

**productive times**

# Go-to tools

Ace Manufacturing Industries Inc., Green Bay, Wis., produces components for manufacturers of agricultural equipment. The majority of the parts are machined from cast and ductile iron. Part volumes average about 15,000 a year, and jobs often repeat under blanket orders. On the other hand, "we always have prototype runs that are hot. They call and they want it by Friday," said Kris Hanson, the company's manufacturing engineer.

The company's other services include weldment-to-casting conversions and rapid prototyping. In general, continuing demand for agricultural equipment keeps Ace busy.

In pursuit of efficiency and speed, the shop continually looks for ways to control costs and boost throughput while maintaining quality. Consequently, Hanson has applied tools from the Gorilla Mill division of Carbide Grinding Co. Inc., Waukesha, Wis., for various parts.

The toolmaker's milling tools' flutes have variable-helix angles and variable pitch, which reportedly eliminate harmonics and resulting chatter during cutting. Hanson said the design works, enabling the tools to cut smoothly. "With the Gorilla Mill, we can take a deeper depth of cut," he said. "With a standard endmill, you'd have to do it in multi-

ple passes."

As an example, Hanson cited side milling a ductile iron component. The shop had been employing a 1"-dia., 4-flute, coated solid-carbide endmill at 1,528 rpm and a 19.55-ipm feed rate. Radial DOC was 0.2", and the required 3" axial DOC was completed in three 4.2"-long passes, stepping down 1" each time. After Ace switched to a 1"-dia., 5-flute, coated solid-carbide Gorilla Mill, speed and feed were increased to 2,100 rpm and 31.5 ipm, respectively. In addition, the 3" axial DOC was completed in a single pass, which wasn't possible with the previous tool. "At full depth, you have to back down on a standard endmill; it will start to vibrate and chatter," Hanson said. "With the Gorilla Mill, you can go right at the recommended feed per tooth."

Hanson said fine surface finish is evidence of the absence of chatter. "We'll finish some bosses at a full-depth axial cut with a radial cut of about 0.100" or 0.200" per side, and we'll get a nice, consistent finish."

Faster cutting speeds and feed rates save spindle time and lower cost per part, and "tool life is there," Hanson said. Elimination of multiple passes decreases the amount of linear inches machined, further reducing downtime for

**END USER:** Ace Manufacturing Industries Inc.

(920) 434-7202  
www.ami-mfg.com

**CHALLENGE:** Productively mill a variety of parts in production and prototype volumes.

**SOLUTION:** Endmills featuring both variable-helix angles and variable pitch.

**SOLUTION PROVIDER:**

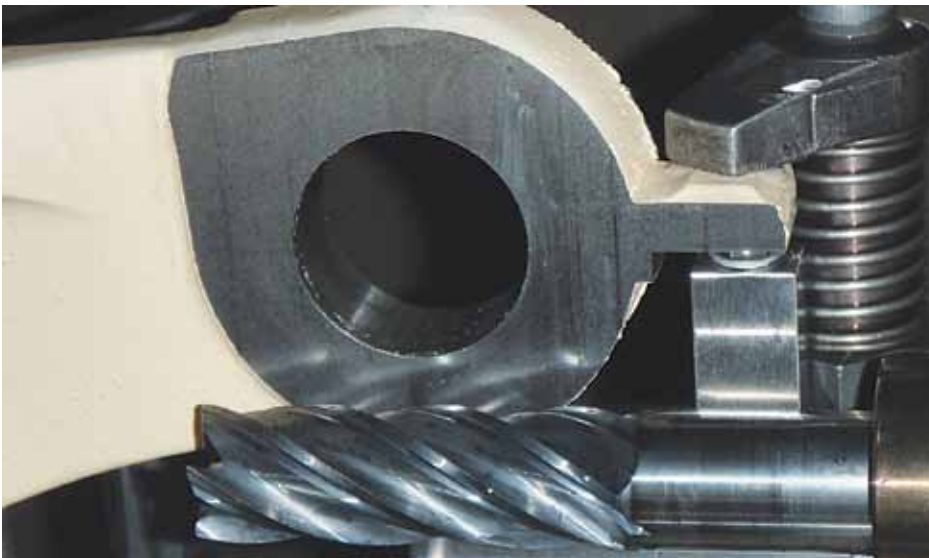
**Gorilla Mill**

(866) 888-9600  
www.gorillamill.net

tool changes.

Quiet operation is a side benefit; "it gets in the cut and you can't even hear it," Hanson said.

The Gorilla Mill has become the shop's "go-to" tool for general and challenging machining. Hanson said: "Everybody on the floor is used to it; they can just take it and run with it because they know its capabilities. We have used these endmills for many different applications, from full slotting, full-depth side milling and helical interpolating cored holes to extended-reach milling of bosses on anything from hydraulic valve bodies and gear carriers." **CTE**



Ace Manufacturing Industries employed a 1"-dia. Gorilla Mill with a 3" flute length to side mill this ductile iron agricultural machinery component.