



Bottleneck Breakthrough

Multi-tasking machines help Alberta manufacturer reduce the bottleneck in its milling operation and boost productivity

By Jack Kohane

In a time-strapped world, multi-tasking is the buzzword for boosting productivity.

For E. Brace Tool Inc., an Edmonton, AB, manufacturer that supplies the oil and gas market, a recent investment in multi-tasking machines has helped the company boost productivity, slash machining cycle times by two thirds, and cut product



About two thirds of E. Brace's products are now manufactured on the Nakamura Tome machines. Above is the SUPER NTX model, one of three multi-tasking machines the company has installed in the past 14 months.



delivery times by close to 60 per cent.

"About two thirds of our products are now produced on the multi-tasking machines, says Chris Brace, general manager and owner of E. Brace.

He adds that the three multi-tasking Nakamura Tome machines—the SUPER NTX, WT 150 and WT 300—open up more floor space, and will allow the company to expand its production capabilities without the cost of a new-build facility expansion.

E. Brace serves the oil and gas industry with wireline products. It's a competitive market, but the company has set itself apart from the competition by building upon a reputation for quality products, service and fast delivery because of its investments in new machining technologies.

"We've been more creative with our equipment than the next shop," Brace. "It's the advancements in technology that keeps us ahead of everyone else."

The 30,000 sq ft facility houses 14 CNC machines (including Okuma, Mazak and Nardini), four manual lathes, manual mills, and drilling machines. The main products produced in the facility include surface and downhole equipment, its own designed hydraulic single shot mechanical tubing perforators, sandline

cutters, selective bridge plug firing heads and other downhole tools used in coil tubing applications.

Some of the raw materials E. Brace uses to machine its products are 4140 HTSR, EN30B, 316 Stainless, and various nickel alloys.

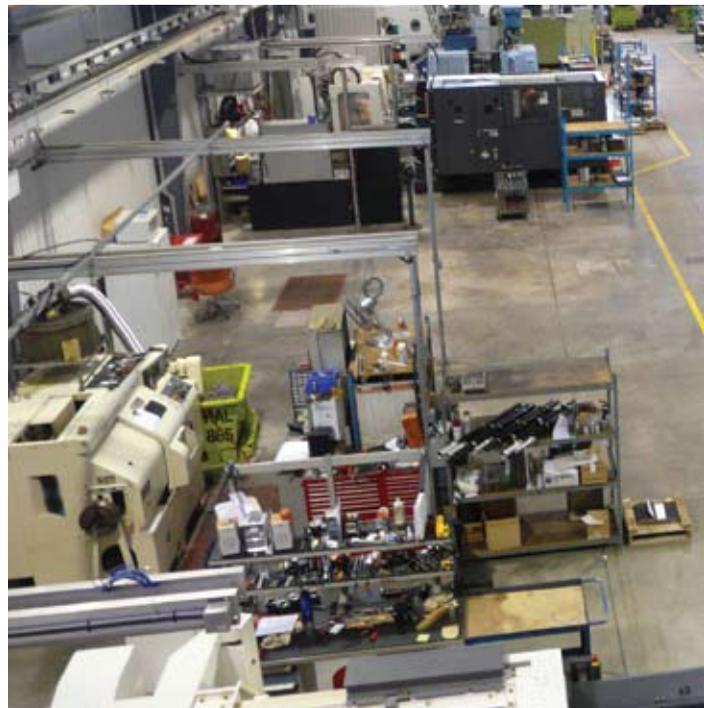
Brace says the company decided to go with multi-tasking machines for the simple reason that "we can make complex parts with fewer setups, reduced tooling and fixturing. Parts or sets of parts come off the machine complete and ready for shipment."

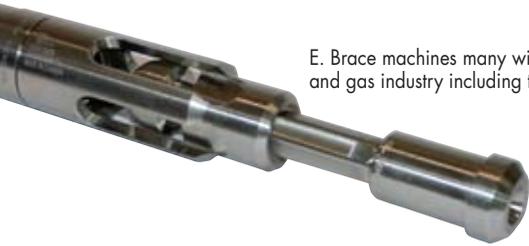
Adds Lockey Rhynold, shop foreman, "we can produce better quality products at a faster rate, and we are less labour intensive. They are more automated and more flexible, enabling us to further expand our product lines."

E. Brace was formed in 1983 by founder Ed Brace to manufacture wireline products for the oil and gas industry. By 1995, the rapid expansion of the wireline industry led to E. Brace's investment in higher production machinery. It didn't take long for the company to expand into offshore markets.

"With the addition of CNC production equipment, and our reputation for quality tools, we realized opportunities for international export in wireline products," says Brace.

Today, 20 per cent of the company's annual revenues funnel in from sales outside of Canada, primarily the US, Mexico and the





E. Brace machines many wireline products for the oil and gas industry including this WJ standing valve.

Middle East. At the heart of this drive for a greater global presence is the company's state-of-the-art CNC machines.

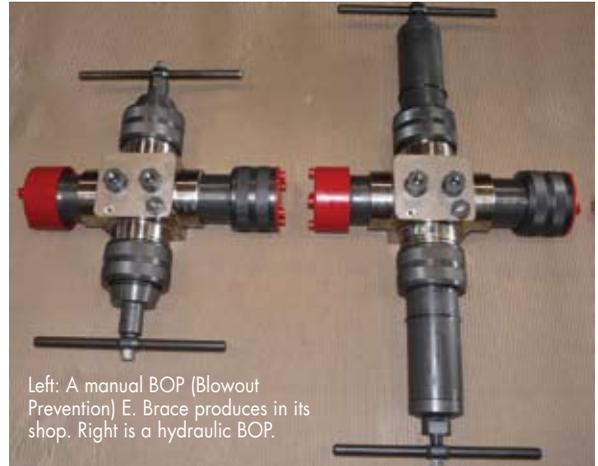
E. Brace Tool, which employs 40-plus people, also runs a 6,000 sq ft retail shop in Red Deer, AB, and a 4,000 sq ft location in Grande Prairie, AB, (staffed by field experienced wireline technicians). And the company recently opened a 4,500 sq ft inventory, service and repair facility in Alice, TX, to better service its US customers.

Brace credits the multi-tasking ability of his Nakamura Tome machines as key to capturing more customers. "Our productivity has risen dramatically, and we use milling machinery less due to the capabilities of these multi-tasking machines." Rhynold is impressed with the performance and operational features of his latest Nakamura acquisitions: the Super NTX (purchased in January 2009), the WT150 (June 09) and the WT300 that arrived at E. Brace last October. Machine tool distributor Elliott Matsuura Canada, Oakville, ON, supplied the machines.

"We are committed to investing in quality machinery such as the Nakamura Tome machines," says Rhynold, because of their reputation for decreased downtime for repairs and maintenance.

Though multi-tasking technology is a relatively new player in the oil and gas industry, it has quickly found a place with manufacturers who need this level of technology to compete in the global marketplace. By merging milling and turning operations, machining processes such as gear hobbing, spline milling, cam milling, and thread milling can now be tacked together in one machine for heightened efficiency.

"This also reduces operator error by lowering part handling



Left: A manual BOP (Blowout Prevention) E. Brace produces in its shop. Right is a hydraulic BOP.

time, fixture, workholding and tooling costs," adds Rhynold.

A tiny titan, the Nakamura WT150 offers opposed two spindle, two turret construction (an upper turret X,Y,Z,C; a lower turret X,Z,C,B), a 70 mm Y axis on the upper turret (± 35 mm strokes), 6,000 rpm milling speed (upper/lower), a 12-station turret with half index capability (48 total), 24 milling tool stations, 20 hp left + 15 hp right spindle motor and a 7.5 hp milling capability. The upper/lower turrets and opposed two spindle configuration of the machine tool helps manufacturers such as E. Brace cut cycle times and improve productivity. Maximum turning diameter and length is 7.5 in. x 15.8 in. (190.5 mm x 410.3 mm).

The WT300 is a twin spindle, twin turret, turning centre. It has an opposed two spindle, two turret construction (upper turret



A stuffing box assembly.

X,Y,Z,C; lower turret X,Z,C,B), 120 mm Y axis on the upper turret (± 60 mm strokes), 3,600 rpm milling speed (upper/lower), 12-station turrets with half index capability (48 total), 24 milling tool stations, and 25 hp + 25 hp high torque L/R spindle motor. This configuration is more suited to higher volume production, especially when working with bar stock material. Maximum turning diameter and length is 10.6 in. x 30.7 in. (269.2 mm x 779.78 mm).

“What I like about our WT series machines are their upper and lower turret configuration and 24-station turrets, enabling us to machine complete families of parts with minimal setup time,” says Brace. Even with complex parts, a mill-turn lathe has its advantages. With all the different machine configurations, Brace says the ability to match a configuration to an application has never been easier.

The Super NTX is configured with B axis Automatic Tool Changer capability and is designed with one lower turret and two spindles (left and right sides), allowing for cutting with two tools simultaneously. The flexible machine allows for a variety of machining methods: four axis turning on one spindle while machining on the other spindle; continuous machining through the use of the lower turret during the upper tool change cycle; using the lower turret to support the part while machining with the upper turret. At the same, machining on the second spindle continues. The rotating tool spindle has the ability to turn in both directions using the B axis, and this can be used for heavy duty milling, for angular drilling with the Y, B and C axes, and for simultaneous multi-axis milling using X, Y X and C axes.



A counter wheel assembly.

E. Brace’s investment in multi-tasking has served the company well. For one thing, Brace says that the milling capability of the machines has improved the roadblock that the two axis machines were causing.

“Parts were constantly backed up at that point. Now the multi-tasking machines open more floor space for us. We can take out two, two axis machines and replace them with one multi-tasking machine, and still achieve higher productivity using less floor space.”

Cycle times have also improved significantly, by approximately 60 per cent, estimates Reynolds.

“Long cycle times incur a hefty cost to manufacturers. Anything that works to reduce the time to make a part provides significant cost savings for us.”



E. Brace’s 30,000 sq ft facility in Edmonton, AB.

Brace adds that the new technology isn’t just good for E. Brace, it’s also a benefit for the machinists on the shop floor.

“In keeping up with technological advances, we keep on educating our employees and keep them engaged in their work.”

While E. Brace will always maintain its milling operation, Brace and Rhynold concur that more products will likely be produced on the multi-tasking machines.

Brace says he recognizes that to ensure success and growth for his business, investments in new technology are a must. And as E. Brace expands its business in the coming years, multi-tasking machine are sure to play a part in the company’s future success. **CM**

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