

## **Aitkin Iron Works Inc., A Job Shop Where The Future Is Now Investing In Machine Tool Flexibility For Production Of Any Type**

It's like being a kid in a candy store, having a job shop with the most technically advanced and most versatile machining equipment available, all under one roof.

Not only does Aitkin Iron Works, Aitkin, MN, have an advanced Palletech system with three Mazak FH-1080 Horizontal Machining Centers for large parts, but it has a Mazak V-100 Five-Face Machining Center with a two-pallet changer that can easily hold a pick-up truck on one pallet. Ask Owner/President Jeff Chatelle why all this capability for his job shop and he'll tell you that "it's the only way to survive in this business."

"I believe in diversity and flexibility for machining capabilities. That's what I look for in purchasing machine tools. As a job shop, it's the latest technology in machining equipment available that will guarantee us work. This enables us to give our customers precision parts with very little lead time and excellent turnaround to meet their Just-In-Time needs."

Some of the machines at Aitkin Iron Works are massive, the largest in their class, all purchased to deliver superior performance and flexibility.

As a job shop, Aitkin Iron Works does machining and assembly work for OEM customers. They will machine parts, laser cut sheet metal, bend, weld and fabricate parts and even offer a finished component to their customers. Chatelle said, "We are doing more and more of finished component type of work. If our customers need it, we'll do it."

Chatelle said that because of their capabilities and customer demand, they outgrew a series of five buildings in the downtown area of Aitkin. In September 1999, Aitkin Iron Works moved into a new 95,000 sq. ft. building. Presently they are doing about 60% chipmaking and 40% welding, but this can change monthly.

### **Palletech System Helps Growth**

"Our customers are growing. To handle their growth, we had to increase our capabilities along with increasing our building space," Chatelle added. To do this, the company purchased a Mazak Palletech System consisting of three FH-1080 Horizontal CNC Machining Centers with 20 pallets and an automated pallet system with two load/unload stations. The FH-1080 has X travel of 64", Y = 51", and, Z =48" and 120 tool magazine. It holds 6600 lbs of payload on a 39.3" pallet.

Chatelle said that the reduction of their cycle times and the flexibility of the Palletech system were the most important keys to its purchase. They are able to do a diversity of parts for many different customers all within a very tight time frame. “We’ve been able to take away the set up time when a customer wants to produce another part because we have the fixtures loaded. In the future, we will add another two machines to the Palletech system and additional pallet storage.”

“With the Palletech system you just load the pallets with parts, schedule the machines and let them run unattended except for loading and unloading. The Palletech is so flexible that when we have a customer call needing a different part run then what we’re running, we can easily make the change.”

Chatelle added that they also have two H-1000 HMCs that are stand-alone units with standard two-pallet changers and a pallet size of 39.3” X 39.3” that allow them to produce small to very large parts. “Our customers have asked us to go into prototyping and fixture building and we will use the stand alone H-1000s for this work. We didn’t have the capacity to do this before. With the new Palletech system, we can use these other machines for this type of work. The Palletech will do production runs and the standalone HMCs will do the small run work.”

Currently, the average lot size for the Palletech HMCs is only six pieces, but the parts are large and very complex with long cycle times involving milling, boring, drilling and tapping.

### **Large Part Flexibility**

“When we were negotiating for a large five-face milling machine, we also researched other machine tool manufacturers. The other manufacturers, who make a V-100 type bridge mill, had limited options that we needed. Mazak had plenty of standard and special options and allowed us to add coolant through the horizontal and vertical spindles.”

Mazak’s V-100 five-face milling machine gives Aitkin Iron Work excellent flexibility. On the V-100 with a two-pallet changer, the pallets are 84” X 156” (large enough to hold a pick-up truck). Part sizes vary from being as small as 4” by 18” long to about 6’ wide 15’ long. Because of the ability to change the machining head from a vertical plane to a horizontal plane in about 30 seconds and the capability to index the spindle in 90° increments, five-face machining can be done in one-setup. This machining capability cuts overall cycle times by reducing setup times and eliminating part movement and resetting between different machines (and possible errors that can develop when repositioning the part).

When machining small parts, Chatelle has fixtured a number of parts on one pallet. With this setup, the machine can do a sequence of operations on each part giving an increase in production speed, or a large part can be machined on one pallet while other parts are setup on the second pallet, allowing maximum spindle usage.

“Because of the machine’s capabilities, we have definitely increased our production capacity by cutting down on cycle times. We don’t have to reposition parts to get at all the sides. This is an

important feature as we do a lot of in-line machining where holes from one side of the part must precisely match up with the other,” Chatelle added.

Most of the materials machined are carbon steel and high strength steel alloys, some stainless steel and ductile cast iron.

Aitkin Iron started in 1985 with a Mazak Quick Turn 10N Turning Center and has grown from there adding more Mazak equipment including multi tasking turn/mill centers such as a Super Quick Turn 250MS, Multiplex 630, Integrex 40; H-400 and H-800 Horizontal Machining Centers; V414-22 and VQC 20/50 Vertical Machining Centers. Recently they added a huge A-16N Mega Turn Vertical Turning Center with a two-pallet changer that can both mill and turn in one setup. All the equipment was purchased because of its ability to be flexible in its capabilities and to save setup time and cycle times by reducing fixturing and movement from machine to machine.

### **Aitkin Iron’s Intranet System**

Aitkin Iron is developing an Intranet system that will be used to download part programs produced from a CAD/CAM system to the machining centers. The Intranet will also link the PC Fusion CNC Mazatrol 640 controls of each machine together. Using a PC linked to Mazak’s Fusion control, Aitkin Iron can get a tremendous amount of information on the status of each machine (such as production status, count, tool data management, and a simulator for scheduling and manufacturing data) by interfacing with the Windows® side of the Mazatrol 640 control.

Mazak’s Mazatrol 640 Control fuses these high performance machine controls with all of the capabilities that a PC can provide in a Windows® environment. Two-way communications with Mazak machine tools and PCs enable concurrent production planning and execution, meaning a reduction in delivery lead times which helps Aitkin Iron with Just-In-Time inventory planning.

Chatelle said, “We want to develop our own Cyber Production Center similar to the one that Mazak has in Japan.” Mazak’s Cyber Production Center uses a comprehensive software package which includes Mazatrol Camware for off-line programming, tool-data management, a scheduler for scheduling workpieces and monitoring for each machine to make overall manufacturing productive. “We also want our vendors hooked into our computer network so they can see the demands on our equipment. Then we can forecast what machine time, tooling and manpower and raw materials we’ll need for the next nine months or so and work with our customer’s and vendors on satisfactory delivery,” Chatelle added.

Here’s an example of how well Mazak has come through for Aitkin Iron when they needed them, in one instance Aitkin accidentally had a crash with an Integrex causing the machine’s casting to break. This machine was originally purchased to produce a long run part. It was going to take three months to get a new casting. Chatelle said, “We were hurting, without the Integrex, we were doing the part on manual machines and putting them in a pick-up truck and driving to Louisville, KY to keep the customer going. Mike Bliss, our local Mazak Distributor, got on the phone and told Mazak of the problem. There

was an Integrex at the Westec Show and before it opened, Mazak had it taken out and sent to us. We ended up buying that machine and we've been able to keep both busy producing parts. That's what Mazak and their local representative has done for us."

Chatelle added, "For parts production, there's not a thing we can't do. We have great capability, total capability. We were confined by space before, but now with this new building, we have the area to add capacity and open new markets."