

# FFJournal

The magazine for today's metal fabricating & forming technologies

A TREND Publication

www.ffjournal.net

## SECOND CHANCES

America's Job Honor Awards convinces manufacturers that people can overcome employment barriers

Kyle Horn (left), founder and director of America's Job Honor Awards, and Edward Ailey-Roberson (right), recipient of the Iowa Job Honor Award

### WELDING

Automation technology travels the world

### WATERJET CUTTING

Manufacturer eliminates the grind

# Toolbox



## Welding system is configurable, compact

Amada Miyachi America Inc.'s LMWS Pulsed Fiber Laser Welding System features a high-speed laser available in 20-70W powers for welding metals and plastics. The systems will weld dissimilar metals, including copper to aluminum, aluminum to stainless and carbon steel, and copper to stainless steel. The model features integrated stage controllers for up to 4 axes of motion, for use in such applications as step and repeat welding, focal plane height adjust and rotary welding.

**Amada Miyachi America Inc.**, Mondovi, California, 626/303-5676, [www.amadamiyachi.com](http://www.amadamiyachi.com).

## Automation controller advances connectivity

Wintriss Controls Group's new SmartPAC PRO press automation controller features a vibrant touchscreen interface, dual-core processors, user-configurable dashboards, unlimited tool setup memory and the ability to share setups among networked SmartPAC PRO units. The new architecture supports advanced connectivity features while maintaining backward compatibility with all legacy SmartPAC 1 and 2 modules. The Wonderware hosting option enables the SmartPAC PRO to run independently created third-party HMIs for associated automation, reducing the number of screens required on the press.



**Wintriss Controls Group**, Acton, Massachusetts, 800/586-8324, [www.wintriss.com](http://www.wintriss.com).



## Optimizing raw material usage via software

TigerStop's Dynamic Pack Optimization efficiently organizes entire packs or bundles of like-profiled material, rather than single pieces. It does so quickly and accurately while tracking material usage statistics. Yield and productivity are the ultimate priorities with the software program. Optimizing raw material usage means more of it is turned into end product and less ends up in the scrap bin.

**TigerStop**, Vancouver, Washington, 360/254-0661, [www.tigerstop.com](http://www.tigerstop.com).



Jon Schmidt, Chief Engineer  
Neff Press, Inc. St. Louis MO

## Complex motion? Can do.

Why does Neff Press®, an industry leader in high-speed hydraulic production presses, integrate Delta RMC controllers into its precision can-making line?

"Delta provides some highly advanced tools for tuning axes very quickly and accurately. That has been our best experience versus other motion controllers we've used."

"...the smoother motion and synchronization between axes enabled by the Delta controller has allowed us to increase our output by 25%."

Look to Delta RMC motion controllers and graphical RMCTools software to make complex motion design so much easier than any alternative.

**Give yourself a break and call 1-360-254-8688 or visit [deltamotion.com](http://deltamotion.com)**

Find the Neff can-making case study or one about your own industry or application. Watch a training video to see how easily Delta can put complexity in the can for you.

### Delta RMC Motion Controller Family



1-2 Axis

Up to 8 Axis

Up to 32 Axis

**DELTA**  
COMPUTER SYSTEMS  
**Motion Control**



# Tight. rein

Aluminum can-forming process streamlined with new press, motion controllers

Sometimes it's hard to see the forest for the trees, particularly when it comes to process improvement. To get the most out of an upgrade, one has to look at the entire process instead of focusing on individual steps. When a manufacturer needed to modernize its aluminum can-forming operation, it turned to St. Louis-based Neff Press Inc. In addition to replacing the company's legacy equipment with a new press, Neff selected Delta Computer Systems' RMC151 8-axis electrohydraulic motion controller to further improve efficiencies.

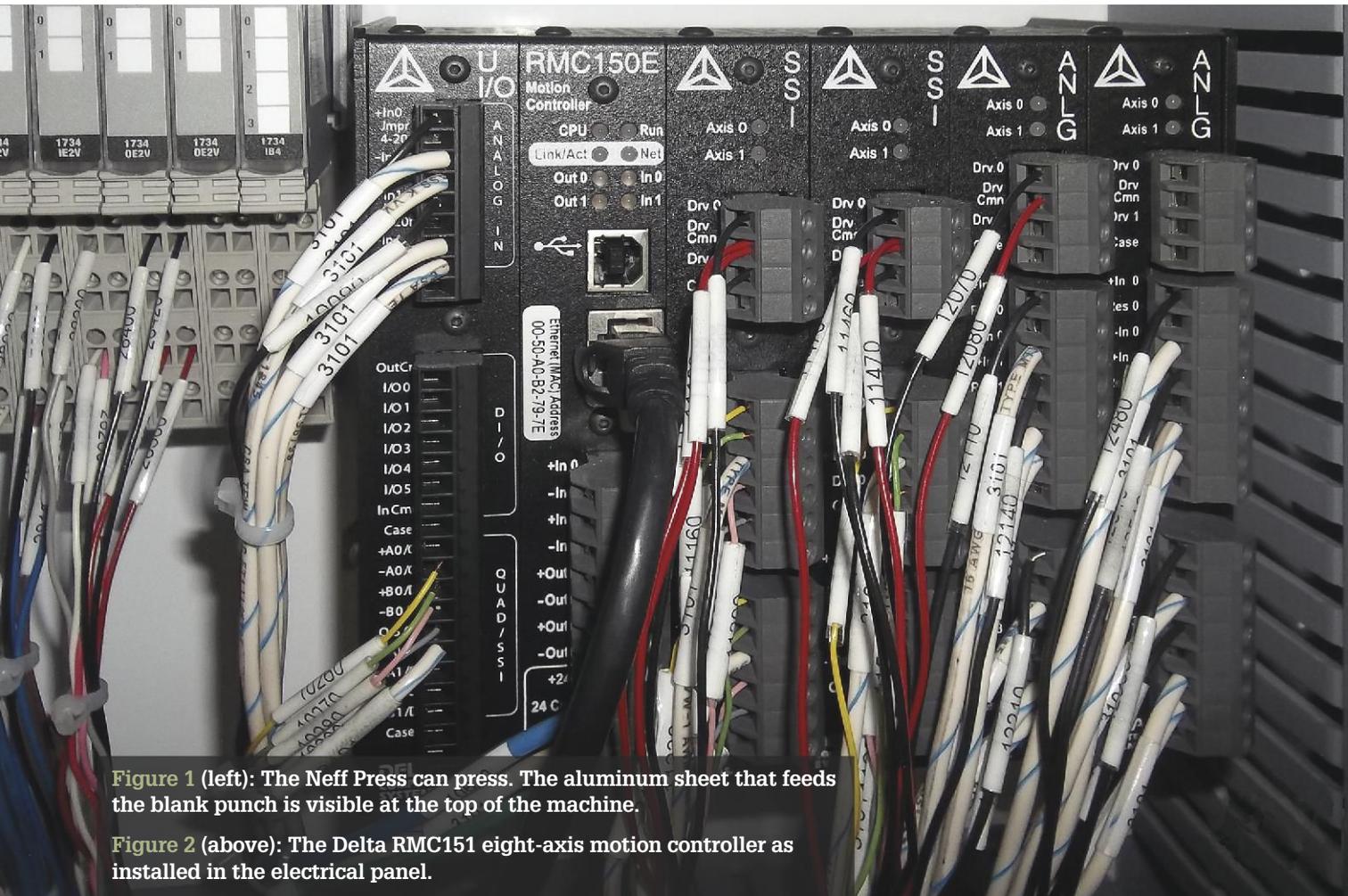
"The fabricator was using a forming operation called reverse draw and ironing," says Jon Schmidt, Neff Press chief engineer. "The technique involved pushing a round aluminum blank first in one direction, then in the other and, finally, through a series of progressively smaller

rings to make a can with a 3-in. diameter and a length up to 24 in." The customer began production with round aluminum blanks. "We scaled up the process with a different style press that allowed the customer to bring its operation in-house and stamp the blanks from rolled sheet alu-

minum," says Schmidt.

The new press also made the operation more repeatable and raised throughput. Neff Press further updated the stamping system by adding a coil-feed line with a zig-zag feeder that optimizes raw material usage by tightly nesting circular blank cutouts.

"Over the past several years we've manufactured more than 100 machines of different types that use motion controllers built by Delta," says Schmidt. "Delta controllers have very high accuracy and execute instructions in microseconds rather than milliseconds. Delta also provides tools that simplify motion design and tuning. A PLC would be harder to program and doesn't execute instructions nearly as fast."



**Figure 1 (left):** The Neff Press can press. The aluminum sheet that feeds the blank punch is visible at the top of the machine.

**Figure 2 (above):** The Delta RMC151 eight-axis motion controller as installed in the electrical panel.

For this application, the Delta RMC151 controls five hydraulic axes that work in concert. Each exerts up to 40 tons of force. Three axes form the first press station, creating a triple action press that blanks the material from a strip of aluminum, draws it into a cup and then inverts it into a shell for further processing.

“The inversion step during draw forming ensures that the aluminum doesn’t tear as the can is stretched further,” Schmidt explains. Binder force—or resistance to the draw axis to ensure that cup forming happens under tight control—is another critical factor. “If we pinch the blank too much between the two rings, the material tears,” Schmidt says. “If we don’t pinch hard enough, it wrinkles. So, we stamp the blank at a higher tonnage

## “ Changeover time from manufacturing one shell can to another has been decreased by half. ”

**Jon Schmidt**, Neff Press Inc.

and then pinch it at a lower pressure while the cup is formed. The Delta controller excels at being able to precisely control the amount of force being applied.”

Conventional presses provide binder force—often called cushion force—with springs or pneumatics. Springs do not provide a constant force [the force increases as the springs are compressed] and using a pneumatic actuator to hold the blank is not accurate due to the compressibility of air.

Neff engineers set up the first three axes to operate simultaneously, using the “virtual gearing” capability that Delta builds into its controllers. Virtual gearing allows the axes to work together as though they were mechanically connected, a feature that lets the cushion follow the punch in order to position the shell can precisely.

### **Precisely repeatable**

“Before we used the Delta controllers this was a lot more complex, and the machine

# Stamping/Presses

“We can control and vary tonnage very precisely, avoiding the hydraulic shock that shortens component longevity.”

Jon Schmidt, Neff Press Inc.

would have had to move much more slowly,” Schmidt says. “Now, we’re able to operate the draw cylinder and cushion cylinder in tandem to precisely and repeatedly orient the formed can so an automated pickup arm can grab and carry it to the next stage of the operation.”

Under the previous forming process, cans were frequently dropped in the robotic handoff between cup forming and the next step of the sequence.

The control’s fourth hydraulic axis chops the scrap aluminum that remains after the cup blanks are punched out. A conveyor moves it to a recycling bin. The cup is transported to the press’s second workstation, where another hydraulic ram—the fifth axis controlled by the Delta RMC151—presses the cup to its final length by forcing it through a series of smaller and smaller rings in a process called ironing.

Delta motion controllers are designed to use servo-quality hydraulic valves on all axes in order to ensure there is tight control of all the motion that is happening.

“Rather than two-position bang/bang valves, these valves are infinitely adjustable,” Schmidt explains. “We can control and vary tonnage very precisely, avoiding the hydraulic shock that causes maintenance problems and shortens component longevity in older systems.”

## Reducing shock

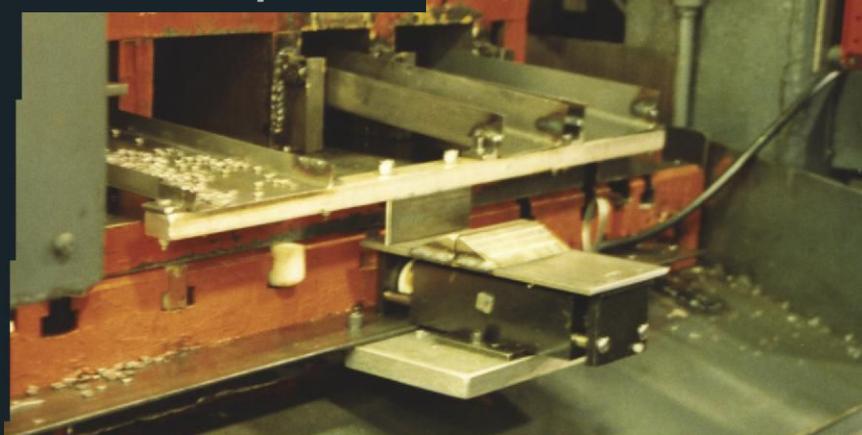
Smooth motion is also important at the end of each forming cycle, when the Delta motion controller moves the various rams out of the way quickly so that the finished piece can be removed and aluminum stock advanced to press the next can.

“The reduction in hydraulic shock has also resulted in less downtime to replace components,” continues Schmidt. “Previously pump and valve replacement was frequent.”

Simply running the old machine more slowly to decrease machine shock wouldn’t have helped, he adds. “Slow, gentle running actually causes the metal to tear. With the RMC151 in control, we were able to increase the motion velocities while ensuring that the customer was producing quality parts.”

Each axis is instrumented to measure

## Vibro Transporters



Remove Stamped Components and Scrap Efficiently and Cost Effectively



For over 30 years, the stamping industry has given the *stamp* of approval to the Vibro Transporter for their scrap removal needs.

At **0.4 cfm**, there is no substitute for the efficiency of the Vibro Transporter. Due to their durable rugged design, many of the Vibro Transporters first sold in 1985 are still in operation today.

All four Vibro models are 100% air operated and 100% made in the USA. Each Vibro unit is backed by a standard two-year, renewable warranty.

Register online or call us to receive your product line kit, application video, engineering support, or to locate a sales representative nearest you.



Global Distribution

**MTI MONTERREY, MEXICO**

**CSP EQUIPMENT INC., Ontario, Canada**

**VEUGEN INTEGRATED TECHNOLOGIES LTD.**  
Ontario, Canada

**FOSMO & DELI A.S.**  
Oslo, Norway

**VIBRO**  
INDUSTRIES

**717.527.2094**  
[www.vibroindustries.com](http://www.vibroindustries.com)

RATED  
**XXX**

**XTREME LIFTING ABILITY**

**XTREME RELIABILITY**

**XTREMELY  
AFFORDABLE**



**4 YEAR  
WARRANTY**

If you're looking for extreme performance from pneumatic die lifters, look no further. AirGlide™ heavy die lifters use no bladders or air bags and provide lift comparable to hydraulic die lifters. Call today and find out how these extremely capable die lifters can make your shop run smoother than ever.

**866-EZSETUP**

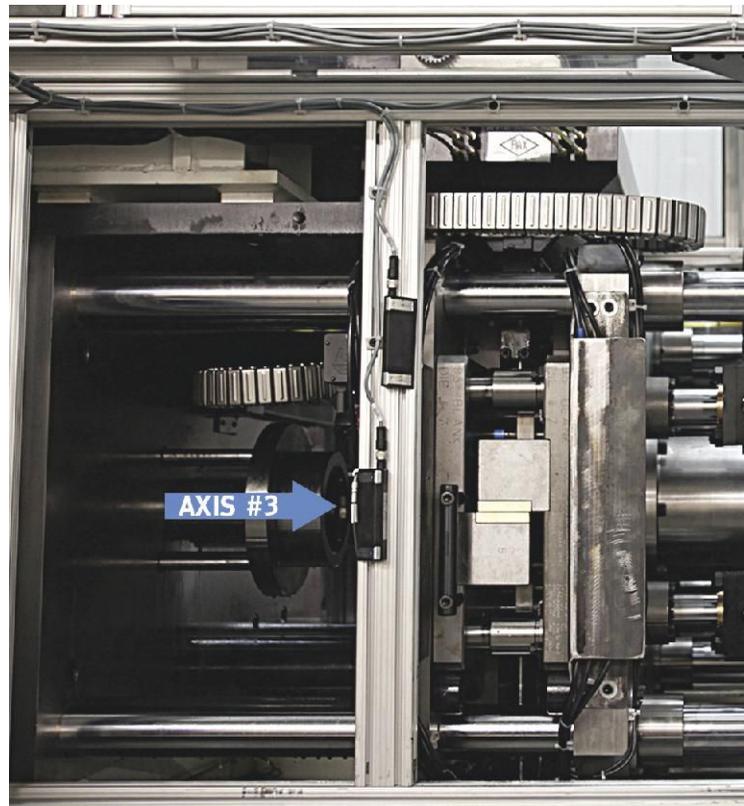
**Pacesetter Systems, Inc.**

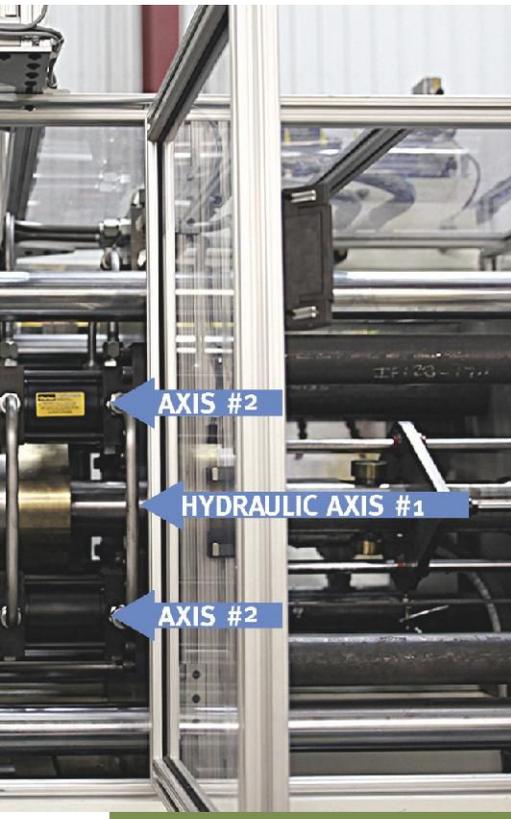
25315 Ave. Stanford  
Valencia, CA 91355

[www.pacesettersystems.com](http://www.pacesettersystems.com)



## Stamping/Presses





**Figure 3: Axes 1 to 3 are shown in this machine close-up.**

real-time force being applied and also the position of the actuator. The RMC151 measures force by calculating the difference between readings from pressure sensors mounted on each end of each cylinder.

The controller precisely tracks axis position by connecting to a linear magnetostrictive displacement transducer (LMDT) mounted in each cylinder's piston rod through a synchronous serial interface (SSI). [Magnetostriction is a property of ferromagnetic materials that causes them to change their shape or dimension while being magnetized.]

Because blank-holding is done hydraulically, changing the holding force to produce a different can model is as simple as updating the program in the Delta motion controller.

Changeover time from manufacturing one shell can to another has been decreased by half, in large part due to changes in the machine architecture to exploit the Delta controller's programmability.

"The hydraulics is controlled more accurately now, with the benefit [providing] higher productivity and very repeatable results," Schmidt says. "The smoother

motion and synchronization between axes has allowed us to increase output by 25 percent, dropping cycle time by 3 seconds per can." **FFJ**

**Delta Computer Systems Inc.**, Battle Ground, Washington, 360/254-8688, [www.deltamotion.com](http://www.deltamotion.com).

**Neff Press Inc.**, St. Louis, 314/854-1200, [www.neffpress.com](http://www.neffpress.com).