Successful bending with less lubrication

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TPJ-The Tube & Pipe Journal® is proud to present TPJ TV. This video series, an extension of the magazine, takes you into tube and pipe production facilities and fabrication shops for a closer look at many of the processes discussed in the magazine.

www.thefabricator.com/tpjtv
Editor’s Angle

Melding, mixing, mingling technologies

Desktop computers first appeared in 1977, and even though they became smaller and faster over the years, the biggest strides that have made them more useful have been in computer-related areas, such as the World Wide Web and wireless technology. Editor Eric Lundin runs through four decades of developments and how they have come together to revolutionize the way business is done in the modern world.

Calendar of Events

Product Highlights

Industry News

In the Know

2014 Tube Mill Entry/Exit Equipment Buyers’ Guide®

Product News

Classified Ads

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Industry Snapshot

Applications

Inverter helps manufacturer achieve improved arc starts, arc control

The welders at JATCO Environmental Inc., a manufacturer of steam-to-liquids condensers, had a problem with striking and maintaining a good arc. Since the company switched from a rectifier-based unit to an inverter-based unit, the arc starts are crisp and the arc always runs smoothly.

Expo Review

TUBE® expo exhibitors demonstrate latest equipment for monitoring dimensions

Manufacturing standards are continuously on the rise as OEMs demand tighter tolerances and ever-greater dimensional consistency. Editor Eric Lundin reviews some of the relevant monitoring and measuring technologies displayed at the recent TUBE® expo.

Shop Stories

Fabricator/entrepreneur makes the most of everything Texas has to offer

Native Texan and former Aggie Devin Gerland earned a degree in agricultural engineering and took a succession of engineering positions in and around Bryan, Texas. Now an entrepreneur with his own fabrication shop, Gerland is putting his farming and ranching experience to work, developing his own line of farm implements.

Tube & Pipe Fabrication

High-performance, high-speed happiness

After realizing he was spending too much time traveling, risk management consultant Hank Padilla decided to take a dramatic career detour. After some vocational courses he opened a fabrication shop and now builds roll cages and exhaust systems for high-performance automobiles put to use in high-risk situations.

Cover Story

Bending tube greener and cleaner

For many, ideas such as green and sustainability are synonymous with recycling, but recycling is just one small part of doing things in a greener way. Minimizing the consumption that later needs to be recycled (waste) is an important aspect too. Among tube and pipe fabricators, one area that can yield big benefits is lubricant consumption.
MELDING, MIXING, MINGLING TECHNOLOGIES

If the number 286 means anything to you, or if you recognize model number TRS-80, you’ve probably been using desktop computers since they were first available. Intel Corp.’s venerable 80286 microprocessor, usually abbreviated 286, was introduced in 1982. TRS-80 was the model number of RadioShack’s first desktop computer, introduced in 1977.

Desktop computers in those days didn’t have a lot of memory. The early TRS-80s had 4 KB. Apple’s flagship product, Apple II, had the same amount. Clock speeds were slow, from 1 to 2 MHz. The software that was available at that time was rudimentary at best, handling little more than word processing and accounting, and it’s fair to say that most home computers in those days were sold to technophiles and assorted gadget hounds who wanted to write their own programs.

Desktop computers would revolutionize office work, and by 1995 or so Bill Gates would prove that you could make a vast fortune peddling a small product, Apple II, had the same amount. TRS-80s had 4 KB. Apple’s flagship processor, usually abbreviated 286, was introduced in 1982. TRS-80 was the model number of RadioShack’s first desktop computer, introduced in 1977.

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The popularity of home computers grew almost as quickly as that of office computers, and while they aren’t quite a necessity, you’d be hard-pressed to find a 20-something who can remember growing up without one. Falling prices and better software fueled their spread, but it was an idea straight out of a science fiction novel that really expanded computers’ capability. Now 25 years old, the World Wide Web enabled useful worldwide connectivity for the masses. While the intention was probably more for academic use and higher-minded purposes, it ushered in a new age of worldwide information sharing.

Along the way computers became a lot more capable, compact, and affordable. Since home computers were introduced, clock speeds have increased by a factor of 1,000, and the amount of onboard memory has increased by a dizzying 2 million times. Meanwhile, prices seem to continue falling. Today a basic laptop is less expensive than a pair of designer shoes. Other changes were afoot as well. The introduction of wireless technology was a big one, providing easy connectivity and mobility.

Similar trends were occurring in manufacturing, ushering in big changes in the design and manufacture of nearly every product. What most home computer users didn’t realize was that many machine operators were a step ahead of them. CNC interfaces had convenient, intuitive touchscreens. Every home computer user was stuck using a mouse and a keyboard.

All that changed when touchscreens were added to cell phones and tablet computers, which seems like a final step in bringing all these technologies together. These days computers are used to design ever-more-complex products and control the machines that make the components that go into them. On the business side, these items are advertised on the Internet, and consumers use it to research goods and services and make purchases from essentially anywhere using an easy-to-use interface on a lightweight, easily portable device.

It’s hard to believe that we’re just four decades removed from TRS-80s and Intel’s 80286 chip. Who knows what the next four decades will bring.

Eric Lundin
FMA Certified Education Centers

FMA Certified Education Centers (CEC) are community and technical colleges, trade schools, and universities that specialize in training adults for careers in the metal forming, fabricating, processing, and machining sectors. They offer coursework for local students year-round and serve as host locations for many types of FMA professional development programs as requested. A council of representative members convene six times a year to plan and execute special programs on worker training for educators and human resource managers from companies of all sizes.

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Sept. 2-4—Monterrey, Mexico
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To have an upcoming event considered for inclusion in TPJ’s calendar of events, send information four months in advance to:
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833 Featherstone Road
Rockford, IL 61107-6302
Fax: 815-484-7765
E-mail: dand@thefabricator.com
Pipe marking unit includes digital inclinometer gauge

Sumner Mfg. offers the Sumner Center Punch for measuring angles and marking pipe. It includes a digital inclinometer gauge which displays angles to the nearest hundredth. The gauge is set on an angled magnetic base, from which it can be removed, that contains a push-button, spring-loaded striking hammer for marking pipe at the desired locale.

The user sets the base on the pipe, turns on the inclinometer gauge, and adjusts as needed until the desired angle is reached. The user then pulls up the spring-loaded hammer and presses the push-button on the angled base to mark the pipe.

Sumner Mfg. Co. Inc., 7514 Alabonson Road, Houston, TX 77088, 281-999-6900, www.sumner.com

Machines perform single-, double-sided endworking of tubes, pipes

Arla Maschinentechnik GmbH offers CNC endworking machines in single- and double-sided models. Based on a solid frame, the machines contain one or two machining units and concentric workholding technology. All components are aligned to realize high accuracy over the length, the company states.

For double-sided machining, the unit works like a double-head machine and runs like two separate CNC lathes operating independently. The principal difference is that this endworking concept comprises a fixed workpiece and revolving tools.

All machining units are directly driven by servomotors. They are built with integrated water-cooled motor spindles, optionally available with automatic tool changing systems on both sides and integrated facing head technology.

Arla Maschinentechnik GmbH, Hansestr. 2, D-51688 Wipperfuerth, Germany, 49-2267-6585-0, www.arla.de

Tube cutting/finishing system produces 5,000 pieces/hr.

Rattunde Corp. has introduced the ACS® + CFM twin tube cutting and finishing system. Equipped with a twin machining head that fits onto the standard head, the machine cuts two tube or bar sections simultaneously, then machines both ends of both workpieces at the same time. The machine can produce up to 5,000 finished pieces/hr. The option also exists for single tube or bar production on the same machine.

In twin mode, the system can process two workpieces of 0.39 to 1.63 in. OD each into finished lengths from 0.39 to 59.05 in. When the twin head is removed, the standard machining head can process a single workpiece up to 4.13 in. OD.

The machine offers secondary brush deburring, end machining (chamfering and facing), inspection, washing, drying, and robotic packaging. The entire machine and all auxiliary workstations are motion-controlled by CNC from a single operator station.


Pressure vessel-production software allows import of part program files from CAD/CAM

New ProShell software package from HGG facilitates the design and fabrication of pressure vessels, spools, and nozzles on the company’s pressure vessel machinery. With it, users can design product profiles and profiling information in MDI, view profiles with a 3-D viewer, and divide them into available raw materials for nesting. Users also can import part program files from CAD/CAM systems.

The software package provides an interface for the export and conversion of entire part program files modeled from various CAD packages into CNC data files without the need for additional processing, while supporting additional editing features.

The pressure vessel machines combine plasma and oxyfuel processes for 3-D steel profile cutting capability. They eliminate the need for laying out lines on shells, grinding a bevel, and additional welding after holes are cut.

All-electric tube bender delivers high levels of automation

The Elect XL150 all-electric tube bender from BLM Group USA bends tubes up to 6 in. dia. The unit can handle applications with few or no straights between bends and those requiring tight-radius bends.

The precise control and positioning of the bender’s electric axes help ensure that optimum working parameters can be reproduced exactly every time without reliance on operator expertise, the company states. When a part program is selected, all the critical settings for the machine and tooling (clamping, pressure die, mandrel position/retraction, centerline radius) are managed automatically by the CNC. Remote access permits offline management and troubleshooting.

The multistack tooling (up to eight stacks) allows several bend tools to be premounted to help minimize tool changeover. The direct gearbox drive is incorporated within the compact head assembly to give the bender greater clearance around the bend area. The machine also combines conventional and variable-radius bends in the same automatic bend cycle.

When the user inputs the component’s bend coordinates into the VGP3D 3-D graphical programming software, the software provides real-time simulation of the bending operation and automatically corrects for possible collision points.

BLM Group USA, 29380 Beck Road, Wixom, MI 48393, 248-560-0080, www.blmgroup.com
APPLICATIONS

INVERTER HELPS MANUFACTURER ACHIEVE IMPROVED ARC STARTS, ARC CONTROL

Situation

Natural gas is a simple compound, CH₄, but it’s extremely useful. It has so many household, commercial, and industrial uses that it would be difficult to get by without it.

Extracting it and preparing it for use requires several crucial steps, not least of which is reducing the moisture content. Moisture wreaks havoc on processing equipment, corroding it at moderate temperatures and freezing at low temperatures, so natural gas processors usually use a glycol dehydrator or similar equipment to reduce the moisture content to about 7 pounds per million standard cubic feet.

The drawback is that a dehydrator complicates matters by removing the volatile organic compounds (VOCs) that normally accompany the gas. These VOCs, mainly benzene, toluene, ethylbenzene, and xylene (BTEX), are hazardous and must be disposed of. This is where a purpose-built steam-to-liquid heat exchanger can come in handy. JATCO Inc., Oklahoma City, Okla., manufactures such a device.

JATCO’s equipment, like all of the equipment used in processing fossil fuels, must be robust. The equipment is subject to all manner of worksite stresses and the vagaries of weather, so it has to stand up to quite a bit of abuse. In the case of JATCO’s condenser, it’s a matter of keeping BTEX contained, preventing spills and soil contamination. The company needs good materials and, just as importantly, good welds.

“The condenser is made from ½-in.-OD tubing, 0.035 in. wall thickness, and 5-in.-OD pipe, Schedule 10, welded to the end sheet,” said Steve Correa, general manager. “The Schedule 10 pipe is also welded to a 150-class flange. In other words, it varies from very thin to very thick material, all of which is 304L stainless steel,” he said.

Building one condenser takes quite a bit of effort, about one shift to do all the prep work, fixturing, and welding. The bulk of that effort, of course, is welding.
JATCO had used two other welding machines to build condensers in the past, so the company was familiar with modern welding machine capabilities and had solid expectations when it was shopping around for a new one. Welder Tim Grigsby said that the main issue was plain and simple: The company’s most recently purchased welding machine, a rectifier-based unit, didn’t have very good arc characteristics. He could get the job done, but it was a struggle from the time he struck the arc.

Resolution
After weeks of trials, the company purchased an inverter-based unit, a Heliarc 281i from ESAB. The machine provides AC, pulsed AC, DC, pulsed DC, manual pulsing, and spot welding.

“With this unit, the strikes are smooth, crisp, and consistent,” Grigsby said. “After establishing the arc, it’s smooth sailing. It just runs better,” he said.

Another benefit is that it uses electrical current more efficiently. Grigsby found that he can turn the heat down and obtain just as much penetration as he did with the old machine. Less heat in the weld means less heat in the welder’s workspace, making it a more comfortable environment. It also shaves a bit off JATCO’s monthly electricity bill.

“Another big advantage is the quick-connects for the torch,” Correa said. “This makes changing the torch a breeze.” He also noted that the small footprint makes the unit easy to move around the shop from one workstation to another. “It really helps a growing company like ours,” he said.

Although JATCO has used the unit only on stainless steel so far, its AC settings make it compatible with aluminum. Waveform options such as pulsed AC and pulsed DC, and a control that balances the AC waveform, optimize the arc’s characteristics to suit the specific application.

TPA HONORS
GEORGE MITCHELL’S
50 YEARS OF SERVICE
TO TUBE, PIPE INDUSTRY

On April 7 in Düsseldorf, Germany, the Tube & Pipe Association International® (TPA) presented to George Mitchell, founder of the George A. Mitchell Co., a plaque to commemorate his 50 years of service in the tube and pipe industry.

Mitchell recounted years of hard work just to get started in his career. His formal education culminated with a high school diploma. His informal education, which Mitchell calls “self-education,” started during his high school years when he took adult education courses in engineering and manufacturing in addition to working as a draftsman for Turner Machine Co., Salem, Ohio. His work at Turner, a company that manufactured a variety of bar straighteners, processing equipment for steel coil sheet, plus continuous coal mining machinery, provided a foundation for his career in the tube and pipe industry.

After graduating from high school, Mitchell’s part-time job at Turner became a full-time job and he continued taking engineering classes at night.

From 1950 to 1963, Mitchell worked in design engineering and engineering management, and later traveled the world in a sales role for Lombard Corp., Youngstown, Ohio, a manufacturer of extrusion presses and tube and bar draw benches. He continued on with night classes, and although he didn’t complete a formal course of study, eventually he felt his self-education was complete. He took and passed the state of Ohio’s professional engineer exam in 1956.

“This was very unusual for a person without an engineering degree, especially to earn one of the highest scores in the state,” Mitchell said, who graduated in the top 10 percent.

In 1963 Mitchell struck out on his own, founding the George A. Mitchell Co. as a one-man engineering firm that provided consulting services and built small machines for tube and pipe applications. His focus, from the first day, was equipment associated with cold drawing and forming metal tubes.

“In cold drawing you need to reduce the tube’s diameter at one end so you can insert it into the draw bench die,” Mitchell said. “At that time this was usually done with a rotary hammer swager.” It was effective, but it was noisy and expensive to operate, Mitchell said. Another process involved heating and squeezing, a slow process. He
came up with the push pointer concept, a hydraulic machine that formed tube cold by pushing a series of dies over the tube end to reduce its diameter. The result is a round, concentric end with a tensile strength greater than the subsequent drawing force. The tubes can be pierced, extruded, tube reduced, welded, or previously drawn, ferrous or nonferrous, for essentially any industry.

Over the last five decades the company has built more than 700 push pointers with capacities from 5,000 to 1,500,000 lbs., handling diameters from 0.25 to 22 in. and wall thicknesses from 0.010 to 1.500 in. The company’s pointers are in operation in 32 countries. The company also has manufactured more than 100 cold-forming machines using the same process for producing near net shapes on metal tubes for automotive and sporting goods applications. The company also has supplied equipment to the oil and gas industry, furnishing 500-ton and 750-ton end formers to resize the ends of casing and pipe in preparation for cutting premium threads.

Summing up the company’s progress since 1963, Mitchell credits the staff for its contributions and accomplishments.

“It’s been a gratifying experience to be closely associated with the others in this organization,” he said. “This is a small company, just 18 employees. Many of our competitors have anywhere from 200 to 2,000 employees. Still, I don’t think this company takes a back seat to any competitor.”

“George and his company are quintessential examples of an American success story—experience, innovation, leadership, and hard work,” said Mark Hoper, TPA’s vice president of expositions and media. “Put it all together and you have an extremely successful company that has been competing with the big boys for 50 years and is positioned nicely to continue competing for another 50 years.”

—Eric Lundin, Editor
INDUSTRY NEWS

CORE CREW LAUNCHES WEBSITE

Cincinnati-based employment agency Core Crew, formerly known as Elite Craft Support, has launched a new website at www.corecrew.com. The company works to recruit and place skilled tradespeople, including welders, pipe fitters, ironworkers, millwrights, plumbers, carpenters, and electricians.

The website includes a comprehensive online application that allows skilled workers to apply for jobs in just a few minutes. The website also features an interactive database of open jobs that applicants can review.

The agency also has partnered with Elite Welding Academy, Cincinnati, to provide training to those interested in joining the skilled trades.

TUBE 2014 PRESENTS 1,200 INTERNATIONAL EXHIBITORS

At Tube 2014, International Tube and Pipe Trade Fair, in Düsseldorf, Germany, in April, more than 1,200 exhibitors from 47 nations showcased their innovations in about 538,190 sq. ft. of total exhibition space.

Exhibitors included 50 companies from the U.S., with 12 companies participating in the North American Pavilion, organized by Messe Düsseldorf North America, Chicago, with the Fabricators & Manufacturers Association Intl., Rockford, Ill., and SME, Dearborn, Mich., as co-sponsors. Attendees came from 62 countries, with most arriving from Austria, the Czech Republic, France, Great Britain, India, Italy, Netherlands, Poland, Spain, Sweden, Turkey, and the U.S.

The next staging of Tube, again held concurrently with wire, will be April 4 to 8, 2016, in Düsseldorf, Germany.

NATIONAL GRID PROVIDES ECONOMIC DEVELOPMENT GRANT TO WELDED TUBE USA

In an effort to assist Welded Tube of Canada Corp., a Concord, Ont.-based tubular products manufacturer, in moving forward with construction of a new steel pipe manufacturing plant in Lackawanna, N.Y., National Grid has provided the company with its first installment of an economic development grant that could reach $500,000.

Welded Tube USA Inc., which has completed a 110,000-sq.-ft. manufacturing plant as phase one of its construction plans, has received $250,000 from the grant award. Completion of additional phases will make the company eligible for the balance of the grant. The company estimates it will have about 121 employees when the project is completed.

National Grid, Buffalo, N.Y., is an electricity and gas company that connects consumers to energy sources through its networks. The grant comes from its capital investment incentive program, which provides funding to support qualifying business expansion projects located in its upstate New York service territory.

NELSON GLOBAL PRODUCTS OPENS PLANT IN MEXICO

Nelson Global Products, Stoughton, Wis., has announced its expansion into Mexico with a new manufacturing and distribution facility in Monterrey. The company manufactures precision-formed tubing and sheet metal structural fabrications, along with exhaust tubing, mufflers, and emissions system components.

The 180,000-sq.-ft. facility is equipped with tube- and flatbed lasers, manual and robotic welding cells, and CNC tube benders to serve the commercial truck, off-highway, and recreational vehicle manufacturers that have production facilities in the region.

JMC STEEL GROUP ANNOUNCES PLANT MODERNIZATION PROJECT FOR WHEATLAND TUBE LOCATION

Continuous-weld pipe manufacturer Wheatland Tube, a JMC Steel Group operating company, has launched a revitalization program for its Wheatland, Pa., plant.

The company is adding new equipment, realigning the manufacturing footprint, and automating many processes in the facility. The $35 million project will continue over the next two years.

JMC Steel Group includes the operating divisions of Atlas Tube, Pico ma, Energex Tube, Sharon Tube, and Wheatland Tube.
Our products are leading the way in tube end forming, tube cutoff and tube deburring. If one of our standard machines will not fit your process we can design and build a custom machine for your manufacturing needs. We offer a full line of services that encompass an experienced engineering department, quality lab with CMM, tube fabricating services, machine shop services and custom automation solutions including robotics.

www.proto1mfg.com
VALLOUREC RECEIVES ASME CERTIFICATE FOR FERRITIC STEEL GRADE

Vallourec, located in Düsseldorf, Germany, has received an ASME certificate for its new VM12-SHC ferritic steel grade. The product extends the company’s selection of ferritic seamless steel tubes for power plants.

Tubes made from this grade can be used for carrying extremely corrosive steam at temperatures up to 620 degrees C. It also offers very high creep strength and resistance to steam oxidation. Tubes in the new steel grade are available heat-treated and in wall thicknesses up to 0.47 in.

STI/SPFA HONORS MEMBER COMPANIES WITH AWARDS

Lake Zurich, Ill.-based STI/SPFA, an association for companies that fabricate steel tanks, pipe, and pressure vessels for use in the petroleum, food, water, and chemical processing industries, has announced the winners of its Steel Water Pipe and Pipeline Project Awards.

The winners are:
• Steel pipe fabrication: MidAmerica Pipe Fabricating & Supply, Scammon, Kan.
• Steel pipeline project: Ameron Intl., Rancho Cucamonga, Calif.
• Pipe supply/service project: National Welding Corp., Midvale, Utah

KENT SUPPLIES COIL END WELDING MACHINE TO ROLL FORMER IN INDIA

Kent Corp., North Royalton, Ohio, has supplied a second coil end welder to a large roll forming company in India. The coil end welder eliminates rethreading the roll form, tube, and stamping lines.

The machine offers a three-blade crop shear that gives a distortion-free cut, says the company. The sheared ends help improve fit-up for smooth end welds. New advances in the GTAW technology allow for welding mild steels, aluminum, copper, and coated materials.
The future — your future — is on full display at FABTECH. From 1,400+ exhibits with end-to-end solutions in metal forming, fabricating, welding and finishing, to the industry’s leading education and peer-to-peer networking, this is your opportunity to capitalize on the future.

The answers and know-how you need for the challenges of tomorrow can be found at FABTECH. Visit fabtechexpo.com for complete event details. REGISTER TODAY!
GREEN initiatives have been around for quite some time, probably longer than most people realize. Congress passed the Federal Water Pollution Control Act in 1948 and the first Clean Air Act in 1963. These efforts got a further boost when the Environmental Protection Agency was created in 1970. While household recycling of newspapers, aluminum cans, and glass bottles got underway decades ago, other ideas and concepts have taken root more recently in industries such as power generation and building construction. Likewise, green practices have been gaining momentum in manufacturing.

In recent years the notion of green has been accompanied by another concept, sustainability. The difference is that green implies that a process or practice has a lower environmental impact than a conventional process, whereas sustainable is where the recycled rubber meets the road, implying that the process can be sustained over the long haul, essentially indefinitely.

Many might think that sustainable means recycling, but it's much more than that. Other initiatives can be applied at many points along the way, especially at the start of the manufacturing process, where waste minimization can have a big impact. Engineering a process to minimize waste reduces the need for recycling, which is similar to using statistical process control (SPC) to reduce process variation, thereby reducing the need for quality control inspections at the end of the process. SPC builds quality into a product, which is more efficient than inspecting quality into a product. By the same token, minimizing waste builds sustainability into a process.

It’s also important to note that sustainability is compatible with lean manufacturing, which seeks to eliminate all waste in both materials and process steps. Planning for sustainability is the same type of thinking, but it goes a little further, considering where the raw materials come from and where the spent materials end up. It’s a cradle-to-grave concept and seeks to limit resource extraction and disposal.

While lean manufacturing is gaining more and more traction each year, the U.S. economy is still very inefficient. Only 6 percent of materials actually end up in products. Total waste in the U.S., excluding wastewater, exceeds 50 trillion pounds per year. The standard of living in western Europe is comparable to that of the U.S., yet resource consumption per capita across the Atlantic is about half that of the U.S.

GREEN DRIVERS

Unfortunately, many in responsible positions believe that sustainable initiatives provide little or no financial gain. In reality, sustainable processes often post a return on investment in 6 to 12 months, which enables a manufacturer to justify the time and investment. Two big companies that have embraced lean manufacturing wholeheartedly, and reaped many sustainable benefits along the way, are Ford Motor Co. and Toyota Motor Corp. Water consumption alone is worth a look.
Assembling a single passenger car requires about 2,500 gallons of water. Assuming that 15 million vehicles are produced in North America annually, automakers use 37.5 billion gal. of water. Since 2000 Ford has reduced the water consumption for its North American operations by 10.5 billion gal. This is the annual usage of 105,000 average American households. Note that the 2,500-gal. figure is just for the OEM. Pollution Equipment News® magazine estimates the actual total to be 39,000 gal. when all of the supplier operations are aggregated.

Toyota Motor’s Green Supplier Guidelines, outlined in its 2007 environmental report, states its expectations: Suppliers are to reduce energy use 10 percent, reduce water consumption, and reduce components made from oil.

Part of Ford’s success is based on minimum quantity lubrication (MQL). Rather than applying liberal amounts of lubricant, the company uses equipment that applies a precise film. This has reduced water usage by 280,000 gal. in plants that have adopted the new application technology.1

An additional benefit of MQL is that the right lubricant in the right concentration can improve the coefficient of friction, which reduces tool wear. In the case of mandrel bending, less friction also requires less energy to bend. Applying less lubricant means less ends up on the shop floor, which is a housekeeping benefit and an annual cost reduction.

A low-viscosity liquid can be problematic. The tube needs lubricant at every point of its circumference—all 360 degrees—but in the few seconds between applying the lubricant and putting the tube into the bender, the lubricant can start to run. The area at the top (12 o’clock position) might have too little, and the area at the bottom (6 o’clock position) might end up with too much. Attempting to fix this by overapplying the lubricant to the tubing or to the tooling doesn’t help much (see Figure 1).

It’s important to remember that liquids never stop moving. Even when the finished tube is removed from the bender and placed into a parts bin or placed on a rack, the liquid lubricant begins a new journey, ending up wherever gravity takes it. This usually means the bottom of a parts bin or onto the floor. It then creates a housekeeping task and a slip hazard (see Figure 2). Abrupt accelerations and decelerations during bending can even cause thin liquids to fly
off the end of the tube, causing an even bigger mess.

MQL efficiencies are best achieved by using an automated application system that pumps the lubricant through the hollow tool rod, delivering it down the length of the rod to the mandrel links at the required amount for each specific bend. The same pump, combined with manifold valves, can deliver a small, controlled amount of lubricant to the wiper die when required.

MATCHING THE LUBRICANT TO THE APPLICATION SYSTEM

Bending tube or pipe requires boundary lubrication, a condition in which the pressure between the surfaces of the tooling and workpiece is extreme, potentially causing some amount of metal-to-metal contact. A lubricant for this type of application should be somewhat immobile so it doesn’t end up on the floor, and it should contain extreme-pressure additives that maintain a microlayer of space between the tool and the tube. This space gives the tube a cushion to ride on and in many cases can prevent the frictional microwelds that cause tool wear. The three types of boundary lubricant are oils, pastes, and gels.

Oils are among the oldest lubricants and can contain ingredients that increase viscosity, or ability to cling. The oil can be put into an inverse emulsion stage with water that gives the product a white creamy consistency. The lubricity of the oil and the increased viscosity determine the amount of boundary protection it provides.

Grease-like or pigmented paste products have been used for decades. They became popular during World War II when oil was in short supply. They usually have an animal or vegetable fat base and additional components, such as calcium, clay, or other low-cost powders.

Gel is the third and newest category. Gel-type bending lubricants were invented with MQL in mind. They use water-based polymers to create the needed boundary. The product has the consistency of ice cream or hair gel. The product stays put and has very good lubricity and temperature control because of the water content and lack of...
oil. Because gels are water-based, they tend to be compatible with downstream manufacturing operations such as welding. When removal is necessary, often a plain water wash is sufficient. They perform best when applied in a microlayer, which is in keeping with MQL.

**GETTING STARTED**

MQL doesn’t have to be complicated. It requires equipment that can dispense an accurately metered quantity at the right time and a compatible lubricant. If your company has a large number of bending cells, it might be challenging to switch all of them over at once, so keep in mind that going green is a journey, not a discrete project. It can start in just one shop area and spread. Your program can start out as light green and progress to a deeper, darker green as your sustainability program evolves.

Also, keep in mind that a sustainability program provides more than just external benefits. Proof is available that when companies focus on more than just profits, they not only do good, they do better. A study over an 11-year period demonstrated “stakeholder-balanced companies show four times the sales growth and eight times the employment growth of companies that focus solely on shareholders.”

**Notes:**


Jeff Jeffery is CEO of IRMCO®, 2117 Greenleaf St., Evanston, IL 60202, 800-323-2933, jjeffery@irmco.com, www.irmco.com.

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FOR tube or pipe manufacturers and fabricators, few issues are more challenging than maintaining consistent dimensional accuracy. The demands for tighter tolerances and rock-solid consistency are relentless for myriad applications. High-volume industries like automotive and highly regulated industries like aerospace and nuclear power demand tight tolerances to meet their goals. Oil and gas applications require minimum ovality for successful threading and square end faces for coupling integrity. Hollow structural sections used in construction projects and oil rigs must meet various strength and bend stiffness specifications.

Proper equipment setup and frequent maintenance are critical steps, but don’t guarantee consistency. Among tube and pipe producers, competitive pressures mean doing more with less at the highest possible line speeds. For fabricators, tooling setup can vary from operator to operator. Even if the equipment is in topnotch condition, the metal’s characteristics vary from heat to heat, so maintaining consistent dimensions—diameter, wall thickness, ovality, and straightness—is an unending challenge.
Keeping up with these demands is a matter of keeping up with the latest monitoring and measuring technologies, several of which were on display at the recent TUBE® expo in Düsseldorf, Germany.

**MONITORING WELDED AND SEAMLESS HOLLOWS**

Tube wall thickness consistency carries a lot of weight with tube and pipe producers. Walls that are too thin are prone to rejection by the customer or premature failure if they are put into use. Walls that are too thick cut into profitability. Diameter measurements likewise are critical.

IMS Messsysteme GmbH’s C-frame and O-frame measuring systems use a radiation source (cesium 137) and up to 13 pairs of transmitters and detectors to provide dimensional measurements on seamless tube and pipe. The tube wall absorbs some of the radiation; the receiver detects and measures the residual amount. The system uses the difference between the transmitted and received signals to calculate the wall thickness.

The systems detect typical wall thickness variations associated with each mill type:
- A round but eccentric ID, associated with piercer mills and presses
- An oval-shaped or four-lobed (cloverleaf) ID, associated with conventional multistand pipe mills (two-roll type rolling stands)
- A three- or six-lobed (hexagonal) ID, associated with premium quality finishing (PQF®) mills, fine quality mills (FQM®), push benches, and sizing mills (three-roll type rolling stands)

The system works on diameters from \( \frac{5}{8} \) in. to 30 in. and wall thicknesses up to 2 in.; temperatures up to 2,375 degrees F; and line speeds up to 50 ft. per second. It achieves wall thickness accuracy less than ± 0.3 percent and tube diameter accuracy less than ± 25 µm.

Customized tube measuring gauges, manufactured by IMS, have the ability to combine all dimensional parameters of the pipe, such as wall thickness, eccentricity, diameter, ovality, out-of-roundness, and length. These gauges can also be integrated with diameter measurement systems manufactured by LIMAB.

LIMAB®’s TubeProfiler™ uses laser technology to measure round, square, and rectangular products, hot or cold,
A key development in Aicon’s TubeInspect P8 is the measurement bed, which is a sheet of glass with reference markers. The glass provides a stable measuring surface, and the markers provide permanent reference points for the eight cameras, alleviating the need for an initial calibration.

The system uses 36 synchronized lasers and a patented algorithm that prevents workpiece movement from affecting the measurements. The system uses triangulation to determine the minimum, maximum, and average diameter; ovality, length, and straightness; and to find defects such as flat spots.

A pyrometer measures the tube or pipe temperature for hot to cold conversion, and an optional Doppler laser measures the tube length and displays defect locations. The TubeProfiler S model has two additional measurement planes, and uses four to eight sensors in each plane, to measure the dimensions of the tube ends, partial sections, or the entire tube.

The systems work on diameters from ⅜ in. to 8 ft. and take up to 2,000 measurements per second. The accuracy is ±0.04 in. at 2σ.

Meta Vision Systems’ pipe end measurement system (PEMS) uses two SLS100LR sensors, mounted at 45 degrees to the pipe surface 90 degrees to each other, to scan around the end of the tube or pipe. One sensor measures the OD surface, the other measures the ID surface, and both measure the end face to build a 3-D model of the pipe end. The user sets the scan spacing in fractions of a degree.

The scanned area is about 4 in. of pipe length and assesses diameter (minimum, maximum, and average), ovality, and end face squareness. The system is sensitive enough to display information stenciled onto the pipe by measuring the thickness of the paint used in the stenciling process.

A key development in Aicon’s TubeInspect P8 is the measurement bed, which is a sheet of glass with reference markers. The glass provides a stable measuring surface, and the markers provide permanent reference points for the eight cameras, alleviating the need for an initial calibration.

Nowhere is the pace of manufacturing technology more evident than in the automotive industry, as manufacturers deal with two opposing mandates: reduce weight and maintain (or improve) crashworthiness. Tailored blanks perform a minor miracle in that they provide varying part thickness, allowing OEMs to specify thin material where weight reduction matters most and thick material where part strength matters most. A U-channel with two thicknesses is a typical tailored part, but much more complex parts are possible, such as a B-pillar with eight distinct thicknesses.

Tailor rolled tube also has a small but critical niche in the automotive industry. For fabricators who work with tailor rolled tube, a primary challenge is proper part orientation, for example when loading the part into a bending machine, said Walter Hölsch, sales manager for Roland Electronic GmbH.

“The thickness difference can be small, often less than a millimeter,” Hölsch said. Rather than rely on a machine operator in a hurry to measure the wall thicknesses with a caliper—a time-consuming process at best—he simply inserts the tube into the company’s E20 unit, which uses a magnetic system to measure the wall thickness.

AICON 3D Systems GmbH has been developing manufacturing and upgrading camera-based measurement systems since it was founded in 1990. A typical application is an automotive brake line or fuel line, a long length of small-diameter tubing with a handful of bends and straight sections.

The latest version of its flagship machine, TubeInspect, was rolled out this year. The new machine is a complete overhaul of a concept that has been in
use more than a decade. In addition to a more modern look, the latest version was designed for improved ergonomics and has a simplified interface. It also is equipped with LED lamps for more uniform illumination and higher-resolution cameras, upgraded from 1.3 megapixels to 2.0 megapixels.

The software uses sophisticated algorithms that compensate for temperature fluctuations and, in the case of measuring long, thin-walled workpieces, compensates for sagging caused by gravity. The system also sends bend correction information to the bender, taking into consideration all of the bends and straights along the entire length of the part.

“The worst thing is sending information to the bender to correct one small area,” said Werner Boesemann, president and CEO. “Changing one bend can throw off the rest of the shape, so this system relies on a full set of bend measurements.”

The company also rolled out its latest system, TubeInspect P8, which has a measurement area of 40 by 23.6 by 15.75 in. and can measure diameters up to 5 in. Boesemann estimates that this measurement envelope encompasses more than 80 percent of all tubing bent for manufactured products. Boesemann added that the machine isn’t limited to tubes that measure 40 in. long. Doors at both ends of the machine fold down so that longer tubes can be fed into it and measured section by section.

The machine is intended to be affordable for manufacturers that don’t have a full production schedule, Boesemann said. At 530 lbs., the system is designed to be portable.

**CONCLUSION**

Manufacturers keep finding more uses for tube and pipe, and the finished products continue to become more sophisticated. Premium threads, intricate bends, and complex end forms will continue to challenge producers and fabricators to make products to increasingly tight standards. As OEMs continue to push the envelope, their suppliers will have to do what they can to keep up. A visit to an all-encompassing expo like TUBE is a way to keep current with the latest monitoring and measuring technologies.

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**Branding**

A TPA PUBLICATION  TPJ • JUNE 2014  23
THE sign on the building reads JackRabbit Manufacturing; the company slogan is “Ready When You Are”; and if you need some fabrication work done, you’ll find out that the staff at JackRabbit, Bryan, Texas, is ready like the sign says and quick like a jackrabbit. Founded in 2011 by native Texan Devin Gerland, JackRabbit relies heavily on a CNC plasma cutting table; several manual tools (chop saw, drill press, and so on); and some welding equipment for fabricating sheet, plate, tube, and pipe. The company isn’t too specialized, which means it’s usually ready to take any fabrication project that comes through the front door. One-offs or a series, mild or stainless steel, subcontracted or not, JackRabbit is sustained by a steady stream of projects for a variety of applications and industries.

This isn’t to say that Gerland is just sitting and waiting for work. He’s a go-getter. He has worked for three manufacturers in the area, so he has a network of companies he calls on frequently, and he’s always looking for new opportunities in new markets. He’s also an innovator who has developed a couple of products and has a couple more in the works, hoping that one of them takes off in a big way.

ORIGINS
Oil has been synonymous with Texas for decades. The first big discovery in the state was in Spindletop (near Beaumont) in 1901. At the time the state was dominated by agriculture and it had no metropolitan areas. The discovery at Spindletop led to more successful wells and ushered in the Texas oil boom, a decades-long period of development and rapid industrialization. Quoting a price for crude oil is always a reminder of the
state’s importance in this industry—one of the two benchmark prices is West Texas Intermediate.

That’s history, but black gold’s importance in Texas hasn’t faded over the decades. In 2013 oil wells in this state pumped 2.6 million barrels of oil per day (38 percent of U.S. production), and its refineries processed about 5 million barrels of oil per day.

If you work in manufacturing in Texas long enough, chances are good you’ll manufacture something for the oil industry. This is actually where Gerland started, working as an engineer for a company that made the pumps and agitation units used to fracture shale formations, allowing the oil to be pumped to the surface more easily. It was a small outfit, so Gerland wasn’t just a face in the crowd. He was half of the crowd. The company had just two engineers.

“It was a great experience,” he said. “I dealt with vendors and customers, made the part drawings, helped out with manufacturing issues, and went to the field to commission the units. I’d cut a purchase order for a $150,000 engine,” he said, referring to the 2,250-HP monster used to power the unit. “Who gets to do that at his first job out of college?”

Gerland still does some work for the oil industry, but it’s not nearly that intense. His former employer and a few others rely on JackRabbit for all sorts of miscellaneous items, such as brackets, gussets, pipe supports, engine mounts, ladders, stairs, and handrails (see Figure 1). It’s good work, but Gerland is finding out that the industry doesn’t need an endless supply of them.

“Eagle Ford is full of fracking units—that market is becoming saturated,” Gerland said, referring to the shale deposit in southern Texas.
No matter. Oil isn’t the only game in this state. Texans love their automobiles. Not just any automobiles. Countless pickup trucks, four-wheel drives, and sport utility vehicles crowd Texas highways and byways. It’s easy to see why. Texas terrain is varied, and quite a bit of it is rugged and unforgiving, from the mountains and deserts in the west to Texas Hill Country in the south-central region. The Big Three automakers estimate that about 20 percent of full-size pickup trucks are sold in Texas, and each makes a Texas-themed version. Like many of these vehicles, the pickup truck Gerland uses for work is outfitted with an indispensable accessory, a Hi-Lift® jack. Faster and easier to use than a standard automobile jack, it’s handy for nearly every utility-type vehicle. The drawback is that, when it’s not in use, it’s usually in the way. This means that the jack is a minor nuisance most of the time, and Gerland figured that he needed to do something about it. He dreamed up a bracket that attaches the jack to the truck’s trailer hitch receiver, which inspired the company’s name. To prevent theft, Gerland incorporated a lock.

ARTWORK ON THE SIDE
JackRabbit isn’t focused solely on heavy plate fabrication for industrial applications. The company has done a few projects on the culinary side, such as mobile meat smokers, barbecue pits, and crawfish fryers. Gerland even capitalized on the jalapeño popper fad by designing a stainless steel plate for grilling them at home.

The company has fabricated its share of handrails, some plain and some decorative, and it has made more than a few gates and grates for various applications. Gerland also has made signs for businesses, churches, ranches, and so on, expressing some of the artistic capability that CNC provides. He also takes any little fabrication projects that show up.

He also does some artistic work. A former Aggie, Gerland thought he’d try making the school’s ring crest out of steel and have it powder-coated in the school’s color. He had no idea how to market his idea, at least not legally, so he started by contacting the university.

“You learn new things when you enter new markets,” Gerland said, making an extreme understatement. He learned that universities don’t commission the coffee mugs, T-shirts, bumper stickers, and dozens of other items adorned with their logos; instead, the university’s marketing staff waits for the phone to ring. Anyone with a new product to sell and the means to produce it is welcome to call, but the approval process is a
lengthy grind. Universities need to be sure that the supplier is reputable and reliable. Good workmanship is a credit to the school’s image, and timely deliveries are necessary to make it worthwhile (the school’s take is usually 10 to 15 percent). Suppliers have to jump through more than a few hoops to get approved.

“It’s like getting a home loan,” Gerland said, referring to the stacks of paperwork required. Despite the red tape, Gerland stuck with it, and now is licensed to make the product (see Figure 2).

**ACCENT ON AGRICULTURE**

As the number of oilfield projects slowed down in 2013, Gerland ramped up his work in other markets. Some of his latest work is in the agriculture industry, where he’s most comfortable. His grandparents farmed 75 acres near Carmine, Texas; his degree is in agricultural engineering (from the school formerly known as Texas Agricultural and Mechanical University); and he had internships designing and installing pivot irrigation systems before he graduated from college. In addition to doing some work for a couple of OEMs in the ag industry, he has built a few prototype implements of his own design for this market.

Gerland is understandably tight-lipped about the products he has developed, but if the market responds with the “Why-didn’t-I-think-of-that?” reaction that every inventor wants to hear, the products will secure Jack-Rabbit’s revenue stream well into the future. (TP)

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JackRabbit Manufacturing & Collegiate Metal Art, 1709 E. William J. Bryan Pkwy., Bryan, TX 77802, 979-446-0073, dgerland@jackrabbitmfg.com, www.jackrabbitmfg.com
What do you do if your professional job involves too much travel, and you have a hankering to change careers? If you’re Hank Padilla, you change careers—you quit your job, enroll in a trade school, work up a business plan, and open a small fabrication shop after you graduate. It actually took quite a bit of time and effort before Padilla was ready to initiate this big, life-changing plan, but in a nutshell this is how he transitioned from a buttoned-down consulting career in risk management to the high-octane path he blazed to become a co-founder, a co-owner, and the lead fabricator at Hanksville Hot Rods, Littleton, Colo.

The longtime racing enthusiast and family man found that he wasn’t happy spending time on the road. “I was traveling too much,” Padilla said, and it was tough to keep up with his daughters’ hobby, racing junior dragsters.

“We would spend a weeknight or part of a weekend overhauling a carburetor or doing some other work on the dragsters, and we’d watch “Monster Garage,” and I guess you could say I watched one too many episodes. I realized I wanted to spend more time with my family,” he said.

Padilla had been a hobby welder and fabricator for years, but had never been too serious about it. Spending weekends at Bandimere Speedway in Morrison, Colo., had immersed him and his wife, Jennifer, in the racing culture, and eventually they gave some thought to starting their own business.

Padilla enrolled in a trade school and focused on two areas, collision refinishing and street rod fabrication. As he was progressing in his coursework, Padilla and his wife pondered specific business models, looking for a niche. A few twists and turns led them to specialty tube fabrication. They knew of a handful of small, one- and two-man tube bending shops in their area, but figured that their specialized racing knowledge and Hank’s professional background would help them create a unique business, bringing something novel to the local area.

**TRACK SMARTS**

Padilla’s background gives Hanksville a thorough perspective on making roll cages. A guy who races a 2000 Ford Mustang® that turns a quarter-mile in less than 13 seconds; puts his daughters on the track in junior dragsters; is a certified technical inspector for the National Hot Rod Association (NHRA) and National Auto Sport Association; and...
If you think a ’57 Chevy is all chrome and tail fins, look again. A peek underneath this one, modified by Hanksville, reveals an intricate undercarriage. The exhaust system has fairly complex bends and was assembled with TIG welding.

Racing isn’t always about getting the lowest E.T. from the latest car; in some cases, it’s coaxing a slightly faster time out of a vintage machine. Hanks created an exhaust system made from 304 stainless for the inline-6 on this front-engine dragster.

(NASA); is the chief tech inspector for NASA’s Rocky Mountain Region; and serves as a volunteer technical inspector for the Porsche Club of America’s Rocky Mountain Region and Sports Car Club of America’s Colorado Region is a guy who knows a lot about roll cages.

“The best way to build true competition roll cages is to understand the mindset of the tech inspector and also to understand the rules and their intent,” he said. “It provides a deep knowledge about the rules.”

The key to making a high-quality roll cage is mandrel bending, which Padilla cites as a unique service in the Littleton area. The mandrel fills the tube to preserve its shape, preventing it from flattening during the bending process. The knowledge developed for mandrel-bending roll cages transfers to exhaust systems, so the Padillas went after this market too. The mandrel is more critical in exhaust systems, because the material is thinner and the bends are tighter than for roll cages. Padilla can bend radii as small as 1.5 times the tube’s diameter (1.5D in bending parlance) and space them closely together, with as little as 2 times the tube’s diameter between the bends.

Although roll cages and exhaust systems seem like complementary products, they actually go to two separate markets—race cars and street cars.

“We make custom mandrel-bent and TIG-welded stainless steel exhaust systems for performance cars—Audis and Porsches, and muscle cars like Chevelle®s, Camaro®s, and Mustangs,” he said.

“Mainly they’re looking for performance and sound,” Padilla explained. “The mandrel keeps the tube from crushing, kinking, or rippling, so you have much nicer, more beautiful, and better-flowing tubes.”

BRINGING RISK MANAGEMENT TO FABRICATION

Padilla brought risk management knowledge with him to this business venture. For example, to reduce the risk associated with a downturn in one of the company’s business segments, Padilla sought a third revenue stream, which the company calls its commercial business.

“These projects can be anything, from production bending for manufacturers to local racing shops that outsource roll cages to us to university students building something for a senior project,” Padilla said.

He also applies risk management to roll cage design. Padilla discussed a recent roll cage he made for a customer with a Jeep®. He views a specific outcome, rolling the Jeep, as a certainty rather than a probability. Padilla assumes a worst-case scenario and builds the roll cage appropriately.

“It’s the same for our road-race cars. We know that every road-race car goes off track at some point, and you never know what you’re going to hit or what you’re going to encounter,” Padilla said.

Regardless of what the driver encounters, he’ll be thankful he encountered Hanksville Hot Rods first. [PI]

Hanksville Hot Rods Inc., 3852 Norwood Drive, Unit 1, Littleton, CO 80125, 303-470-1850, hank@hanksvillehotrods.com, www.hanksvillehotrods.com
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- Service Center Directory
- Tooling Buyers’ Guide
- Tube & Pipe Bending Machine Buyers’ Guide
- Tube & Pipe Mill Machine Buyers’ Guide
- Tube & Pipe Buyers’ Guide
- Tube Mill Entry/Exit Equipment Buyers’ Guide
TUBE AND PIPE POLISHER

Th. Wortelboer B.V. has introduced the Tube and Pipe Polisher (TPP) with an electric drive. The unit cleans the inside and outside ends of pipe simultaneously before welding.

The machine is available with various kinds of flap wheels to handle different cleaning applications.

Th. Wortelboer B.V. • 31-24-358-65-14 • www.wortelboer.ws

TUBE MARKING

Rea Jet offers variable systems for marking data matrix codes on pipe IDs and ODs with inks, laser, and paints.

Large-character inkjet DOD and spray mark technology systems process data received from the production master computer and convert it in real time into serialized readable text and 2-D codes. Each marking is unique, so that each tube is traceable as one of a kind.

In addition to marking pipe ODs, the DOD system can mark pipe IDs from 7.87 in. A compact, 32-nozzle print head mounted to a special mounting device is driven into the tube. The contact-free marking takes place during the rotation of the tube.

The spray mark technology system can be used to mark weld lines and colored rings onto pipes and for longitudinal marking of wire cables. The markings support the identification, quality inspection, and correct installation of products. It also is used to apply paint full-screen to prepare the pipe for inner tube marking. After that, the company’s CL CO₂ laser system can be used to remove the paint and leave a legible, sharp-edged marking.

Rea Elektronik GmbH • 49-6154-638-1122 • www.rea-jet.de
ULTRASONIC THICKNESS GAUGE

Olympus has announced the release of the 27MG ultrasonic thickness gauge, designed to take measurements from one side on internally corroded or eroded metal pipes and structures. The 12-oz., battery-operated unit is designed for one-handed operation.

Standard features include automatic probe recognition, auto zero compensation for measurements on hot surfaces, gain adjust for measurements on sound-attenuating materials such as cast metals, differential mode, high-low alarm settings, and a min./max. mode that recalls the minimum or maximum thickness at 20 measurements/sec.

The gauge comes standard with the D7910 dual-element transducer that enables inspectors to make thickness measurement in basic corrosion applications. For measurements on very thin or thick materials or small-diameter pipes, the company offers dual-element transducers.

PIPE CARRIERS

Dhatec offers standard and premium pipe carriers. They are made from UV-stabilized, recycled LDPE with a high load-bearing capacity. The weatherproof carriers have no parts sticking out, making them safe for coated pipes.

The standard carrier is suitable for storing small-diameter pipe from 2.87 to 36 in. The premium carrier, which allows tube bundling, covers diameters from 4.5 to 20 in. The premium carrier is 4 ft. long.

SECTION BENDING MACHINE

Schwarze-Robitec offers the series SB section bending machine, which features 11 axes in the standard version to provide increased bandwidth of bending contours. Depending on the section sizes used and the material stiffness, the number of axes can be adjusted to the respective bending requirements.

The machine processes flat or angle irons, as well as T-, I-, C-, and special sections in varied formats and dimensions. Its large bending moment allows it to form particularly difficult sections with ease, the company states. The machine is equipped with three or four rollers.

The machine can be fit out optionally with a unit for 3-D forming or a bending mandrel for small diameters. A measuring system that monitors the bending radius during the bending process also is available.

PUNCHING STATIONS FOR TUBING

Multicyl offers Projection Mandrel punching stations to help overcome obstacles that occur when working with tubing or extrusions of different sizes.

The mandrel is projected outwards from the base of the tool, leaving the space underneath open to accommodate different diameters of tubing for punching.

SYNTHETIC LUBRICANT

IRMCO® Advanced Lubricant Technologies has announced the formulation of a synthetic stamping lubricant that the company claims is the first developed for automotive electrogalvanized and galvannealed metals.

The new line of 892 and 313 series lubricants have shown good results on automotive zinc-coated sheet metals, the manufacturer reports.

pipe carriers

pipe carriers

pipe carriers

pipe carriers
**DRY-CUT CHOP SAW**

CS Unitec’s new model 9435 Premium Super Dry Cutter cuts metal pipe, plate, and profiles without the need for lubrication or manual deburring. The 14-in. chop saw cuts up to 6 in. deep at 90 degrees in stainless steel, ferrous and non-ferrous metal, plastic, and aluminum.

Bevel cuts up to 4.75 in. at 45 degrees can be achieved with the patented quick-release, heavy-duty vise. The saw’s 19-amp, 115-V, high-torque motor delivers a free cutting speed of 1,400 RPM. Safety features include a depth stop, safety-locking pin, and protective shield.

The saw is supplied standard with a 14-in., 90-tooth tungsten carbide-tipped blade for cutting stainless and thin steel. A blade-stabilizing system reduces vibration.

CS Unitec Inc. • 800-700-5919 • www.csunitec.com

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**PIPE END MEASUREMENT SYSTEM**

Meta Vision Systems has introduced a pipe end measurement system. Combining two of the company’s SLS laser sensors with various modifications and calibration techniques, the system generates a complete 3-D model of the end of a pipe, together with all required dimensional measurements, in real time.

The system measures the end face, as well as both the ID and OD surfaces, up to 3.94 in. into the pipe. The 3-D models can be stored and retained for retrospective analysis.

Meta Vision Systems Inc. • 514-333-0140 • www.meta-mvs.com

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**HIGH-STRENGTH STEEL TUBING**

Plymouth Tube has introduced HS-50 High Pressure Hydraulic Tubing™. According to the company, the high-strength tubing is designed to allow for increased system pressure while minimizing costs.

The tubing features a minimum yield strength of 50,000 PSI and a 30 percent minimum elongation.

Plymouth Tube Co. • 800-323-9506 • www.plymouth.com/hs50
**RECPROCATING SAW BLADES**

The M. K. Morse Co. has introduced a new line of bimetal reciprocating saw blades.

The Master Cobalt® products replace and simplify the core product line. In addition, the Advanced Edge line introduces several metal cutting and demolition blades. The Advanced Edge Bolt™, a patent-pending tooth and set design, provides fast cutting, while the Advanced Edge Power™ is wider and thicker to deliver straighter cuts and handle heavier feed pressures.

The Renovator™ blade is a wide blade with a tooth pitch designed to provide control for finer cuts when renovating or remodeling existing structures. In addition to these are Havoc™; Pipe Boss™; Salvage™; Pallet Dismantling; Plaster; Fire & Rescue; Airsaw; and specialty blades in diamond-grit, carbide-grit, and carbide-tipped styles.

**SURFACE POLISHING PRODUCTS**

Walter Surface Technologies has added three new products to its Quick-Step line of surface finishing and polishing products. Featuring Velcro® support, with a central pin to ensure proper placement and safety, the new items are designed for finishing ultraclean stainless steel surfaces.

Quick-Step Finisher is a compact, variable-speed surface finishing tool for sanding, finishing, and polishing tasks. Featuring an extra-large gear and adjustable Dynamax electronic speed control, the tool’s motor provides high levels of torque even at low speeds.

Quick-Step Blendex is a surface-conditioning disc designed for long disc life. Featuring nonwoven construction, the disc is suitable for preparing surfaces for final finishing treatment on steel, aluminum, and stainless steel.

The Quick-Step Flex finishing disc offers surface finishing and a high-removal rate of grinding and finishing welds. It is designed as the first stage in a multistep finishing process.

Walter Surface Technologies • 860-298-1100 • www.walter.com

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**Perfect Solutions**

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Trilogy Machinery – Exclusive North America Distributor
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3-D WHITE LIGHT SCANNER
Aicon 3D Systems offers the breuckmann stereoSCAN for inspecting big components directly in the production run. The white light scanner captures minimal deviations and delicate structures with high accuracy.

The scanner captures the entire surface of the component, resulting in a high density of information.

Breuckmann GmbH • 49-7532-43-46-0 • www.breuckmann.com

ULTRATHIN ABRASIVE CUTOFF WHEELS
Flexovit USA Inc. has introduced Razor Thin abrasive cutoff wheels. The ultrathin wheels offer fast, smooth cutting, giving maximum cuts with minimal kerf loss while providing reduced cutting resistance and sparks, the company reports.

The wheels are offered in Type 27 and Type 1 shapes and in 4.5-, 5-, and 6-in. dia. with a 0.875-in. arbor. They leave no burrs or burns on any type of metal, according to the manufacturer.

Flexovit USA Inc. • 800-689-3539 • www.flexovitabrasives.com

QUALITY CONTROL SOFTWARE
Prodim has developed TubeCheck software for quality control of tubes. Integrated into the company’s Proliner Tracker 10IS measuring device, the software enables digitization of tubes on the device’s screen for checking.

The portable device can measure points and contours with high accuracy, reports the company. The comprehensive CAD software and 10-in. touchscreen simplify checking and editing of measurements. Wire technology and leapfrog software allow execution of measurements larger than 65.61 ft.

Checking and calculating centerlines, radii, and angles requires only a few sections of the tube to be measured. Results are displayed immediately on the touchscreen, making it possible to compare the measured tube with the original design. By defining the tolerances of the tangent and intersection points, the software can identify any deviations.

Prodim • 31-492-57-90-50 • www.prodim-systems.com

SAWING TABLES
TigerStop offers SawGear job site tables in 8-, 12-, and 16-ft. working lengths. Users can add infeed tables made to customized lengths.

A hinge system and tripod supports make the tables transportable, simple to level, and quick to set up and break down, the manufacturer reports.

Call or E-mail Today!

TigerStop LLC • 360-254-0661 • www.sawgear.com
MANUAL BAND SAW

The Kalamazoo Machine Tool model H275 manual band saw is engineered to cut tubes, pipes, light structural shapes, and small solids up to 10 in. at 90 degrees. The saw’s heavy-duty construction, carbide saw guides, and rigid guide supports help ensure accurate, straight cuts.

With a variable-speed blade from 65 to 320 FPM, the saw can miter up to 60 degrees to the right. The 2-HP TEFC motor couples directly to the worm gear drive for smooth power transmission to the saw blade. Operations include manual saw frame raise; manual vise; hydraulic/solenoid powered downfeed; and status indicators for power on, correct blade tension, broken blade, and band wheel cover open.

Kalamazoo Machine Tool • 269-321-8860 • www.kmtsaw.com

FIBER LASER, CO₂ LASER EQUIPMENT

Rofin offers FL series fiber laser equipment for welding thin-walled stainless steel tubes, as well as CO₂ slab lasers for welding medium- and thick-walled stainless steel tubes.

The fiber lasers, with output power up to 6 kW, are suitable for welding different stainless steels and nickel-based custom materials from 80 to 150 μm thick. During the welding of thin materials, only small weld pools are developed, so processes can be realized that are not possible with conventional welding methods.

The CO₂ slab lasers have an output power up to 8 kW and a beam quality of K = 0.95. They are suitable for welding wall thicknesses from 0.04 to 0.31 in.

The equipment is based on the Profile Welding System (PWS), a complete laser welding system with integrated process sensors for gap recognition and seam tracking.

Rofin-Sinar Laser GmbH * 49-40-73363-4380 * www.rofin-ham.de

Welcome to TPJ TV!
Brought to you by
TPJ-The Tube & Pipe Journal®

Join TPJ Editor Eric Lundin as he takes you into tube and pipe production facilities and fabrication shops for a closer look at many of the processes discussed in the magazine! In the latest Webisode, Eric visits Falls Manufacturing Inc. in Butler, Wis., to learn about bending tube and pipe on a roll bender.

And don’t forget to check out earlier Webisodes of TPJTV:
Webisode 1: Dan Janikowski of Plymouth Tube Company, East Troy, Wis., discusses the tube manufacturing process.
Webisode 2: Paul Krickeberg, owner of Sharpe Products, New Berlin, Wis., discusses free-form, compression, rotary draw, and roll bending.

www.thefabricator.com/tpjtv
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- 1.5" EATON LEONARD VB150HS
  Premier Touch Screen CNC, 8" Max. Radius, Rebuilt 1998, #17041

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- 3" PINES #2 HYDRAULIC ROTARY Tube Bender, 12" Bend Radius, Mandrel Extractor, Wiper Die, Tooling #2147

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INDUSTRY SNAPSHOT

By Eric Lundin, TPJ Editor

THE PULSE comprises data from selected industries pertinent to the majority of TPJ-The Tube & Pipe Journal’s subscribers. This information is intended to provide an overview of industry fundamentals for tube and pipe producers and fabricators. It is not specific to any particular industry.

The fuels and power index includes several fuels and electricity. The metals index comprises a multitude of alloys and includes steel and iron. Because of the volatility of steel and iron, these categories also are broken out separately. These graphs do not show specific prices but rather price indexes—they reflect an agglomeration of prices set at 100 in 1982.

The trade balance covers tube and pipe products listed in the Harmonized Tariff Schedule (HTS) Sections 73 (iron and steel) and 76 (aluminum).

The industry employment total comprises employment figures for four industries among TPJ subscribers: primary metal producers, including tube producers (9.8 percent of TPJ subscribers); fabricators (30.9 percent of TPJ subscribers); machinery manufacturers (20.2 percent of TPJ subscribers); and transportation equipment manufacturers (9.8 percent of TPJ subscribers).

Data is provided by U.S. government agencies, including the U.S. International Trade Commission (www.usitc.gov), and the Bureau of Labor Statistics (www.bls.gov). NAICS codes reported in The Pulse are 331 (primary metal manufacturing), 332 (fabricated metal product manufacturing), 333 (machinery manufacturing), and 336 (transportation equipment manufacturing).
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