Regardless of Shop Size, It's

TECHNOLOGY that MATTERS

For more than a decade, technology change has had a universal impact – from the largest plant to the smallest shop. Most who embraced the change, took the leap and invested in new technology have found they've made the right decision. What some might not have foreseen, however, is that once they've made the leap forward, they have to continue to leap – if they expect to keep up with technological change.

WOOD DALE, IL — John Bachmeier, speaking of technology and change, says, "You know, it wasn't all that long ago we all thought the fax machine was a brilliant idea. So much for that. Today the fax is just about obsolete. Everything now is executed through electronics — e-mail, texting, instant messaging, tweeting. It's gotten to the point that some customers don't want to talk with you on the phone." His conversation is peppered with such observations.

Bachmeier is president of Damen Carbide, a 60 year old shop of 25 employees operating in a 20,000 sq. ft facility. "I see us as very much the definition of the job shop" he says. "We do just about anything: turning, milling, EDM, jig grinding, flat grinding, ID/OD grinding, profile grinding.

"We work in very tough materials: tool steel, alloy steel, carbide, tungsten carbide, ceramics, titanium. Our lot sizes are one part and up ... to tens of thousands. Some of what we make includes solid carbide saws, knives, flat and circular form tools, carbide dies, CNC ID/OD and out of round grinding.

"We're in just about any industry you can think of: energy, agricultural, automotive, electronics, aerospace, medical, defense, military. You name the industry, and somewhere on a vendor list you'll find Damen Carbide."

STABLE OF STUDERS

A decade ago Bachmeier thought about upgrading his battery of grinders. He needed to replace older technology, and at the same time he wanted to take his grinding capability to the "next level." He called on Integrated Machinery Systems (IMS) (Itasca, IL), a firm he had worked successfully with in the past. Together they looked at various brands of grinders. They compared features, ease of programming, level of automation, loading/unloading systems, processing capability, wheel and dressing monitoring systems, industry reputation, especially regarding service and, of course, price.

Every Damen Carbide part is completely inspected – manually on small runs and Zeiss CMMs for longer run jobs.

From the beginning of their search, both Bachmeier and IMS were drawn toward United Grinding Technologies (UGT) (Miamisburg, OH) and the company's wide array of grinding technology. "One of the things that comes with every UGT machine — besides superior technology — is the peace of mind knowing that you've got the best applications and service team in North America behind you. Which is a rarity in the machine tool business," Bachmeier says.

Then came the Studers. In a period of ten years Bachmeier bought five CNC Studers: three S40s, one S31 and the latest, an S22 with the HSG (high speed grinding) package. He also has a Walter Tool and Cutter grinder and has just now purchased a Blohm Profimat MT 408 for surface and profile as well as creep feed grinding.

"Today customers expect jobs to be done faster, cheaper, with absolute

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accuracy and lightening-fast turnaround," says Bachmeier. "Tolerances: +/- 0.0001" and tighter, with surface finishes to 2µ - 3µ RMS, a true polish finish. The only way you can achieve this kind of accuracy, speed and turnaround is to have the very best technology. In our case that means CNC Studers from UGT."

The CNC S31 is designed for the grinding of workpieces in individual as well as small and large series production operations. It can be automated and is – thanks to its universality – especially suitable for use in the tooling and aerospace sectors, for example. The machine features a revolving wheelhead that can be swiveled manually or automatically, a high-resolution B-axis, a frequency-controlled motor grinding spindle for ID and OD grinding and a C-axis for the workhead for form and thread grinding. "Common to all Studers," Bachmeier says, "is the Granitan® mineral casting S103 machine base that provides superior dampening and thermal stability resulting in better grinding finishes at higher speeds and unbeatable tolerance holding capability. It's this kind of stability, from the machine base on up, that allows us to guarantee our accuracy at very high speeds and amazing throughput."

Other applications require special grinding equipment like this Walter Helitronic Power Production Tool & Cutter grinder for highly accurate and complex pieces.

The CNC S40 features up to four grinding wheels via a turret wheelhead that swivels automatically, a high-resolution B-axis and a C-axis for form and thread grinding. "The advantage the CNC S40s give us is the capability to grind long and heavy workpieces. These machines have a grinding length of 63" and workpiece weight of 286 lb.," says Bachmeier. "Once people found we had that kind of workpiece capacity, we began receiving RFQs from companies that produce long, heavy shafts — 50" to 60". The CNC S40s have opened new doors to customers in the long shaft business."

Bachmeier's latest Studer is the CNC S22 with HSG package. "This machine is blindingly fast," Bachmeier says. "Due to its modular design the machine has remarkable flexibility. Programming is a breeze with StuderWIN, Studer's latest Windows-based operating software package."

The new S22 grinding platform, with its diverse expansion options, can be configured to provide the perfect production machine for any grinding application. Highly dynamic axis drives with linear motor technology, short reaction times and optimized travel form the basis of the S22. The HSG feature, with circumferential speeds up to 140 m/s, also contribute to increased productivity. The X- and Z-axes are designed as cross slides, and the longitudinal table is bolted permanently to the machine. This cross slide system has been used and proven over the past decade.

The S22 can be used with one or multiple grinding wheels to complete a part with different features in one clamping. The machine can also be used to do high speed grinding as well as high speed machining in conjunction with the high precision C-axis. The machine can even have a rear roll dressing device to minimize dressing time.

"With CMMs and contour tracers we now can tackle jobs we couldn't before."

A bank of Studers, with one of three S40s in the forefront. The S40, with a distance between centers of 63" and a workpiece weight of 286 lbs, has allowed Damen Carbide to enter the long shaft marketplace.

"When customers visit and they see our battery of CNC Studers, they automatically know what we're capable of — the tight tolerances, polished surface finishes, accuracy and repeatability due to machine stability. When we put on our Web site that we had five CNC Studers, it was amazing the number of new and large customers that called us. Let's face it, Studer is the Ferrari of grinding machines."

ONE LEAP LEADS TO ANOTHER

Bachmeier knew that the acquisition of the CNC Studers would put him in a very good place competitively. What he didn't know — at least right away — is that taking his grinding capability to the "next level" would require taking the same leap with other grinding related processes.

"The Studers were so much faster than previous methods of grinding that we soon found we were processing parts faster than we could inspect them. Micrometers and comparators were soon going the way of the fax machine," Bachmeier says. "We had to find a faster, more accurate means of inspection. We bought Zeiss CMMs and contour tracers. With this technology, we are not only keeping up with processing, but I'm now involved with companies with special needs — unique thread rolls, special shapes, complex and complicated parts. With CMMs and contour tracers we now can tackle jobs we couldn't before."

About a year ago, Bachmeier received ISO 9001 certification, which he says has become a necessity if you want to supply many companies. Certification and advanced inspection equipment are required if one wants to go after new and larger companies. He adds that they had one customer who put a hold on a job in process and waited until we had the CMM before we could finish the job.

"The truth of the matter," Bachmeier says, "is that customers, especially the big guys, are less and less willing

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"If you want to stay in business, you've got to invest in the latest and very best, regardless of the process – there is no in between."

do incoming inspection. They've thrown this back on the suppliers. They don't want to have sophisticated inspection facilities. They want their suppliers to make that investment. They rely on us, and not just for the physical inspection. They want data — all the data relevant to their particular parts, data that systems like CMMs and contour tracers can generate. They want this data in inspection report form, printed out and included in every shipment. Now they have complete traceability. Customers know when their parts were made, on what machine, how the parts were made, what was inspected, process variations — just about anything involved in making their parts."

A PLACE FOR OLDER MACHINES

"We've made the investment, and we're comfortable with that," he says. "It's part of our corporate strategy, and it's a reality-driven business decision. If you want to stay in business, you've got to invest in the latest and very best, regardless of the process. There is no in between. You either make the ongoing investments to ensure your competitiveness, or you're standing still. Standing still, and you won't be in business long. You've got to think of the future, you've got to keep an eye on what's coming next. If you're standing still, the future will blow by you."

However, this doesn't mean it's necessary to scrap out older equipment. There's usually a place for older, manual equipment. "In our case,"

The Studer S31 is designed for the grinding of workpieces in individual as well as small and large series production operations. It can be automated and is – thanks to its universality – especially suitable for use in the tooling and aerospace sectors, for example. The machine features a revolving wheelhead that can be swiveled manually or automatically, a high-resolution B-axis, a frequency-controlled motor grinding spindle for ID and OD grinding, and a C-axis for the workhead for form and thread grinding.

Bachmeier says, "we still have some manual grinders, those with handles and wheels, circa 1950. We try to put our small lot orders on them. We can't make any money setting up one part or two part jobs on one of our CNC grinders. Nor would the customer want to pay for a one part job that's been run on one of our CNC Studers. So, we direct all our small lot jobs to the manual machines, and this seems to work out fine. We've drawn a line at ten pieces. Any jobs above that line are candidates for the CNC machines; below the line, and they run on our manual machines."

WHO'S NEXT?

Bachmeier says that when he took over the business from his father, it was't anything at all like the father simply bestowing leadership on the son — the ceremonial placing of the Crown on the Golden Son. "Absolutely not," Bachmeier says. "I worked my way up. I started out at the very bottom, sweeping floors, cleaning out carbide sludge tanks. I clawed my way up. I learned all the machines, all the processes. I learned the business from the inside out. Toward the end I could look at a job and know if we could do it, how we'd do it and how much to quote."

Who will take over when Bachmeier wants to become less involved? The answer is easy. "I have two sons, and my sister Rita Olvera, vice president, has one son, and they're already actively involved," Bachmeier says. "They're going through CMM training right now, but they'll have to work their way up just as I did. When they're ready to take over managing Damen Carbide, they'll know the business inside out. Of this you can be certain." **GJ**

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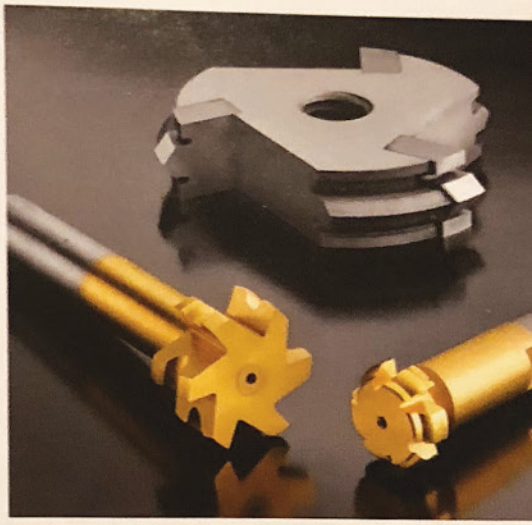

More examples of Damen Carbide parts. Note the attention to detail, complexity and polished surface finishes.

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A sample of the diversity of parts produced by Damen Carbide. "Today customers expect jobs to be done faster, cheaper, with absolute accuracy and lightening-fast turnaround," says Bachmeier. "Tolerances: +/- 0.0001" and tighter, with surface finishes to 2 µ - 3 µ RMS, a true polish finish. The only way you can achieve this kind of accuracy, speed and turnaround is to have the very best technology."