

SHARP INNOVATION

BTM's automatic band saw delivers clean, fast results on both sides of the border BY NICK WRIGHT

As a part of machine tool technology that hasn't significantly evolved in decades, band saws don't face pressure to change. With the advent of tougher, sharper blades of different materials as well as sophisticated controllers, the metal-cutting workhorses can be beefed up and dialed in to last longer. But in the grand scheme of band saw design, similarities abound.

At BTM Saws North America, Woodstock, Ontario, engineers have taken a step back and approached band saw design by focusing on the heart of the machine, rather than the consumables. Constructed with a stress-relieved head frame, isolated gear box and unique roller guide block, BTM's premier automatic band saw line has redefined a technology typically slow to change.

Canadian service center ASA Alloys, Toronto, installed the model 520 CNC 600 automatic band saw in 2011 to boost its cutting capabilities for a number of reasons.

"Probably No. 1 would be precision in terms of the straightness and smoothness of the cut," says Ward Seymour, chairman of Canadian Specialty Metals, the parent company of ASA Alloys, a company that Seymour founded and formerly owned. "But more importantly, we were looking for a machine that would cut a variety of bar and variety of grades quickly."

ASA has approximately 115,000 square feet at its Toronto service center, one of its five locations across Canada.

"We're a speciality steel house doing aluminum, stainless steel and aircraft alloys," says Gregg Cousins, president of ASA Alloys. "It's a real cross section of grades within those sections."

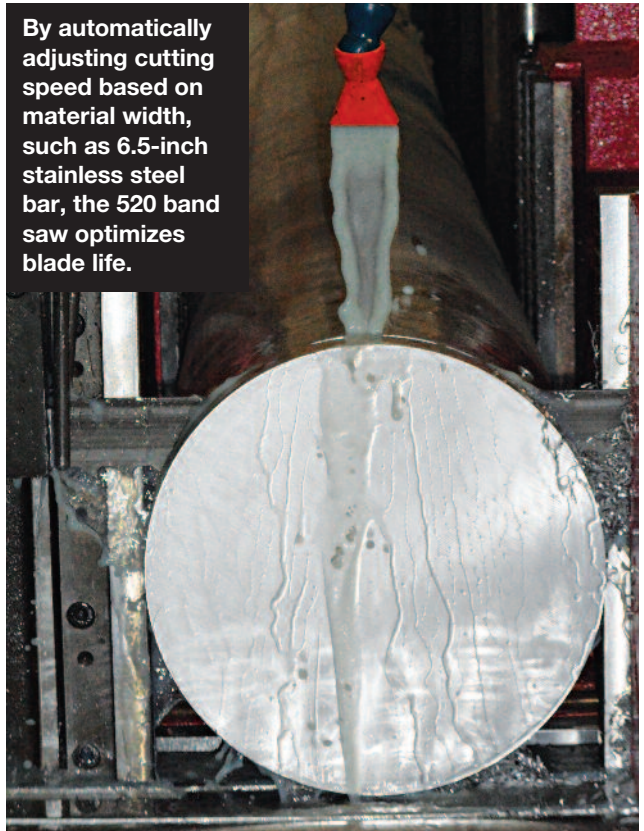
Among the main metals ASA offers is stainless steel in alloys 316, 304 and 17-4 precipitation hardening stainless steel, as well as aluminum in alloys 5052, 6061 and 3003, says Cousins. The company mainly cuts round bars from 1 inch to 7 inches in diameter on its BTM saw; however, the 520 fits up to 20-inch round bar. ASA also distributes aircraft-quality vacuum arc remelted steels such as 300M and 4340.

ASA's customers include a wide range of capital goods manufacturers in industries such as transportation, agriculture, energy, aviation, building and construction.

Simple solution

ASA, which was founded in 1983, had several band saws from other manufacturers prior to working with BTM. ASA's purchase of the

By automatically adjusting cutting speed based on material width, such as 6.5-inch stainless steel bar, the 520 band saw optimizes blade life.



additional band saw arose out of internal capacity needs, according to Cousins. "We needed another saw. When we went looking for one, we decided to give BTM a chance," he says. "We had not done BTM saws before."

After receiving a request for a quote, BTM recommended the 520 based on ASA's cutting requirements, says Ian Tatham, president and owner of BTM. Because many of the production band saws from North American manufacturers are based on older designs, the odds are high of buying the same machine today as one from 10 years ago.

"They wanted something that was different, if you will," says Tatham.

Because of sluggish band saw evolution, BTM looked to high-end machining centers and machine tools as part of its inspiration for new tools. "Machining centers are constantly developing, pushing the envelope, new technology and controls with programs to make machines work better," he adds.

From the programming standpoint, the 520's proprietary controller makes loading, feeding and cutting bar simple and efficient for ASA. The 520 will automatically adjust blade speed to match the cross section of the workpiece, which not only provides fast cutting

times but also increased blade life due to its optimized speed.

“The programming on the machine is easy to use,” says Cousins, noting the conveyor’s rollers make feeding the saw smooth. “That can be time consuming on some of our other units, whereas you can program cuts easily and quickly on the 520.”

In Toronto, ASA’s bar-cutting workflow is simple. For long products, for example, ASA uses a state-of-the-art Kasto cassette storage tower, which retrieves bar. The loading cartridge releases bar onto a conveyor right in front of the saws. After cutting material on the 520, ASA packs and ships its customers’ product.

Vexing vibration

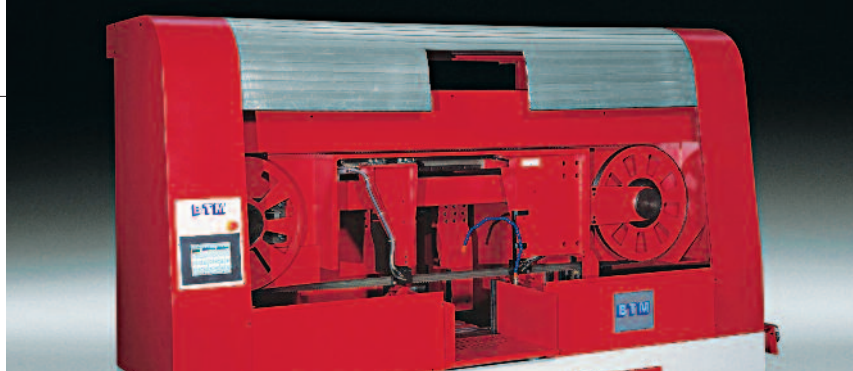
Blades are the first item to wear down in a band saw. But with rigorous, regular use over the course of time, other parts can fatigue, all of which contribute to vibration at the cutting tooth—the most critical part of the cutting operation. Those vibrations can produce a maddening squeal as the blade cuts through material.

BTM developed three vibration-dampening advancements for the 520, beginning with the head, says Tatham. Its head frame is a fabricated weldment that’s oven-treated for heat stress relief. This hardens all the welds, making it stiffer and tougher. It also de-stresses the metal so it acts like a cast component to absorb cutting vibration. Most band saw manufacturers cast the head frame for which the molds are expensive, making design changes cumbersome. With weldments, design tweaks are flexible.

“That is huge from a performance standpoint,” Tatham says. “It’s unbelievable the difference it makes.”

Second, BTM isolated its gearbox from the blade. The gearbox generally is the most expensive part of a band saw, he says. With precision hardened gears, the gearbox resists blade tension and cutting forces with a massive independent drive shaft, which is mounted on bearings on the outside of the drive wheel, with two large bearings on the inside. All of these components work together to resist vibration.

“What it does is makes the drive extremely stiff and allows you to use a high-end gearbox that won’t need replacing,” Tatham says. In eight years of



The BTM 520 CNC band saw’s head frame is a fabricated weldment that’s oven-treated for stress relief. This stiffens the saw to absorb vibration.

providing this feature, none of the gearboxes have required replacement.

Third, BTM innovated its guide block. Typically, in a carbide guide block arrangement, there are two side guides and a top guide. The top guide rubs against the top of the blade, absorbing the cutting force and driving it up into carbide, which causes friction on the blade. “We replaced that top guide with a hardened feeding roller, so now instead of top guide, you have little friction because the blade is rolling with it,” Tatham says.

Because ASA processes high-quality stainless steel, speed and blade life are equally important, which directly affects how quickly ASA can get the product on the machine, cut and out to its customer, Seymour adds.

“And we certainly have achieved that with a carbide blade. So far its been a wonderful machine,” he says.

To effectively monitor blade condition, the 520 controller keeps track of the number of square inches the blade cuts. After every cut, the machine adjusts its parameters to compensate for wear before the blade becomes dull. The 520 prompts operators to automatically break-in new blades, as well.

“That way, you don’t prematurely kill your blade,” Tatham says.

Top service

Across the border, service center American Stainless Corp., Buffalo, N.Y., ordered its first model 520 band saw this year. Seymour, an investor in American Stainless, says after considering a variety of band saws, BTM’s ability to provide a fast cutting machine led to an order. ASA demonstrated its 520 for American Stainless’ general manager.

“[American Stainless] brought some of their exotic material up and watched it cut, timed it and were quite pleased based on what they saw with their own eyes,” Seymour says.



After ASA Alloys retrieves bar from storage, a loading cartridge places it onto a material handling conveyor in front of the 520 band saw.

ASA cut American Stainless’ sample material with a blade that had been cutting for a week at 5,000 square inches. Typical blade life is 5,000 to 9,000 square inches.

“It was not a fresh blade,” Tatham recalls. “He was standing by the machine and it started cutting. He didn’t even realize it. He looks over and says, ‘Wow this thing is cutting!’” Before, the cutting process took 25 minutes and ate through blades quickly. “We did it in about five and a half minutes,” he says.

Emphasizing the 520’s advanced features and construction is BTM’s customer service. Its nearby location and attention to customers help iron out any installation issues or unforeseen hiccups.

“The service is excellent,” Seymour says. “As we grow our business in Canada, which we are, we will definitely be adding the BTM machines to our group of cutting tools.” ■

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