Very small holes

Sometimes it seems that parts are just getting smaller and smaller. With this decrease in size comes tighter tolerances and accompanying challenges in machining. Flowing are two tools specially designed for hole-making and reaming in small dimensions.

Micro Boring

For boring small holes, 1 mm to 8 mm in diameter, the Multihole-Bore Micro offers a variety of cutter shapes in coated or uncoated carbide. The tool holder fits in a standard chuck, and the cutter insert is secured in the tool holder with a special nut that allows changing inserts by hand. The toolholder leaves the insert slightly and radially, so no adjustments need to be made after changing inserts. The Multihole-Bore Micro is made by Utilis of Switzerland and distributed in North America by Geneve Swiss Industries, Inc.

Orbitally Floating Micro Reamer Chucks

The task: drill more than 100 holes inside an aircraft fuelage component, parallel to the bed of the machine. Sounds like a lot of facing and hand-drilling, right? Not necessarily. At Precision Machine and Manufacturing in Grove, OH, they make just such a part at a TruTool 600 vertical machining center. When it comes time to drill all those holes, the tool of choice is a coolant-poured right-angle drill head, and Wade Cavallin, product development engineer at Precision.

Mother of invention

All these products started out with someone recognizing a need or problem. If you’re having trouble with something in the shop, you’re probably not the first person to encounter it. If you have the idea that “this process can be done more efficiently,” you’re probably right. Ask around. Check the Internet. Someone else may have already created a solution. If not, maybe this is your opportunity to invent. It can solve your problem and could become a whole new product line for your company.

Many in the machining business find that part of its attraction is that every day there’s something new to deal with. And that’s why new technologies are developed all the time — and old ones dusted off and brought back in new applications — to help keep those parts coming off the machines.

For more information


Above: Multihole-Bore Micro holder & quick-change boring bar with thou- cassettes from Geneve Swiss Industries.

Above: Orbitally floating micro reamer chucks from Geneve Swiss Industries.

Above: Coolant-driven right-angle head and coolant-driven knee leg from Ethol.

Above: Close up of hydraulic pump housing showing holes Bored radially in small holes or multiple passages, taking advantage of small profile and variability of coolant-driven right-angle head from Ethol.

Above: How it works — Alike to fit into openings as small as one inch in diameter, the Tiptop head from Ethol Corp., Cincinnati, OH, uses high-pressure coolant to drive a positive displacement ball piston motor. Depending on the load, the coolant pressure needs to be between 200 and 2000 psi, said Ed Croft, vice president of marketing at Ethol. The speed of the unit depends on the load, the coolant pressure and flow rate. For example, with 8 psi of load, the speed might be 5000 rpm at 450 psi and 9000 rpm at 1000 psi. Since the head doesn’t depend on the spindle for power, it is possible to mount the Tiptop head on the spindle as an indexing device, which is what Precision Machine does when drilling all those holes. The figure below and right show holes drilled with at Tiptop unit inside a hydraulic pump housing. For instance, Ethol also makes a coolant driven keycutter that machines keyways right on the machine, so a separate machining process is not needed.

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