



### Application Story: MJC Engineering

## Siemens 840Di puts new "Spin" on control scheme at MJC

MJC Engineering and Technology, Inc. of Huntington Beach, CA is a builder of CNC spin-forming machines, typically used for spinning circle blanks up to 15' in diameter, tube spinning, steel & aluminum pressure vessel production up to 22" in diameter, as well as in the manufacture of automotive/truck/motorcycle wheels. The company also builds retrofitted spinforming machines and production-based specialty equipment.

Founded in 1993 by Carl Lorentzen, MJC was formerly the captive machine building/machine shop operation of its parent company, Hydrospin Inc. Hydrospin is now Luxfer Ltd., the world's leading manufacturer of spun aluminum pressure vessels for SCBA and CNG cylinders.

Today, the "spinoff" company, MJC occupies a 12,000 sq. ft. facility in Huntington Beach, CA and employs a staff of 16 full-time design engineers, machinists, fabricators, sales and marketing personnel.

According to Dave Grupenhagen, MJC's Vice President of Sales & Marketing, "Our business was very solid and steady, but we wanted to investigate a new control system, which would enhance our efficiencies and give us a competitive edge in the markets we serve."

"Our top priorities in seeking out a new CNC were a Windows-based system with Profibus-to-Analog control outputs to monitor the closed-loop, servo-hydraulics on our machines. Furthermore, we needed up to four-axis motion control, along with the ability to program and execute various second and third forming and machining operations, while the part was still in the machine. MJC uses our own proprietary SpinCAD™ programming software, a Windows-based operator interface program which allows the machine programmer to simply generate spin passes on a computer through point-and-click technology."

"With our SpinCAD™ software, all machine functions and editing steps are created and saved. When the program is complete, SpinCAD™ automatically generates a G-code program which the new CNC system would use to form the part."

With this priority list in hand, the MJC team went to the last IMTS and reviewed all the controls on display.

Dave Grupenhagen continues, "We found the Siemens 840Di at IMTS and, to our surprise, it satisfied every criterion we had on our list. After the show, we had our follow-up discussions, reviewed all the particulars and made our decision."

"Previously, we'd used an industrial-grade computer with either Tech-80 or Galil servo axis cards, Opto 22 I/O modules and individual servo valve drivers, housed in a large enclosure. While that system served us well, it was getting outdated in its construction, plus the installation and wiring took too long to accomplish, according to our studies.

"Now, with the Siemens 840Di, because it's so compact, we can install the computer in a machine-mounted swiveling pendant arm. We need only one other small panel on the machine face for mounting the ADI-4 and I/O module with power supply. The Profibus communication hardware has drastically reduced the amount of wiring needed, since all communications are done through one cable which runs throughout the machine. All these features, plus the Windows NT environment, made our decision a clear choice."

Grupenhagen also cited the training, application assistance and product support services received from the control manufacturer.

**Above left:** Operator checks dimension of spun metal part

**Above right:** Siemens SINUMERIK 840Di package includes all CNC, drive and PLC components in open architecture, modular system for customer adaptation

"In less than six months from our initial meetings, we'd redesigned our machines, purchased and installed a new CNC system. Doing this required substantial investments on our part and the supplier's. We were also entrusting our company's future reputation and longevity in the market to this supplier. Additionally, because MJC was one of the first companies in the world to utilize the Siemens 840Di as an OEM component, we were taking a risk, but it was a calculated risk. And, it's paid off," remarked Grupenhagen, noting the company had already sold numerous machines with new control systems onboard, before the prototype machine was up and running at an MJC customer.

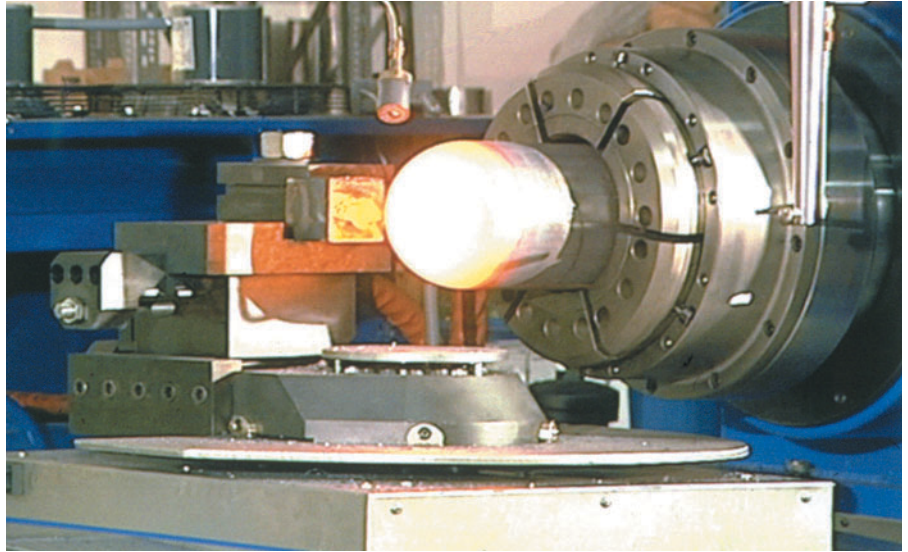
With the new CNC, the set-up of a typical job on an MJC spinning machine is as follows:

1. The programmer writes the program on a desktop PC.
2. The finished program is downloaded to the Siemens 840Di via an Ethernet connection or 3.5" floppy disk.
3. The machine set-up person mounts the new tooling/mandrel on the machine.
4. The spin program is accessed from SpinCAD™ (proprietary MJC software) and the G-code file is generated.
5. The machine operator sets the home position on the machine, a quick and simple task, owing to the CNC's operating capabilities.
6. The operator loads the part to be spun and hits the "Start" button.

Commenting on the benefits of the new control system for MJC machine operators, Dave Grupenhagen observes, "In normal production, the operator finds the keyboard and pushbuttons easy to use. The screen is both easy to read and fully configurable to present the operator all the necessary information needed, when spinning metal."

"Because MJC programs the Siemens system prior to shipping for the specific machine application, minimal programming security levels are needed. This means faster customer programming, protected machine configuration files and eliminated chance of a customer accidentally changing machine settings."

"The Siemens 840Di and HMI software are configured to provide the production personnel with cycle time, total parts per hour and total parts run at a single glance, while the machine is in operation. In addition,



High-pressure cylinders are made with spun tubes on MJC machinery

QC personnel will appreciate the part consistency and repeatability of cycles, while holding closer tolerances, which the MJC machines now achieve due, in no small part, to the Siemens controls. And, of course, management personnel at our customers realize the value of their time and money investments to keep their factories running smoothly and efficiently. That's where the back-up of a good control supplier is critical to our success as a machine builder."

Grupenhagen commented specifically on the assistance received from the Siemens Application Engineer, Yogesh "Yogi" Bhargava. "Yogi made two week-long trips to MJC to ensure the integration and start-up of the controls on our first machines. No other manufacturer would have done that for us. We cite this as proof of the commitment and support received from this particular supplier. That means a lot to MJC."

In the various markets sold by MJC, which include consumer cookware, lighting, automotive, cylinders, aerospace and defense ordnance, materials typically spun include aluminum up to 2" thick, carbon steels to 1", titanium to 1-1/2", as well as copper, lead and numerous aerospace alloy metals. Parts range from pots & pans, lamp shades, lamp posts, conveyor rollers, HVAC ducting and musical instruments to wheels, shock absorbers, brake drums, SCBA/CNG cylinders, pressure vessel/tank ends, jet engine parts, missile nose cones and satellite housings.

MJC's customers comprise metal spinning job shops, in-house departments of parts manufacturers and others.

Machinery in the MJC line include two-, three- and four-axis spinning machines, such as the SP Series for circle blanks, STT Series for tube spinning, OSC Series for cylinder necking-in and bottom spinning and WS Series for wheel spinning.

MJC also offers a complete rebuild and/or CNC retrofit for older Autospin, Leifeld and Cincinnati Hydrosin machines with hydraulic tracer, Electrologic CNC, Future Controls and Hess-MAE playback control systems. Each machine can be reconditioned to "like-new" with a full one-year warranty from MJC.

In addition to its proprietary metal spinning machinery, MJC routinely designs and builds custom production equipment for the wood and plastics industries, as well as other

metalworking operations. Examples include automatic cylinder OD sanders, tube end cutting and boring machines, table and vertical panel saws, hydraulic drawing and ironing presses, plus workholding fixtures for CNC machining centers.

MJC Engineering and Technology, Inc. operates a complete machine design and fabrication facility, including a fully-enclosed electrostatic painting system, as well as designated bays for electrical, hydraulic, final assembly and testing.

Dave Grupenhagen says there's no "spin" needed, when he simply observes, "Choosing this new CNC for our machinery was the smartest decision MJC has made, since we started the company." ■

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