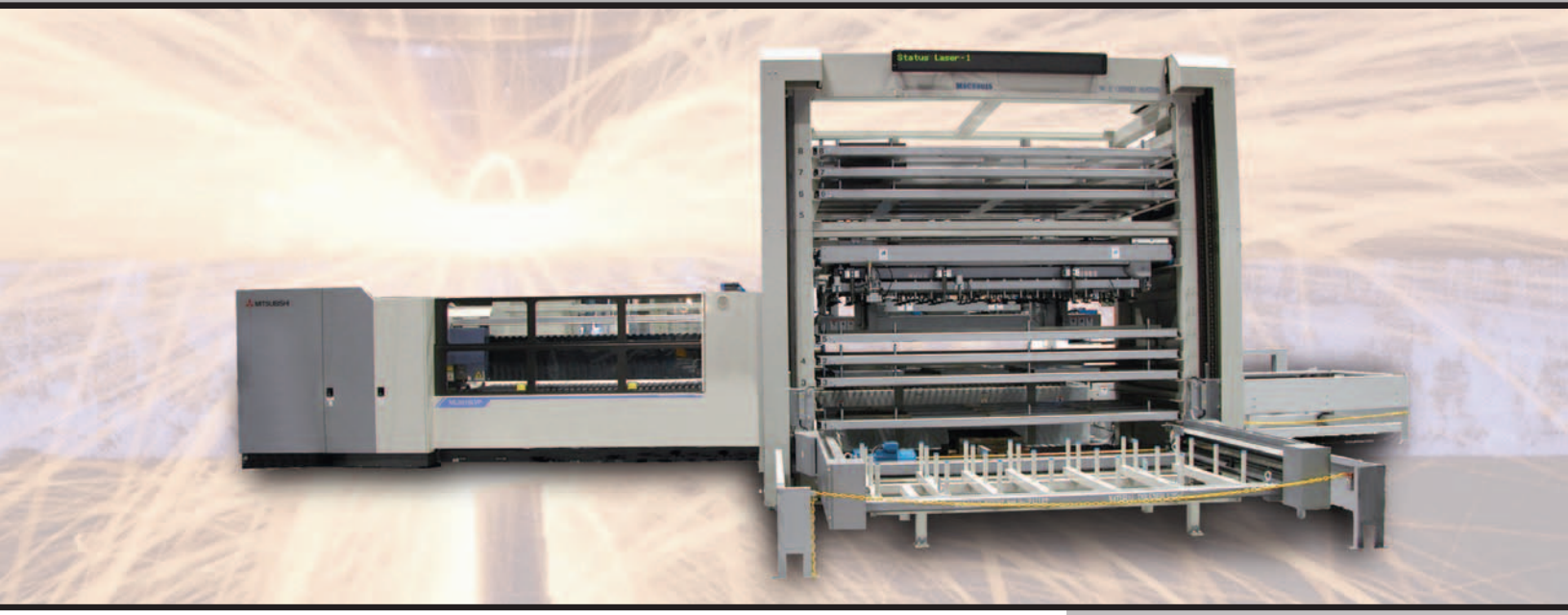
MITSUBISHI LASER

Summer/Fall 2004

theEDGE

Information and Insights to Keep You on the Laser Industry's Cutting Edge



Mitsubishi Laser Offers Automated Pallet Changer on All LVP Models

Mitsubishi Laser is among the industry leaders in automated laser systems. The LVP series CO2 laser cutting system is available in three different sizes, giving fabricators an option to suit their needs. The LVP series is available in 4x8, 5x10, and 6x12 table sizes. The LVP comes standard with pallet changers that have 1" full-size sheet capacity and a shuttle time of approximately 25 seconds.

The 5x10 and 6x12 LVP series models are expandable into the MSCIII automated material handling system. Mitsubishi's modular automated system allows for growth with the customer.

The LVP series also features Mitsubishi's patented cross-flow, rectangular-wave, high-peak pulse resonator, available in 2,000 and 3,600 watts. Mitsubishi's revolutionary X-flow resonator is available in 4,000 watts, creating the perfect blend of output power, beam quality, beam stability, and power control. All of this results in superior cutting power and edge quality.

The LVP comes standard with an advanced, high-speed processing head with anti-plasma technology for high-speed cutting of a wide range of materials. This feature streamlines the cutting and automation process. The processing head automatically changes focus from one material to the next.

Every critical component on every Mitsubishi Laser is engineered and manufactured by Mitsubishi.

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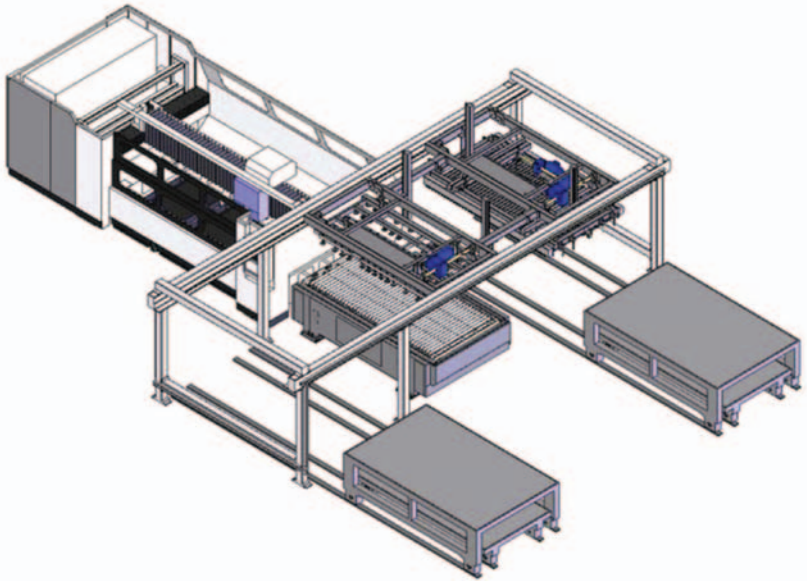
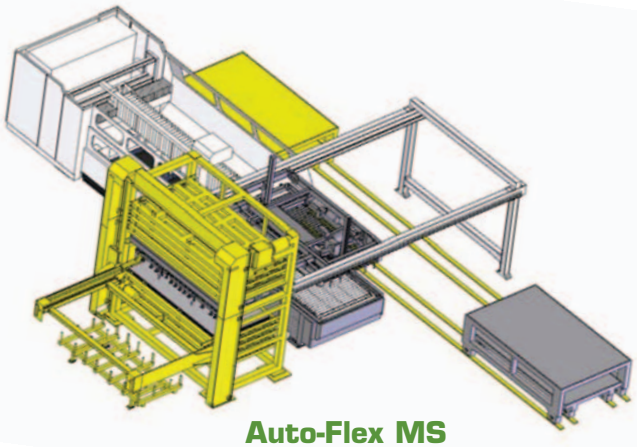
:: MSCIII Automation

Mitsubishi Laser's MSCIII Modular Automation

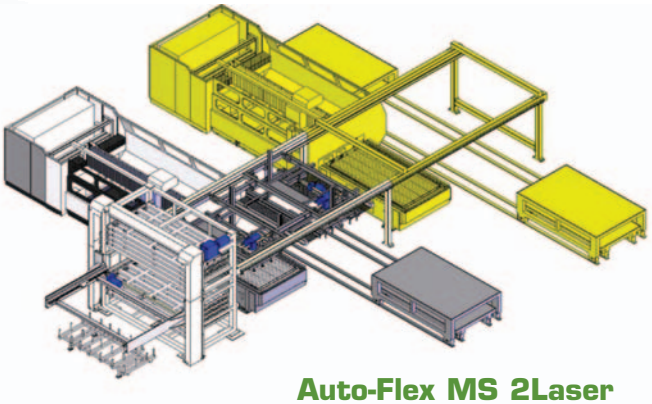
Automation is the edge you need to compete. We are helping businesses of all sizes make the transition to automated systems with our modular designs that allow greater flexibility than ever before. Job shops and OEMs are benefiting from Mitsubishi's unique position as the provider of the most customizable automated systems in the industry. Only Mitsubishi has exclusive software from Ncell Systems, the worldwide leader in automation software. Only Mitsubishi gives you the ultimate flexibility and power to take on any competitor. Mitsubishi's MSCIII is the fastest automated system in the market and can keep up with your laser. You can benefit from all of these features and find the automation that suits your company best.



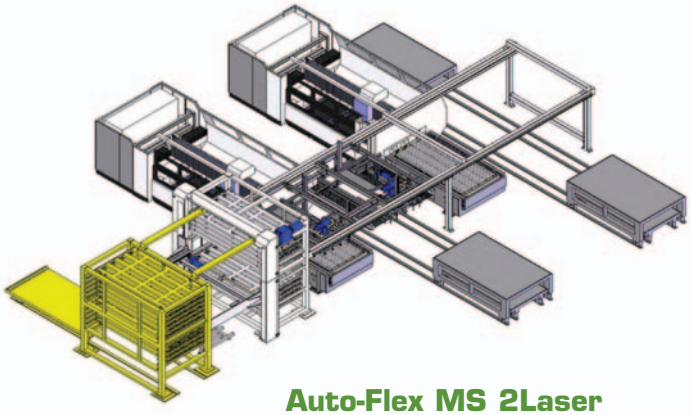
Auto-Flex EL4



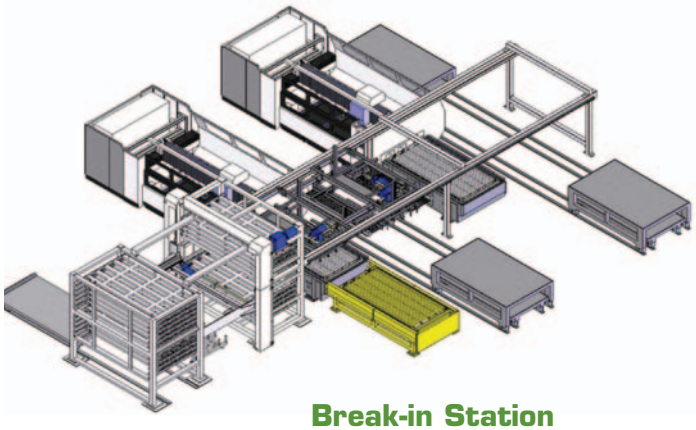
Auto-Flex MS



Auto-Flex MS 2Laser



Auto-Flex MS 2Laser Twin Tower



Break-in Station for Prototype

JOB SHOP CRANKS INTO OVERDRIVE

With a laser and automation package, shop does more work with fewer machines and employees

When Jeff Gauger saw his shop's latest purchase in action, he decided going with a new laser system with automation was probably the best business decision he's made in a very long time.

Argon's Mitsubishi MSCIII FMS system (Mitsubishi Laser-Wood Dale, IL) comprises dual 4kW Mitsubishi Lasers with Ncell automation, fed by a 12-shelf material-handling tower that, according to Mitsubishi, represents the fastest FMS laser system in the world today. As soon as it began running, Argon increased its capacity by 300 to 400 percent—according to Gauger—an amazing increase, considering Argon reduced its lasers from four to two.

Ncell (Minnetonka, MN) and Argon (Milwaukee, Wisconsin) have developed a one-of-a-kind automation system that links Ncell and its various modules to the company's JobBoss manufacturing software. Gauger said Mitsubishi's relationship with Ncell made the difference in choosing a laser for his growing shop.

"We're going after the long runners as they are perfect for automation," Gauger said.

As soon as it began running, Argon increased its capacity by 300 to 400 percent — according to Gauger—an amazing increase, considering Argon reduced its lasers from four to two.

Gauger was impressed with Ncell's willingness to work with his shop to create a custom system, which has been specialized to handle four motorized finished product carts, as opposed to the standard two. Commenting on how the laser and Ncell can communicate both ways, Gauger says, "With the other machines, it couldn't do that. It could just communicate to the machine; communication couldn't come back from the machine."

The software also eliminates many of the chores the shop used to do manually: entering the job into the manufacturing software, pulling information together, taking sales orders to the engineering department, pulling files together with prints, then eventually sending the job to the floor.

Argon is doing away with those processes. Soon, inside salespeople will be able to enter orders into JobBoss, which will send them directly to Ncell and into a queue that can automatically determine how many parts it has going for a certain material and nest them tightly on 16-gauge carbon steel, stainless steel, or whatever material is needed. The integration covers business-side tasks as well—Ncell tracks how much time and material a job uses and sends it right back to the manufacturing software.

"It automates our entire system—not just manufacturing, but everything, the accounting side of the business as well," Gauger adds.

However, the system is no black box. With its iManage module, Argon employees can peek at which jobs are running on the new lasers, right from their laptops, locally or remotely, at any time.

"Anyone in the company with log-in credentials can go to our Web browser and see what products have been nested, what products are being cut, what the cut time was, when it was done, if it's in the queue, if it's a work in process, [or] if it's done," Gauger comments. That allows Argon salespeople at a customer's shop to pull up a specific part on a laptop and report on its progress. In a special twist for customers curious about the process, the company is going to install Web cams in the shop, Gauger says. "So if it's being cut right now, our salesman can say, 'Here let me show you; it's being cut right now.'"

The system also can run with no monitoring whatsoever, so the company runs lights-out on less expensive material after second-shift employees have called it a night. "When second shift has completed their shift at 1 or 2 in the morning, they set jobs up so that throughout the night and until first shift starts, the lasers will continue to run and cut," Gauger said. "When our first shift comes in, there's a stack of finished goods sitting on the finished product carts."

The Ncell-JobBoss combination even will allow repeat customers in the future to interact with Argon's system themselves. "As this develops … they'll be able to go to our website and say, 'I need 1,000 of Part 1234, and I need it by this date,'" Gauger predicts. "It's sent and it goes straight to JobBoss, which generates the order. There's not even a telephone call. It's automatic and paperless."

On the other end of the order spectrum, an Ncell module called iDemand allows Argon to insert spot orders into the product schedule to accommodate urgent orders or higher margin jobs, such as prototypes.

"Or maybe a customer needs a couple more parts of something—we can go to the iDemand module and said, 'I need two of these immediately,'" Gauger says. "It'll stop what it's doing, unload that material, load the new material, cut it, and have it done in minutes."

What really sets the system apart, though, is its speed. Argon's MSCIII has a 30-second beam-off to beam-on time, half the time it takes other systems to perform the same function. It also boasts a nest unload/sheet reload time of one minute, which outpaces other systems' by about 400 percent. Additionally, the system uses two load stations, allowing it to load dissimilar materials to either laser without skipping a beat.

Gauger notes that the flexibility offered by 4 kilowatts (40CFX resonator) of power is ideal for a shop that plays in a tough neighborhood. Argon fabricates a full gamut of parts, from flat pieces all the way up to full assemblies, out of a variety of materials—from relatively easy-to-cut carbon steel (22-gauge to 1-inch plate) to different gauges of stainless steel and aluminum.

"We're the type of shop that prefers to chase the more difficult jobs, the types of products that most job shops cannot cut," Gauger said. "There are a lot of customers that come to us with some thicker materials and say, 'Well, you probably can't do this, can you?' And our response is, 'Absolutely—give us the tough stuff.' We're well aware of the fact that a lot of people out there cannot cut the thicker materials, and a lot of people don't want to work with stainless steel or aluminum. The new system has no problem with stainless; edge quality is fantastic."

While Argon does use alternate cutting technologies, such as abrasive waterjet and turret punching, the lasers clearly are the machines Argon is pinning its hopes on.

"Lasers are pretty much replacing turrets now," Gauger says. "They're so fast. Even though you do have some consumables—nozzles and lenses and gases and so forth—materials that they're capable of cutting and the speed at which they can cut make it virtually a no-brainer."

Despite the system's advantages, getting buy-in from Argon employees for the FMS system wasn't exactly the easiest task, simply because it changed the way Argon did its business so greatly. The shop's old stand-alone lasers required a good deal of manual labor to move material in and out and operate the machine. The 12-shelf tower and elevator system changed that quite a bit.

"It was definitely a cultural change for the shop," Gauger says. "What we're doing is essentially eliminating as much human intervention as possible. We'll probably reassign some duties of people because ... this system is capable of running 24/7, fully unattended."

"When we began this company, our goal was to have the latest and greatest cutting-edge technology," Gauger says. "We felt that by doing that we could effectively compete with the foreign companies as we could make our parts more efficiently and with a higher quality."

TOYOKOKI UNMATCHED PRECISION

MC Machinery Systems Inc. began importing Toyokoki press brakes in 1994 as a way to bring a superior level of fabrication equipment to its customer base. Toyokoki Press Brakes hold tolerances as tight as one micron. That's as much as 10 times the accuracy of other press brakes. This enables customers to make profitable parts that others simply can't manufacture.

Toyokoki has been manufacturing high-precision brakes since 1962. Its facility in Nagoya, Japan ships two press brakes somewhere in the world every day.

Toyokoki is the OEM for many press brake manufacturers throughout the world. Its advancements in engineering and technology have put the company in a unique position to provide customers with unparalleled equipment.

For some shops, any press brake will do, but when precision is the name of the game, nothing will outperform a Toyokoki Press Brake.

If accuracy drives your press brake profits, nothing pays like a Toyokoki.

Toyokoki manufacturing facility in Nagoya, Japan.

ELECTRIC APB

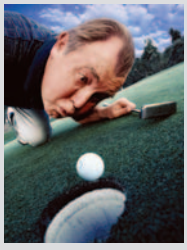
HYBRID HYB

The APB is the world's first 100% electric press brake developed to meet the growing demand for shorter lot runs with greater accuracy and repeatability.

- 1-Micron Ram Accuracy
- 100% Electric
- Virtually No Maintenance
- Thickness-Sensing Technology

The HYB Series offers a patented electric/hydraulic "hybrid" system. Its AC servo, motor-driven hydraulic pumps are capable of extraordinary positioning accuracy.

- 1-Micron Ram Accuracy
- 50% Less Power Consumption
- Patented Double-Wedge Crowning
- Thickness-Sensing Technology



When precision counts, Toyokoki pays.

:: Duggan Manufacturing

MITSUBISHI LASERS DOUBLE LAST YEAR'S SALES IN SIX MONTHS

Don't talk to Rodney Westich of Duggan Manufacturing (Shelby Township, MI) about calculating payback on high-technology investments. Westich has a better yardstick. He bought four Mitsubishi laser-cutting machines over a 12-month period beginning in mid-2003.
The results:

Duggan Manufacturing sales, 2003:
• $3.9 million.
Duggan Manufacturing sales, first six months of 2004:
• $4.1 million.

Duggan Manufacturing specializes in creating prototypes and doing short- to medium-run production on parts with applications in trucks and automobiles. In business for about 3-1/2 years, the company started in a small garage; it has now graduated to a 28,000-sq.-ft. facility bristling with hydraulic presses up to 1,200T, four CNC machining centers, a number of CMMs, and now, four Mitsubishi Lasers.

Employment has mushroomed to 60 people, split among three shifts, six days a week. Stamping mostly galvanized or AKDQ cold-rolled steel, the workers typically follow four steps in creating a prototype or production part for a customer, according to Westich:

1. Blank development.
2. Creation of drawing quality tool.
3. Production of formed blank.
4. Laser-cut prototype or product production.

The parts Duggan Manufacturing produces include a variety of small brackets and other components a few inches in length. They typically go into automotive systems such as window-lift mechanisms. Production runs range up to about 25,000 pieces, and up to about 11,000 pieces on the lasers.

In the early days of the firm, Westich says, the parts and prototypes it produced were finished with trim dies before final outsourcing. As the business grew and customers' tolerances became tighter, Duggan Manufacturing began to outsource part trimming to sources that did laser cutting.

"We reached the point where we were farming out $60,000 worth of laser work a month," says Westich, "The problem was, our customers needed turnarounds of anywhere from three days down to three hours. Outsourcing the cutting took three days or more. We couldn't service our accounts to the level we wanted."

Westich contacted Roscommon Machinery, a Mitsubishi dealer in Newbury, Ohio. He also considered machines from a variety of laser manufacturers, but the result was an order for a Mitsubishi VZ1 2015 (5X7) with the 3020D 2,000-watt resonator.

Things moved very quickly. "I couldn't believe how fast Roscommon and Mitsubishi reacted," Westich testifies. "The paperwork took less than 24 hours. The machine was installed 10 days from the date of the quotation, which is exceptional."

"We ran that first machine around the clock for nine months after we started it up. It had a backlog of work before it ever arrived," he continues.

Westich also sent his first operator for training the day he shook hands on the deal. The operator was ready to go when the machine was, and that operator subsequently trained eight others.

A used, 1993 Mitsubishi model 1212HC (4X4) laser with 1600W resonator followed, and two more new VZ1 2015s came shortly afterward. All four machines were purchased over an 12-month period ending in March 2004. Westich says that all have been busy continuously since they arrived. Duggan Manufacturing now uses a CNET computer program for design work and does some offline programming to set up work on the machines.

:: Duggan Manufacturing

"We're very happy with the lasers," Westich declares. "They've been extremely dependable. We really haven't had a single breakdown or problem with them, despite running them around the clock. The edge and part geometry we've been getting are of extremely high quality and accuracy. The cost to run the machines is much lower than what we were doing before. And the machines were competitively priced with other equipment we considered."

Duggan Manufacturing has no plans to add automation to its present setup. "We've got no room for it!" Westich laughs. The company is however interested in another five-axis laser, perhaps in 2005.

"Anytime you can double the previous year's volume in six months, you're doing well," the Duggan Manufacturing executive concludes. "The recovering economy is a factor, of course, but the main thing is that the lasers have enabled us to take on more, higher-quality business."

For more information on Mitsubishi's VZ Series Lasers visit, us online at www.mitsubishi-world.com

:: Customer Service

Regional Service Continues to Expand

Mitsubishi Laser continues to expand its regional service reach. In September 2004, its Michigan office will open with tech centers in Wisconsin, North Carolina, and Massachusetts soon to follow. The regional locations aim to:

- Increase on-site response speed,
- Reduce travel time and customer expenses,
- Improve customer relations, and
- Increase customer satisfaction.

Customer Support Available Online

Mitsubishi-World continues to be the leading source for online customer-assistance in the machine tool industry. Mitsubishi Laser now offers its customers online part catalogs. These catalogs are designed to allow customers to find the exact part they need through detailed machine diagrams and organized parts numbers. This convenience benefits customers, while improving productivity.

Visit us at www.mitsubishi-world.com

Laser Makes "Subtraction by Addition" Pay Off for Oven Manufacturer

It's a manager's dream: free up machine operators, get rid of unneeded equipment, and expand a company's manufacturing capabilities by ADDING machinery.

One might call it "subtraction by addition." And it's what The Grieve Corporation (Round Lake, IL) accomplished recently with the purchase of a new Mitsubishi laser cutting machine.

The Grieve Corporation dates back to its 1949 founding by G.P. Grieve. Originally a fabricator of sheet-metal parts, the Grieve Corporation was drawn into production of industrial ovens by customer demand. Today these ovens come in all sizes and shapes and serve a tremendous range of markets — paint curing: medical, pharmaceutical, and biotechnological laboratories: stress relief in metals: curing of solid state modules for electronics: the aircraft industry: the automotive industry, and even hydrogen embrittlement of metals. The Grieve Corporation manufactures a stock line of ovens and also offers custom design and manufacture of ovens to customer requirements. Industrial furnaces for heat treating a variety of metals at temperatures up to 2,200°F were added to the line about 15 years ago.

The company's 107,000-sq.-ft. headquarters sits 40 miles north of Chicago and boasts about 140 workers at full employment (one shift a day). The building bristles with the latest CAD/CAM/CAE equipment for product design and a host of top-drawer metalworking machines, many of them CNC. The Grieve Corporation boasts on its website (www.grievecorp.com) that the company not only carefully checks out every unit before shipment —"Problems are uncovered in our plant, not yours" — but that it has never retired a job file, and can call up designs from the 1940s and 1950s and produce replacement parts today.

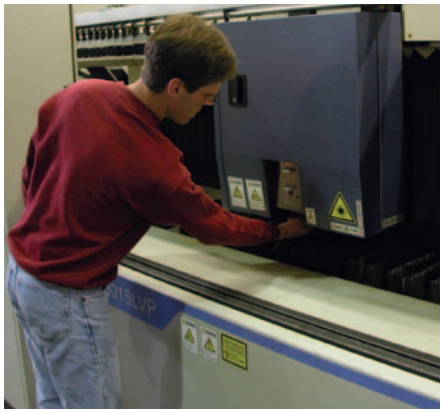
The ovens are produced from cold-rolled steel, stainless steel, or aluminum in anything from 20 to 12 gauge. They range from desktop-sized units to monsters. "We just shipped one the other day that was 12' wide, 38' long, and 10' high, and that's not unusual," comments company president Pat Calabrese.

As might be expected in a company basically producing "metal boxes" (Calabrese's words), the production machinery a year ago was heavy on CNC turret punch presses. Manufacturing was relatively labor-intensive, involving hand loading and unloading of machines, frequent tooling changes, considerable setup time, and lengthy programming of the CNC units. There were no known problems with the tightly controlled production, but it was an operation waiting for a new idea.

That idea came to Pat Calabrese on a trip to Germany. "We were given a tour of a plant that had a laser cutting machine in it. The entire operation was explained to us, and they said they had replaced some CNC machines with the laser. I sat down and talked about it with our plant manager, Tom Hammonds, and we agreed it might be worth a try. We spent the next year looking at lasers."

The Grieve Corporation execs indeed "looked at 'em all" over the next 12 months or so, evaluating 6 to 12 different vendors, visiting suppliers' headquarters and customer plants,

and comparing specifications and capabilities. In the end, the combination of a manufacturer, Mitsubishi Laser (Wood Dale, IL) and a machinery dealer, Advanced Manufacturing Solutions, Inc. (AMS, Schaumburg, IL) – both with offices within 50 miles of the Grieves Corporation – proved irresistible.



Operator easily adjusts head on the LVP.

"I think Grieve wanted to buy through us because they felt comfortable and confident with AMS on important issues such as installation and setup," notes AMS partner Jim Grasse. "This was a new system for them, and they wanted us to do everything to get it running well. We've put a lot of systems like this in place over the last nine years. I think the ability to go to Mitsubishi's showroom in Wood Dale and see the actual machine in operation helped seal the deal."

What the Grieve Corporation finally decided on was a Mitsubishi model 3015 LVP CO2 laser with a 20CF resonator. The unit is rated at 2,000W maximum output power (3,000W pulse peak power) and can deliver a top processing feed rate of 1,180 inches/minute. The 25,000-lb. cutting machine can accept a workpiece up to 10' X 5' in size and 2,050 lb. in weight. The 3015 LVP also comes with Ncell software on board, allowing numerous extra programming options.

AMS suggested, and the Grieve Corporation agreed to, a 10-shelf Mitsubishi MSCII sheet material handling tower to feed the new laser. This material-handling giant features raw material and finished product shelves in the same tower, automatic loading and unloading from the same elevator, an adjustable shelf configuration, and a small footprint.

"There were five points in the laser system's favor," Calabrese elaborates:

- "A CNC punch press produces a lot of noise, and our workers had to wear headphones around ours. There is virtually no noise with the laser."

- "The laser's accuracy is better than a shear's."

- "On a punch press, if your tools aren't good and sharp, you get a burr on the back edge of your cut, requiring a secondary operation to remove it and finish the work properly. The laser produces no burr."

- "You can do all kinds of intricate shapes on the laser that you can't do with a CNC punch press."

- "Finally, we are going to lean manufacturing. The laser has helped a lot in that area. In many cases, we've been able to run it operator-free. It selects the steel and does the job all by itself. We can push a lot of metal through this machine."

"It also has an etching feature, which lets us label all of our parts as they're made. Put all of these factors together, and it was the only way to go," the enthusiastic executive concludes.

"It's a much better process for them compared to the punch presses," adds AMS partner Jim Grasse. "It lets them get product out the door faster. They've been able to eliminate a lot of extra steps in their operations. I think the laser

"A CNC punch press produces a lot of noise, and our workers had to wear headphones around ours. There is virtually no noise with the laser."

The Grieves Corporation staff thoroughly inspects assembled products.

has even allowed them to redesign some of their existing oven models."

AMS teamed with Mitsubishi on the sales effort and did much of the installation, including the rigging, foundation, electrical power, and hookups. The first problem — and one of the Grieve Corporation's key requirements — was the new machine's footprint.

"We never even considered space for a system like this when we laid out this building years ago," observes Calabrese. "We had to move a lot of machines around to squeeze the laser in."

Training was another key requirement handled jointly by AMS and Mitsubishi. The Grieve Corporation ended up training four people, including Plant Manager Hammonds for five days at Mitsubishi's Wood Dale facility, and AMS has been onsite frequently since to supply application data and field questions.

Approximately a year after installation, what's the verdict? "There's no question this was the right move," declares Calabrese. "The system does a good job. We've even used it unattended — put a job into the machine, press the button, and go home for the night, and the job is ready first thing in the morning. We're learning as we go along, but the machine will do more than we thought it would."

The biggest plus for the new system, Calabrese and Hammond report, is that it has allowed the company to get rid of equipment and free up operators. Calabrese says it no longer has an operator for its deburrer, because it's not needed with the laser's fine finished edge on the work. And the company no longer has shear operators, and in fact, has sold one of the shears.

"We're using the laser as much as possible. Tom Hammond wants to get as much work as possible off the CNC machines and put through the laser. We may be able to sell one of the CNCs, since we really don't need it now," The Grieve Corporation president adds. Setup time has been slashed and manual handling of material dramatically reduced, saving still more costs and labor. Metal-cutting time is described as faster than CNC machines.

Training has gone better than expected and taken less time than anticipated. Calabrese reports that the operators got very familiar with the machine in just a couple of months. They have learned to program the new machine and enjoy it, "because you don't have to be a genius to use it."

The Ncell software has also been a boon to the Grieve Corporation. Calabrese does not want to go into too many details because the company has developed a number of programming innovations on its own, but it is clear the company is using Ncell to nest products so that multiple parts, and in some cases an entire oven, can be cut out of a single sheet of metal.

Will the laser be able to keep up if the recession ends and business ramps up? "My gut feeling is that there are capabilities in this machine we haven't begun to use," Calabrese asserts.

Subtraction by addition seems to work, at least at The Grieve Corporation.

Etching On A Part

Dru Schwartz

To minimize a "hot spot" at the start point of the etching process, try the following program changes:

1. Remove all the M101 commands from the etching portion of the program.
2. Change the M121 commands to M87 commands.
3. Add the following lines of code just before the M66 in the program:
   a. M67
   b. M#10? (etching condition)
   c. M86
   d. M87
   e. M66 (original program)

This should minimize the "hot spot" at the start of each etch.

Dru Schwartz
Senior Engineer
Laser Division Pre-Sales Department

Paul Greiner

Summertime Preventative Maintenance

Summertime is here. It is time to begin keeping an eye on optic temperature set points and make sure the power supply cabinet is kept clean. With the higher ambient temperatures, it is necessary to keep the optic temperature set point high enough to avoid condensation. Generally, this setting is 70–75 degrees. On very humid days, it may be necessary to increase this set point to 80 or 82 degrees to eliminate this condensation. (NOTE: 40CFX users must ALWAYS be set to 86 degrees, regardless of the ambient temp/humidity.)

Also, during the hottest days of summer, you may incur power supply temperature alarms. Keeping the power supply filters clean can reduce this occurrence. It is also recommended to clean out the power supply with Nitrogen or clean dry air on an annual basis. Particular attention should be paid to cleaning the bank units and heat sinks. Please contact the service department for additional advice and precautions.

Water conductivity alarms are common after the chiller has not been run for several days or after holiday weekends. They may also occur if a significant amount of water has been added to the chiller, or if the DI resin or prefilter are in need of replacement. Many times, this alarm can be cleared up simply by running the chiller manually for about one hour. If the alarm does not clear, please contact the service department for additional suggestions and ways to monitor the water conductivity level.

Paul Greiner
Phone Support Supervisor
Laser/Press Brake Division

Bill Isaac
VP, Sales and Marketing

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As I See It – A Letter from Bill Isaac, VP, Sales and Marketing

Dear Fabricators,

The last few years have been challenging for manufacturers and machine tool builders alike. However, it is during the tough times that I am most impressed by the creativity and resilience of our customers. Developing new ways to compete in the global market is a challenge that is constantly pursued here at Mitsubishi, and we know that it is your priority as well.

Working hand-in-hand with our customers, we are helping rebuild the confidence and momentum of American manufacturers. We are totally committed to helping you deal with the change and working with you to develop solutions that are unique to your business.

We have positioned ourselves as the "Automation Experts." To me, that simply means two things: providing a consultative approach to your business based on our extensive automation experience and providing superior products and service to help you accomplish your business goals.

Our strategic partnerships with Ncell Systems (automation software) and Toyokoki Press Brakes give us the ability to serve all your fabrication needs. We are continuing to build our service and support structure and have recently developed a Consumable division to give you even more access to authentic Mitsubishi parts. We know how important productivity is, and we strive to deliver the most productivity to your business.

We're proud to support the finest manufacturers in the world. We owe our success to you, our customers. As your needs change, we promise to keep pace. Thank you for your continued loyalty to MC Machinery. I wish you a prosperous year.

Sincerely,

Bill Isaac

MITSUBISHI LASER

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www.mitsubishi-world.com