

COOL TOOLHOLDING

System delivers the power of shrinkfit without the heat.

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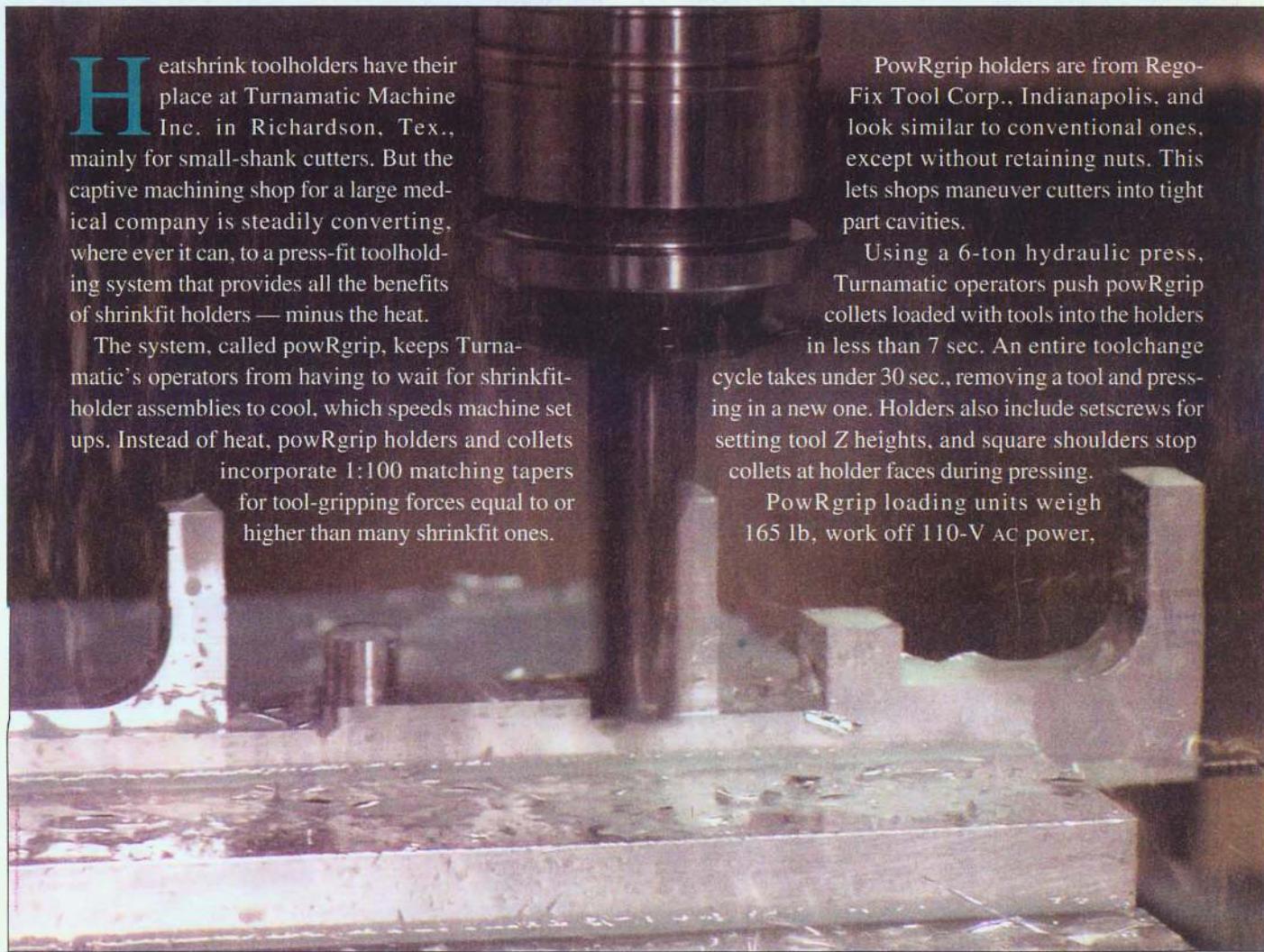
Heatshrink toolholders have their place at Turnamatic Machine Inc. in Richardson, Tex., mainly for small-shank cutters. But the captive machining shop for a large medical company is steadily converting, where ever it can, to a press-fit toolholding system that provides all the benefits of shrinkfit holders — minus the heat.

The system, called powRgrip, keeps Turnamatic's operators from having to wait for shrinkfit-holder assemblies to cool, which speeds machine set ups. Instead of heat, powRgrip holders and collets incorporate 1:100 matching tapers for tool-gripping forces equal to or higher than many shrinkfit ones.

PowRgrip holders are from Rego-Fix Tool Corp., Indianapolis, and look similar to conventional ones, except without retaining nuts. This lets shops maneuver cutters into tight part cavities.

Using a 6-ton hydraulic press, Turnamatic operators push powRgrip collets loaded with tools into the holders in less than 7 sec. An entire toolchange cycle takes under 30 sec., removing a tool and pressing in a new one. Holders also include setscrews for setting tool Z heights, and square shoulders stop collets at holder faces during pressing.

PowRgrip loading units weigh 165 lb, work off 110-V AC power,



Press-fit powRgrip toolholders give Turnamatic the performance of heatshrink toolholding, without the heat, for its aluminum machining.

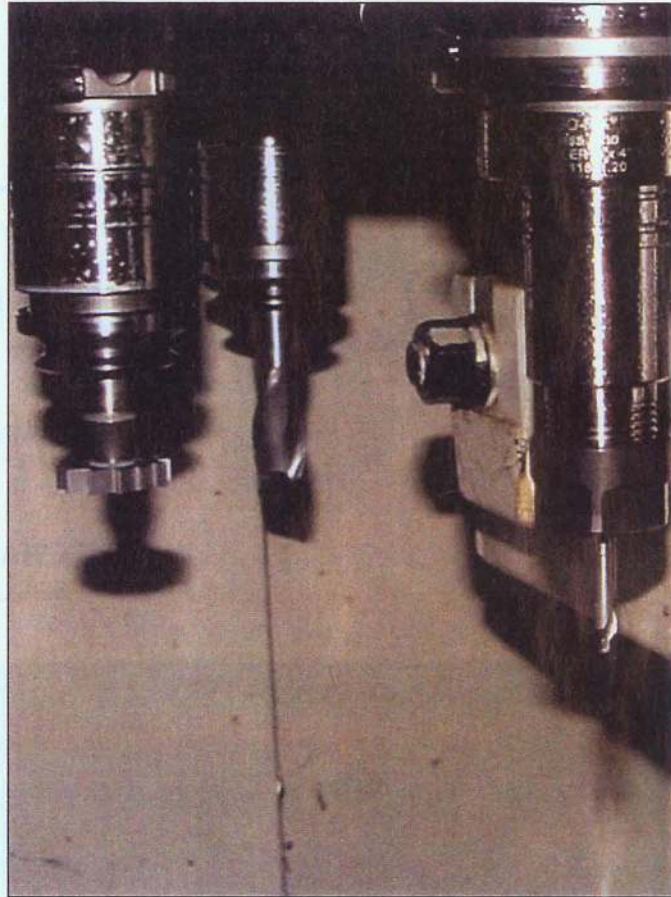
and easily fit on workbench tops — as opposed to similar systems of equal clamping power weighing hundreds of pounds and requiring higher voltage power sources. Rego-Fix offers hand-pump and automatic versions of its loading units with factory pre-set pressures.

Two operating buttons on the loading units make for simple toolchanging. Users press tools in holders with an “in” button and remove them with an “out” one.

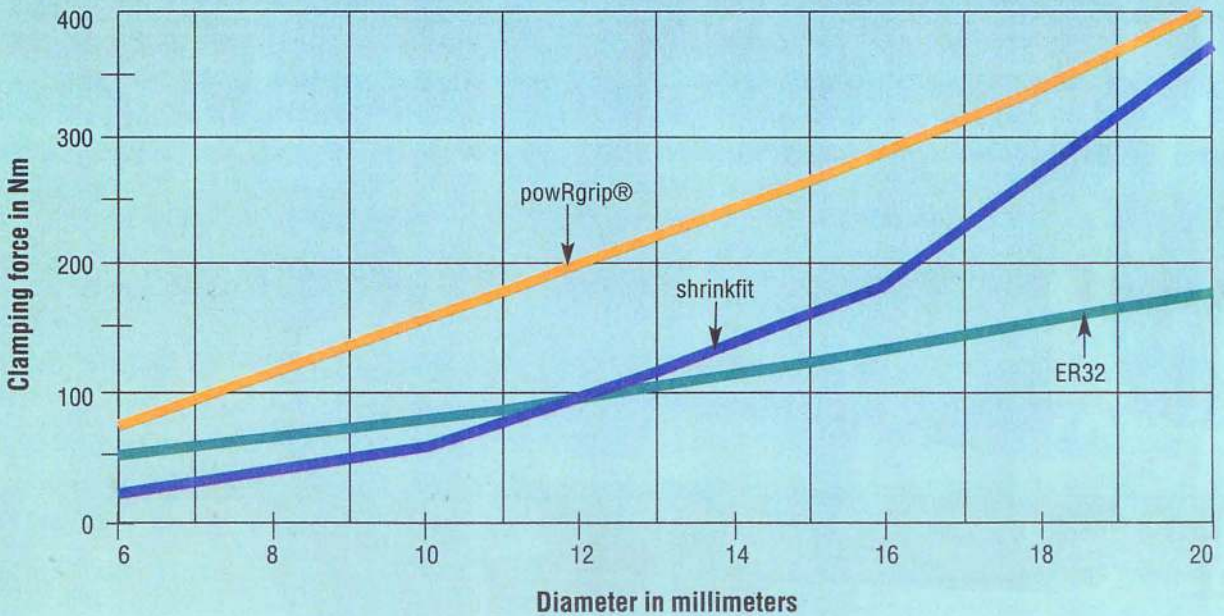
Besides gripping strength, powRgrip’s matching-taper fit provides 0.0001-in. runout at 4× cutter diameters. Such accuracy is critical in Turnamatic’s machining operations, especially when milling holes to accept press-fit pins. The shop cuts these critical holes taper-free to tolerances of +0.0005 in./-0 with cutters mounted in powRgrip holders.

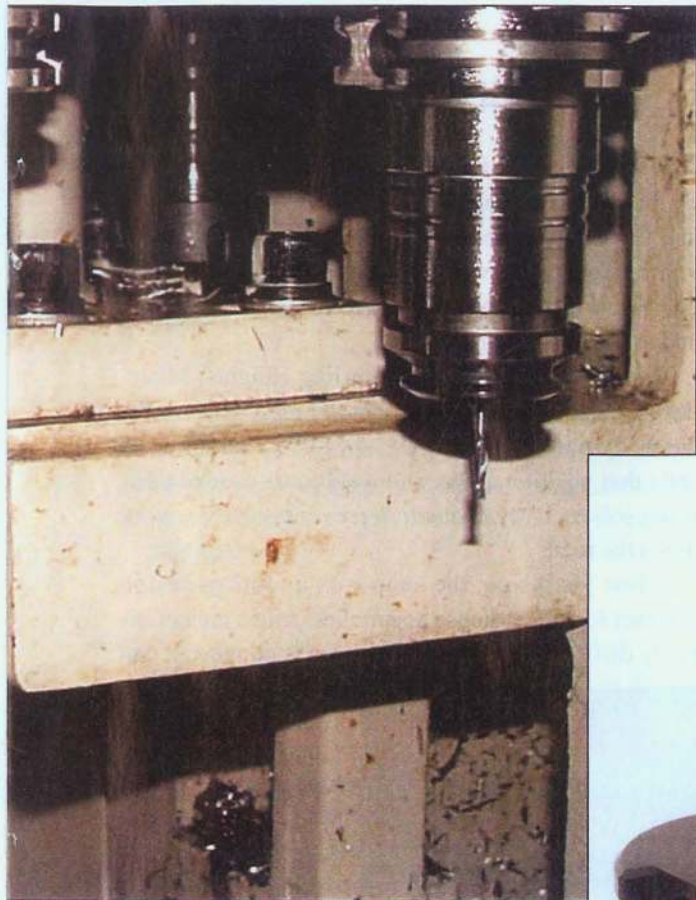
“We have a lot of money invested in other holder styles, so the switch to powRgrip holders is slow. However, when jobs call for tight tolerances, we use our powRgrips,” says Chris Holladay, a programmer at Turnamatic.

Mainly, the shop builds custom prototype components out of solid aluminum, runs such jobs in production for a while, and then eventually produces the components from castings. And doing secondary machining on the castings, according to Holladay, can be tough, but the holders handle it.



PowRgrip’s clamping force as compared to shrinkfit and ER 32-type holders.





Unlike a standard toolholder (center), powRgrip holders don't use retaining nuts.

Working with a lot of 6061 aluminum and aluminum castings, the shop typically roughs and finishes a part with the same cutter in a powRgrip holder. Because of the holder's accuracy and the fact that Rego-Fix balances all its holders by design, Turnamatic easily achieves the finished part surfaces it needs. The holders also include grooves that accept balancing rings, so shops can balance holders and cutters as complete assemblies using a balancing machine.

"The powRgrip holders are ideal for high-speed machining because they are well-balanced and concentric," says Holladay. The shop typically runs them between 6,000 and 20,000 rpm in 40 and 50-taper machines.

PowRgrip models accommodate tools from 0.125 to 0.750 in. in diameter, and Rego-Fix is developing ones

for larger tools and adding extensions to the line. While small-diameter cutters often pose problems when using heatshrink holders, they are easily removed from powRgrip holders.

"Overheating an HSS cutter in a shrinkfit system can potentially marry the cutter to the holder, making removal impossible," comments Jim Proctor, president of Turnamatic. He also says that constantly heating and cooling carbide cutters damages their molecular structures.

In testing, powRgrip's components reportedly withstood over 20,000 insertions and removals with no

reduction in clamping force or holder accuracy. That's because Rego-Fix treats its powRgrip holders and collets with friction-reducing processes that make their surfaces hard and wear-resistant. CT

Because of special surface processing, powRgrip holders and collets, in testing, delivered up to 20,000 cycles (tool removals and insertions) without diminished gripping forces or accuracies.

