



**The Problem**

Inability to quote on complex, tighter tolerance work

**The Solution**

Internal cylindrical grinder for complete ID forms

ID cylindrical grinder rounds out full service grinding for tooling shop

BY MARY SCIANNA



A close up view of the interior of the Studer CT960 grinder.

# Grinding Work

**G**RINDING SHOP OWNERS Tim and Wendy Middlehurst have a wish list of machines they would like to purchase for their newly expanded 8,000 sq ft Orangeville, ON, shop, Hi-Quality Carbide Tooling Inc. "There are currently eight items on the wish list," says Wendy, vice president and secretary/treasurer of the company.

Goods Program approved company specializes in the production of carbide tooling for cold forming, fastener and spring industries. The fast-growing company expanded its facility last year, adding 4,400 sq ft to an existing 3,600 sq ft and set up a new quality inspection department featuring a Mitutoyo Crysta-Apex S544 full contact CMM. Today,



Hi-Quality Carbide Tooling owners Wendy and Tim Middlehurst with the new Studer grinder, the CT960, the number one item on their machine "wish list."

The new Studer CT960 grinder from United Grinding is number one on that list. The grinder was purchased through United Grinding's distributor Machine Tools Systems, Toronto, and installed this past August.

The new machine is a dream that took four years to turn into a reality. The Studer ID grinder is the latest in a line-up of more than 25 machines, of which nine are cylindrical or surface grinders.

Founded in 1980 by Tim Middlehurst's father Dennis, the ISO 9001:2008 certified and Controlled

the shop offers OD, ID and surface grinding services, as well as vertical and horizontal honing, polishing, wire EDM cutting (the company just purchased and installed a new Sodick wire EDM) and CNC turning.

The new Studer ID cylindrical grinder is the second Studer in the company's shop. Hi-Quality purchased the first Studer, the S33 CNC OD cylindrical grinder, in 2007.

"It was the top of its class for the application we required, which was grinding carbide extrusion pins. The



The first Studer grinder in the shop, the S33 CNC OD cylindrical grinder. Impressed with the performance of this Studer, Tim and Wendy Middlehurst decided to purchase a second Studer.

first Studer opened up a new market for us and brought more customers to our shop,” explains Tim.

Indeed, in 2009, the company produced its first set of solid carbide feed rolls for the spring industry and solid carbide edge rolls for the magnetic wire shaping industry using the first Studer CNC cylindrical grinder.

Impressed with the performance of its first Studer, the machine tool builder and the service, Tim and Wendy went to Switzerland in 2009 to see the Studer CT960 in action.

“I had never seen or heard of a machine like it,” recalls Tim. “It was able to grind complete ID forms without having to specifically dress the form into the wheel. You can use a simple wheel profile to grind a very complex form, go in with another wheel, since it has multiple wheel heads, and finish and polish it in the same chucking.”

Tim was especially impressed with the machine’s ability to eliminate time-consuming manual hand dressing and polishing.

“Years ago, my father and I would have to hand dress the form onto the wheel and plunge in, and we’d be there for hours. Then we’d have to take the part out and hand polish it. The CT960 is the machine we always dreamt about

back then, but it didn’t exist.”

Before purchasing the machine, Tim and Wendy attended IMTS 2012 to research other similar grinders.

“It was our first time going to IMTS and that show sealed it for us because after seeing similar machines made by other manufacturers, we came back home with a list of machines that we didn’t want to buy,” says Tim. “When we compared the Studer to these other machines, there really was no comparison.”

Although Tim and Wendy knew the Studer CT960 was the right machine for their shop, it took close to four years to make the purchase and to justify the almost one million dollar investment.

“Back in 2009, the economy was still unpredictable and we were already managing a lot of work,” says Wendy. “Tim wanted the machine and we knew it could bring in more work but it was a significant investment. I needed to evaluate the potential revenue in order to see if it would offset the cost of the machine. We needed to do a lot of number-crunching to justify the investment.”

By 2012, existing customers were asking for more grinding services from Hi-Quality Carbide. Customers wanted a turnkey grinding operation. The

## THE EQUIPMENT

### ➔ FLEXIBILITY, VERSATILITY AND AUTOMATIC FINISHING

are key characteristics of the Studer CT960 internal cylindrical grinding machine that helped make the decision to purchase it an easy one for Hi-Quality Carbide Tooling owners Tim and Wendy Middlehurst.

The compact grinder can perform internal, external and form grinding, and polishing of a range of parts in a single clamping.



The machine offers complete finishing of ground parts with up to four grinding spindles on the turret. The spindle turret is equipped with a direct drive motor with a resolution of 0.00005°. The integrated swivel axis (B1) on the spindle turret is key to the complete machining concept of the grinder as it swivels automatically, enabling the use of up to four grinding spindles. The workhead’s swivelling automatic B axis, also equipped with a direct drive motor, has a swiveling range of 61° to 91°. The B axis is sealed off, requiring no maintenance.

Sensors and a measuring probe on the machine help maintain grinding accuracies and tolerances. The sensors monitor processes during grinding and dressing, while the probe is used for such functions as length positioning, measuring non-interrupted inner and outer diameters, optimizing grinding cycles and detecting thread positioning.

The machine is equipped with a 31i-/A series Fanuc control.



## MACHINING | Grinding



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demand from existing customers, and the potential to grow the business with new customers, spurred Tim and Wendy to purchase the machine. It's already beginning to pay for itself and they forecast a return on investment (ROI) of approximately three years.

"We have existing customers that have work we've never quoted on because we didn't have the grinding capabilities," says Tim. "Now we can quote on that work because this machine can do out of round grinding and thread



A view of Hi-Quality Carbide Tooling's shop in Orangeville, ON.

grinding."

In fact, Tim estimates that 85 to 95 per cent of the work the shop does will end up going through the new machine at some stage. More importantly, it will eliminate much of the honing and hand polishing they used to have to perform by hand on the parts.

"We're streamlining the operations, reducing manual processes and getting a

better quality part all because of the new grinder," adds Tim.

The future is looking bright for Hi-Quality Carbide Tooling. Although the company has just expanded its existing operation, Tim and Wendy estimate they'll outgrow it within the next three to five years and will need to expand further.

As for the machine wish list, Tim and Wendy are looking at purchasing another Studer grinder. "This new grinder can handle very complex parts. I'd like another Studer like it, but a simpler version to handle less complex parts." SMT

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