

Automation Accessories

Accessories that manufacturers need to integrate to achieve unattended production.

Automating a shop for lights-out production is about more than advanced machine tools, rail-guided vehicles and already-setup workpieces and cutting tools.

A manufacturing system's major components are needed, but so are suitable machine tool accessories. These accessories, like bar feeders, angle heads and parts collectors, also have to allow for unattended manufacturing.

Among those automation-ready accessories are the Turbo 3-36 bar feeder from Edge Technologies, St. Louis, a division of Hydromat Inc. A 12' magazine bar feeder, the 3-36 is for feeding round, square and hexagonal bar stock up to 36mm in diameter into sliding-headstock CNC Swiss-style machines or fixed-headstock CNC lathes.

The 3-36 features quick-change guide channels for improved productivity. Edge Technologies offers several sets of FMB guide channels for handling bar stock of different diameter ranges, such as a set for diameters from 12mm to 20mm. "If you are changing diameters within this range, it takes less than 5 minutes to change the bar feeder over from job to job," said Kevin Meehan, Edge Technologies' general manager. "If you are changing to a diameter outside of this range, the quick-change guide channels can be changed in about 10

minutes."

These guide channels are made of polyurethane to reduce vibration and noise. "Polyurethane absorbs more vibration than steel and is easily molded to different size ranges," Meehan said.

Moreover, the 3-36 floods its guide channels with oil, creating a hydrodynamic effect that centers the bar in the channel, dampens vibration and dissipates heat when the bar rotates during lathe operation.

Also, the 3-36 holds onto the bar stock with a pusher and collet that are sized to the lathe's headstock and permit retraction of the remnant out of the lathe before loading a new bar from the feeder's 11-linear-inch rack magazine.

Another automation-ready bar feeder is the Mini Boss 338 from IEMCA, Charlotte, N.C. A slightly larger version than the Mini Boss 332, the 338 handles bar stock from 3mm to 38mm in diameter for sliding-



Designed for use with automatic toolchangers, Koma Precision's Slimline angle heads accept NSK micromachining, front-end attachments and extensions and are for light-duty milling and drilling in hard-to-reach or confined areas.

headstock Swiss-style lathes.

IEMCA developed this larger version to keep up with a trend in lathes. "This option was created to meet the requirements for the growing popularity of larger diameter Swiss-style, or sliding-headstock, lathes," said Allan Dopf, IEMCA national sales manager. "Some Swiss machines are going to 38mm capacity."

The 332 can feed and retract the remnant of a 32mm round or non-round bar. With its 39mm-dia. guide channel, the 338 can feed and retract the remnant of a 36mm round bar and can feed and front eject the remnant of a 38mm round bar. The bar feeder can retract only a 36mm bar because some space must be left for a collet to fit around the bar.

The 338 has a front support bushing to stabilize larger diameter bar stock. Like Edge Technologies' 3-36, the 338 floods its guide channels with oil. Also, both the 338 and 3-36 include devices that synchronize them with a lathe's headstock so they move with the headstock rather than lag behind.

Angle Heads

Machining accessories like angle heads contribute to automation if they can be handled by an automatic tool-changer (ATC). Examples of angle heads that can be handled by an ATC are the Slimline angle heads from Koma Precision Inc., East Windsor, Conn., and the Half series of Rite Angle heads from Tecnar Tooling Systems Inc., Santa Fe Springs, Calif.

The Slimline angle heads are for use in hard-to-reach or confined areas and are suitable for light-duty milling and drilling of small-diameter holes. The heads accept NSK micromachining, front-end attachments, as well as extensions. The cartridge collets can hold cutting tools as small as 0.04" to about 0.118" in diameter. Also, the heads have a maximum input speed of 20,000 rpm. The angle heads are available in two models, an "A" version capable of 1.0 Newton-meters of machining torque and a "B" version capable of 4.0 N-m of machining torque. Also, the Slimline heads are available in 45° and 90° versions.

The angle heads are designed and manufactured by Alberti Umberto & C., Saronno, Italy. Koma Precision imports the heads, as well as Alberti live tools, to North America. Koma Precision introduced the Slimline heads into the U.S. market after it was approached by a company that

needed to drill a 0.090"-dia. hole in an aluminum structural aerospace component. The application was similar to one performed by an Alberti customer involved in automotive racing, so Koma Precision obtained the heads for the aerospace application. Joe Halik, Koma Precision's OEM sales manager, added that in addition to aerospace and automotive applica-

the 152, and the 155 Type, the same body as the 154. The 153 accepts up to a 1/4"-thread-size ANSI tap, while the 155 accepts up to a 3/8"-thread-size ANSI tap.

The series' three other models are universal angle heads, the 175 Type, the 176 Type and the 177 Type. The universal models permit precision machining at infinitely variable



The FMB Turbo 3-36 bar feeder from Edge Technologies includes quick-change guide channels for improved productivity. Also, the bar feeder reduces vibration, noise and heat through its polyurethane, oil-filled guide channels.

tions, the heads are suited to machining small pumps, valves and medical parts.

Tecnar Tooling's Half series includes angle heads for drilling, light milling and tapping. The Half series is based on Tecnar's MST Rite Angle attachments, which have a compact head. The company offers the Half series to shops with limited budgets so they can accept a wider range of advanced projects.

The Half series consists of seven models. The right angle models include the 152 Type and the 154 Type. The 152 uses DETa-1 070 series collets and can hold up to a 0.276"-dia. cutting tool and can achieve 6,000 rpm. A larger version, the 154, can hold a tool up to 0.512" in diameter with DETa-1 120 series collets and rotates a tool up to 4,000 rpm. These models are for drilling and milling.

Their tapping counterparts are the 153 Type, which has the same body as

The following companies contributed to this report:

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IEMCA
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Koma Precision Inc.
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Royal Products
(800) 645-4174
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Tecnar Tooling Systems Inc.
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angles and all three have a top speed of 3,000 rpm. The 175 and 176 can be applied for drilling and milling. The 175 uses a DETa-1 070 series collet and can hold up to a 0.276"-dia. cutting tool, and the 176 uses a CTA10 series collet with maximum capacity for a 0.393"-dia. cutting tool.

The 177 has a shank configuration that accepts up to a ¼"-dia. ANSI tap.

After Machining

To collect machined parts, Royal Products, Hauppauge, N.Y., offers a device that permits unattended machining. The Rota-Rack parts accumulator has a 700-lb. capacity and a 3'-dia. turntable. The table's surface area is more than 1,000 sq. in. and can hold hundreds of parts, depending on their size. Also, the table includes a spiral rail that ends at the table's center.

The Rota-Rack collects parts as they come off a machine tool, primarily a CNC lathe. To use the accumulator with a CNC lathe, the machine tool needs a parts catcher and a collection box, which may need to be modified so finished parts can fall through the box onto the Rota-Rack's conveyor.



Royal Products

Running an unattended shift became possible for Royal Products after it developed a large-capacity device for collecting finished parts from its machine tools. The company now sells the Rota-Rack, which features an indexing turntable and stationary spiral rail for gathering parts from a conveyor. Also, the Rota-Rack avoids damage to the parts, which can happen when they're dropped onto each other in a collection box.

The accumulator has an index timer that a machinist can set to match a part's cycle time, so each time a part is finished, the turntable indexes beneath the separate, stationary spiral rail.

"The spiral guide gently conveys the parts to the center, where they are eventually collected by the operator," said Tom Sheridan, marketing director for Royal Products.

Also, the Rota-Rack includes a second timer that controls the amount of time the turntable spins and therefore controls the degree of rotation. Machinists can set this second timer for a few seconds or for longer intervals, so the turntable can rotate longer if the lathe is machining long parts and shorter if it's machining short parts.

Royal Products created the accumulator for use in its own facility, designing it to have more capacity than collection boxes. The additional capacity allows Royal to run a shift unattended. Also, the Rota-Rack avoids the sometimes damaging effect of parts being dropped onto each other in a collection box. Royal Products suffered this effect when manufacturing its live centers. Their sharp points tended to damage other centers when they fell on them in the boxes. However, the Rota-Rack nudges parts against each other as they accumulate at its center.

A manufacturer's decision to automate for lights-out production will always start with a review of the company's major components. But that review will eventually encompass even small components, such as angle heads, because if the devil is in the details, then automation is in the accessories. △



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