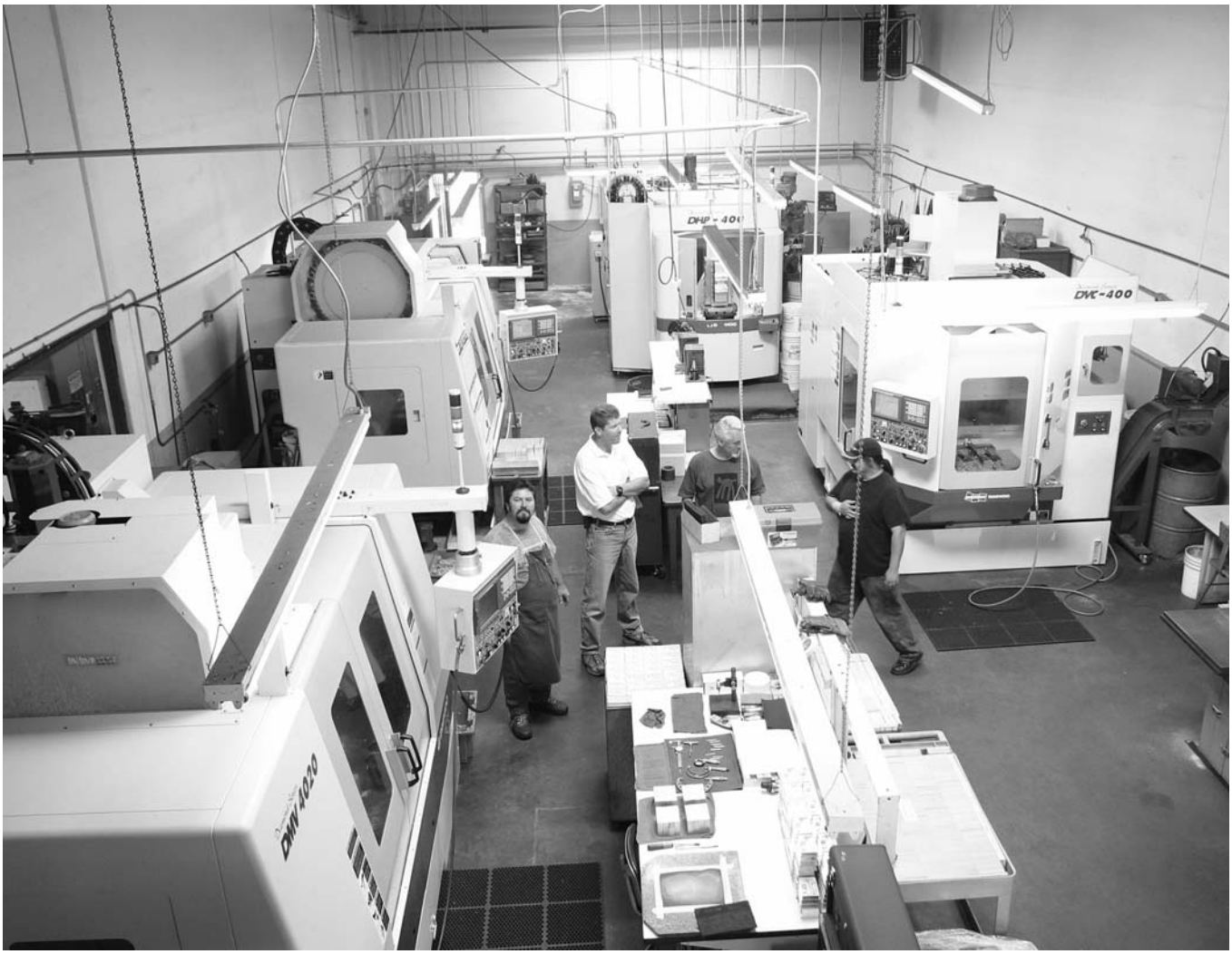

Overview of the Daewoo machining department at Wolf's Precision Works, Inc. The company operates a Daewoo Lathe, 2 DVC-200 VMCs, 2 dual-pallet DHP-400 horizontal machining centers and a DVC-400 dual-pallet vertical machining center.

Silicon Valley Success Story

Machining the "Tough" Stuff Leads a Menlo Park, CA Job Shop to Long-term Success.

Story and photos by C. H. Bush, editor

Wolfgang Pohl bought a small (1,000 sq ft) Mountain View, CA machine shop in 1979, renamed it Wolf's Precision Works, Inc., and has never looked back since. Since then, his company has thrived and now occupies a 6,500 sq ft facility in Menlo Park, CA. A tool and die maker, trained in a 4-year apprenticeship programin Germany, over the years Pohl has trained a lot of top Silicon Valley machinists. He currently employs 13 people in the shop, many of whom are loyal and long term. But Pohl's story is not the typical, started-in-his garage tale, he says.

"Actually, the way I got started was funny," he says. "I had a good friend who was the sales manager for Ampex, where I was foreman in the machine shop. One day he came in and said, 'There's a shop for sale. I want you to go there and buy it.' So I went to see the owner and three hours later I was in business. I also had $20,000 worth of business from Ampex to get me started."

The shop Pohl bought was small, but it had the equipment he needed to go with his know-how—two manual lathes and five manual mills.

"The good part was that I immediately got business from Watkins & Johnson and Ampex," he recalls. "And then the head engineer left Watkins & Johnson and moved

As seen in CNC-West, Arpil/May 2006 Issue

General manager Bill Pursell (left) and Wolf's president Wolfgang Pohl discuss ways to create fixtures to hold more part to run on the the Daewoo DVC 400, dual-pallet vertical machining center. The machine changes pallets in 6 seconds.

to Harris Farinon, and I started working for them, too."

Tough Projects

The projects Pohl got were to build parts called carriers.

"Carriers are the metal pieces they mount smart electronic chips on," he explains. "Back then they were made out of molybdenum or Kovar. Carriers have to have a coefficient of thermal expansion similar to the chips. Otherwise the chips will pop off them when the temperature changes. The only problem was those materials are tough to machine. Most of the stuff we did in the early years went into military guidance systems for missiles and aircraft, that kind of thing."

When the head engineer from Watkins & Johnson moved to Harris Farinon, Pohl found himself plunged into the world of machining tungsten carbide.

"He told his people, 'Get Wolf in here and let him see what he can do with this stuff,'" Pohl recalls. "He was talking about copper tungsten, which is 80% tungsten, 20% copper. They wanted carriers made out of it, but it's really tough to machine. We worked at it slow and easy. It took us two years to learn how to do it right."

Wolf's Precision Works, already specialists in Kova and molybdenum, quickly became specialists in copper tungsten, but not without cost.

Hard On Equipment

"Copper tungsten is very destructive on your machines and equipment,"Pohl explains. "The material has the density of gold, yet it is very hard and abrasive. But it is also very stable, so it is used in high-energy microwave and cellular phone applications. It has to handle high voltage, high amperage and high heat."

"Copper tungsten is so hard and brittle it eats cutting tools for breakfast and machines for lunch" says Wolf's general manager, Bill Pursell. Pursell joined the company as a young man in 1985, learned machining under the tutelage of Pohl and worked his way to become Pohl's second in command. "It chews up cutting tools at a rate twenty times faster than normal machining. And it doesn't matter how expensive the tool is, either. High-priced tools wear out as fast as cheap ones, so we use cheap ones."

Pursell says that by investing in the time and knowledge needed to learn to efficiently machine copper tungsten Wolf's Precision was pretty much immune to the downturns in the economy.

"Our work didn't go offshore," he says. "The Chinese can't compete for our kind of work. They just don't have the know-how yet."

"Even after the 9/11 recession, we only had one negative month," Pohl adds. "Otherwise we've grown or remained stable."

Mike Harrison, CNC operator, loads parts into one of two Daewoo DHP-400, dual-pallet horizontal machining centers operated by Wolf's Precision.

Reward for Doing the Hard Stuff

In November 2003 Wolf's Precision's business mix changed significantly.

"One of our customers, Harris Microwave, originally called Harris Farinon, came to us and asked us to bid on some high-volume aluminum housings," Pursell says. "We had been doing Kovar and copper tungsten carriers for them all along, and I guess they appreciated what we did, so they wanted to give us a shot at some high-volume work. We wanted the work, of course, but we had a problem."

"The first order was for 200 pieces," Pohl says, "which was huge for us. But then they

Line up of YCI machining centers used by Wolf's Precision Works, Inc. to machine copper tungsten carriers. The service is so tough the machines have to taken down once a year to clean out the copper tungsten powder that accumulates and causes the pallets to get out of level.

started ramping up. Soon they wanted 1000 parts a month, and then 500 a week. We just didn't have the equipment that could handle that."

"We didn't want our customer going elsewhere," Pursell says, "so we decided to invest in some new equipment. We had done business with Paul Riley, who is one of the owners at CNC Solutions, so we told Paul our situation, and he recommended a solution."

Daewoo DHP-400

The solution turned out to be a Daewoo DHP 400, dual pallet horizontal machining center with a 25-hp, 14,000-rpm spindle.

"We were getting 20-second tool changes on our older machines," Pohl says. "On these new ones we're doing changes in one and a half seconds. Our productivity has significantly increased, we're getting very high precision and repeatability. The machine is rugged and has fast rapids. We've never had a service call on it yet."

"We run that horizontal ten hours a day, six days a week," Pursell says. "Since we bought it our volume has continued to increase until now our aluminum business is 50% of our sales."

Over the next three years Wolf's Precision purchased 5 more Daewoo machining centers.

"We've added two DM-4020 vertical machining centers, a 6,000 rpm Daewoo Lynx 210 CNC lathe, a DVC-400, 12,000 rpm, dual-pallet Daewoo vertical machining center, and most recently, we bought another twin-pallet DMH-400. This line up of machines has boosted our capacity tremendously."

Where to Next?

Pursell says Wolf's Precision's sales and parts volume has tripled in the past four and a half years.

"As far as we can tell, we'll just keep growing," he says. "We've succeeded because from the beginning we have specialized in doing things others couldn't do. Now that we are involved in producing high-volume aluminum parts, we will concentrate on being as efficient as possible so we can remain competitive."

"The future is never really clear," says Pohl, "but we have some really key people here. Our foreman has 25 years experience as a machinist, and several people in our shop have more than 15 years with us. I figure that with that kind of experience, there's not much we can't do." ■

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