

From robots, to power sources, to torches, and all of the other types of products that make up the welding world today, this year's show contained many examples of the clever and the creative. Everywhere the emphasis was on reduced costs, higher speeds and quality, and cleaner operations. In fact, although this is a mature industry, it's also a high-tech industry. Following are some examples.

#### Mature and High-Tech

"What we're showing is this new universal cutting machine, plasma oxy-fuels. It is state of the art and uses CNC controls with Windows-based technology and either PC or central processor systems," explained John Capozzi, president, Koike Aronson, Arcade, NY. Capozzi added that his company's new machine, the KPS 200, could run at 800 in./min.

"We've incorporated touch-screen technology into the machine and we've designed it so that any future upgrades the customer wants can be integrated into the unit at minimum cost. In other words, it's a modular machine," Capozzi explained.

The Koike Aronson machine unveiled at the show also comes with a new off-site diagnostic system. "We can look inside the machine, remotely, over the telephone." Additional new features include "c-cut software that takes CAD data and automatically converts it to machine code, as well as automatic nesting of parts, which minimizes scrap.

Like the rest of the machinery on display at the show, the Koike Aronson exhibit emphasized automation and efficiency. In effect, the welding equipment suppliers, like the rest of the metalworking industry, are continuing to produce technology that cannot be ignored by the welding industry. "Yet, business right now is flat," noted Capozzi, "although the level of interest and quotation level



# Welding Industry Thrives on Innovation and Automation

Although many users consider welding to be a "mature" year's AWS Welding Show, held in St. Louis, MO, April

at this show is surprisingly high."

"We expect modest growth this year, even though exports are down considerably—especially to the Asian markets," Capozzi predicted. He expects "at least three to four more years of good economic performance in the United States." The main reason is: "high consumer confidence."

#### Optimism Reigns

Other exhibitors at the show reported similar business conditions, as well as other technical innovations in their equipment. Sources at Hobart added to the general reports of good business outlooks. "Business has been good for the last four years," noted Bruce Morrett, marketing manager, tubular wires and key

accounts, Hobart Brothers, Troy, OH.

"International is off and we see some softening, but we are watching the economy optimistically. We may be heading for a peak," Morrett told *MetalForming*. One of the technical innovations at the show that Morrett pointed to was a new product line of tubular wire. In general, however, "we try to improve the products we have," he added.

Not to be outdone, Hypertherm, Hanover, NH, featured its new consumables, as well as a 40-amp plasma cutter that can run at 1600 mm/min. (20 in./min.). The machine uses coaxial flow consumables and is part of Hypertherm's Hy Life series. It recently was released in Europe, and will become available in the United States during the fourth quarter of this year, Morrett reported. "It will be very competitive in the 40-amp class," he answered when asked about pricing.

#### New Distribution Paradigm

The outlook? "There's been a major paradigm shift in the domestic distribution business," explains Philip D. Winslow, Hypertherm vice president, sales and marketing. "Customers are expecting stronger,

industry, that doesn't mean there is nothing new. In fact, judging from this 12-15, there is as much innovation in welding as there is in computers.

value-added service. They are demanding a reduction in nonvalue-added activity. In other words, they want significant reductions in the paper work that surrounds traditional sales."

"Ten years from now, the welding supply industry will have taken a major position in terms of the customers' inventory management.

*The Kuka RoboCell shown in St. Louis was a compact cell that combines advantages of both robot and laser technology with the use of tried and tested standard components. The system is completely encased and mounted (apart from the laser beam source) on a stable baseframe.*

There will be no purchase orders. It will be all electronic commerce. We will have bypassed, and largely eliminated the paper work," Winslow predicts. "We, the manufacturers, must assume more and more responsibility for the customers' inventory turns. In a lot of cases, we will drop ship to our distributor's customer."

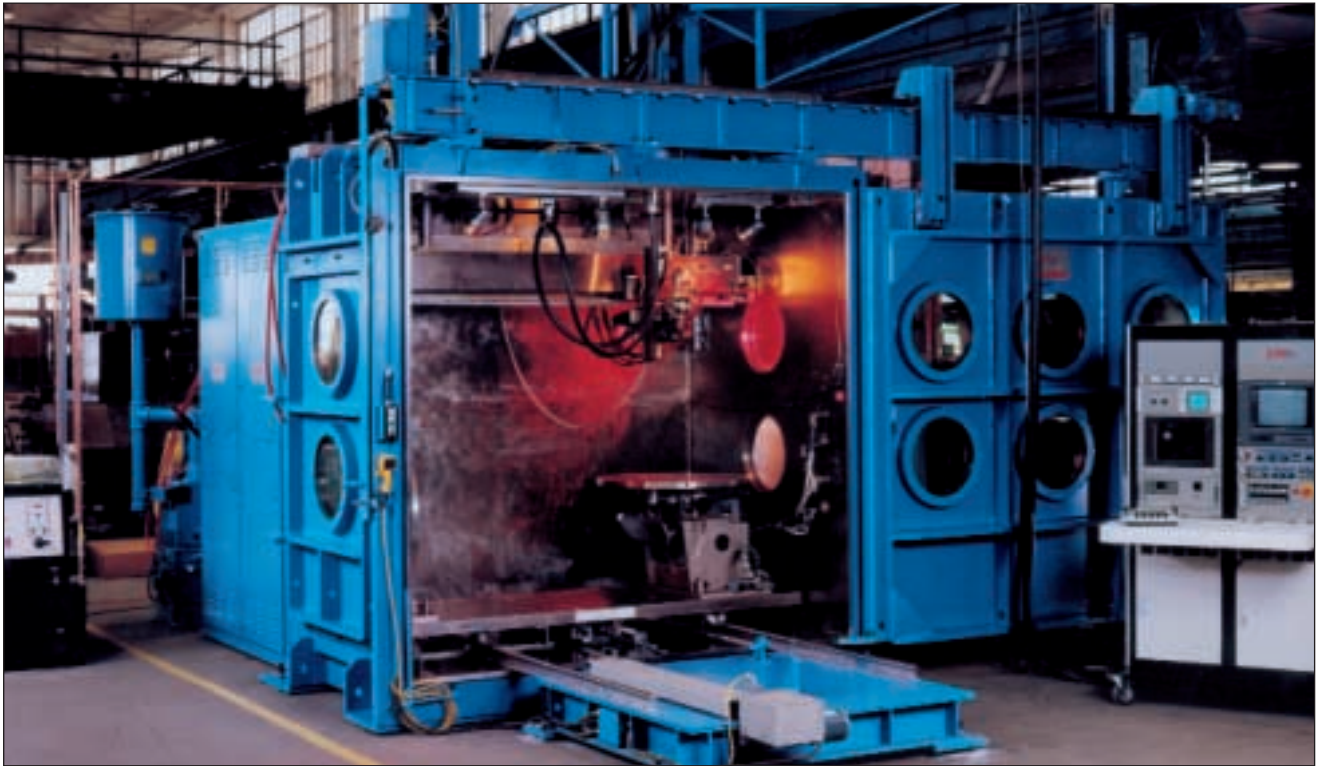
Winslow also noted that as welding products become more "technically challenging, our function in terms of technical expertise and training actually enhances the distribution value."

Similar predictions could be heard throughout the show. ESAB, Hanover, PA, for example, pointed out that now it is offering a "full suite

of electronic commerce solutions to its distributors." According to the ESAB Welding and Cutting Products senior vice president, information technology and supply, Dick Powell: "E-commerce will benefit our distributors' customers in three ways. These are more efficient delivery, delivery on demand and 24-hour access, seven days a week.

ESAB bills itself as the world's largest manufacturer and supplier of welding and cutting equipment, filler materials and technology. Its huge booth gave testimonial to that claim as the company displayed its wide array of new and improved equipment."

Hobart Brothers touted its new website, which is about as high-tech



*A defense contractor is using a model VX Electron Beam welding machine from Sciaky, Inc., Chicago, IL, to weld casing assemblies fabricated from a special class of high-strength maraging steel. In addition, Sciaky designed and built the custom tooling, which includes expanding and retracting mandrels that secure the parts.*

as websites get. As they put it, welding equipment buyers now can handle all of their welding needs “without leaving their work stations,” just by clicking onto the Internet. Now part of Illinois Tool Works and called ITW/Hobart Brothers Co., Troy, MI, the company featured its line of filler materials, wire and electrodes at the show.

Lincoln Electric Co., Cleveland, OH, showed off its own array of the new and the improved, including a new Multi-Weld System that was designed for welding large structures, such as ships and oil platforms. It offers portable power sources and continuous control of the arc using only one cable.

Lincoln Electric also featured some machinery that uses the company’s Diamond Core Technology. This technology was integrated into Lincoln’s new Power MIG255, “the professional’s choice for welding,” as they put it. “There is a patent

pending on this technology,” Jim Harris, manager of light industrial and commercial products, Lincoln Electric, told *MetalForming* magazine. The technology, however, involves the shape—geometry—of the laminations. “There’s a diamond shape in the air gap area that makes the filtering smoother,” he explained. The MIG255 does not actually use diamonds.

Hobart also had diamonds on its mind at the show, promoting its Diamond Arc, a new line of stainless steel electrodes for welding austenitic stainless steels to unalloyed or low-alloy steels. The fully alloyed core wire with rutile coating can be used for welding buffer layers on unalloyed steels prior to joining austenitic grade steels, Hobart reported.

### Cold Welding?

An Israeli company, Pulsar Ltd., Yavne, brought its recently (1998) announced and patented “new

welding process” to the show, which uses magnetic pulses to create a “cold” weld. The process can weld materials that previously were considered impractical or impossible to weld. Under development for more than five years, the technology actually is based upon the decades-old magnetic pulse theory.

Cold welding currently works only for highly conductive tubular parts, such as those made from aluminum and copper. However, lower conductivity materials, such as steel and titanium, as well as plate welding, are being researched, Pulsar announced in St. Louis. Prototypes for these applications may be ready by the end of 1999.

The process uses a highly focused magnetic field to “force” one tube over another. It is said to take a mere fraction of a second. Cost savings are forecast at 10 percent to 50 percent of currently used methods. No filler materials, gases or consum-

ables are used. Company CEO Oren Gafri notes that "the process is almost counter-intuitive." The Edison Welding Institute (EWI), Columbus, OH, will receive a system for further research and demonstration.

Innovation and new thinking were pervasive at the show, and hundreds of companies in the business offered the new and the improved from their engineering staffs.

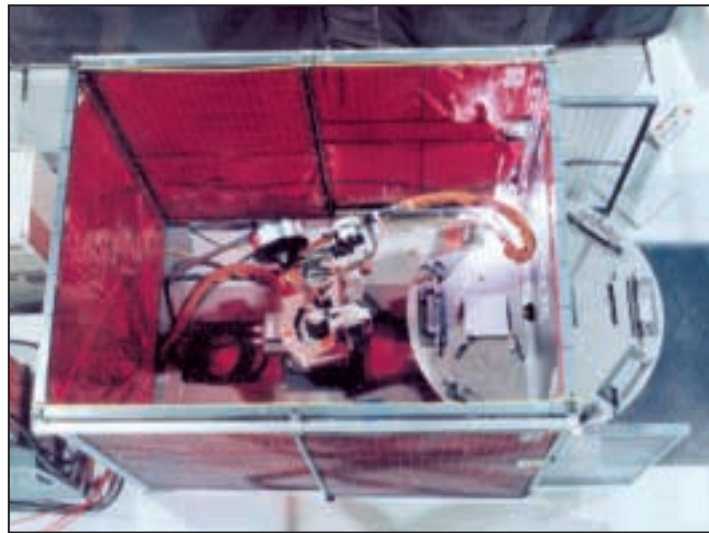
The mature industry of welding was reinventing itself as a high-tech business. In fact, anticipatory engineering is now part and parcel of the welding industry, as well as metalworking in general. Hypertherm, for example, has quadrupled its engineering staff in four years.

"The fact is, the time-to-market issue requires that," Winslow explained. "We constantly must anticipate the customers' needs." This year's Welding Show reflected a great deal of exactly that kind of anticipation. Panasonic Factory Automation, Franklin Park, IL, and its new partner, Nuvonyx, Bridgeton, MO, were good examples.

Nuvonyx displayed its new microchip diode laser technology in a joint exhibit sponsored by Panasonic. Called the ISL 2500L, the welding system uses a Panasonic robot, the VR-0016, as well as the Nuvonyx diode laser.

This 2500-watt system is "ideally suited for welding, heat treating, metal cladding, epoxy curing, paint stripping, soldering and plastic welding," Nuvonyx says. The system uses micro-optics with the laser diode to create an extremely fine laser beam, about 810 nanometers in diameter.

According to Nuvonyx president and CEO, Mark S. Zediker, Ph.D.,



*The compact ArcWorld® II-116HD is a pre-engineered, off-the-shelf arc welding system that can deliver medium to high-volume production of small parts. All system components are mounted on two common bases and shipped for easy installation, typically in just a few hours.*

this machinery will be available in the United States sometime in the fourth quarter of 1999 or first quarter of 2000. Zediker told *MetalForming* that his company is "encouraging people to suggest applications for this technology besides the ones they've already noted."

Panasonic showed off its entire welding robot line as well as its AA-PanaStar 350/500 series of advanced technology power sources. The AA-PanaStar uses enhanced fuzzy logic artificial intelligence, which can reduce spatter significantly due to fast response arc control. This is a second generation artificial intelligence power supply from Panasonic.

## Better Mousetraps

"The robotic welding industry has been a growth segment within the overall metalworking market," noted Motoman (division of Yaskawa), vice president, sales, Dean J. Elkins. "In 1998, compared to 1997, the robotic welding industry grew by almost 25 percent. Why? The answer is innovation. We're always innovating." Motoman, West Carrollton, OH, also exhibited a new power source series at the show. Called

Motoweld, the machines are designed to handle higher speeds and thinner materials, as well using advanced intelligence. "These little innovations will keep us ahead," Elkins added.

On the economy, Elkins, like most people at the show, was "bullish on the economy. Five years from now, we will be looking back on fantastic growth, especially in the auto industry."

Reflecting the opinions of many at the show, Elkins pointed to the relentless globalization of the industrial world as another source of optimism.

"Companies in the robotic industry are thinking and acting in a global manner like never before. What's driving much of this is economics and also the better mousetraps."

Another better mousetrap came from Kuka Flexible Production Systems, Corp., Sterling Heights, MI. The Kuka RoboCell, shown in St. Louis, is a compact cell that combines the advantages of both robot and laser technology with the use of tried and tested standard components. The system is completely encased and mounted (apart from the laser beam source) on a stable base-frame.

New technology also came from CONCOA, Virginia Beach, VA, with its series of gas distribution systems for lasers, typically CO<sub>2</sub>. A central control remote alarm module, said to be the heart of the system on the pressure switch and transducer models, can monitor up to four separate gas systems simultaneously.

Welding may be mature, but it certainly isn't complacent. Judging from the latest exhibits of the industry's innovations, it's going to remain an exciting and dynamic business well into the future. **MF**