

# New Twist On Rotary Transfer Machines

By Chris Koepfer

**Rotary transfer machines** are productive high volume producers of a wide variety of workpieces. While traditional rotary transfer machines are very capable of volume production of complex workpieces, they tend to be more dedicated with regard to job changeover, with the exception of families of parts.

In what might be described as a nod to the future of rotary transfer machine technology, Hydromat (St. Louis, Missouri) has introduced its new AT (Advanced Technology) machine. The new design departs from the company's traditional rotary transfer machine configuration in several significant ways.

The AT is designed to produce mid- to high-volume quantities of parts originating from irregular shaped casting and forging blanks. It's full CNC with servo driven ballscrew axis actuation.

Designed as a pallet machine, the AT is available with eight or ten stations and accommodates a work cube of 4.5 inches (115 mm). Machining modules are conventional three-axis X-Y-Z that can be configured for five-axis machining if needed. Tooling

possibilities include horizontal or vertical toolspindle units and multi-tool turrets for multi-tasking. Each unit can be equipped with an automatic tool changing system holding redundant or common tools.

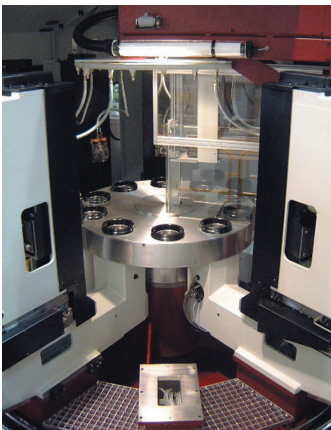
Each machining unit is modular. Constructed of a single piece casting, these units are built as a C-frame machining center. The workpiece pallet is mounted on the same structure as the machining

spindle axes. This maintains relative positions of the workpiece and cutting tool within the machining unit itself.

The pallet system on the AT uses the Erowa modular power chuck for accurate location of the pallets. With this system workpieces are mounted on a pallet that is transferable from one receiver to another, around the periphery of the rotary table. This power chuck system uses a Hirth coupling ring to locate each pallet in its receiver. Clamping pressure is 2,033 pounds (9,000 N). The Hirth ring gives location accuracy and repeatability of 2 microns or less.



A new rotary transfer design indexes palletized workpieces across eight or ten machining modules. Each module can be configured with automatic tool changers.



On Hydromat's new AT machine, the table lifts and rotates to index the workpieces from station to station. The machining units are modular and can be set up off-line to expedite changeover from job to job.

The machining modules are actually C-frame machining centers. The pallet receiver is integral to the machine structure. The receiver is CNC controlled and can be used for contouring or it can be rotated up to 5,000 rpm for turning. Relative accuracy of the machine spindle and the work is maintained.

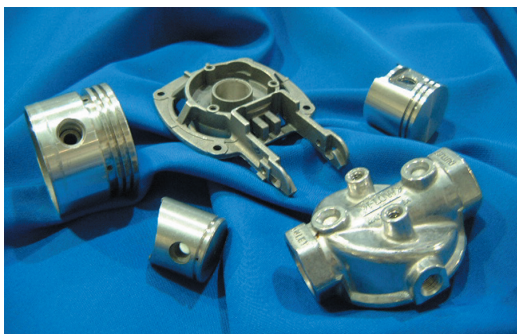


When the machine indexes from one machining unit to the next, the rotary table lifts and transports the palletized workpiece from one station to the next. All pallets unclamp and are moved in unison.

Because the pallet receivers are integral to the machining unit, the table is simply a transfer device and has no impact on position or accuracy of the workpiece relative to the machining spindle. When the index is complete, the rotary table lowers the pallets onto its receiver, and the Erowa system clamps it in place on the machining module.

The AT is designed as a multi-processing machine tool and as such it is capable of milling, drilling, tapping and turning. The machining module mounted receiver is servo driven and can rotate at 5,000 rpm if a turning operation is required for part processing. This CNC rotary axis can also be programmed for contour machining.

Workpiece candidates for the AT include piston manufacture for small displacement internal combustion engines. The Erowa system allows the piston to be clamped in the ID so overall turning can be done on



A work volume of 4.5 cubic inches accommodates a variety of irregular shaped castings and forgings that are difficult to fixture. Complex parts in medium to high volumes can be milled, drilled, tapped and turned on this rotary transfer machine.

the OD. The machining models can also cut the oil and compression ring grooves as well as the wrist pin holes. Pistons come off the machine complete. Other job candidates are brake components, appliance and instrument housings, valve and faucet bodies, and parts that require angular machining beyond the fixturing capabilities of conventional rotary transfer machines. ■

*For more information about rotary transfer machine technology from Hydromat, call (314) 432-4644, enter 31 at [www.mmsinfo.com](http://www.mmsinfo.com) to visit Online Showroom, or write 31 on the reader service card.*