

# Finding a Niche

## High quality, tight tolerance work is focus for BC job shop

When Derek Brady and Paul McDermott, both British ex-patriots, met in British Columbia, they found a lot more in common than just their homeland. Over a number of pints, the two machinists decided to stop being employees and start their own business. In 1998, they opened Advanced CNC Machining Inc. in Maple Ridge, BC.

Advanced CNC Machining specializes in CNC turning and milling, with six CNC machines in their industrial park facility. They have five machinists, an administrator and two very hands-on owners.

As a mid-sized job shop in the Metro Vancouver area, Advanced CNC is in good company. Brady estimates that there is nearly \$10 million of business for local job shops, with about 50 located in the province.

"We found our niche in high quality, very close tolerance work," says Brady. "We work a lot with exotic materials and the closer the tolerance is the more perfect the part." Brady explains that a human hair is 4/1,000 of an in., but that tolerances can be 8/10,000,000 of an in. when machining a part. Advanced CNC services a variety of clients, including the high technology, fibre optics, high-end graphics, medical, marine, aircraft, electronic and transportation industries.

Some of their favourite projects include machining parts for a new camera mount for a space telescope in Hawaii and creating aircraft parts, like a small mechanism that locks the main door on a commercial airplane.



"Our bread and butter work though, is supporting local industry, machining for pump stations, railway companies, and so on," says Brady. "Our experience comes in on how to machine the parts. Between us, Paul and I have more than 50 years experience as machinists."

### THE MACHINING PROCESS

When a customer calls for a quote, Advanced CNC will look at the drawings and files, set a price, and then once accepted, set up a purchase order for the job. Each job is assigned a number. Parts are first designed on a computer, either made by Advanced CNC or provided to it by the customer. Raw materials are ordered and once they arrive, the order goes to the shop with a "job traveller," a docket to help the machinists keep track of all the details for that job, including

tracking their time, keeping all the paperwork together such as an operation sheet and customer drawings.

From here the programs go to the shop for the CNC machines, which use computer information to direct the cutting tools inside the envelope of the CNC machine.



Raw materials ready to be fed into a Haas CNC HMC.

"CNC really makes a difference when you do more than five of a part," explains Brady. "With the computer control, every part comes off the machine the same every time. Once the machine is programmed, it's done, and producing more of the same part isn't too expensive."

After the CNC commands are loaded into the machine, the parts can be machined. The programming can go on any machine because they are basically the same. Many parts require the cutting of special jigs, or holders, that allow for accurate cuts. The machine can bring down new tools within as it is controlled by the computer. Machinists move the raw materials into the CNC machine by hand to ensure that they are properly positioned for machining.

"With small batch work like we do, 50 to 500 pieces, we need a person to work the machine and can't really replace them with a robot," says Brady. "It can take longer to set up a robot to do the work than have a person do it."

Once parts have been through the CNC machines, these machined parts now move to quality control. Many details are checked, including the accuracy of cut and finish. The inspection area has two computer measuring devices, including a Mitutoyo Linear Height machine. This level of accuracy in quality control is needed because Advanced CNC regularly machines to very high tolerances and the highest standards.

Once the parts have been inspected, they are sent to the back shipping room for packaging and shipping to the customer.

"Our lead time can be anywhere from two to five weeks to produce a part," says Brady. "The timing really depends

on the job. Some parts need to be sent out for finishing such as anodizing, heat treatment, zinc plating, black oxidizing and so on."

**THE CNC MACHINES**

Advanced CNC has three CNC milling machines and three CNC lathes. It has two Haas VF-3 vertical machining centres and one Haas VF2.

The job shop operates two Okuma Crown Big Bore Lathes and one Okuma ESL 6, which also has an automatic bar loader attached to allow the robotic feeding of raw materials into the lathe, which can often free up the operator to do other tasks. In the lathes or turning centres, the tool is fixed and the part rotates.

"All our machines are manufactured in North America, with Haas in California and Okuma in North Carolina," says Brady. "It's helpful to have them made nearby, and both companies have great local representatives to service their machines. We can't afford to be down, because of course that costs us money."

The machines' manufacturers have one of the best industry records on their equipment for low downtime and local service on the machines, Brady says. "Our machines have lasted a long time because we baby the machines and polish them every week," he brags. "We've had a couple of them for ten years, and the downtime has been minimal."



In their back shop next to the shipping centre, Advanced CNC has a computerized cutter to cut raw stock and space to store raw materials. It also has a manual machining centre, with handles to turn to set the tools.

"We use this to make our own tooling and machinery," explains Brady. "Sometimes we use it for machining, too, because there are cases when it is quicker to do it manually. The operator can leave the CNC running and come to the hand machine, so he can have two machines going at once that way."

The company also keeps some inventory on hand for regular customers with whom it has minimum/maximum agreements. "We are guaranteed that they'll buy a minimum of the part from us each month so we can keep extra on hand. This is for regular customers who are building own product, like the client who builds fuel pumps."

The front office has a display showcase with samples of some of the parts it has made. Brady animatedly shows a visitor some of his favourites, like the mechanism that locks the main door on a Boeing 747, and a part for a camera that could detect a cancer cell by light emission right in the operating room, and the tip of an M16 rifle.

"We also do less exciting stuff, like work for the tool and die industry, such as making moulds," he adds. "We work with stainless steel, aluminium, titanium, other exotic materials like high temperature alloys, bronze, or brass."

"We do everything from a tiny screw to a larger drilling mechanism." Despite the versatility, Brady says there is a shrinking customer base in the province, with lots of work going instead to China.

"The advantage we have is that being local, we can resolve problems quickly," he says. "We also give the advantage of using local currency, and we offer great customer service."

His partner adds that there are some parts they can do better than an overseas machining shop. "The smaller volumes and higher quality, we do better," says Paul McDermott. "There have even been cases where we ship parts to China."

Fortunately, for the past decade, Advanced CNC has had steady business, and is also diversifying its client base. "There's a real value-added to have us here," says McDermott. "We communicate quickly, they can come out and see us, and when our parts arrive at the customer, it's 100 per cent, so they don't have to check if we made mistakes. We do quality."

Besides, with a shortage of skilled labour, it would be difficult to grow the operations. As former apprentices themselves, Brady and McDermott have been happy to bring apprentices into their shop.

"We have had three apprentices in here, but it's a cost to us to have someone who is learning," says Brady. "We'd like to see more government involvement in helping small businesses like us with apprentice costs."

"We believe in apprenticing, because that's how we learned the business." **CM**

*Carla S. Shore is a freelance writer based in Vancouver.*



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