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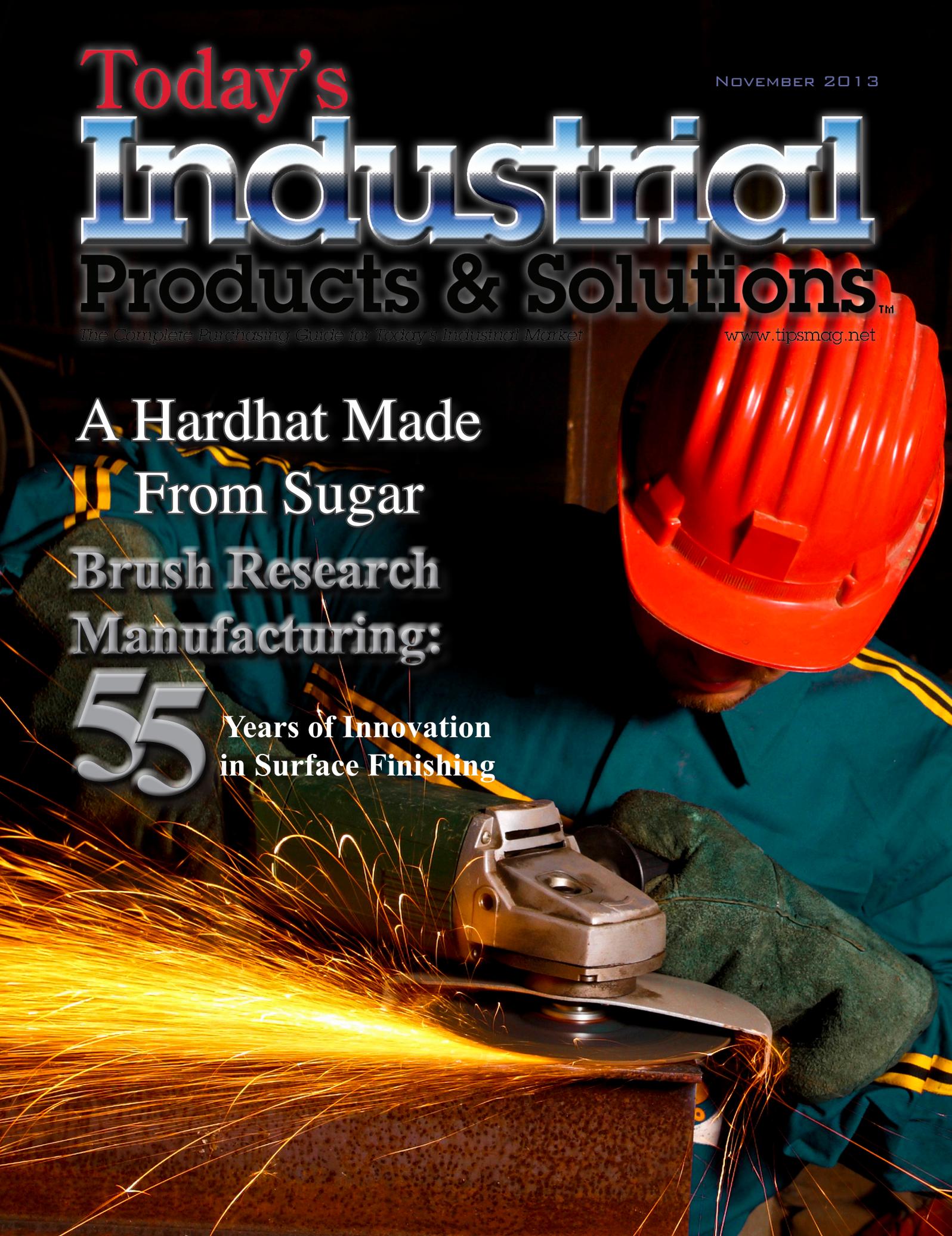
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The Complete Purchasing Guide for Today's Industrial Market

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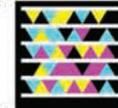
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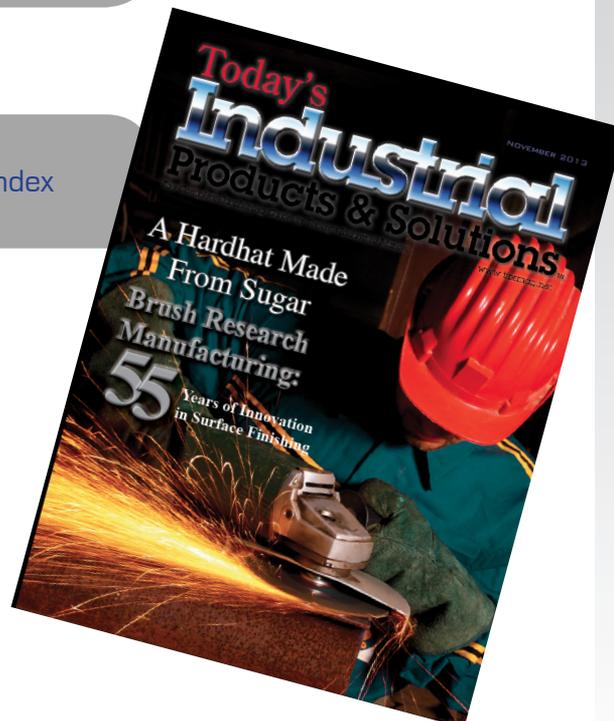
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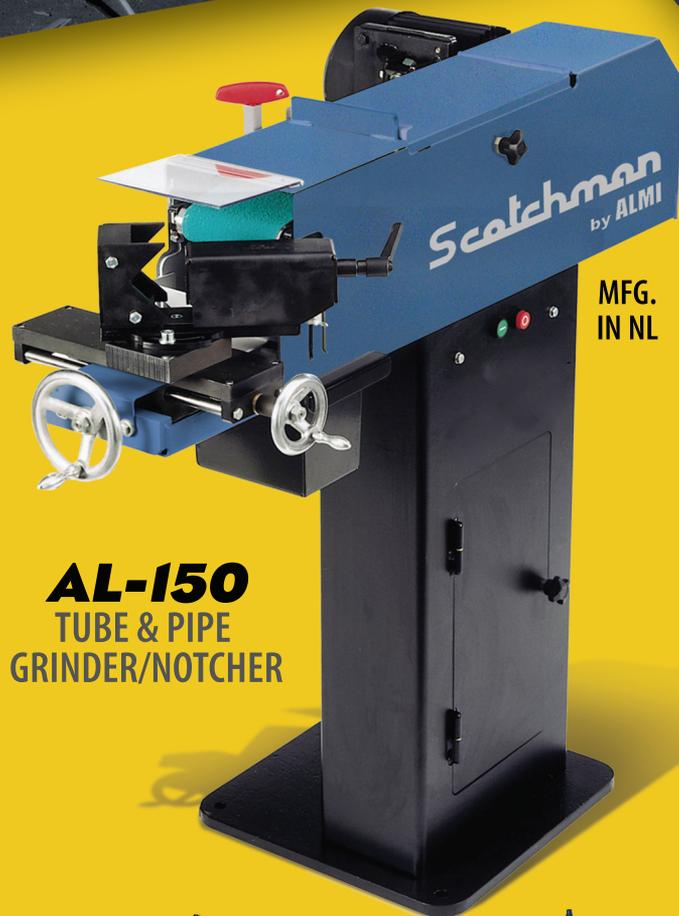
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Today's Industrial Products & Solutions™

Letter from the Editor:

In taking the helm as the new editor of Today's Industrial Products & Solutions, I'm excited about a few new things on the horizon.

First, plans are underway to have all of our publications BPA Audited in 2014. A BPA audit is simply a third-party verification that we are doing things the way they ought to be done for the good of both our readers and our advertisers. Our aim is for the audits to begin in earnest in Q2, and wrap up by year's end.

Second is the decision to take the magazine nearly 100% digital. This was a decision we spent a long time deliberating over. In the end this change will allow for several advantages. It allows us to increase distribution of the magazines by more than 50% at the same cost, while remaining free to subscribers. It gives us the freedom to expand the books with more content. It also enables us to be much more creative with complementary and interactive content, which our readers can access from any computer or mobile device, but still have a feel very similar to the publication in print.

Third is a huge push to bring in outside experts as contributors to the magazine, including Jerry Yudleson, head of a green building consultancy, published author and recognized expert on LEED certification and sustainable construction. We're in talks with a few others, but we're always on the lookout for unique voices with something to contribute. If you're interested, call or send me an email, right now.

Fourth, the addition of a new structure to the magazines, bringing you not only the latest and greatest products out there and the aforementioned new voices, but also pointing you to the best stories, information and interesting media we've found online. Add to that some new features that we're going to be rolling out on our own site, and you'll find the magazine now extends far beyond the edges of the page.

Finally, we're in the process of building out a new office space.

To help us with that, we're being supplied with some fun toys to use and review-- including the newest lines of cordless tools from Bostitch and Porter-Cable. This is, I hope, the start of a brand new, ongoing series of reviews that we want to make as entertaining as they are informative... but I'll elaborate more on this in future issues.

These are five big reasons I'm excited to be taking over and guiding the magazine. I don't want this to be a book that sits on your desk to be flipped through while you're bored on a long conference call. I want this to be the magazine you anticipate receiving, issue after issue, and talk about in the hallway when you're done.

I'll close with this appeal. If you feel that you have something to contribute to the magazine-- a voice that needs to be heard or a topic that needs more exposure—call or send me an email. If there is something you think we should be covering but aren't, call or send me an email. If you have a product you'd like us to review for our readers, call or send me an email.

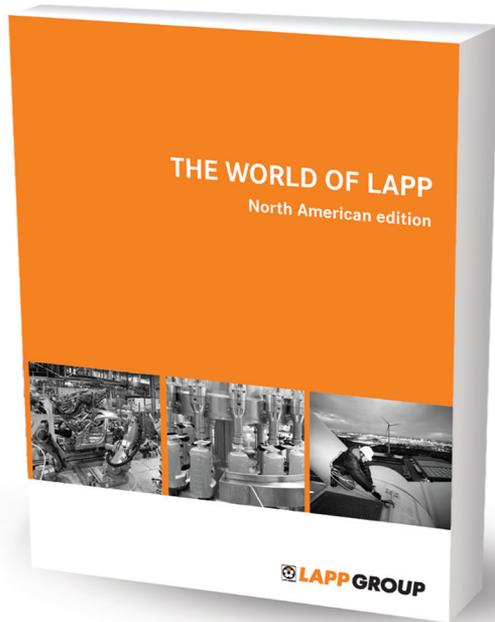
You, the reader, are what the success of this magazine hinges on. I look forward to hearing from you, telling us what we're doing right, and what we need to do to make this magazine one of your favorites.

Sincerely,
Danny Thompson, Editor



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Brush Research Manufacturing: 55 Years of Innovation in Surface Finishing

Over a half a century after its founding, Brush Research is still providing manufacturers and distributors with new and innovative ways to improve surface finishing and ensure supply chain strength

Brush Research Manufacturing (BRM) of Los Angeles, California is unveiling new products, strengthening supply chains, and helping manufacturers save time and money. Founded in 1958, this American-owned ISO 9001:2008 company is best known for inventing the Flex-Hone Tool and building it into a global brand. This year BRM will be celebrating 55 years of solving surface finishing challenges with innovative brushing technologies.

As company founder Steve Rands once said, “Keep an open mind. Experiment. Nothing improves until someone stops and questions an accepted assumption.” Today, BRM remains true to Rands’ vision by offering innovations such as new generations of Flex-Hones and other specialty abrasive brushes.

The Birth of the Flexible Hone

The Flex-Hone tool, BRM’s signature product, is the standard against which all other finishing tools are compared. Built with a stiff metal stem and flexible nylon abrasive filaments, the Flex-Hone removes cut, torn, or folded metal while leaving the base metal undisturbed.

Versatile and easy-to-use, this flexible hone can be used for edge blending, plateau honing, polishing and chamfer operations and can be used with manual or automated production equipment, or even a handheld electric drill.

During the company’s early years, the Flex-Hone was popular mainly in the automotive market. By deglazing the walls of engine cylinders, for example,

users extended the service life of diesel engines while reducing oil consumption and lowering emissions.

However, by listening to an ever-growing marketplace Brush Research soon began supplying its surface finishing solutions to many other industries.

Today, the Flex-Hone tool is sold through a worldwide network of distributors for surface finishing of everything from big diesel engines to small brass tubes in musical instruments, as well as honing the barrels and chambers of firearms and chamfering holes in critical parts used in jet engines.

BRM surface finishing solutions are also helping customers in industries such as

aluminum extrusion, fluid and power, hydraulics, oil and gas, and earth moving equipment.

“All of those developments came from listening carefully to the marketplace”, says Jonathan Borden, BRM’s National Accounts Manager. “That means working directly with customers to provide customized solutions to their application requirements.”

In a recent example, Sikorsky Aircraft turned to BRM to find a tool that could remove scale from a carburized bearing surface. The legendary helicopter manufacturer initially attempted to solve the problem by using carbide reamers and diamond laps, but these tools didn’t work well with 9310 alloy steel. Sikorsky then



BRM surface finishing solutions are also helping customers in industries such as aluminum extrusion, fluid and power, hydraulics, oil and gas, and earth moving equipment.



The tool, which can be mounted in a hand drill motor or a machine tool chuck, is used for finishing or resurfacing of the hard metals, ceramics and other tough materials used in items such as ports, sleeves, and cylindrical bores.

tried BRM's Diamond Flex-Hone, which uses a diamond abrasive. The BRM tool worked so well that Sikorsky immediately placed a rush order for these high-quality flexible honing tools.

BRM's 6 Pillars of Success

But the company is much more than its flagship product and other abrasive technologies. Building on the success story of the past 55 years, BRM has adopted a new focus on their "six pillars of success" that include value, education, partner support, quality, character and innovation. For the company, these characteristics are more than words; they are a commitment to providing added value to products that might be viewed as commodity items.

"Within those six pillars are attributes that really set our organization apart and will allow us to continue with our success," says Jonathan Borden, who has been with the firm for over 10 years and is now BRM's National Accounts Manager. Borden's deep understanding of the company's product lines and internal business practices is derived from his experience with its customization program, inventory & shipping, marketing and technical services.

Solving Tough Challenges for Customers

According to Borden, the first pillar – value – represents the company's focus on providing added value to both distributors and end users. By offering flexible shipping options along with high-quality products and creative solutions, BRM is proving that it values long-term relationships.

Stock outs aren't an option for manufacturers who need industrial brushes to keep production lines moving. Unlike other industrial brush suppliers, however, BRM understands what's at stake.

"If a brush supplier can't deliver on-time and on short-demand, it's the brush distributor who takes the blame," explains Heather Jones, BRM's Director of Marketing. "That's not fair to the distributor. BRM keeps 98% of catalog items in stock and offers flexible shipping options. This lets distributors reduce inventory carrying costs and invest their capital in other business opportunities".

To support its global distributor network, Brush Research offers same-day or next-day shipping. In an effort to provide the perfect solution for the customer, Brush research provide custom power brush and twisted-in-wire solutions in as little as 24 – 48 pieces and the Flex-Hone Tool can be provided in single piece custom solutions. His ensure the customer is receiving the maximum value for their application.

BRM can also deliver large quantities of custom brush tools on tight production schedules, as Sikorsky Aircraft learned after trying the Diamond Flex-Hone.

As Grant Fowlie, BRM Customer Service Manager says, "Because our facilities are consolidated within a single Los Angeles location, we can coordinate orders with efficiency and offer a quick turnaround."

Filling the Sikorsky order was a challenge, but BRM adjusted production schedules and worked overtime to get the job done.

Resources and Relationships

Education is another area in which BRM excels. The company offers a full electronic library of resource guides that include case studies, high-resolution

photography and video content.

In addition, Brush Research listens for surface finishing needs by monitoring social media channels and sharing solutions via Facebook, YouTube, Twitter, and LinkedIn. BRM also posts regular blog entries and press releases, and is planning a mobile application to aid customers with product selection.

Manufacturers can also visit BRM's website, where the Literature menu offers easy access to free technical books, case studies, and safety and engineering guides. There's even a downloadable Tech Lab Request Form for specialized applications. After reviewing all of a customer's specifications, BRM may suggest a standard brush tool or offer to design a custom brush.

The Brush Research website also provides instructional videos with titles such as How to Use a Flex-Hone, How to Automate Deburring and Surface Finishing with NamPower Abrasive Brushes, and How To Use the Flex-Hone for Firearms, a BRM gun tool that's trusted by leading gun manufacturers such as Beretta, Colt, and Smith & Wesson.

Although much of this material is designed to assist manufacturers and end users, it is also a critical component of the company's "partner support" pillar. BRM partners receive access to all of these high-quality materials, along with field support, high-resolution photography, and on-going training and education.

Manufacturing and Quality Improvements

Over the years, one of the biggest changes for BRM has been in manufacturing processes, many of which are proprietary. Since the days almost 50 years ago when the first Flex-Hone tools were made by hand, the company has continued to invest heavily in automation and quality control systems to improve its manufacturing accuracy and efficiency.

"With advanced technologies and quality management systems you can really control the manufacturing process and that is where many of our advancements have taken place: smaller hones, tighter tolerances, and continuously improved



Founded in 1958, Brush Research Manufacturing is an American-owned company best known for inventing the Flex-Hone Tool and building it into a global brand.

product quality,” explains Borden.

In addition to delivering a broad array of Flex-Hone models and sizes, BRM offers engineering assistance. At its surface finishing laboratory in Los Angeles, Calif., the firm analyzes customer parts that require finishing, then selects and tests the tools that will provide the best solution according to customer operating

parameters.

The results include everything from a customized brush with a tapered configuration, or even a stepped-tapered shape of a certain length and honing material.

“Whatever the parameters, we’ll design a brush tool to meet the specific application in the most affordable manner,” says

Borden.

The Flex-Hone itself has evolved over the years into new product offerings from BRM.

In 2012, the company introduced the Diamond Flex-Hone, which uses diamond crystals laminated to the ends of its flexible filaments. The product is used to achieve exceptionally smooth surface finishing of cylindrical parts composed of hard materials such as ceramics, carbide and hardened tool steel.

Today, BRM is building upon a 55-year history of surface finishing success by introducing the NamPower family of disc brushes.

These abrasive nylon brushes contain a combination of ceramic and silicon carbide filaments that deliver maximum burr removal rates and ideal surface finish in a single operation. The abrasive filaments work like flexible files, conforming to part contours, wiping and filing across part edges and surfaces.

The disc brushes are designed with a new tool holder that allows coolant to flow through its center for better lubricant dispersion. This permits the brush to run at greater cut depths while reducing heat generation to eliminate filament smearing, improve surface finish and promote longer tool life.

By automating their deburring operations with NamPower technology, parts manufacturers can reduce labor costs and speed high-volume parts finishing. Industries that will benefit include aerospace, automotive, industrial, medical and robotics applications.

“Innovation will always remain an important ‘pillar’ to us,” Borden says. “We are continually developing specialty abrasives that are tailored to specific applications to help optimize those applications.”

For more information, contact Brush Research Manufacturing, Brush Research Mfg. Co., Inc., 4642 East Floral Drive, Los Angeles, CA 90022; Phone: (323) 261-2193; Fax: (323) 268-6587; email: info@brushresearch.com or visit the web site: www.brushresearch.com.



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A Hardhat Made From Sugar



Unlike conventional hard hats manufactured from high-density polyethylene (HDPE) sourced from nonrenewable petrochemicals, the V-Gard GREEN hard hat from MSA is manufactured using “green” HDPE sourced entirely from sugarcane ethanol. Developed by MSA in Brazil, the V-Gard GREEN hard hat will be introduced to North American customers at the 2013 National Safety Council Congress & Expo, scheduled for September 28 through October 4 in Chicago.

“By developing a hard hat sourced from sugar, we are effectively

reducing the overall carbon footprint associated with the life-cycle of this product,” said Eric Beck, MSA’s Global Director of Strategic Marketing. Mr. Beck explained that through the natural process of photosynthesis, sugarcane cultivation captures CO₂ from the atmosphere, thereby reducing greenhouse gas emissions. In fact, according to a 2007 eco-efficiency study conducted by Fundacao Espaço Eco, for every ton of green HDPE produced, approximately 2.5 tons of carbon dioxide are captured from the atmosphere and environment.

Just like MSA’s market-leading,

traditional V-Gard hard hats, the V-Gard GREEN protective hard hat meets the company’s rigorous performance standards as well as those defined by ANSI Z89.1 and CSA Z94.1. “The sustainable benefits of using ‘green’ HDPE in a hard hat are what initially captured our interest,” Mr. Beck said. “But at the end of the day, the hard hat has to provide the same high level of head protection that our V-Gard brand is known for around the world. That’s what makes this product option so attractive.”

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stream as conventional HDPE, making it suitable for reuse in non-safety products and further enhancing the sustainability benefits of the new hard hat. Like traditional V-Gard hard hats, the new V-Gard GREEN hard hat will be marked with a recycling label to further remind and educate users to recycle their helmet at the end of its use cycle.

In recognition of MSA's leadership and innovation in head protection, Frost & Sullivan, a global research organization of 1,800 analysts and consultants who monitor more than 300 industries and 250,000 companies worldwide, recently selected the V-Gard GREEN for its 2013 New Product Innovation Leadership Award.

The MSA V-Gard GREEN hard hat is being launched in the midst of steady growth in the green building industry. According to an industry report released earlier this year in collaboration with the U.S. Green Building Council and the World Green Building Council, 28 percent of architects, engineers, contractors, building owners and building consultants around the world report an increased focus on sustainable design and construction. The report found that firms

are shifting their business toward green building, with 51 percent of respondents expecting more than 60 percent of their work to be green by 2015.

"With the rise in green building and construction projects in general, this is an opportune time to introduce an alternative, sustainable safety hard hat that also helps to reduce carbon emissions and demand for fossil fuels in product manufacturing," says Mr. Beck. "With millions of hard hats manufactured and sold annually in the United States, Canada and Mexico, the V-Gard GREEN hard hat provides those in the construction industry as well as those working in the utility, energy and industrial fields a more sustainable choice that protects both people and planet."

The technology to produce this new helmet was deployed at MSA's Brazil operations, in conjunction with Braskem, the world's largest producer of green thermoplastic resins. Offering increasingly sustainable products is a pillar of Braskem's global business vision, which includes intensifying its research into renewable chemicals.



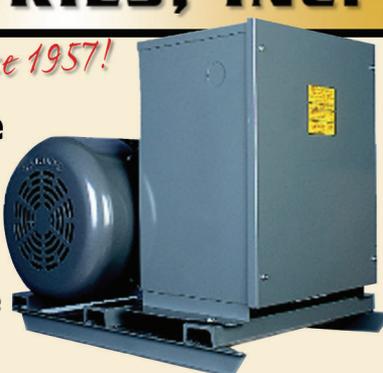
MSA will manufacture its V-Gard GREEN hard hat at the company's Murrysville, Pa., manufacturing facility located near Pittsburgh. The hard hat will be made available to customers in late September 2013.

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In addition to the system advantage, the benefits of the device include the easy, single-hand operation, the small size of the shock-resistant housing (approximately 18 cm), the long-lasting and fast-charging battery, the low weight (approximately 600 g) and the illuminated LCD display with intuitive user interface in several languages.

Furthermore, the OXYBABY® P offers the advantage of speed. Even at the maximum measuring range, measurements are provided in ten seconds or less. The integrated circulating memory captures the results for 500 measurements, and data transfer to a PC for further processing is possible via a USB connection.

“Measuring the gas concentration in pressurized lines: The mobile gas analyzer, OXYBABY® P, is the newest innovation from the German gas equipment manufacturer, WITT.” |—————

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Trunnions turn the tables on wasteful setups, allow actuator manufacturer to crank up productivity, hit part tolerances and eliminate WIP

Bolt-on trunnion tables help Indelac Controls reduce setups from six to two and cut cycle time by 40 percent, while delivering a 100 percent ROI in just days.

Upgrading machine tool technology – either by major retrofit of existing machines or purchase of new equipment – is often an expensive proposition requiring non-productive downtime and months or even years to realize a return on the capital expenditure. However, Indelac Controls discovered an easy way to boost production and maintain tight accuracy requirements for its electric actuator housings, while not breaking the bank on new machines or costly upgrades. The Northern Kentucky shop turned to a nearby source, TrunnionTables.com, for a workholding solution that had immediate impact on the shop's productivity, cutting cycle times by 40 percent and eliminating batch processing that required work in process. Bolt-on trunnion tables were installed in minutes on the fourth axis indexers of the company's two Haas VF4 vertical machining centers, producing a 100 percent ROI within days. The two machines now mill, drill, tap and even do light contouring on Indelac's 319 aluminum castings with 66 percent fewer part setups. Time-consuming part locating, previously required to meet accuracy requirements of 0.0005", was also eliminated without compromising part quality. "We were pleasantly surprised to see that something so simple could exploit the fourth axis on our machines and have such a dramatic impact on our business," said Bill Robinson, shop foreman for Indelac Controls. "We can now produce the same number of parts in a day that may have taken a week using our old methods."

Fewer Setups = More Parts

Florence, KY-based Indelac Controls manufactures a variety of electric actuators, including: quarter-turn, multi-turn, spring return and linear. The actuators are used in wastewater treatment facilities, power plants, refineries, pipelines, oil and gas exploration and a host of other process automation applications. Today's

actuators have advanced functions that go beyond simple open and close capability. Some are packaged with position sensing equipment, torque sensing, motor protection, logic control and digital communication. These hi-tech functions make accuracy of the housings critical to proper function, so Indelac has always produced its machined parts with an accuracy of 0.0005," though its process methodologies made this time consuming and labor-intensive. Indelac's need for accuracy required frequent indexing off of previously machined features using "homemade" fixtures, clamps and angle plates. "On top of everything else, locating on cast parts is more difficult because the surfaces can vary greatly from part to part," said Clay Huff machinist at Indelac.

Multiple part setups had driven cycle times at Indelac up to 50 minutes or more and parts were batch processed, created stage by stage over a series of operations. "Some of our housings require machining on all six sides, and with our previous workholding methods that meant six separate setups," said Huff.

Make More, Sell More

The abundance of applications for actuators creates consistent demand, and companies that can deliver quickly are able to build repeat business. To improve cycle times in its machine shop, Indelac turned to TrunnionTables.com, also in Florence, for a workholding solution that slashed setup time, maintained accuracy and boosted productivity. "I knew Stan Martin (president of TrunnionTables.com) and he came in and looked at our operation and immediately said they could help us," said Robinson. "We worked with Stan and his team to setup our VMCs with CNC trunnion tables and improved fixturing so we could produce these parts in a maximum of two setups. The tables transformed our manufacturing process the minute we got them on the machines."

Indelac purchased two custom-made tables and four fixtures from TrunnionTable.com, as well as a standard model Stallion 9X23 – a double-sided table with quick-change plates – that is compatible with most vertical machines. The quick-change plates allow one-minute changeovers and 0.0005" repeatability.

The new trunnion tables and fixtures use locator pins to position and hold the part, ensuring part-to-part consistency and hitting Indelac's high accuracy standards with less effort. Huff routinely checks every fifth part with a CMM to close the quality control loop. Fewer setups and part handling have made hitting the accuracy tolerance a faster, easier enterprise. "With the old fixtures we had to indicate repeatedly to make sure we had it right. My life is a lot less stressful now that we have the trunnion tables," Huff added.

With the new trunnion tables the company was able to implement continuous production and improve its cost-per-part numbers by decreasing manufacturing costs and increasing finished part production. "Our cycle time is down to about 30 minutes with the trunnions compared to 50 minutes or more with our old fixtures, and we get a finished part off every time we hit the cycle start button," said Robinson. "We've reduced cycle times and eliminated WIP, so if a quick-turn order comes in we can setup the machine, run the part and get it out the door."

A Small Investment with Big Results

Ninety percent of Indelac's parts can be run using the new workholding devices and the days of manual clamps, angle plates and plugs are over at the shop. "Compared to purchasing a \$300,000 five-axis horizontal machine, spending a few thousand to get the most out of our four-axis verticals is the deal of the century," said Robinson. "Sometimes the simplest, least expensive method produces the desired results and that's what we found with these trunnions."

Lincoln Electric Prepares For A Major Presence at FABTECH

Lincoln Electric is ramping up for a huge push at FABTECH. In addition to more than a dozen products being either launched or featured at the show, the company is showcasing several educational endeavors, and has scheduled an extensive press conference where it plans to tout the new offerings.

Here is a preview of just a few of the things you will see there:

FLUX

Lincoln Electric introduces Lincolnweld® 842-H™, a submerged arc flux designed to meet the specific welding requirements for the offshore construction industry. Great for typical offshore welding joints with narrow groove angles and heavy wall thickness, Lincolnweld 842-H has excellent slag detachability, superior bead profile and smoothness.

KEY FEATURES

- Ultra-Low Diffusible Hydrogen – Less than 3 mL/100g of deposited weld metal in DC and AC polarities
- Consistent Impact Toughness – Impact toughness capable of exceeding CVN values of 160 J (118 ft•lbs) at -60°C (-76°F) in the body and cap pass for consistent CTOD toughness
- Outstanding Bead Profile – Smooth bead profile with low entry angles especially desirable for cap pass welding in fatigue sensitive applications
- Excellent AC and DC Operation – High current capacity for single or multiple arc configurations
- High Operator Appeal – Excellent slag detachment and wash-out
- Robust Design – Allows for consistent deposit composition in a central recovery system

This neutral welding flux lowers the risk for delayed cracking and is capable of exceeding impact toughness requirements at -60°C (-76°F) and Crack Tip Open Displacement toughness at -10°C (14°F).

SPIRIT II

The new Spirit® II Series plasma system from Burny Kaliburn, a Lincoln Electric company, features FineLine™ high definition plasma cutting technology that delivers excellent cut quality over the entire consumable life at low costs. The system does this by achieving minimal part taper over the life of an electrode. When paired with Burny Kaliburn's proprietary UltraSharp™ Hole technology, the system also delivers exceptional hole quality.

This family of Spirit II plasma cutting and marking systems features three amperage options: The 150-amp Spirit II 150 has the ability to pierce most metals up to 1 in (25 mm) thick, with a maximum capacity of 1.5 in (38 mm). The 275-amp Spirit II 275 can pierce most metals up to 1.25 in

(32 mm) thick and has a maximum capacity of 2.5 in (65 mm). The 400-amp Spirit II 400 is able to pierce most metals up to 2 in (50 mm) thick, with a maximum capacity of 3 in (75 mm).

All Spirit II models deliver precise, square, dross-free cuts with 2° or less cut-edge bevel, using up to 78 percent less plasma gas than the competition. Operating costs are also controlled by using the same consumables to cut and mark. All provide

these additional features and benefits:

- Impulse Start Technology™ to eliminate high frequency starting.
- Fully automated or manual process control.
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- Automatic setting of process parameters to provide ease of operation.
- Advanced torch technology for a stable plasma column and optimized plasma gas flow.

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- Optimized nozzle design for dominant convective heat transfer that results in longer nozzle life
- Separate gas control for plasma cutting and marking through a CNC output, serial link or manual selection

Advanced Module

With customer expectations and industry demands growing, investing in advanced waveform control is essential.

The Lincoln Electric Company introduces the Power Wave® Advanced Module to increase flexibility for manufacturers by expanding their welding capabilities. The module has alternating current (AC) welding capability to run aluminum processes. “We understand what goes into producing a great weld, so we know the importance of having flexibility,” said Matt Albright, product manager for welding equipment, Lincoln Electric. “The Power Wave Advanced Module provides customers with a solution to increase weld process control by expanding their welding capabilities.”

The new welding system module performs several welding processes – shielded metal arc, metal inert gas (MIG), pulsed MIG, tungsten-electrode inert gas (TIG) and Surface Tension Transfer® (STT®). With STT welding capability, the module can also help welding open root gaps with high frequency inverter technology.

STT is a controlled MIG short circuit transfer process that uses current controls to adjust the heat independent of wire feed speed, resulting in superior arc welding performance, good penetration, low heat input control and reduced spatter and fumes.

The Advanced Module reduces burn-through and increases wire feed speed and cleaning. Also, it incorporates a high frequency starting mode that can

be controlled at the wire feeder or power source user interface. The careful use of high frequency starting can improve the appearance of TIG welding arc starts and helps to reduce contamination caused by scratch starts.

RANGER 305G

Lincoln Electric introduces the K3928-1 Ranger® 305 G EFI, combining a powerful multi-process engine-driven welder with a Kohler® 25-hp electronic-fuel-injection (EFI) engine. A new option to the standard Ranger 305 G with a Kohler carburetor engine, the EFI-engine product provides easier starting in cold weather – no choke to adjust – as compared to the carburetor engine. Another advantage of the EFI engine over its carburetor counterpart: fuel savings of 12 percent at 300 amps and 30 percent at high idle.

Ruggedly built for solid performance, the K3928-1 Ranger 305 G EFI tackles stick, TIG, wire and pipe welding. It includes Lincoln Chopper Technology®, providing simple starts, a smooth arc, low spatter and excellent bead appearance.

KEY FEATURES

- Electronic Fuel Injection – The Kohler 25-hp EFI engine delivers easier starts in cold weather and lower fuel use.
- Multi-Process Welding – Excellent DC multi-process welding capability makes it ideal for various processes, including general-purpose stick, downhill pipe (stick), TIG, cored-wire, MIG (CO2 and mixed gas) and arc gouging.
- Digital Weld Meters – This technology simplifies precise preset of procedures and monitoring of actual welding output.
- Superior Arc Performance – Lincoln Chopper Technology provides easy starts, a smooth arc, low spatter and excellent bead appearance.
- High-Watt Generator Power – Its single-phase AC generator provides 12,000 watts peak for motor starting and 9,500 watts of continuous AC power for tools.

Even with its advanced capabilities, the K3928-1 Ranger 305 G EFI remains simple to use, and a flip-down door on its straightforward control panel keeps less frequently used controls out of the way.

VIKING HELMET

The new, lightweight VIKING™ 1740 Series Auto-Darkening Welding Helmet from Lincoln Electric offers a variety of features designed to reduce the cost of ownership while providing solid protection from a basic helmet.

Weighing in at a mere 18.6 ounces, this entry-level helmet series features solar power with battery assist, eliminating the need for an on/off switch. A continuously variable internal 9-13 shade control offers sensitivity adjustment for different welding environments and features adjustable delay time from a dark to a light setting.

The 1740 Series helmet is offered in black and includes a two-year parts and labor warranty. It is also magnifying ‘cheater’ lens and hard hat compatible. Extra cover lenses are included - two for the inside and five for the outside.

ROLL CAGE GLOVES

New Roll Cage™ Welding and Rigging Gloves from Lincoln Electric deliver complete hand protection for both welding and rigging, which eliminates the need for two separate pairs of gloves for each task.

Rugged, dual-purpose Roll Cage Welding and Rigging Gloves are ideal not only for welding and rigging, but also for cutting and grinding.

Designed to withstand tough environments, the gloves are constructed with durable fire-resistant cowhide and sewn with Kevlar® thread, then enhanced with segmented high temperature-resistant silicon pads

for knuckle protection. The finger-structure design enhances grip and durability.

The gloves offer numerous safety features, including an overlaying layer that reinforces high-wear areas of the palm; inside lining that helps protect against cuts; and a longer-length cuff that guards wrists and forearms against heat and sparks. Fire-resistant Velcro® wrist guards secure the gloves while allowing for quick removal.

ELECTRIC WELD SEQUENCER

A welding fabrication blueprint on large, complicated parts can be difficult to follow because it's two dimensional

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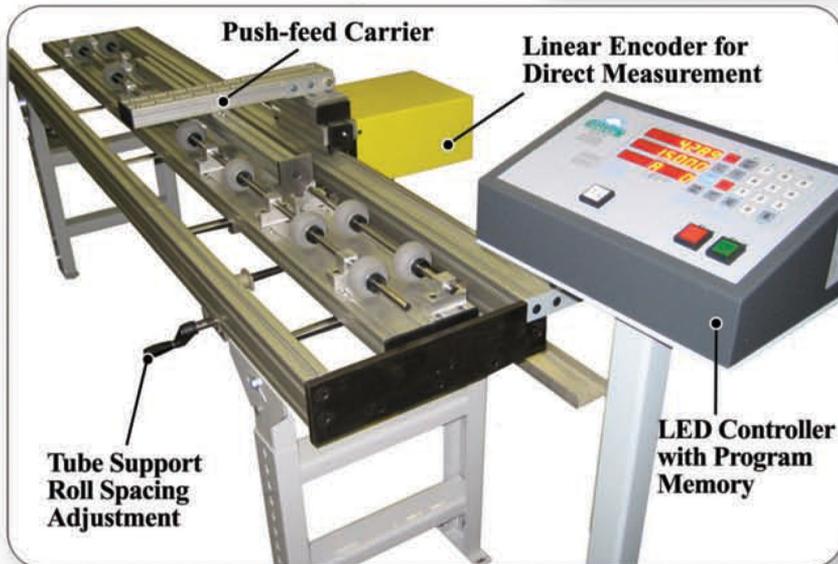
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showing many welds throughout. The new Weld Sequencer from The Lincoln Electric Company shows a picture and explains where to add the welds step-by-step.

“With costs to manufacture so high, there is no room for waste in the process stream,” said Matt Albright, product manager for welding equipment, Lincoln Electric. “We are providing welding operators with a simplified view to gain productivity and improve quality.”

The benefits of the Weld Sequencer include the following:

- The welding power source parameters, such as voltage, wire feed speed and others, are automatically set for each discrete weld, helping to ensure that the operator performs an optimal weld on the part.
- Because each weld may be best performed using different weld parameters, it is sometimes difficult, time consuming or perplexing for the operator to manually make these changes at the machine or wire feeder. The Weld Sequencer makes the parameter changes automatically and tracks the operator’s action to confirm that each weld was performed.
- The Weld Sequencer tracks time, wire feed speed, voltage and other parameters while comparing against the predetermined optimal path. Then, the actual performance is scored, which helps to determine if the part was correctly assembled.
- The software includes the ability to monitor additional control issues, including badge scanning confirmation, correct consumable confirmation and other functions.

PRO ROBOTIC TOUCH GUNS

Now with Air Blast, Wire Brake and Ready-Pak® models, Lincoln Electric’s expanded line of Magnum® PRO Robotic Torches provides consistent arc, industry-leading expendable life and an easy-to-maintain design for delivering dependable, high-quality welds and a long service life in automated MIG, pulsed MIG and flux-cored welding. These guns are ideal for industrial fabrication, heavy equipment and automotive manufacturing applications.

Both the Thru-Arm Air Blast and Wire Brake capable models enhance weld

quality and extend expendable life. The Air Blast feature introduces a pulse of high-pressure shielding gas to dislodge spatter and other foreign materials at the nozzle to ensure uniform gas coverage and superior weld quality. The Wire Brake feature uses a pneumatic clamp to hold the wire in place as the robot changes

positions, maintaining stickout to prevent weld inconsistency.

New Ready-Pak options streamline the ordering process. Models available with the Thru-Arm Ready-Pak, the K3359-XX series, come pre-packaged with a gun tube, liner and expendables.

All Magnum PRO Robotic Guns are air cooled and rated at 550 amps at 100 percent duty cycle. They feature single tool center points (TCP), robust cable systems, simplified expendable parts selection, HexConnect™ gun bushing for better electrical conductivity through full-face contact, and an extended-reach mounting bracket that optimizes clearance in tough-to-reach welding applications.

EDUCATION SERIES

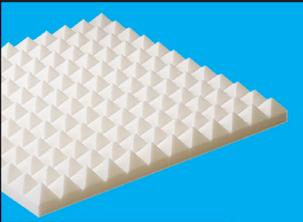
Robotic Welding Lincoln Electric is proud to offer the ‘Putting The Right Skills in the Hands of Our Students’ promotion. Choose between a FREE Miniflex® Portable Weld Fume Control System (230V input) or a \$2000 Discount on the purchase of a new Robotic Welding Education Cell during this exciting promotion. The Robotic Education Cell is a complete, mobile welding training system designed to demonstrate, develop and teach the proper techniques, programming and robotic welding

skills. The promotion runs through December 31, 2013 and is only eligible with the purchase of a NEW Robotic Education Cell.

Manufacturing has transformed into an exciting environment with advanced equipment and technology driven by automation and robotics. Today’s workforce is challenged to accelerate skills and knowledge to meet the growing needs of manufacturing. “Globally, one in three (34%) employers reports experiencing difficulties filling positions due to lack of available talent” (Source: <http://us.manpower.com/us/en/multimedia/2011-Talent-Shortage-Survey.pdf>). Industry continues to implement industrial robots to achieve higher productivity and quality and skilled robotic jobs continue to grow. To resolve and address this issue, Lincoln Electric is focused on developing programs and solutions to support education and industry to assist in bridging the skills gap.

“A Robotic Education Cell offers the opportunity to teach skills required for advanced manufacturing today in a va-

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riety of environments, from a classroom to a lab to a recruitment event”, states Deanna Postlethwaite, Business Unit Manager at Lincoln Electric. The International Federation of Robotics (www.ifr.org) identified that in the next eight years, it is projected that 2.5 million jobs will be created by robots (http://www.ifr.org/uploads/media/Update_Study_Robot_creates_Jobs_2013.pdf). “Due to the forecasted expansion in robotic positions, it is imperative to ensure we educate the workforce to meet the skills manufacturing and fabrication need today and in the future to keep US manufacturing productive and competing on a global scale.”

Virtual Reality Project Lessons

Lincoln Electric is pleased to announce the release of a new and exciting supplement for welding training.

The initial release of Lincoln Electric's Project Based Lessons for the VRTEX® welding training systems is a set of projects or lessons that can be implemented into a welding curriculum that exists today. The projects are designed with reference and ties to the educational common core standards as well as the American Welding Society SENSE standards. Available at FABTECH on November 18-21, 2013, Lincoln Electric will present and make available for sale, the first release (part number K4057-1) of this new program.

VRTEX welding training systems have proven that welding education is more effective and efficient with a blended training approach. Hands on welding training combined with virtual welding training provides an opportunity to practice, develop and refine proper welding body position and technique as well as learn from student interactions and collaboration.

Project based learning is an effective educational model that allows students to benefit from:

- Solving complex problems in a multi-disciplinary approach
- Utilizing fundamental skills (reading, writing, and math)
- Incorporating 21st century skills (teamwork, problem solving, research gathering, time management, information synthesizing, utilizing high tech tools)

- Targeting multiple and various styles of learning
- Motivating students with technology and engaging learning processes

The VRTEX product line offers the most realistic welding visual and audio feedback to allow students to learn welding technique in a simulated environment. The VRTEX® 360 takes best-in-class virtual welding training to a new level providing a realistic, retractable SMAW device, tube and pipe welding as well as additional common joints, a flexible and all position table and stand and the eXtensions™ software program which offers an ongoing set of expanded features and functionality including additional material types, joints, instructor analysis, testing tools and much more! The VRTEX® Mobile, takes virtual welding training on the go. This portable design brings the benefits of the VRTEX® systems to mobile welding training, recruiting and career fairs, community outreach programs, evaluation and screening as well as much more. The ingenious packaging offers the ability to store the table top stand, helmet, coupons and assorted items inside the mobile machine for quick and easy transportation of virtual welding training where you need it.

Welding Lessons Book

With technical careers in robotics undergoing rapid advancement and growth, it is vital that welding educators implement robotics and automation in a dynamic curriculum.

Training courses should be engaging and give a true representation of the demands of an advanced manufacturing career pathway and the tools used. With this in mind, Lincoln Electric has published the first edition of Robotic Welding Project-Based Lessons for use with Lincoln Electric robotic welding training systems, such as the Robotic Welding Education Cell 2.0. This new textbook is part of Lincoln Electric's commitment to workforce development and closing the skills gap.

These new lessons provide an interactive approach learning by emulating the real-world use of robotics in production welding. The material enhances students' overall learning experience, providing exercises designed to develop students' problem-solving and decision-making

skills. This book can work seamlessly into existing welding robotics training programs as a supplemental material.

This versatile teaching tool is suitable for varying educational needs. For an educator or instructor, project-based lessons allow the instructor to use lessons plans that are developed with today's systems in mind. For students, the coursework empowers them to follow the project, develop complex learning skills, work collaboratively and learn hands-on with a real welding robot. Lessons are applicable for a wide variety of student audiences, ranging from high school students to advanced welding students, to robotic programming classes and more. The overarching goal of the program is to improve training in welding robotics and programming and shorten the learning curve for students when they hit their first job site.

The book's 13 lessons present students with a manufacturing process and task them to improve it. These lessons identify objectives, outline material used, provide step-by-step instructions and also offer discussion questions aimed to challenge students throughout the learning experience. As the students work through the book, they will be exposed to various joint types and welding processes. Upon completion, they will gain the knowledge needed to create a faster, more-advanced manufacturing process in any given situation.



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