

Leader of the **PACK**

A BC shop's early adoption of machining automation keeps business strong through economic turbulence

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The Problem

Staying competitive

The Solution

Purchasing machining cell automation



PHOTOS
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Long before there was any need for five axis machining, automation and machining cells, a mid-sized machine shop in Delta, BC, invested in all of these technologies.

Why?

“If it wasn’t for our first piece of automation equipment, a two-pallet stacking shuttle machining centre, we wouldn’t have survived the recession in 1991,” says Udo Jahn, general manager and owner of Modern Engineering. “We were able to be more productive and we went on to buy four more of these machining cells within five years.”

But it didn’t end there. In the late 1990s, it purchased its first flexible

manufacturing system, consisting of two horizontal machining centres (HMCs) with a 28-pallet delivery system. Within the next three years, it added another HMC and increased to 40 pallets. “This helped us get through the next recession in 2001.”

And it didn’t end in 2001 either. In 2006, it entered the world of five axis machining automation by purchasing its first MAM72-63V five axis vertical machining centre equipped with a six pallet pool. In 2011, it purchased two MAM72-35V five axis machining centres with 32-pallet stocking towers, then purchased its third such system in 2013.

This spring, Modern Engineering



Udo Jahn, left, says automation is key to becoming more competitive. The latest machining automation investment is the purchase of five axis machining centres (one seen above) with pallet stocking towers.

will take delivery of its fifth, five axis 18-pallet machining centre.

All of the five axis machining cells are Matsuura MAM72 (Matsuura Advanced Manufacturing) models purchased from long-time machine tool supplier Elliott-Matsuura Canada Inc., Oakville, ON.

Asked why he has made such significant, multi-million dollar investments in machining automation and Jahn responds with a matter-of-fact statement: “automation is key to Canada’s ability to compete on a global scale. We’re using productivity and automation to compete globally. You can’t become globally competitive with

an anvil and a hammer.”

Lindsay Harris, the BC regional sales manager for Elliott-Matsuura Canada Inc., Modern Engineering’s point man for the machining cells, knew Udo Jahn long before he joined Elliott-Matsuura. During a two-year stint as a productivity consultant, Harris helped Modern Engineering implement machining automation systems, productivity improvement processes and procedures, and the 5S system.

“Udo’s philosophy is simple; you always have to stay ahead of the competition and he’s doing that by investing in five axis machining automation. His five axis capabilities

are the strongest of any manufacturer in Canada. He knew five axis would be the next wave and he has positioned himself to be the strongest in this technology.”

Growing pains

The machining cells allow Modern Engineering to operate 24 hours a day, but Jahn says reaching the point of lights out didn’t happen overnight.

“It was a long learning curve and it took from six months to about a year to have our systems functioning properly for lights out. We were totally unprepared for what we had to do; fixtures we had to build for five axis automation, tooling we needed to acquire and

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understanding how to schedule for lights out. We needed to create a good ERP system to plan production and material scheduling.”

Jahn adds that help and support from Elliott-Matsuura’s service and applications team, including Ken Archer and his predecessor Hans Strohhacker, eased the learning curve for lights out automation.

Modern Engineering’s strength in five axis machining automation is attributable to two things: technology and people.

“The engineering staff really understand simultaneous five axis machining,” says Lindsay Harris, the BC regional sales manager for Elliott-Matsuura who has helped Modern Engineering on its journey to machining



Modern Engineering's machine shop is capable of producing a wide range of complex, precision parts.

THE EQUIPMENT



➔ **MODERN ENGINEERING HAS** been active in five axis machining automation since 2006, when it purchased its first Matsuura MAM72-63V five axis machining centre with a six pallet pool. In 2011, it installed the MAM72-35V machine, equipped with a 32-pallet tower. Last year, it took delivery of two more of the same Matsuura 32-pallet tower machines. And it will soon install the newest member of the five axis machining automation family, a MAM72-63V model with a 18-pallet stocker.

Five key components in the MAM72 series provide Modern Engineering with flexible machining automaton: one set-up for simultaneous five axis machining, linear pallet systems, a patented MAXIA spindle, a magazine matrix capable of storing up to 520 tools, and the MIMS (Matsuura Intelligent Meister System) interface for easier and quicker operation, process control, programing and monitoring.

The 63V model features a 51-tool drum magazine as standard with a 10.40 in. screen and Matsuura's Flip Up Arm APC configuration which, according to Matsuura, shortens the machine length and reduces the overall machine tool footprint. It's designed with a large working envelope for parts up to 800 mm in diameter, X, Y and Z axis travels are 760 mm (29.92 in.), 845 mm (33.26 in.) and 660 mm (25.98 in.) respectively. The C axis travel can rotate 360° while the A axis travel's tilting range is -120° to +120° with a pallet changer and -120° to +30°.

The 35V model is designed for five axis machining of components up to 350 mm in diameter. It features X, Y and Z axis travels of 550 mm (21.65 in.), 440 mm (17.32 in.) and 580 mm (22.83 in.) respectively. Rapid traverse and feed rates in X, Y and Z axes are 60,000 m/min (2,362.2 ipm). The machine is equipped with a tilt and rotary table with twin side supports for increased rigidity and braking torques for tilt axis cutting.



automation. “Modern has staff on board that know how to design workholding for five axis and they’re an innovative group of people.”

In addition to making its own fixturing for five axis machining, Modern Engineering also built its own inventory tool management system.

“It’s a system our programmers

and machinists use,” explains Jahn.

“We have a toolcrib and access to information online via a server, but tool management and tool monitoring is still a challenge for us in this type of machining automation environment and it’s an area we could use more education to improve our processes. SMT

Carving A New Manufacturing Niche

In 2013, Modern Engineering was named Business of the Year by the Delta Chamber of Commerce for its initiatives in changing the manufacturing landscape in British Columbia.

Modern Engineering is changing that manufacturing landscape in two ways: by carving out a new niche for five axis, high precision, advanced automation and by developing a young skilled workforce to handle these complex manufacturing processes.

“We’re on the West coast and this is an area renown for logging, mining and fishing and we’re trying to carve out a totally different niche and change a mindset of what BC manufacturers are capable of,” says company owner Udo Jahn. “Manufacturing won’t locate in BC unless it has a supply chain capable of handling the needs of manufacturers from around the globe.”

To maintain an advanced manufacturing, lights out operation requires skilled workers, something everyone knows is in short supply. But Jahn has an answer. Hire high school students.

“For young people to want to get into machining, there has to be a demand and we’re creating that demand by employing them and taking risks. I’ve seen many colleagues die, including my father, and libraries have died with them. The best thing you can do for humanity is to share your knowledge.”



The Matsuura machining centres are equipped with pallet stocking towers.

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