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STREAMS OF SAND

Metal service center successfully uses one garnet media at all its cutting tables

One of six Flow abrasive waterjet machines that Penn Stainless Products operates.

An ultrahigh-pressure stream of water becomes a highly efficient and powerful cutting tool when garnet sand is mixed into the water stream and passed through the mixing tube on a waterjet cutting machine. Garnet sand is the lifeblood of abrasive waterjet cutting. But not all garnet is equal.

That's the opinion of Brian Yeakel, plant manager at Penn Stainless Products Inc. in Quakertown, Pennsylvania. The family-owned service center, founded in 1979, exclusively cuts with Adirondack 50 HPX garnet produced by Barton International in Glens Falls, New York.

"When we first started waterjet cutting 20 some years ago," Yeakel recalls, "our equipment supplier recommended Barton and we've preferred its garnet ever since."

Since then, Penn Stainless has expanded its waterjet department and now operates six waterjet machines manufactured by Flow International Corp. The company's most recent addition is a Mach 700, with two bridges and four cutting heads. The company employs seven operators to run those machines around the clock, five days a week, in a 10,000-square-foot area dedicated to waterjet cutting.

"Tonnage-wise, waterjet cutting represents a relatively small portion of our total business," Executive Vice President Dan Seward says, "but in terms of the value it brings to our company—and to an important group of our customers—it is substantial."

ADVANTAGES

Penn Stainless uses multiple dynamic waterjet machines to efficiently cut complex

Mined from Barton's hard rock deposit in upstate New York (left), HPX garnet has a crystalline structure that produces a waterjet abrasive with sharp, angular edges.

geometries in cold-rolled stainless steel sheet as thin as 30 gauge and standard plate up to 6 inches thick. The waterjet process offers significant advantages. It virtually eliminates the taper that can be left by laser and other cutting methods. Because it is a cold-cutting process, it develops no heat-affected zones, which can lead to cracking when cutting certain grades over 1 inch thick.

"Cutting tolerances are tighter, there's less secondary finishing required, and cutting speeds are faster and deliver consistent edge quality with the 50 HPX product," Yeakel says.

The right garnet ensures that the service center's cutting meets customer demands. Penn Stainless has tried other garnet abrasives, he notes. "We've been offered samples of garnet from other suppliers, but they don't cut the way Barton's does. We have a multi-machine operation and, at one point, we considered running a lesser quality garnet on one machine for cutting thin material, but we didn't see any real advantage. The 50 HPX is a very versatile product."

CLEAN AND CONSISTENT

The HPX garnet is a consistent product that cuts cleanly and is readily available without a long lead time, Yeakel says. "Because we use so much abrasive, we have standing orders that come in regularly, but if we need additional material Barton can ship the order within the week. That's industry-leading turnaround for us here in Pennsylvania."

"With six waterjets running nine cutting heads, Penn Stainless is a major HPX user and is a great organization to work with," says Alex Schuster, regional sales manager for Barton. Mined from Barton's hard rock deposit in upstate New York, HPX garnet has a crystalline structure that produces a

LIFE CYCLE

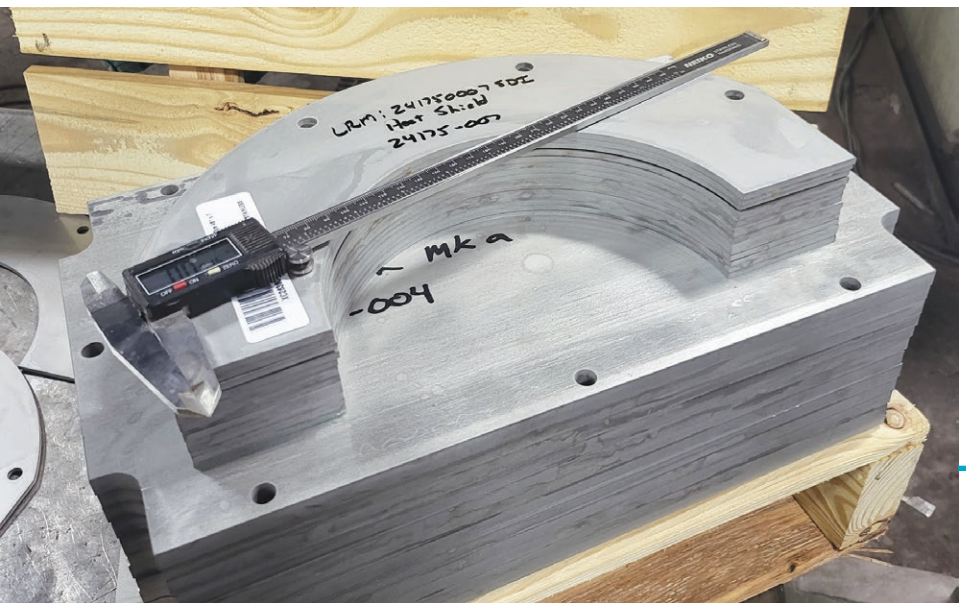
KNOW YOUR NOZZLES

In addition to purchasing garnet abrasive from Barton International, Penn Stainless Products sources RocTec waterjet nozzles from Barton.

According to Brian Yeakel, plant manager at Penn Stainless, the company had used nozzles from different manufacturers over the years. "We tested RocTec nozzles and found they delivered good cut quality and cutting speed. The life of the nozzles is also good, and we have switched all our waterjets to RocTec nozzles," Yeakel says.

Kennametal Inc., Pittsburgh, produces the RocTec nozzles from a tungsten-carbide composite in a proprietary process.

Yeakel adds that Penn Stainless will use different nozzles on a waterjet machine depending on the job requirements. "Every job is different. If we have a precision job, we might replace nozzles before they are completely worn to ensure we supply our customers with the best possible edge quality."



"When we first started waterjet cutting, [a] supplier recommended Barton. We've preferred its garnet ever since."

Brian Yeakel, Penn Stainless

Waterjet machining is a cold cutting process that exerts minimal pressure on the workpiece material and is unlikely to cause warping or other distortions.

About 10,000 sq. ft. of Penn Stainless Products' 220,000-sq.-ft. facility in Quakertown, Pennsylvania, is dedicated to waterjet machining.

waterjet abrasive with sharp, angular edges. Based on decades of experience and field trials with both customers and waterjet equipment OEMs, Barton has found that its garnet cuts faster than competing brands. Barton processes its HPX garnet to stringent specifications for product consistency and exceptional quality.

"One of the upsides of using a high-quality garnet with a consistent particle size is it minimizes the risk of running a job out of spec," Seward says. "For those critical, high-dollar projects, the threat of a rejection from a poor-quality cut is not worth the risk that would come with using inconsistent garnet."

Penn Stainless runs a closed-loop water system. As Yeakel explains, after the garnet is used in the cutting process, it is separated from the water, which is returned to the waterjet. Although the garnet is not reused for cutting, it is repurposed locally.

"That's a sign of Penn Stainless' commitment to the environment and doing things right," Yeakel says. "It's a lot better than just sending used garnet to a landfill."

Penn Stainless is an AS9100-certified company, with a nationwide clientele that includes aerospace manufacturers. In addition, the service center has a fleet of 27 trucks to deliver product daily throughout the Northeast, including every state in New England, Maryland, Delaware, Virginia, New Jersey, New York, Ohio and Pennsylvania. FFJ

Barton International, Glens Falls, New York, 800/741-7756, barton.com.

Penn Stainless Products Inc., Quakertown, Pennsylvania, 800/222-6144, pennstainless.com.

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