



Machining

Meet Guhring's RT100XF: A High-Performance Carbide Drill Developed for Tough Metals

Roland Jones | Jun 09, 2020

When it comes to metalworking, durability and reliability are key. That's why the RT100XF is such a compelling choice for machine shops looking to become more productive and efficient. We talk to Guhring about the development of the company's latest drill.

There's a new drill in Guhring's lineup: *the RT100XF*. The newest addition to the company's line of high-performance drilling products, which boasts impressive performance in various machining conditions, is branded "extreme and powerful," but its development wasn't necessarily straightforward.

Guhring's primary aim was to create a drill that could target specific materials, but the company soon discovered that the drill worked well on other materials. So Guhring continued its development and created a final design that works well across multiple material groups.

"We spend a lot of time and resources on R&D to make sure that we end up with the best possible tool."

Brandon Hull

Director of Product Management and Business Development, Guhring

"From a development standpoint, we took some key design features from the proven design of our successful RT100HF drill, which was designed for titanium and nickel alloys, and made some tweaks, which allowed us to significantly boost the drill's performance in steels," says Brandon Hull, Guhring's director of product management and business development.

How Guhring's RT100XF Combines Hardness and Toughness

Built to manage the demanding requirements of high-production machining with high process reliability, the new line of drills is the "perfect combination of hardness and toughness," according to Guhring.

The durability is attributed to the brand-new K40XF carbide grade developed specifically by Guhring for

the RT100XF, and which the company says is tougher than the standard carbide. It dramatically increases the toughness of the drill without sacrificing hardness, and it provides more strength to the tool while maintaining excellent wear characteristics and reducing the potential for microchipping at the cutting edge. All this means the RT100XF is more forgiving in less rigid machining conditions.

Through research and testing at its proprietary R&D facilities, Guhring came up with an improved process for applying the coating—a better adhesion to the carbide substrate—so the drill lasts longer and provides better evacuation of material, Hull says.

“We’ve improved our already popular nano-Firex coating by utilizing a specialized pre- and post-treatment process that improves adhesion to the carbide substrate and polishes the outer layer of the coating for reduced friction and improved chip evacuation” he notes.

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New Premium-Level Features

Other notable premium-quality features include highly polished flutes with an almost mirrorlike finish that reduces friction and allows chips to evacuate more efficiently, and reduce the heat generated during the operation of the drill, protecting the cutting edges and preventing the part from being work-hardened.

Both the 5xD and 7xD drill lengths use a double margin design that engages immediately, resulting in improved hole concentricity, roundness and straightness. The double margin design also improves the sidewall finish inside the hole.

Hull says Guhring developed its micro-geometry through the utilization of advanced equipment and improved fine grinding techniques that allowed the company to significantly tighten up the tolerancing of the chisel centrality and the cutting-edge hone.

“It allows us to apply a smaller, perfectly consistent and repeatable true radius hone, with significantly tighter tolerances, rather than the traditional K-land type hone most manufacturers use,” Hull says. “This leads to a stronger cutting edge, resulting in extended tool life and a more reliable drilling process. We can consistently produce and reproduce these features while holding tolerances to the nearest micron.”

“We were also able to drastically improve the surface finish of the cutting edges, web-thinned area, flutes and the finished diameter at the margins,” he adds.

A Compelling Choice for Machine Shops

At a time when efficiencies are so important to many shops, the RT100XF is a likely useful addition to a tool lineup. It was designed to cut cycle times for materials that are difficult to machine and is hard-wearing. The reliability and durability are likely to make the RT100XF a compelling choice for machine shops looking to become more productive.

Guhring tools are premium-level quality, and they justify that price tag with their strong performance. If you’re drilling 1,000 holes of a difficult-to-machine material, maybe it’s hardened steel, the RT100XF looks like an excellent choice, Hull says.

“This drill is designed for high-production applications, those requiring excellent hole quality and repeatability, applications requiring high process reliability, and applications with difficult-to-machine materials,” Hull says. “It’s a drill that serves multiple purposes and is intended for those looking for a

premium product to maximize their production capabilities.”

Hull adds that, depending on the material machined, the RT100XF is capable of operating at speeds and feeds about 20 percent to 30 percent higher than other drills, which can provide significant productivity gains. And once the tool is worn, Guhring can recondition it to its original geometry and coating at a fraction of the cost of a new tool at its reconditioning facilities here in the United States.

Led by Manufacturer Research and Development

For several years, manufacturers have aimed to cover all materials with one or two different types of drills to cover all the bases, but lately there’s been a trend toward material-specific and application-specific tooling, Hull says. Some customers do work a lot with titanium or stainless steel, and they need tools that are designed specifically for those materials, he adds.

A few years back Guhring came out with the RT100S—a drill that was designed specifically for high-production applications in steel. Although it worked well in steels, it had limitations in other materials, Hull says. With the subsequent development of the RT100XF, Guhring landed on a design that not only excels in steels, but also performs very well in titanium and nickel alloys, stainless steels, and in cast iron.

“So even though Guhring was trying to target specific materials applications, the company came out with a drill that does work well across multiple material groups,” he adds.

This kind of versatility is driven by Guhring’s strategy to control its production, and its in-house research and development facilities that have been instrumental in carbide development, machinery and plant engineering, and the development of the company’s coating technologies.

“We spend a lot of time and resources on R&D to make sure that we end up with the best possible tool,” Hull says.

What types of drills do you find most useful in your shop?

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