in the pallet fixture with repeatability within 2 microns or less. The index table serves as a pallet transport only. Machining accuracy is built into each individual station, eliminating tolerance stackup from station to station.

The AT 115-10 CNC machine shown at the open house was a 10-station

machine set up for machining small engine pistons. An 8-station version is also available. One station is for loading/unloading manually, with pick-and-

machining and turning stations is possible depending on the requirements of the final product. A servo drive is mounted in the base of each workstation to provide unlimited axial positioning of the pallet fixture as well as high-speed fixture rotation up to 5,000 rpm for precision lathe-type operations.

The range of tooling possibilities includes horizontal and/or vertical toolspindle units, multi-tool turrets for multi-tasking and redundant or common tools to reduce downtime associated with worn tool replacement. Typical machining operations include milling, boring, turning, drilling, cross drilling, reaming, recessing, threading, tapping and broaching.

Control is supplied to the AT machine by a GE Fanuc CNC controller. According to Weber, programs can be offset on the fly and complete program changeovers can be done at the machine control, downloaded from a host computer or done off-line on any PC, then delivered on a floppy disk.



Martin Weber, VP-manufacturing (left) and Bruno Schmitter, Hydromat president and CEO, show off the AT machine at Hydromat's open house.

place devices, or by robot. Four stations were tooled as 4-axis machining stations with HSK A40 toolholding and 3.7

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kW spindle motor; five stations were tooled as 3-axis turning units with HSK B50 toolholding.

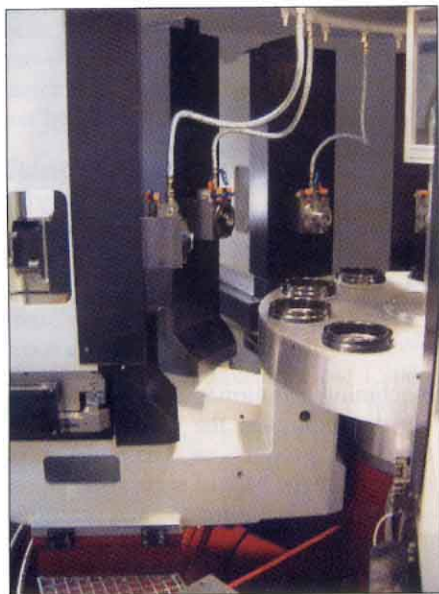
In fact, any combination of prismatic

Swiss turning plus

The AT marks the second highly innovative precision transfer machine introduced by Hydromat within the last half year or so. At IMTS 2000, Hydromat premiered its HT 32-12 CNC HydroTurn machine, which combines a sliding headstock at the in-feed station, allowing Swiss-type turning of rotating bar stock prior to cut-off and clamping.

"The patent-pending HydroTurn design marries the best capabilities of both sliding headstock and rotary transfer machine technologies for parts requiring significant OD turning, close tolerances and consistent surface finishes," says Schmitter.

The HT 32-12 is a modular system with up to 12 horizontal and 4 vertical toolspindle units with 1/4" bar capacity



Each workpiece is chucked once on the Erowa ITS PowerChuck pallet clamping system and indexed by the transport table to workstations. Automotive truck cylinder block example

that can machine parts from standard bars up to 12 feet long. Once cut off, the stationary workpiece can undergo many types of machining operations, including drilling, cross drilling, boring, turning, milling, external and internal recessing, threading, tapping, broaching and the like.

The HT 32-12 has an inverting unit that removes the workpiece from the collet, turns it 180 degrees, end-for-end and puts it precisely back in the same collet. In this manner, the backside of the part can be completely machined, eliminating what would normally be a secondary operation. Flexibility is further enhanced by the ability to use different collet diameters from station to station. Collets can be all the same size, or every second collet can be a different diameter, permitting clamping a part on two different diameters.

Enhanced service support

While at the open house, visitors had a chance to view first-hand Hydromat advances in its operations and support services intended to improve its response to customer requests for parts, collets and cutting tools. Hydromat's HSLdirect Storefront, first shown at IMTS 2000, is now on-line.

HSLdirect Storefront is an e-commerce solution that makes ordering parts fast, easy and entirely at the customer's convenience, day or night. Ordering parts is as easy as visiting



Erowa PowerChuck clamps pallet fixture with repeatability within two microns.

<http://hydromat.com> and clicking on the HSLdirect page link or simply typing in <http://www.hsldirect.com> for immediate access. The customer types in the part description, chooses the respective quantities, method of shipment and payment, and can even track previous orders.

Hydromat's newest addition to speeding service support to its customers, its customer service paging system, was also demonstrated. "Hydromat customers can get answers to technical questions no matter what the day or time with our 24/7 web-enabled immediate customer service paging system 365 days a year," says Schmitter.

At the same time, Hydromat employees looking to fulfill customer requests for parts and components are benefiting from its automated storage and retrieval system. Hydromat has installed eight Remstar units that have reduced the work area required from 4,000 square feet to 800 square feet to automate order picking. The new ASRS, which is bar code driven, is expected to dramatically reduce leadtimes for all part orders.

To facilitate customer training, the Hydromat training program has been put on CDs to make it fully interactive and self-managed. "Switching from videotape to CD technology allows trainees to proceed at their own pace, taking time to fully digest each training segment before moving on to the next or hitting the help menu if they need assistance," Schmitter explains.

Grinding cell and more

Another highlight of the open house was Hydromat's new grinding cell that will provide 48-hour turnaround on collet grinding, from the time the customer places an order for collets to the time they are shipped. The cell features a highly automated overnight grinding production capability. The cell compris-



Typical parts that the AT machine is designed for include irregularly shaped cast or forged blanks within a 4" (100 mm) cube.

es a Studer CNC four-spindle precision internal grinder driven by an automated workflow/material handling systems from Erowa.

An Erowa 5-90PHM robot automatically introduces workpiece pallets to the Studer grinder. Each pallet is equipped with a data carrier system and as it is loaded the machine tool reads the program that is to be run. The computer chip in the data carrier system is regenerated every time the pallet is reset. The Erowa PowerChuck clamping system with data carrying chip is the same one that is used on the AT machine.

According to Schmitter, Hydromat will expand its capacity to grind tools for its customers by adding a second 5-axis tool grinder and is investigating the possibility of adding a coating system to its manufacturing capabilities.

And, of course, the full range of Hydromat machines were shown. They ranged from the economical Pro 20 to the largest 16-station machines and the Rismat 125-8 for secondary machining operations.

The entire IEMCA lineup from smallest single spindle units to the largest multi-spindle feeders were also shown, as well as the new BOSS 547 with 2" diameter capacity that was introduced at Westec 2001.