

# Shop

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## Metalworking Technology

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# Manufacturing AT WORK

A close-up look at industry's  
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# Machining's *Hidden Sector*

New grinding technology gives gear shop an edge

**I**T IS GENERALLY accepted that metalworking and manufacturing suffer from an identity crisis, making it difficult to find and obtain qualified people interested in a manufacturing career. Add a specialty like gear cutting and gear finishing to this mix and it's more like waving at distant boats or planes from a deserted island, waiting to be discovered.

Alan Balazic, general manager of Premier Machine & Gear, Kitchener, ON, acknowledges "if manufacturing was more in the spotlight, you'd see more young people interested. By comparison, gear cutting is a hidden sector, when it's really simply specialized milling. We have a hard time conveying to school administrators that a gear shop does metalworking."

Premier Machine & Gear sees growth in larger, coarse-pitch gears for energy and mining.

## ↘The problem

Higher hardness levels difficult to grind on existing grinders

## ↗The solution

New grinder for 36 to 40 HRC or higher materials opens doors to new markets

BY ED ROBERTSON





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Gear profile and pitch can be checked on board, saving substantial time.

“Gear cutting operations at the shop are equipped with specialized tooling and machining functions, such as hobbing and shaping of spur, helical and herringbone gears, worm and worm wheels, and racks.”

He looks to his own education for the reasons why. “When I finished high school, guidance counselors didn't really “guide” students,” he says. “Instead of looking at desires or wants, they looked at grades—university or college for better students and industry for the weaker. They parked you.”

There was never a chance to cultivate a manufacturing career for those that wanted it, he adds. “Industry has to change that perception.”

Founded in 1989 by Alan’s father, Jozef Balazic, the company’s

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## MACHINE TOOLS | Grinding

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Hand inspection is also a service.

purpose was to provide precision custom machining of gears, splines, keyways, milling and turning. Its record has been one of steady growth. In 1993, Premier Machine & Gear expanded into a neighbouring unit increasing in size from 2,000 to 3,000 sq ft. In 1996, Balazic needed more room for his machinery and moved into a 6,400 sq ft building of his own. In 2002, a 6,000 sq ft addition was built, bringing the current building size to 12,400 sq ft.

Gear cutting operations are equipped with specialized and diverse tooling and machining capabilities, such as hobbing and shaping of spur gears, helical gears, herringbone gears, worm and worm wheels, and racks. Industries served include steel processing, mining, power presses, agriculture, pulp and paper, and forestry, among others.

Alan points to his father Jozef as the main reason for the company's record of growth. "He's set a high standard for service

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MACHINE TOOLS | Grinding

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An up-close look at the Niles ZE 800 gear grinder.

and commitment, and as it's a family business, you feel an extra sense of obligation. I went to school for industrial engineering, but 99 per cent of the knowledge I use every day is attributable to my dad. He's a good machinist and a good man."

On the horizon, Balazic notes a reduction in gears in certain low-torque equipment in favour of direct-drive motors, but a rise in the need for larger, coarse-pitch gears in the areas of mining, energy, and others. "Hardness levels are going up, too. We've been used to working with 28 to 32 Rockwell

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C”; now we’re seeing level requirements at 36 to 40 HRC or higher,” he says. “Such levels are often impossible to finish on a conventional mill, making equipment like the Niles ZE 800 gear grinder necessary.”

The benefits are substantial.

“The arrival of this latest piece of technology not only increases our capacity and versatility, it also supports our plans to improve the gears for our current customers



and enter into new markets, such as the renewable energy sector. We have undergone training from Niles with excellent support from their offices in Colorado and Germany. The machine is fully operational with immediate effect

as we had secured contracts ahead of the purchase. However, we will be looking to recruit further by offering AGMA class 14+ capabilities with full profile and lead-modification capability.”

Sounds like a hidden sector that won’t remain hidden for long. SMT

*Ed Robertson is a manufacturing journalist and contributing editor. editor@shopmetaltech.com*

## THE EQUIPMENT



**ALAN BALAZIC** points to new technology as making the gear cutting field more attractive. Earlier in 2012, the company invested in a new Niles ZE 800 gear profile grinder from Kapp Technologies, calling it “the latest in form grinding technology and full inspection of our gears for satisfying our customers’ expectations in quality, delivery, and cost. High feedrate grinding, on-board measurement and full-contact grinding often reduce or eliminate time-consuming roughing and pre-finishing operations.”

The machine was purchased from Niles’ Canadian distributor Machine Tool Systems, Toronto, which specializes in multi-axis CNC grinders.

The Niles ZE 800 has the capacity to grind Ø800 mm x 600 mm face and tooth profiles from Module 1 (25.4DP) to Module 26 (0.9769DP) in straight or helical form including double helical.

Balazic describes precision gear grinding as “cut it, leave a little material, check it, pre finish, check, finish, and check again.” Checking includes measuring profile, lead, and pitch. Moreover, Premier’s old gear grinder lacked any measurement capabilities, so finishing a gear meant multiple setups and multiple shippings to an outside company. With the onboard measurement of the new ZE 800, “it saves an enormous amount of time and effort,” Balazic says. And the machine includes a modem, so diagnostics and checking can be done over the phone.

While certainly operating new equipment means a higher operating cost, there are significant process savings in addition to onboard measurement and checking. Particularly with large, coarse pitch gears, heavy duty roughing might take six hours and finishing an additional eight or 10. With the ZE 800, finishing time is often reduced to two hours, a time savings of 80 per cent. “It often means delivering a superior product—gear finishing on the new grinder as opposed to gear hobbing on a mill.



For more information on machining technologies, visit Shop Metalworking Technology’s **MACHINING ZONE** online at [www.shopmetaltech.com](http://www.shopmetaltech.com).

