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- Vacuum Impregnation Sealing
- Methodology of Crimp Validation



Genco Industries

By Fred Noer

Although the Great Recession inflicted trauma on the U.S. economy and society, the period did serve to educate and enlighten people and transform companies. Paul Lusic and Genco Industries, where he is general manager and vice president, are among them.

Genco, located in Waukesha, Wis., approximately 20 miles west of Milwaukee, is a contract manufacturer of cus-

tom cable assemblies, wiring harnesses and electromechanical assemblies for OEMs, many of them ranked in the Fortune 500. The company also does wire processing.

“I would say the recession helped our company overall,” said Lusic, 36. “We came out stronger than most companies in our industry and in general. We do more with less, and we’re more efficient. Yes, we lost people along the way, but it solidified us as a group as we’re all in this together.”

The Genco staff consists of 26 people



As part of Genco’s lean manufacturing efforts to eliminate waste, shared tools and hand crimpers are organized and must be checked in and out for each use.

– 18 in production and eight in management. Before downsizing in 2009, total staff members numbered 42.

While the recession was an imposing challenge for Lusic, he had to deal with another one, more significant in terms of Genco’s long-term viability, when he arrived at the firm just after Steve Dom-

brock, Lusic’s stepfather, bought it in July 2006. They learned a large customer, representing 20 percent of Genco’s total sales, was leaving, a fact not known to them before the sale.

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The Methodology of Crimp Validation

By Keith Nicholas
TE Application Tooling
Electrical Controls Manager

A good crimp is one that exhibits optimum mechanical and electrical properties. The mechanical properties help ensure that the crimped harness survives its post-crimp handling and long-term stresses such as vibration or jarring that occur during its lifetime. The electrical properties include the current carrying capacity and its termination impedance. To achieve these optimum properties, everything in the crimping process must be correct. That’s a tall order when you consider everything that can influence the crimping process, but if you understand it, then you’re doing better than most. If everything is understood and correct in the crimping process, you can be more confident that the final crimped product will meet quality



Keith Nicholas

expectations. But, how do you know you have a quality crimp? It starts with understanding your customer’s requirements, be they industry specifications or

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Vacuum Impregnation Sealing

A Hidden Opportunity for Wire Harness Manufacturers

By Joe Tito
Wiring Harness News

Among the exhibitors at the recent WHMA show, an aquarium was on proud display. But there was nothing fishy going on at the Magna Tech booth. They were simply demonstrating the wire sealing ability of their Enviroseal™ technology. The display featured two jacketed cable assemblies with a small amount of air pressure applied to each. Air bubbles were visible on one of the assemblies revealing the leak path that existed between the jacket and the individual wires. The other sample was treated with Magna-Tech’s Enviroseal vacuum impregnation sealing technology, and had no air bubbles passing through the sample.

Chris Russell, VP Sales and Marketing for Magna-Tech, was on hand to explain the Enviroseal process. It all starts with a need. Russell noted that small voids and leak paths are inherent in most harness assemblies. These leak paths, he noted, allow the introduction of moisture, salt spray, oils, and other corrosive agents; and can ultimately lead to part failure. Russell touted Enviroseal as a robust and economical solution to the problem.

Vacuum impregnation technology has been around for about 60 years, and

was initially developed to seal voids in porous metal castings, and powdered metal components. The process was adapted for electrical wiring components in the early 90’s, and is rather simple. Cable assemblies are placed in baskets that go in a pressure chamber where a vacuum is drawn. A special liquid resin is introduced, and the chamber is then re-pressurized. The vacuum release forces the resin into the voids, or leak paths. Russell compared it to squeezing a sponge, submersing it in water and then releasing it. In this scenario, the natural capillary action would fill the voids in the sponge with water. That’s essentially what is done with the assemblies, “and the void that was starved of air is now filled with the resin,” he explained.

At this point, the baskets of assemblies travel through several rinses to remove any excess resin from outside surfaces. The remaining resin filling the voids is left to cure to a flexible, thermoset, irreversible form. There is no change in the appearance or dimensional attributes of the component. The resulting resin seal is robust and resistant to contaminants like moisture, salt, glycols, oils, chlorinated and fluorinated solvents, and mild caustics.

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Dear Readers,

It sure seems like a long time since we've seen and/or felt the warmth of the sun but Spring is finally here. What a relief! The rain has left our creek sparkling in the sun. Every morning I have my cup of coffee and look at the peaceful scene and then in a flash Belle our labradoodle, is chasing the Mallard ducks up and down the stream and the peace is no longer. Dogs and water - what a combination!

The WHMA conference was a record breaker - increasing attendance by 20 percent. The association continues to grow, providing members with cutting edge improvement strategies and offering members a chance to network with suppliers and other wiring harness and cable assembly manufacturers.

At the Electrical Wire Processing Technology Expo, Keith Nicholas of TE Connectivity presented a seminar on "The Methodology of Crimp Validation" which was published in the March/April issue of WHN - but due to an editorial error the presentation was not published in its entirety. Keith has graciously allowed me to present it to our readers again - but this time you have "the rest of the story!"

Look for coverage of the Electrical Wire Processing Technology Expo in the July/August issue.

Please update your records to email all press releases, ads and/or ad changes to my new email address: mjmagowan@yahoo.com. When I receive ads and/or ad changes I will send you a confirmation.

Thanks everyone and have a great summer,

Marilyn

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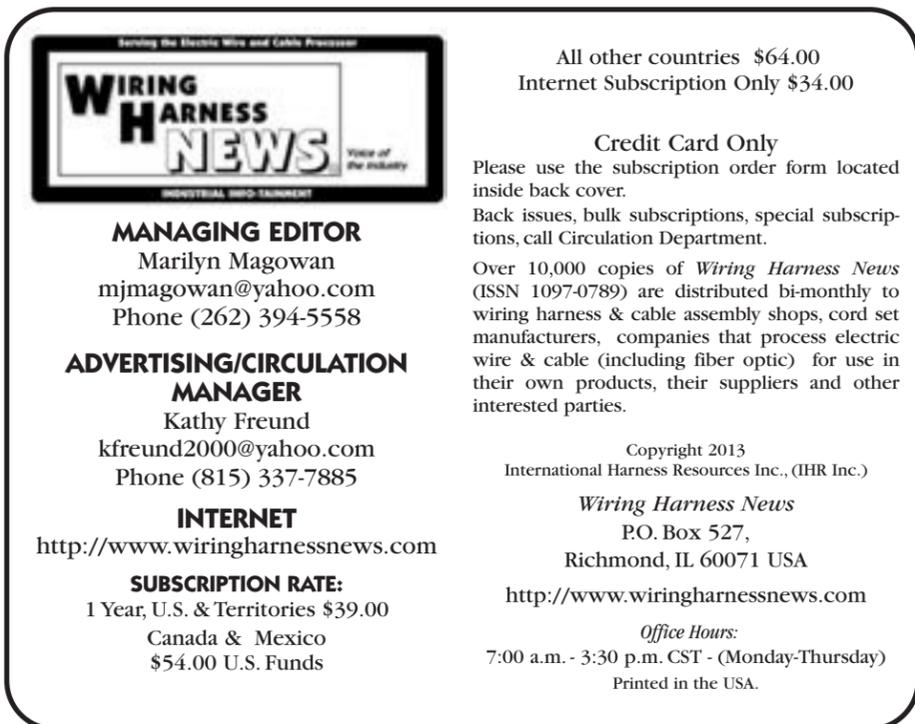
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My Favourite "I" Words

By Paul Hogendoorn



Paul Hogendoorn

"Innovation" is one of my favourite "I" words, but it's not my most favourite - it doesn't even make the top three. It is one of what I consider as being in the middle three "I" words. It's in a group just behind the top three, and just ahead of the bottom three.

So here are my favourite "I" words, starting with the bottom three: "Income", "Incentive", and "Industry". These are the desired outcomes from all of our working, business development, and entrepreneurial efforts - it always comes down to one of these three words. It's the fruit of our labour or the return on our investment. It's what pays the bills and causes us to go to work each day, whether we enjoy our job or not. Individually, it's the generation of income. Collectively, it's the creation or propagation of industry.

"Innovation", "Ideas" and "Improvement" are the middle three. These are the words that we credit for the success of our income generating activities, and our industries too. We have come to learn that we can't keep doing things the same way we used to, or the same way that other people do them, because if we did, we would eventually fail. In North America, we will never win the price game, and good quality is already considered a given. Having a good prod-

uct, with good quality and good service is often not enough these days. It's only a matter of time before someone else recognizes your formula for success, and then they'll aim to deliver a product or service slightly better than you are delivering, or slightly cheaper, or with slightly better service. The only way to stay one step ahead is through new ideas, or innovation, or through a continuous improvement philosophy that encompasses more than just your production processes. Innovation and improvement require a constant supply of fresh ideas, and a commitment to investigate and sift through all the new ideas that come into

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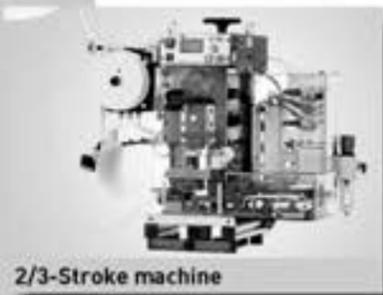
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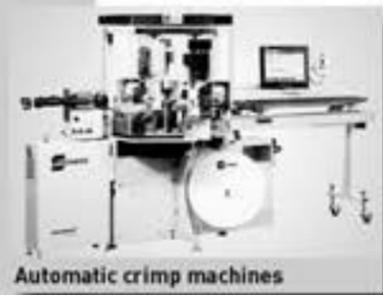
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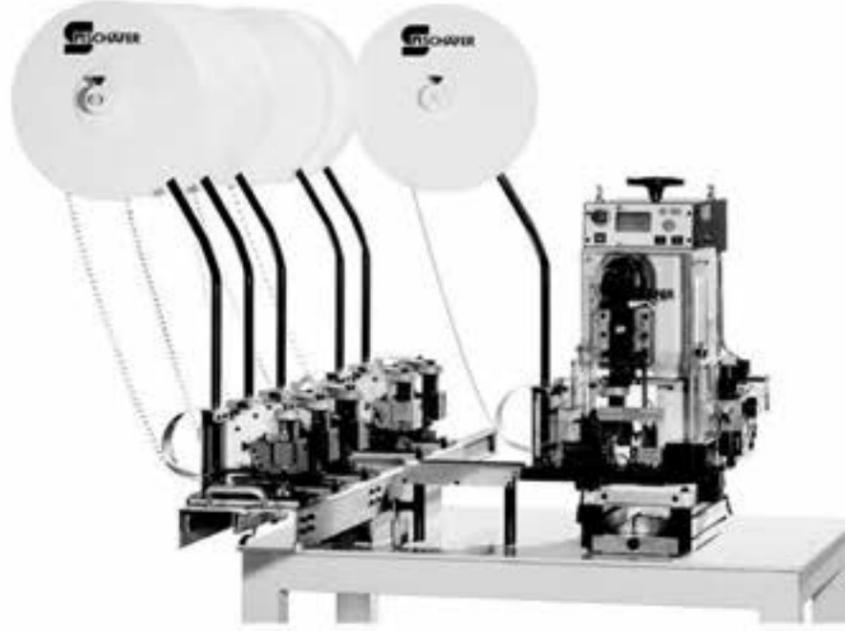
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My Favourite “I” Words

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the new idea hopper. Sometimes it astounds me how many companies I encounter that profess a commitment to “Innovation” and “Improvement”, but in practice are at best reluctant, or at worst adverse, to considering any new ideas that might change their current paradigms. In a world where manufacturing capacity exceeds demand (likely for the first time in history!), sustainability is not assured by continuous improvements or incremental innovation alone, because everyone else is doing those things too. Every now and then, we need a market making or game changing idea – and they come from the top three “I”s.

“Inspiration”, “Insight” and “Imagination”; these are my favourite “I” words. It’s where ideas come from – they come from some place magical. You can’t learn it, or teach it; all you can do is foster a culture and attitude that is receptive to it, embraces it, and has the courage and discipline to apply enough energy and resources to see what might happen with even just the wisps of those ideas. Inspiration is often defined as a divine influence. Insight is thought of as self-awareness, or having a clear perception. I think it’s both; it’s a matter of looking inside of yourself and being honest with what you see. Imagination is the ability to form new images that are not perceived through your regular five senses (your sight, hearing etc). New ideas come from the top three “I” words. When you see something and it trig-

gers a “that’s it!” sensation inside of you, that’s your insight alerting you and telling you to take notice. When something comes to mind that didn’t get to you through your five senses, it was formed in your imagination, or it was inspired into you.

I gave a talk once on “my favourite ‘I’ words” and was asked why I chose to group them as I had. The first response that came to mind was a slogan I had read elsewhere. It read “Conceive it; believe it; achieve it”. The conceiving of new ideas comes from the top three “I”s. When you believe it is when you improve or innovate, and when you achieve it is when your income happens and your company prospers.

It’s safe to say that in manufacturing today, our primary focus is on the bottom three “I”s of income, incentive and industry. When we are facing some pressure to change, we adjust our sights just a little bit and challenge our organizations to think about things like new ideas, improvement, and innovation. But to differentiate ourselves from all the other companies (remember, they also spend time on the middle three “I”s), we have to adjust our sights even higher, and start to tap into the power of the top three “I”s – my favourite “I” words.

Paul Hogendoorn founded TPI Associates, an organization dedicated to helping entrepreneurs and business leaders pursue their vision and build their companies. For more on this topic, please visit www.tpi-3.com or contact Paul directly at paul@tpi-3.com



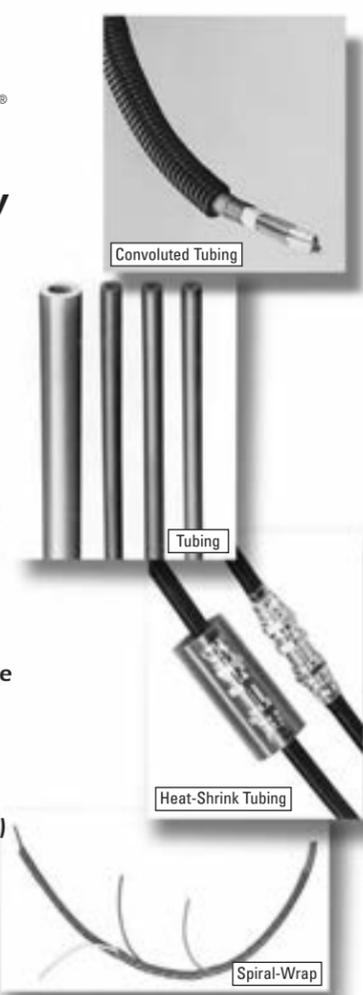
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Wire Harness Myths

Loren M. Smith, CEO
Blue Valley Capital

A myth is an often-repeated story, which becomes a widely held belief that may have absolutely no basis in fact. There are many myths surrounding the wire harness industry. Here are 5 wire harness myths I will attempt to dispel in this article.

1. The industry drives gross margins to levels (i.e. 18%) that make it difficult if not impossible to achieve a respectable bottom line.

2. Harness companies with strong customer concentration (high percent of revenue with very limited number of customers) are very risky.

3. Wire harness manufacturing is a "me too" business with no technological content.

4. Small (under \$10 Million revenue) harness manufacturers are at a strong disadvantage compared to much larger harness companies, and thus should not be considered viable sources for OEM's.

5. Wire harnesses produced with US labor simply can't compete with much cheaper foreign labor.

Why should anyone care about these wire harness tales?

When these myths create a barrier to the interest of your wire harness company, you care.

Facts abound to refute all 5 of these widely held mythical beliefs about our industry.



Loren M. Smith, CEO
Blue Valley Capital

1. *The market drives gross margins to levels (i.e. 18%) that make it difficult if not impossible to achieve a respectable bottom line.* It's true that many of the markets wire harness compares serve drive gross margins to the high teens (gross margin is what you have left after paying for direct and indirect labor, factory overhead, and material). When you are operating with an 18% gross margin, unless your operating expenses (or administrative expense) are very thin (5 to 8 percent), you will indeed have a dismal bottom line. The degree to which harness companies can make this model work is highly variable, and in my experience follows the normal distribution curve. There are many harness owners who are able to operate with very impressive bottom lines despite relatively

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low gross margins, while some harness companies just get by. The difference between those who make serious money and ones who do not is not a function of the harness business, and relates strictly to the skill the owner and his or her management team. It's this difference that drives the bottom line, not the wire harness business per se.

2. Harness companies with strong customer concentration (high percent of revenue with very limited number of customers) are very risky. Small or medium size wire harness businesses often have very strong customer concentration. i.e. a high percent of revenue with a few customers. Here's a fact that refutes this myth: a wire harness company with 2 customers accounting for 80% of their revenue sold for 6.5 times EBITDA. This multiple is the very high end of the spectrum for manufacturing companies this size. (This company had revenue of \$23M). Why did a sophisticated financial buyer pay an exceptional multiple for this company with such high customer concentration? The buyer took the time to understand the value of this company's customer relationships; he saw the exceptional level of mutual dependence, i.e. the degree to which these customers relied on this wire harness supplier. He saw just how difficult it would be for both of the company's big customers to change harness sourcing, and he saw that these customers were world class OEM's with huge growth potential. Other buyers looked

at this company, saw the customer concentration and ran the other way. In this sense myths are like prejudices; when someone holds an opinion based on prejudice, it's very difficult to change their view.

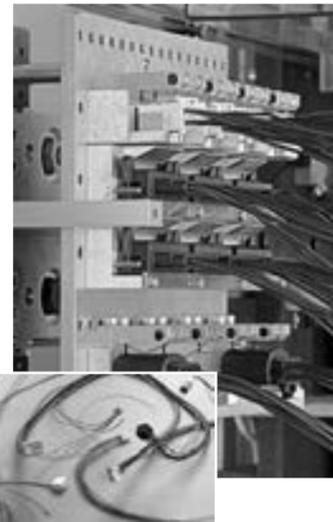
This example is not an isolated case; I have put together a number of harness sales with similar high concentration achieving a similar result.

3. Wire harness manufacturing is a "me too" business with no technological content. Tell this to an OEM whose end product sells for a million dollars; his million dollar machine will not work without a functioning wire harness, and his million dollar machine must function for x number of hours without a failure. When you understand the number of ways a wire harness can fail, you understand a wire harness might not be a patentable semiconductor, but it's not a low-tech product.

4. Small (under \$10 Million revenue) is a strong disadvantage compared to much larger harness companies, and thus should not be considered viable sources for OEM's. Some large users of wire harnesses will not deal with suppliers whose revenue is less than some arbitrary number, thus showing bias toward large companies. There are many small wire harness companies whose cost structure and technical competence

Continued on page 10

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Wire Harness Myths

Continued from page 9

(ability to help their customers with design) is equal to or better than many larger harness suppliers, and, better yet, they are much more nimble (able to change on a dime). Universal access to leading edge software, cutting/terminating equipment, and JIT material vendors has leveled the playing field, substantially enabling small harness companies to effectively compete with any of the big boys.

5. Wire harnesses produced with US labor can't compete with cheap foreign labor. If this were true, there would be no harness manufacturing in the US. But the facts simply do not support this. In the Midwest alone, there are at least 20 wire harness manufacturers with combined revenue of several hundred million dollars. These companies

serve customers who have all looked at harness procurement from non-US labor markets. If it made sense for them to source outside the US, they would have done so.

In many respects the wire harness business is a poster child for US entrepreneurial ingenuity. With the exception of very large automotive and appliance harness suppliers the industry is comprised of very competent entrepreneurs who know how to serve their niche markets. When harness myths create barriers for harness companies who wish to sell their business, find financing, or penetrate a new customer, it's possible to overcome these myths, but it requires a creative approach to describing your business model and the value you provide your customers.

Loren Smith can be reached at lms@blvcapital.com or by visiting www.bluevalleycapital.com

Calendar of Events

Page 58



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Pages 59-60

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Vacuum Impregnation Sealing

Continued from page 1

Although the basic process behind Enviroseal has changed little since the early 90's, the resins have achieved a much greater level of sophistication. In the early days, Russell noted "the resin wasn't as flexible as it is today, so we had issues with the assemblies being stiff." In recent years, however, much development has gone into the design of resins. The result, explained Russell, is a product that maintains a high and consistent level of strength and flexibility throughout thermal cycling. Temperature capability of the treated wire or assembly is from -40° to 177° C.

Vacuum impregnation sealing can really be done at any step of the assembly manufacturing process. Russell noted Magna Tech's ability to seal a simple length of wire, a length that is cut and stripped, or a terminated assembly; whether crimped or soldered. "We can do the wire from the simplest stage of being cut only, to a complex, fully assembled wire harness," explained Russell, "and we have customers who send us product in each of those stages." He added that for practical reasons, a few customers have Magna Tech purchase bulk wire to cut, or strip, to specification. "That's mostly for our overseas cus-

tomers who don't want to deal with the logistics of moving the wire around," he said.

Of obvious concern was whether wire sealed with this process requires any special processing. Russell stressed there is no difference in the way sealed wire is cut, stripped, or terminated. "It's interesting because the resin has some bond strength, so it moves with the jacket when you strip it back," he instructed. And because the resin that remains between the strands is flexible, he indicated no difference in the force required to crimp the sealed wire. He noted the only reason some customers send them wire that has already been stripped is not because they are concerned about getting the jacket off, "it's because that's where they feel comfortable pulling them out of the process and having them impregnated." And Russell stressed that there is no power or signal degradation using sealed wire.

Competing Technologies.

Traditionally, designers have sought the use of potting compounds to block leak paths in cable assemblies. Although this can be a viable solution, Russell revealed this method seals only the entrance to the leak path; whereas vacuum impregnation seals the entire assembly.

"Instead of coating or putting a patch over the leak path, we were actually eliminating the leak path altogether." And, he noted, the Enviroseal batch method translates to a more consistent process versus potting.

Another popular industry sealing technology is the use of silicon blocked wire. Silicon blocking is a type of wire manufacture where individual strands are twisted together along with a silicon blocking agent to prevent fluid wicking. Russell noted that the biggest benefit of silicon blocked wire is that it can be purchased by the reel and fed directly into production, without any interruption. He feels that blocked wire can be effective in 18 AWG and up sizes, but can be problematic in larger sizes. "It takes a lot of silicon to fill the void in a 12 AWG wire, and that silicon can literally be pushed out of the wire under pressure," he said. "My benefit over silicon blocked wire," he continued, "is we're using a cured resin to fill those voids from end to end; and testing we've seen shows it's a far more durable process to have those voids filled with resin versus silicon." He further cautioned that "General Motors doesn't allow silicon blocked wire in a transmission because the silicon can

Continued on page 13

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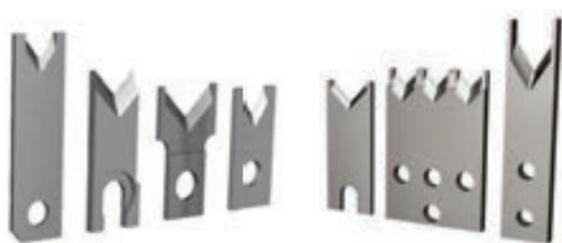
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NEWS PLUGS

Schleuniger, Inc. to Showcase Coaxial Cable Stripping Solutions at International Microwave Symposium

Schleuniger, Inc., a leading international manufacturer of high-precision wire processing machines, will exhibit equipment from its line of coaxial cable stripping machines at the 2013 International Microwave Symposium.

This annual international meeting is the premier event for anyone involved in all aspects of

microwave theory and practice. The exhibition will be held June 4-6, 2013 at the Washington State Convention Center in Seattle, WA and will feature over 550 exhibitors, representing state-of-the-art equipment in all segments of the microwave community. Schleuniger will be at booth #1837 providing hands-on demonstrations of innovative solutions for processing coaxial cable.

Coaxial cable is used in a variety of products serving many different markets. It is used to carry higher frequency signals from point A to point B with minimal signal loss and degradation.

Schleuniger offers a complete range of semi- and fully automatic machines for stripping coaxial, micro-coaxial, triaxial as well as semi-rigid cables. The patented



Schleuniger CoaxStrip 5200

rotary stripping and cutting concept in each of these machines ensures the precise and repeatable stripping quality Schleuniger is known for.

As part of the exhibition, Schleuniger will demonstrate the newly released CoaxStrip 5200, a semi-automatic, multi-step stripping machine for coaxial, multi-conductor cable and single conductor wire. Thanks to the universally designed blades, centralizers and clamping jaws, the machine can process a full range of cables without the need for mechanical adjustments, saving the user valuable time and increasing output when switching between applications.

As the newest member of Schleuniger's line of coaxial cable strippers, the CoaxStrip 5200 also offers user-friendly features such as easy access to the LED lit working area, color touch screen and an intuitive, menu-driven data input system that allows cable programs to be created, saved and recalled quickly, ensuring consistent, repeatable results each time.

Additional machines in Schleuniger's line of coaxial cable strippers include the CoaxStrip 5300, CoaxStrip 5300 RX, CoaxStrip 5400 and CoaxStrip 5500.

More information about these products can be found at www.schleuniger-na.com. Should you have any questions, please e-mail sales@schleuniger.com or call (603) 668-8117.

Schleuniger is one of the globally leading companies for wire processing solutions and is specialized in high precision stripping & crimping technology.

Manufactured in Switzerland and Germany, Schleuniger machines and equipment are used in various industries and markets all over the world.

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Vacuum Impregnation Sealing

Continued from page 11 _____

leach out of the wire and contaminate the transmission fluid." He also mentioned that the price of vacuum impregnated wire and silicon blocked is "penny for penny, about the same."

Vacuum impregnation of wires and assemblies comes at a relatively low cost. "The beautiful thing about what we do is it's inexpensive," said Russell. "For the amount of risk we remove, I've never had a customer say, 'we would really like to do this, but it's just not cost effective.'" It's the nature of the large batch process that makes the piece cost so low, he instructed. He cited one example saying, "In just one of our 20 systems, I could run a 12 AWG wire, cut to a 20 inch length, at 5000 per basket, at a rate of 2.5 baskets an hour off our line." Some of those 20 systems are set up for metal castings, but since the technology is basically the same, those units could produce wire assemblies if needed.

Opportunity for a Harness Manufacturer

As manufacturers strive to become more involved in the design process, Russell thinks there is great value in awareness of Enviroseal, and vacuumed impregnation in general. "Some of the bigger harness manufacturers are now designing these harnesses," he said. "Companies like GM are approaching the manufacturers saying 'we have an idea of what we want this to do; you need to design the harness.'" That's where he is confident that knowledge of the Enviroseal process will add value to industry members. Russell is making it a point to educate the industry through lunch-and-learns at OEMs while also

focusing attention on harness manufacturers. Through these efforts, he has made this observation:

My belief is that the wire harness manufacturers are a great resource for growing this business. They're the ones now being required to develop based on the design. If the folks designing that product knew that the vacuum impregnation technology existed, I believe they would have looked to it as an alternative to other sealing technologies. Where we struggle is when a customer says 'Where we're you guys two years ago when we designed this, because this would be a much better fix than what we have today.'

Magna Tech has developed a great deal of confidence in their ability to seal a wide variety of harnesses that are required to withstand many types of harsh environments. Russell pointed to several connector and harness manufacturers currently using this technology including Amphenol, Siemens, GM/Delphi, Polaris, John Deere, Harley-Davidson, Caterpillar, Polaris, and Navistar. "We actually have a couple of applications that go out to Toyota and Hyundai," he added. In some of these cases, Magna Tech is not the direct supplier, but Russell noted "we are on the print."

For more information about Magna Tech's Enviroseal process, you can contact Chris Russell directly at 765-284-5050 (ext. 130), or at crussell@magnatechmfg.com. Video and more detailed information on the vacuum impregnation process can be seen at www.envirosealmt.com.

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NEWS PLUGS continued



Thomas & Betts' iPad Application Provides Access to Electrical Industry Information

Thomas & Betts' new iPad application, T&B Mobile, provides full access to the company's wealth of product, application and industry information and insight, as well as distributor services, multimedia presentations and electrical industry news and information.

"The T&B Mobile application puts a wealth of valuable T&B information at your fingertips," said Chris Castleberry, vice president of marketing at Thomas & Betts. "Information about the products we manufacture, the solutions we provide and the markets we serve is available quickly and intuitively from an iPad. This application provides access to what makes T&B

unique in the industry: Its focus on identifying and solving the challenges that an enterprise faces with the operation and maintenance of its electrical system."

Once the application is downloaded, information, such as brochures, presentation materials and videos, is organized by markets, solutions and products, and accessible via simple touch and swipe navigation. Information about the Thomas & Betts Signature Service program for distributors is also available through the "Channels" button.

There are also links to building information modeling (BIM) objects, two- and three-dimensional models in computer-aided design (CAD) formats and the Floor Box Selector, which identifies the appropriate Steel City® or Carlon® floor box assembly for the specifications entered by the user.

For more information about the T&B Mobile application, send e-mail to tnbmobilesupport@tnb.com.



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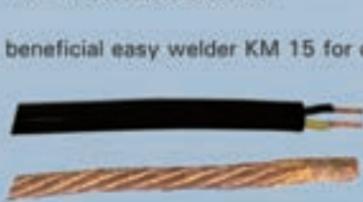
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In the Black: WAGO 2060 Series

A new, black housing for WAGO Corporation's 2060 Series SMD Push-Button Terminal Block helps ensure correct LED device wiring. Offered as a 1-pole unit (2- and 3-pole upon request), the black housing provides on-board "+" and "-" color-coding when paired with light gray 2060 Series blocks. Beyond clear inputs/outputs, the new block also offers WAGO-exclusive push-button terminations to streamline LED device assembly, e.g., downlights.

The new housing also supports higher-temp applications, such as high-output, outdoor LED fixtures for roadway and stadium lighting. The black 2060 Series features the same ratings as its UL/cUL Recognized siblings — 600 V (1-pole), 250 V (2- and 3-pole) and 9 A nominal current (all models).

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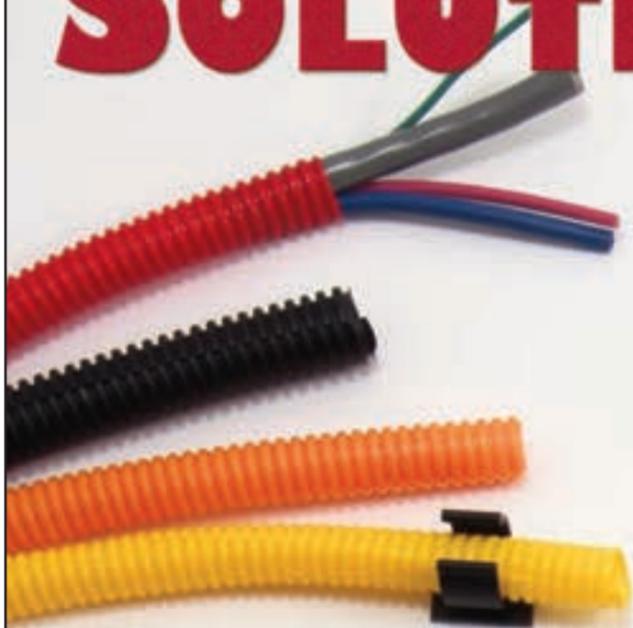
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NEWS PLUGS continued


Sonobond Introduces High-Performance Dual Head SpliceRite™ Ultrasonic Wire Splicer

Janet Devine, President of Sonobond Ultrasonics, announced that development of their high-performance Dual Head SpliceRite™ Ultrasonic Wire Splicer—the most recent in their SpliceRite™ series—resulted from Sonobond's pioneering efforts in the area of dual head ultrasonic welding technology. This ultrasonic equipment can reliably weld stranded copper wire bundles having cross-sections of 48 to 100 square millimeters. It even accommodates lightly tinned or oxidized wires up to 60 square millimeters without pre-cleaning. No other ultrasonic metal welder can accomplish these splices in a single pulse. These advantages make the Dual Head SpliceRite ideal for fast, dependable, cost-efficient ultrasonic splicing of the heavy-duty cables used in wire harnesses for cars, trucks, trains, industrial machinery, and similar applications.

Development of the Dual Head SpliceRite resulted from the company's earlier work on dual head ultrasonic welding technology for the automotive industry.

In the years between 2004 and 2008, Sonobond Ultrasonics was involved in a NIST ATP project with Ford Motor Company and others. At that time, the automotive industry was looking for ways to weld various aluminum alloys at sheet thicknesses up to two layers of 3 mm each. However, the available ultrasonic welder power delivery capabilities were limited. This necessitated a lengthy weld time that resulted in sticking between the welding tip and the aluminum. Sonobond began working on a solution. The result was the Dual Head Ultrasonic Spot Welder. This machine was able to bring power to the weldment from upper and lower tips and weld the desired thickness of metal in shorter welding times, substantially reducing tip sticking. The success of the Dual Head Spot Welder then encouraged Sonobond to look for a way to apply this technology to ultrasonic wire splicing, which led to the development of the Dual Head SpliceRite Ultrasonic Wire Splicer.

The Dual Head SpliceRite features two ultrasonic transducers and couplers, one above and one below



It requires only one pulse for the Sonobond Dual Head SpliceRite™ to weld stranded copper wire with cross-sectional areas of 48 to 100 sq. mm. No other ultrasonic welder can do this with a single hit.

the wire bundle. In addition, there is a set of pneumatically driven jaws that gather the wires tightly to a preset width. The upper tip then descends to complete the compressing of the bundle and ultrasonic power is applied. When the cycle has been completed, the jaws open so the wires can be removed. A support for the wire array can also be integrated into the tooling if necessary.

In commenting on this important advancement in ultrasonic welding technology, President Devine says, "Development of the Dual Head SpliceRite has enabled us to add yet another innovative machine to our line of cost-effective, environmentally-friendly metal welders that produce exceptional results. Like all our other ultrasonic metal welders, this

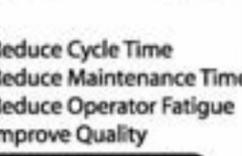
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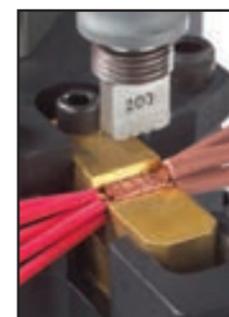
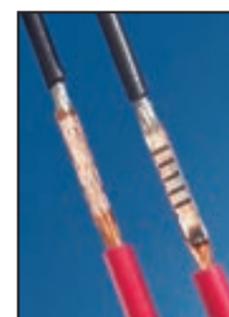
Sonobond uses the unique, patented Wedge Reed bonding system that combines high vibratory force and low amplitude coupling to deliver precise results every time. Our units are made in the USA and require only minimal operator training. Sonobond also goes the distance by providing the very finest technical support and customer service—before, during, and after installation.

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NEWS PLUGS continued

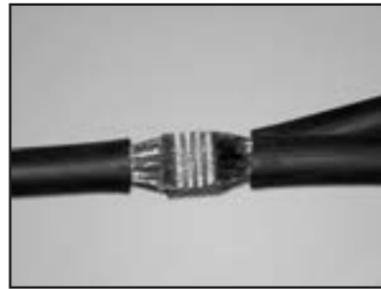


Continued from page 17

machine is made in the U.S.A. and, it can be operated easily with only minimal training.”

Ultrasonic welding is an increasingly popular method for assembling wire harnesses. This process creates solid-state metallurgical bonds that have high conductivity. It does this without producing arcs, sparks, or fumes and without melting the metals. This is especially significant in the case of the Sonobond Dual Head SpliceRite Wire Splicer with its two ultrasonic heads, one on each side of the welding area. As a result of this dual-head capacity, stranded copper wire—with cross-sectional areas of

48 to 100 sq. mm—can be welded with a single pulse. No other ultrasonic machine can equal this capacity with just one hit. Even tinned wires up to 60 sq. mm can be accommo-



Like all of Sonobond’s ultrasonic spot welders, the Dual Head SpliceRite™ uses the unique, patented Wedge-Reed bonding system of high vibratory force and low amplitude coupling. This permits splicing of most oxidized and tinned metal with one pulse and without pre-cleaning.

dated without pre-cleaning.

All Sonobond spot welders, including the Dual Head SpliceRite, use the unique, patented Wedge-Reed bonding system of high vibratory force and low amplitude coupling. Shear mode vibration, parallel to the welding surface, is utilized while the line of force is directly over the parts to be welded. This creates precise, dependable welds without bending stress or stalling. It is also enables most oxidized and tinned metals to be spliced with one pulse and without pre-cleaning. No other ultrasonic metal welding system can consistently weld oxidized or tinned surfaces.

The Dual Head SpliceRite features heat-treated, tool steel taper lock tips that can last for 100,000 welds or more. These are designed for quick tooling changes and help ensure fool-proof placement with no need to recalibrate. The equipment has a 3500-watt power supply with a micro-processor that stores and recalls up to 250 jobs. Welds can be controlled by height, by energy, or by time.

In 1960, Sonobond—then known as Aero-projects—received the first patent ever awarded for ultrasonic metal welding. Over the intervening 53 years, Sonobond has continued to enjoy a well-earned reputation for its pioneering work and quality-engineered products. Sonobond currently manufactures a complete line of ultrasonic welding and bonding equipment for firms in the automotive, appliance, solar, electrical, filtration, aerospace, medical, body armor, and apparel industries.

Sonobond recognizes that manufacturers and assemblers need to confirm that ultrasonic welding is appropriate for their specific application(s). So it offers a no-cost Ultrasonic Welding Viability Test. This gives companies the opportunity to submit their materials to Sonobond to have sample welds made. Once a manufacturer decides to introduce Sonobond equipment into its production process, every effort is made to ensure that this is accomplished in as seamless a manner as possible. Sonobond also backs its equipment with superior customer service and provides prompt, dependable technical support before, during, and after installation.

A short video showing this equipment in operation is available on the compa-

Does your Cable Tester:



Print a bar code label only if the harness passes?



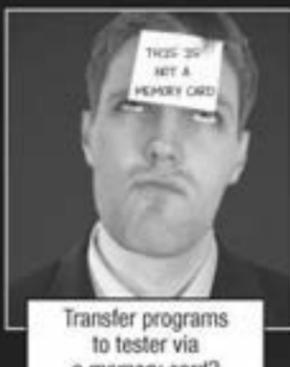
Restrict an operator from altering the program?



Identify the operator for labels and data collection?



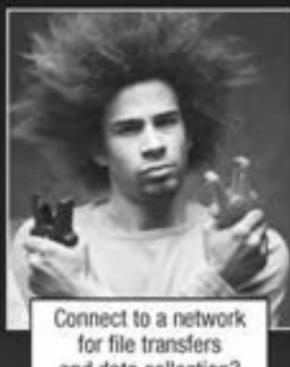
Verify the bar code label is applied to the harness?



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TEST SYSTEMS



ny's website at www.SonobondUltrasonics.com. This website has details about Sonobond's complete line of ultrasonic metal welders, as well as information on how to take advantage of the free, no-obligation Ultrasonic Welding Viability Test.

For questions or immediate service, please contact Sonobond's Vice President, Melissa Alleman, at MAlleman@SonobondUltrasonics.com or by calling 1-800-323-1269.

The Light Brigade® and iT Learning Solution Partner for Fiber Optic Training in Asia

The Light Brigade and iT Learning Solution (iTLS), a Singapore-based IT training company, have signed an agreement to prepare a global workforce for the rapidly growing need of experienced fiber optic technicians and managers in the fiber optic industry. The partnership expands iT Learning Solution's world-class IT training portfolio to include fiber optic training provided by The Light Brigade and in turn, broadens The Light Brigade's reach into the Asia Pacific market.

"With bandwidth continuing to expand, only fiber optic technology can deliver the services vital to meet the communications needs of society. A new breed of skilled professionals is required to design, plan, install and maintain these systems so that businesses can grow," explained Dario De Paolis, vice president and general manager of The Light Brigade. "This partnership brings the experience, reach and confidence IT managers require so they can deliver leading-edge courses that prepare their staff for real-world situations involving fiber optic networks."

Norbert Jacobsen, vice president of APAC South/iTLS reaffirmed, "With The Light Brigade's experience and proven track record, we are confident they can provide the appropriate training and maintain competitive standards ensuring that we have highly-skilled trained professionals knowledgeable with the most up-to-date fundamentals of fiber optic technology."

iTLS aspires to be one of the most sought-after education companies in Asia. Operating under the Fast Lane group of companies of Germany, iTLS commits to maintaining the same level of absolute educational competency, great customer service and guaranteed customer satisfaction. iTLS has been delivering basic to high-end IT training

in south Asia Pacific covering countries such as Singapore, Australia, Malaysia, Indonesia, Thailand, New Zealand, Vietnam, Philippines and Sri Lanka.

The Light Brigade operates primarily in North America and with this partnership, plans to establish a strong presence in Asia. As a catalyst in this rapidly-evolving field of fiber optics, The Light Brigade will continue to help the communications industry advance in North America and abroad.

About The Light Brigade

Founded in 1987, The Light Brigade has instructed over 45,000 attendees worldwide in its public and custom classes on fiber optic design, maintenance, and testing, including advanced topics such as

FTTx, DWDM, and PMD/CD. In addition to creating custom courses tailored to any need or skill level, the company produces educational DVDs and CDs that provide focus on specific fiber related topics. To learn more, visit their website at www.lightbrigade.com.

About iT Learning Solution

iT Learning Solution (iTLS), a Fast Lane company, was founded in the year 2004 is a cloud and data center certification specialist in Asia Pacific. Prior to this partnership, iTLS has been delivering IT trainings for almost a decade primarily Cisco, NetApp and Citrix and including trainings in participation with a partner for Red-Hat, Microsoft, VMware, HP, Juniper and Fast Lane courses. To learn more, visit their website at <http://sg.itls.asia/company>.

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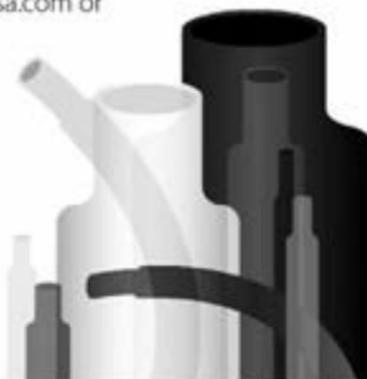
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NEWS PLUGS **continued****VIDEOJET® Introduces Next Generation 1550 and 1650 Ink Jet Printers**

Videojet Technologies Inc., a manufacturer of coding, printing and laser marking products, fluids and accessories for the product identification industry, introduced two next generation printers to its reliable 1000 Line – the 1550 and 1650 ink jet printers. Designed with new features to promote productivity and profitability, the 1550 and 1650 ink jet printers provide metrics to measure availability as well as the tools to measure and improve uptime and Overall Equipment Effectiveness (OEE).

Simple to operate, the 1550 and 1650 also include Code Assurance features to help reduce coding errors and ensure the right code is printed on the right products.

With an innovative design to provide customers with high Availability for production lines and the right metrics to track it, the Videojet 1550 and 1650 printers reduce unplanned downtime through features like the patented CleanFlow™ printhead and Dynamic Calibration™ ink flow system. Designed to resist ink build-up that can lead to a shutdown, both the 1550 and 1650 possess an auto-cleaning function, meaning there are less frequent printhead cleanings and positive flow of filtered air for more reliable, clear and consistent codes, even at the end of long production runs. The unique printhead design and long-lasting core minimizes

planned downtime due to long intervals – up to 14,000 hours – between planned routine maintenance cycles.

The 1550 and 1650 ink jet printers also help customers measure Uptime by providing OEE Availability metrics. The Availability measure is also configurable to more closely reflect how customers operate production lines and measure Availability across their plant.

“Every company strives for 100 percent production line uptime. A recent survey by Videojet of customers representing over 400 1000 Line printers on active production lines showed an average 99.9 percent Availability in the previous month.1 Videojet’s 1550 and 1650 ink jet printers allow customers to shrink downtime and expand Availability,” said Dennis Howe, vice president of business management for Videojet.

Beyond providing an Availability metric, users need to be able to identify and eliminate the major root causes of unplanned downtime to improve it.

The Videojet 1550 and 1650 printers present downtime information in a logical way to support efficient and effective problem solving. The printer enables drilling into Availability data to help discover technical and operator causes of downtime. Understanding root cause is critical to implement and achieve sustainable process improvements.

Coding errors are common – codes that are one digit off, dates that don’t exist, codes on wrong products, typing errors. These mistakes can mean waste, rework, regulatory fines and potential damage to a manufacturer’s brand.

Operator error is the most prevalent cause of coding mistakes. The Videojet 1550 and 1650 possess Code Assurance features to foolproof and help prevent mistakes, keeping customer production lines productive and ensuring brand integrity.

The Videojet 1550 and 1650 are designed for limited and simple interaction so users can focus on production. Operators can access all common operations in five touches or less on a large, bright touchscreen interface.

The 1550 and 1650 help provide improved control of job parameters and efficient, productive line management. In addition, the Videojet Smart Cartridge™ fluid system eliminates waste, mess and mistakes, and when it’s time for planned maintenance, the 1550 and 1650 modular core system is easily replaceable – getting customers right back to production quickly and efficiently.

“We’re dedicated to continuously work toward reducing the frequency and length of both planned and unplanned downtime so our printers are performing at maximum ability and readiness,” said Howe. “By designing our equipment to be more available, simplifying and minimizing equipment interaction and making information more actionable, we have created a coding and marking solution that delivers the maximum level of uptime available on the market today.”

For more information about the Videojet 1550/1650 printers and Videojet 1000 Line, call 800-843-3610 or visit www.videojet.com.

Wire Terminal Testing



Made simple

The all-new WT3-200 wire terminal tester is an integrated solution for measuring wire and tube termination pull force. An ergonomic lever easily produces up to 200 lbF (1,000 N) of force for wire diameters up to 0.25 in (6.3mm). The WT3-200 includes a long list of features and functions, such as data outputs via USB, RS-232, and Mitutoyo, on-board data storage for 1,000 readings with statistical calculations, password protection, and more. It can be operated on a rechargeable battery power, or AC. All at a competitive price of just \$2,195.

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Model 2000

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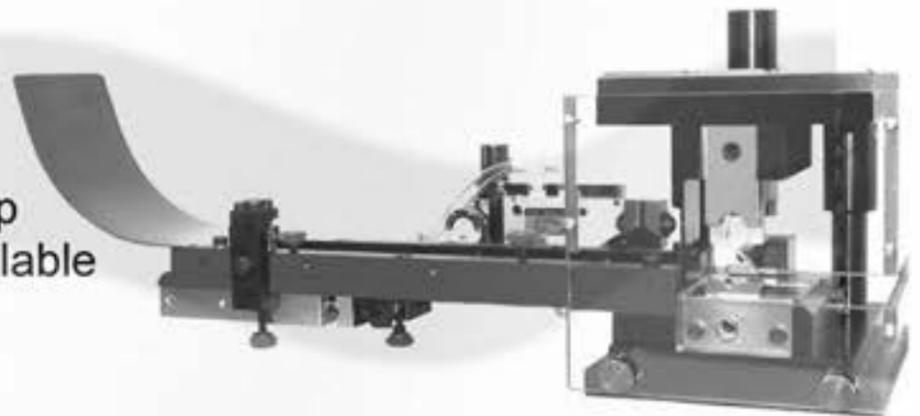


Model 1500



Model 2100

DSA applicators are designed for large terminals manufactured from heavy gage material with center to center distances up to 3 inches and widths to 3.5 inches. Available in left to right, right to left and rear feed configurations.



DSA Series

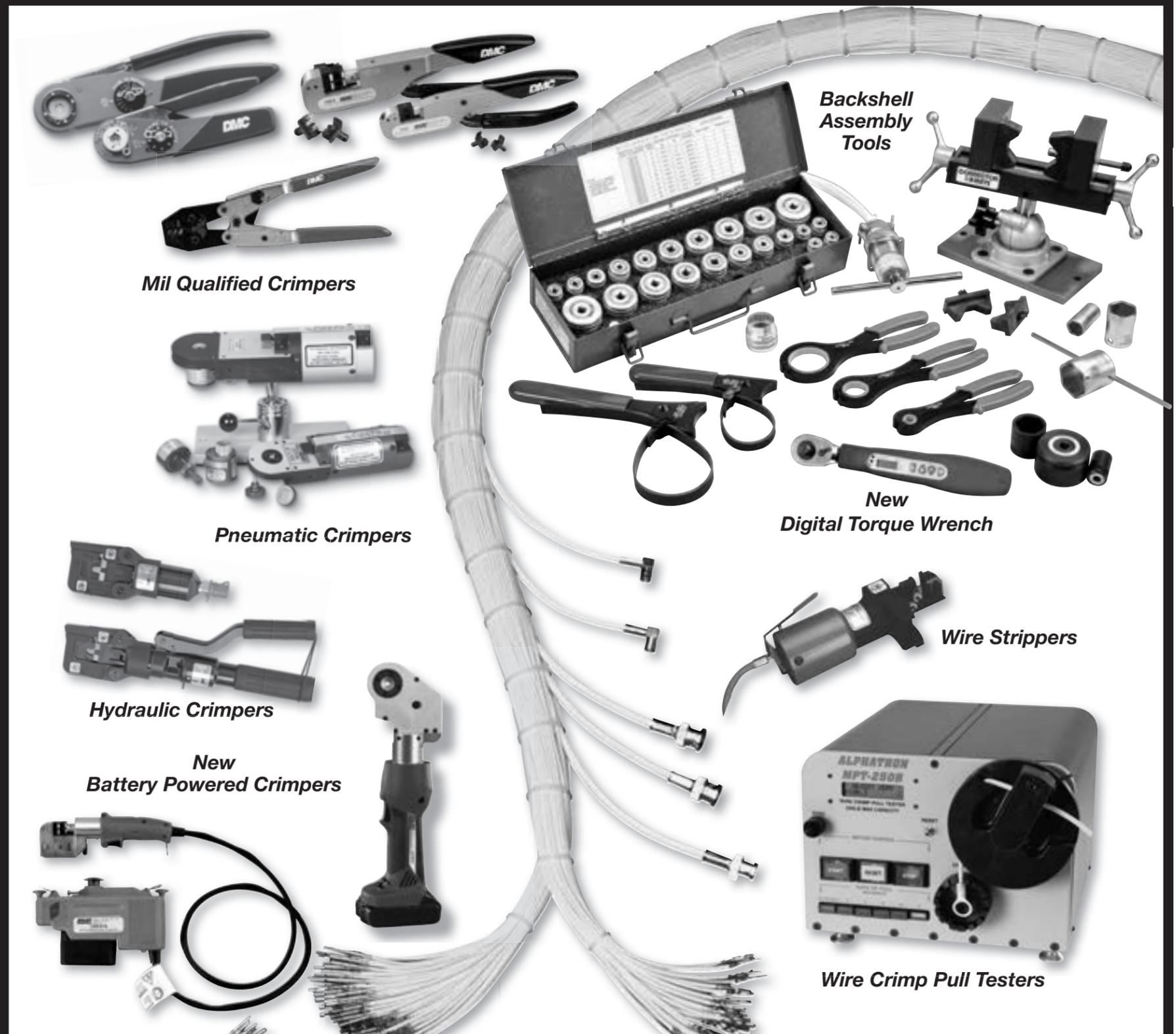
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PV Cable from Amphenol Used in Grounded and Ungrounded Systems

Amphenol Industrial Global Operations, a global leader in interconnect systems, now offers a single jacket photovoltaic (PV) cable used for interconnection wiring in grounded and ungrounded PV systems. Amphenol's PowerLink solar cable is ideal for use on utility solar farms and in commercial and residential solar projects.

Designed with a smaller outer diameter than a standard dual jacket, the single jacket PV cable is more malleable and makes crimping connectors easier. It is also available for fast delivery.

The new cable, which is offered from 6 AWG to 18 AWG, is sunlight resistant and suitable for direct burial. It has a temperature rating of 90°C wet or dry and a cold bend of -40°C. Its voltage rating ranges from 600 V to 2000 V. This new RoHS compliant, UL4703-rated cable has a flammability rating of VW-1.

Unlike a dual jacket cable that is only available in black to meet 720UV requirements, the PowerLink solar cable is manufactured in a variety of colors including black, white, red, blue, green,



PV Cable from Amphenol

yellow and orange.

For more information, please visit <http://www.amphenol-industrial.com> or e-mail energy@amphenol-aio.com.

Alpha Wire Grows EcoGen™ Product Line with EcoCable™ and EcoFlex™

Alpha Wire has unveiled the latest additions to its growing environmentally friendly product offering: EcoCable and EcoFlex. Utilizing the innovative 100% recyclable MPPE insulation found in EcoWire, EcoCable and EcoFlex are designed to be up to 65% lighter and 47% smaller, with up to 91% lower outgassing than traditional PVC cable. The two control cables are nonhalogenic and contain no heavy metal pigments, allowing them to meet RoHS and Waste Electrical and Electronic Equipment (WEEE) requirements.

"Since the launch of EcoWire three years ago, our customers have asked us for a multiconductor version that retains all the size benefits of EcoWire. In EcoCable and EcoFlex, we are able to offer two styles that are really the first of its kind in the cable industry," states Kristen Berard, Product Manager at Alpha Wire. "The combination of space savings, weight savings, and recyclability is unheard of in control cables."

EcoCable offers space savings of up to 47% compared to traditional PVC control cable. For example, a 22 AWG PVC insulated cable has a diameter of 0.502 inches (12.75mm). The equivalent EcoCable has a diameter of 0.219 inches (5.56mm). Its

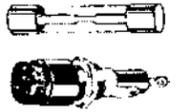
Continued on page 26

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WHMA Breaks Attendance Record in Las Vegas



The Wiring Harness Manufacturers Association (WHMA) held its annual Wire Harness Conference at the Las Vegas Renaissance Hotel on February 20-22. This was the 20th annual event for WHMA, and the attendance record was shattered by 20 percent.

Twenty five key industry suppliers were on hand, exhibiting in an intimate setting designed to help key managers develop cost-cutting and productivity improvement strategies.

Typical of previous WHMA Conferences, the seminar schedule included carefully selected speakers who also dealt with cutting-edge improvement

strategies. Greg Lane, consultant with Low Volume Lean, got the ball rolling with his presentation on the virtues of extending lean initiatives beyond the shop floor. Since transactional processes are more critical in the harness industry, it is especially incumbent upon leaders to eliminate bottlenecks and waste in administrative functions. He suggested using an hourly diary to understand how time is being spent; asking the question 'is this activity focused on customer value?'. He urged attendees to use the diary method, and other lean principles, to reduce non value-added activities at the CEO level, and throughout the administration functions.

Next, Dr. Nick Smith of Mentor Graphics promoted quick quote turn around as a strategy for winning harness business. He noted that the size of the industry, coupled with the relatively low barriers to entry, make it an intensely competitive environment. Slow quoting loses business, and many companies use spreadsheets and tailor made software that neglect the ever changing environment. He promoted the use of Mentors' software that captures not only the harness design and bill of materials, but also accounts for the manufacturer's capabilities and corporate standards. The system also builds a process tree while quickly and effectively calculating costs.

Ken Fleck of Fleck Research discussed the current state of the industry, and the growing re-shoring trend of cable assemblies back to North America. He calculated the 2012 worldwide cable assembly market at \$20.77 billion (down 3.4 percent) with \$3.86 billion for North America and \$10.12 billion for China. He noted that over the past five years, \$392 million in harness business has returned to North America; and projects another \$931 million re-shoring to occur over the next five years. Fleck notes many factors causing this movement including the high weight of larger gauge sizes, high shipping costs, shipping delays, and language barriers. He made a special notation of North American OEMs, especially in the medical arena, requiring that assembly manufacturers in Asia re-shore at least some of their manufacturing.

Greg Lane returned to the podium to stress the

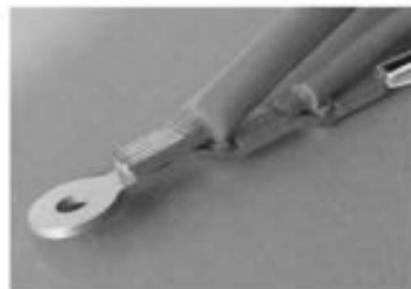
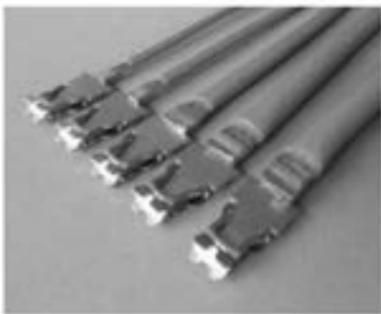


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idea that implementation of lean strategy requires a cultural transformation. His research showed two-thirds of lean initiatives fail to sustain results. He cited several reasons for this including too much reliance on lean tools, and not enough concentration on creating lean culture throughout the organization. In his view, it is incumbent on leadership to create awareness of their own traits and behaviors in order to minimize the 'other guy' syndrome within the organization.

Finally, David Donlan of HubSpot was on hand to discuss online marketing ROI, and offer tangible tips for online endeavors. He made some interesting distinctions between pay-per-action advertising and blog content development. Google advertising, for example, disappears the moment the campaign is over. The leads and search results that come from blogging continue to reap results long after the initial posting. Businesses who blog, he noted, are much more likely to develop traffic to their

site, and "the niche-ier a business is, the easier it is to get someone on your site." Donlan strongly suggested using numbers in blog titles, such as, 5 tips for increasing... HubSpot markets comprehensive software for managing all aspects of online endeavors, including social and email marketing, contact/database management, and online analytics.

In addition to the seminars, Mark Wood, Chairman of WHMA, and David Gillies, Team Leader on the A-620 project; discussed the new Revision B of the IPC/WHMA-A-620 Requirements and Acceptance for Cable and Wire Harness Assemblies.

The annual WHMA event continues to grow in the depth and breadth of information it provides to the wire harness industry. If you're not already a member of WHMA, please jump on their site (www.whma.org) to see how membership and attendance at the yearly event can increase your company's performance.



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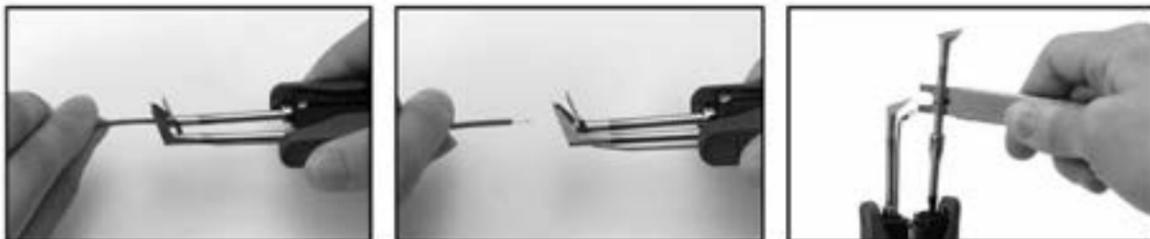


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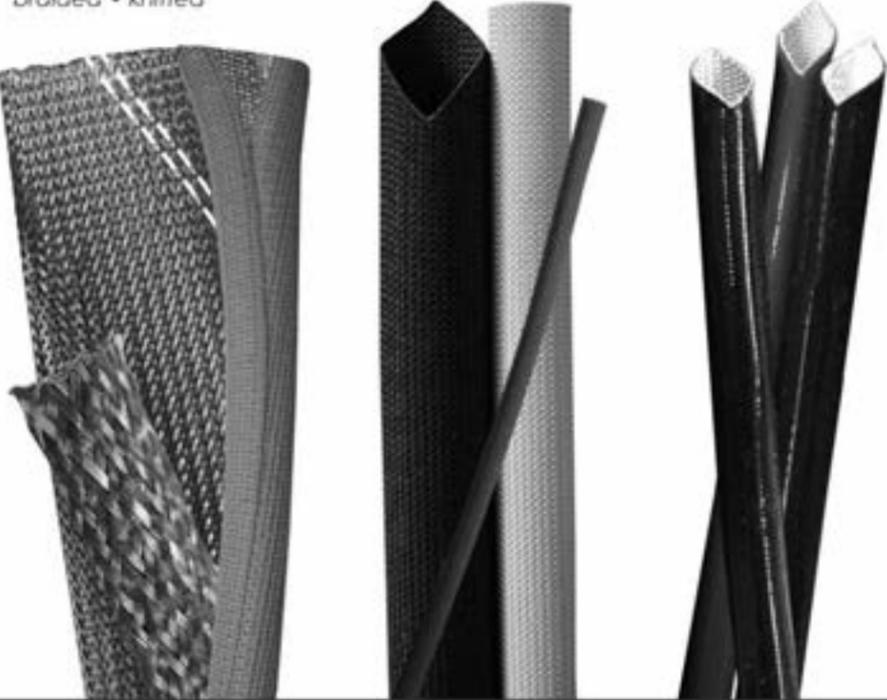
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NEWS PLUGS continued



Continued from page 23

counterpart EcoFlex offers space savings of up to 32% versus PVC and is rated for up to 1 million flex cycles.

The initial EcoCable offering is a UL AWM 21510 and CSA Rated cable available in sizes ranging from 24 AWG (0.28mm²) to 14 AWG (2.08 mm²) available in 100ft and 1000ft lengths. EcoCable is suitable for use in NFPA79 applications and is RoHS and REACH Compliant. Its temperature range of -50°C to +105° exceeds that of standard PVC cable.

EcoFlex is a UL AWM 21819 and CSA Rated flexible control cable available in sizes ranging from 28 AWG (0.09mm²) to 10 AWG (5.32mm²). It's offered in 100ft and 1000ft lengths, with bulk available for larger quantities. With up to an 8x flexing bend radius and rated for more than 1 million flex cycles, EcoFlex is suitable for use in NFPA 79 applications and is RoHS and REACH Compliant. Its temperature range is -40°C to +105°C static, and -5°C to +105°C while flexing.

EcoGen Products are the next generation of eco-friendly high-performance wire and cable designed to provide better performance, in a smaller package. All EcoGen products contain no halogens, phthalates or heavy metals, and are 100% recyclable. Their innovative mPPE insulation and jacket materials allow them to meet RoHS and WEEE Requirements for the elimination of hazardous substances and recyclability.

For over 80 years, Alpha Wire has designed and manufactured industry-leading wire, cable, and tubing products for factory automation, packaging, automotive, alternative energy, and other technically advanced applications. For further information visit www.alphawire.com.

Lockheed Martin Opens Its Doors to Young Minds At Work

Lockheed Martin [NYSE: LMT] Space Systems Company campuses across the nation today opened their doors to more than 3,200 children aged six to 18 to introduce them to the wonders of science, physics and mathematics in the space industry through Young Minds at Work day. The annual event inspires children to consider pursuing science, technology, engineering and mathematics (STEM) degrees by demonstrating applications in our everyday life.

"STEM education is critical to our nation's future and the global economy," said Richard Ambrose, executive vice president for Lockheed Martin's Space Systems Company. "Students exploring science, technology, engineering and math will be the next generation of innovators and leaders. Young Minds at Work is just one way that Lockheed Martin invests

Continued on page 28

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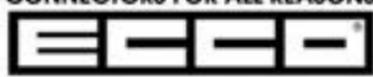
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- 2 SCHLEUNIGER CP1250 Coiler
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- 1 SCHLEUNIGER CS9100 Cut/Strip Machine w/CA9170 Rotary Stripper, 1995
- 1 SCHLEUNIGER CS9100 Cut/Strip Machine with PC and Stand, 1998
- 1 SCHLEUNIGER Model CS9050 Cut & Strip Machine
- 1 SCHLEUNIGER Model EC3200 EcoCut, #34-2007
- 2 SCHLEUNIGER Model US2015, US2100 Bench Top Strippers
- 5 SCHLEUNIGER PF1000 (1), PF2000 (5) PreFeeders
- 1 SCHLEUNIGER PS9500 Cut/Strip Machine with a PF2200 Prefeed, 2002
- 2 SCHLEUNIGER PS9500 Power Strips, new 1999, 2001
- 1 SCHLEUNIGER WS1000 Wire Stacker, excellent condition, approx. 2005/06
- 1 KOMAX Model KAPPA 320 Cut & Strip Machine, 2009/10, absolutely Like New
- 1 KOMAX/WEIDENBACH Model IMS 291 InkJet Printer, 2006
- 1 KOMAX Kappa 240 Cut & Strip Machine
- 2 KOMAX "Delta 50" Strippers, V-Cut Blades
- 1 KOMAX Kappa 240 Cut & Strip Machine w/RAMATECH Model ABW-800-300
- 1 KOMAX Alpha 422 Cut, Strip, Crimp, Print, 1998
- 3 KOMAX Model 29, 31, 34 Bench Top Strippers
- 1 EUBANKS Model 8000-01 Cut & Strip Machine w/Prefeed, Model 6880-05
- 1 EUBANKS 4000-04 Tandem Cut and Strip Machine, extra Blade Sets
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- 2 AMP 626 Tool, with and without foot pedal

PLUS: IDEAL Model STP Stripper, Part #45-930, Serial #4593001204; RENNSTEIG Model CM-25-1 Pneumatic Crimper, 2006; CARPENTER Model 70B Strippers (3); ERASER Model WT-20 Wire Twister; SCHAEFER Model EPS2001 Crimpers w/stripper units (2); ONDAL Taper, Model 243241, 1993; SHINMAYWA Model TR101 Automatic Terminating Machine, Prefeed, 1996; MEGOMAT Model ASM3001-U Cut, Strip, Crimp Machine w/Crimp Force Monitor, 1996; VIDEOJET IPro XHS Inkjet Printers, Model 390600-03 (3); METRONIC Alpha Jet C Inkjet Printer, 2006/07; MULTITECH 55T Injection Molding Machines, used 1 year; ARBURG 35T Injection Molding Machine, new; STORMTRONICS Model MT-II Mini Twister.



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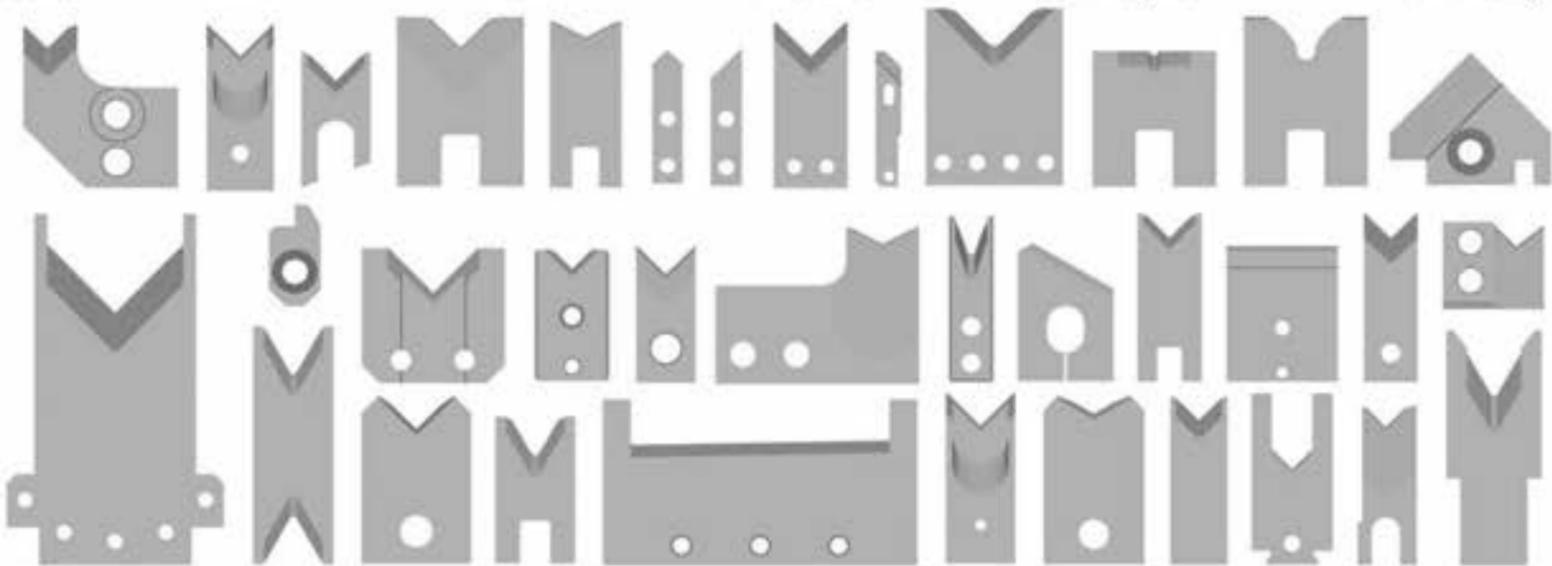
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NEWS PLUGS continued



Continued from page 26

in our children by tapping their natural curiosities and problem-solving skills.”

Lockheed Martin employees and contractors sponsored their children at company facilities across the nation. Highlights of the activities include:

Mentoring by NASA astronaut Rex Walheim about careers in STEM; practicing docking a spacecraft with the International Space Station; testing space knowledge in the Cosmic Challenge Trivia Game; and launching test rockets – Denver, Colo.

Flying an airplane in a simulator; playing with Frisbee-tossing robots; learning about orbital mechanics; and creating rockets – Sunnyvale, Calif.

Hunting for a geocache treasure to understand global positioning systems and working with engineers on an antenna design activity – Newtown, Penn.

Lockheed Martin Space Systems Company, a major operating unit of Lockheed Martin Corporation, designs and develops, tests, manufactures and operates a full spectrum of advanced-technology systems for national security and military, civil government and commercial customers. Chief products include human space flight systems; a full range of remote sensing, navigation, meteorological and communications satellites and instruments; space observatories and interplanetary spacecraft; laser radar; ballistic mis-

siles; missile defense systems; and nanotechnology research and development.

BURNDY Announces Release of Battery Post Terminals & Lugs through 4/0

BURNDY, a leading manufacturer and provider of connector solutions to the industrial, energy, construction, telecommunication, petrochemical, data center, and transportation industries, announces the introduction of the battery post terminals and lugs for standard battery stud connections.



BURNDY Battery Post Terminals & Lugs

The battery terminals and lugs are compatible with battery studs that adhere to SAE, JIS and DIN standards. These are offered in three styles: Straight post terminals, Flag (T-type) post and Grounding/Starter Lugs. They accommodate a wide range of conductor combinations (AWG & Flex). Connectors are made of copper with tin plating.

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Continued on page 35

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The Methodology of Crimp Validation

Continued from page 1

customer specifications. Then you must be able to implement the various tests and measurements necessary to satisfy those specifications. As a cable and harness manufacturer, you are responsible for the overall crimp quality.

The crimping process involves more than you may realize, so let's review the factors that can influence the crimp.

The Wire: use the strip length set forth in the terminal manufacturer's specification, watch for nicked or cut strands, perform a clean, straight insulation cut, and practice proper handling of stripped wires if crimping is done by hand or a bench terminator.

The Terminal: use lubrication when recommended by the manufacturer, take care in handling and storage of the terminal reels so as not to damage the cardboard sides or cause the terminal strips to become entangled, and be very careful when handling the product strip as it is being threaded through a machine and into the applicator.

The Applicator: always use OEM tooling, inspect the surface condition of the crimper for any wear, make proper terminal feed adjustments to position the terminal over the anvil and confirm proper feed track adjustment for front-to-back terminal positioning on side feed applicators. Also, make sure you select the proper cam for bench or

automatic processing.

The Termination Machines (such as bench terminators and lead makers): check correct machine setup for the product that you are producing and, most importantly, have preventative maintenance processes. Preventative maintenance applies to your applicators and hand tools too.

The Operator: train your operator in proper hand tool use, machine setup and operation, wire handling and positioning for crimping, and basic crimp theory. There are many factors at play and, if you slack off in any of these areas, your crimping process may suffer quality problems and other issues.

Once all aspects of your crimping

process are understood and in control, then you need to be able to validate the crimps. There are quite a number of specifications that you can use or may be asked to use by your customer for validation. These include manufacturers' specifications, such as those provided by TE Connectivity, which can include terminal application specifications, applicator instruction sheets, and machinery customer manuals. Broader industry standards may be requested such as IPC/WHMA A-620, UL 486A-486B, and SAE AS7928, and USCAR-21. Finally, there are your customer's own specifications that likely have many similarities to the terminal manufacturer and industry specifications. Some of the common validation criteria that we will review include visual inspection, crimp height measurement, tensile strength or pull out force, and terminal cross sectioning. In addition, applicable specifications may include electrical testing such as current cycling test, voltage drop test, and dry circuit terminations. Along with the electrical testing, the crimps may also be exposed to environmental elements such as sudden temperature change, known as thermal shock, and humidity change. The terminal manufacturer typically performs these electrical and environmental tests during product development to confirm the crimp meets its intended performance. It is rare for a harness manufacturer to be required to conduct such testing.

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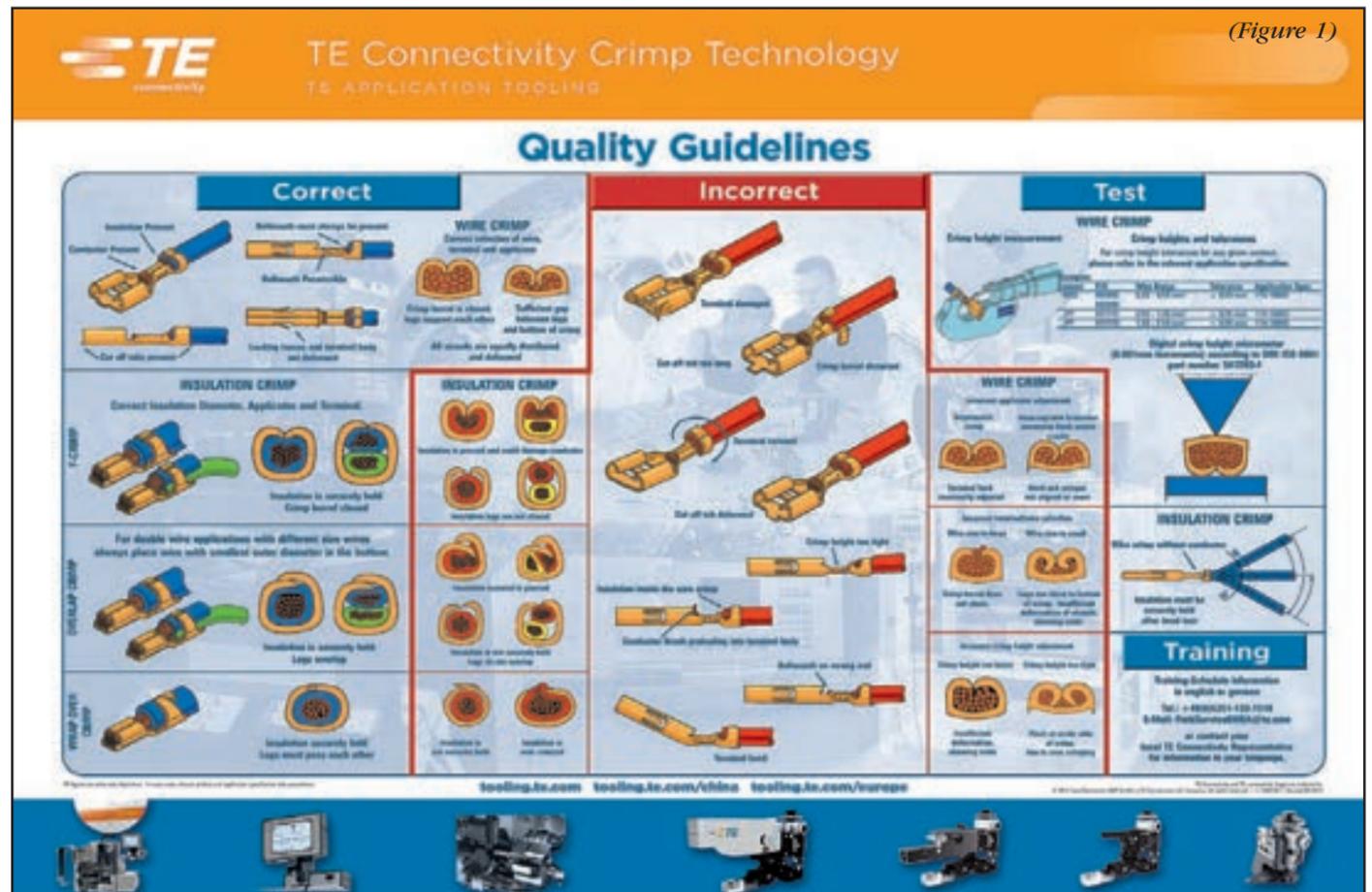
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of the most important validation tests performed and is where you must trust your operators. Operators must be trained in basic crimp theory, as they are your first-line of defense in the validation of crimps. They may need eye-loops, microscopes, magnifying glasses, and good lighting for this task. Visual inspections of crimps can include all of the following: conductor brush presence, conductor brush length, conductor strands cut, conductor strands not captured by the crimp legs, correct bell-mouth on the wire crimp, proper insulation placement, terminal roll, terminal twist, terminal damage including locking lances, crimp leg closure for both conductor and insulation crimps, and proper length cut-off tabs. Some of these features are subjective, so you should ensure that your operators are consistent in the way they visually inspect crimps. Terminal manufacturers may offer basic crimp theory training and visual aids. For example, you can obtain a visual aid poster from TE Connectivity by going to www.te.com and searching for part number 65780-4 or 'Crimp Quality Guidelines' (Figure 1).

Measuring the crimp height is a long standing measurement for non-insulated terminals that helps to ensure that the crimp will perform to the specifications prescribed by the terminal manufacturer. This measurement is done using hand held crimp height micrometers, a bench crimp height measurement station, or a crimp height measuring station on a Lead maker. Bench or machine mounted measuring stations are more



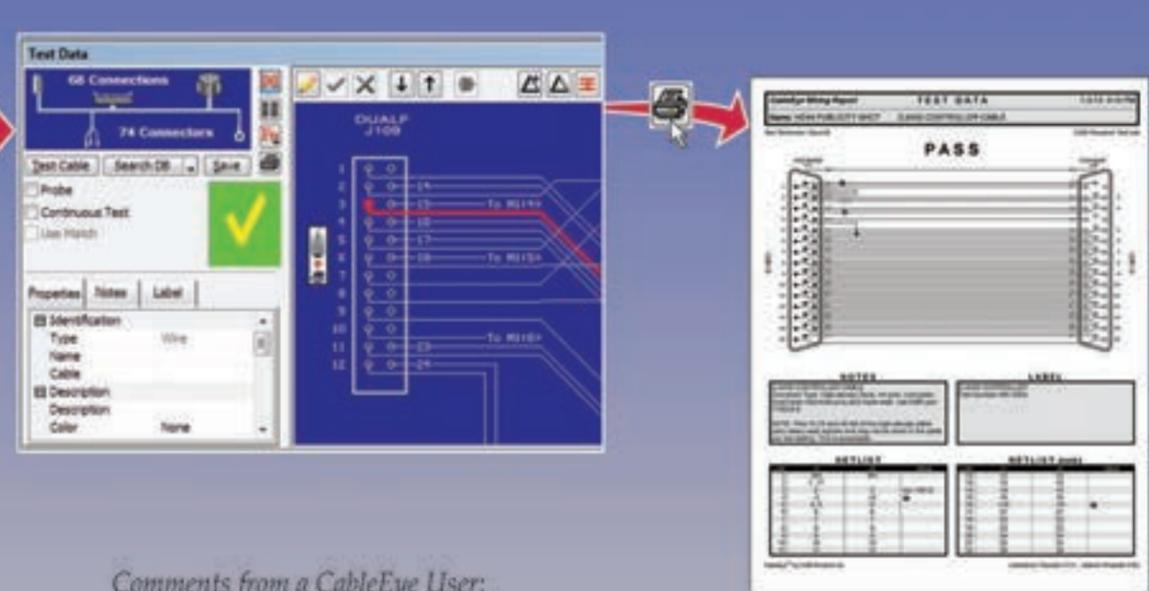
repeatable as using hand held crimp height micrometers takes some finesse and practice. This is another training opportunity for your operators that can make or break the quality of the crimps you produce. During this training you want to confirm that the operators are measuring the crimp height at the correct position on the wire crimp barrel and are consistent with this position. Most terminals have internal serrations that have a subtle effect on crimp height as it is measured along the crimp body,

so consistency in the position of the micrometer is important. Measuring the crimp height is typically performed during system setup, but it should also be checked periodically during larger production runs as any thermal expansion slowly causes terminators to change their physical characteristics thereby affecting crimp height. Crimp monitors (such as the TE CQM-II) that calculate the crimp height in real-time can detect this subtle change and automatically notify the operator.

Another test that is commonly performed is wire crimp pull out force. It's used to validate the mechanical properties of the crimp. This test uses a piece of equipment that has the proper crimp grips and wire clamps for this purpose. Numerous manufacturers make pull out force testers that are either manual or motorized. It's important to note that the pull out force test is done only on the wire crimp and not the insulation

Continued on page 38

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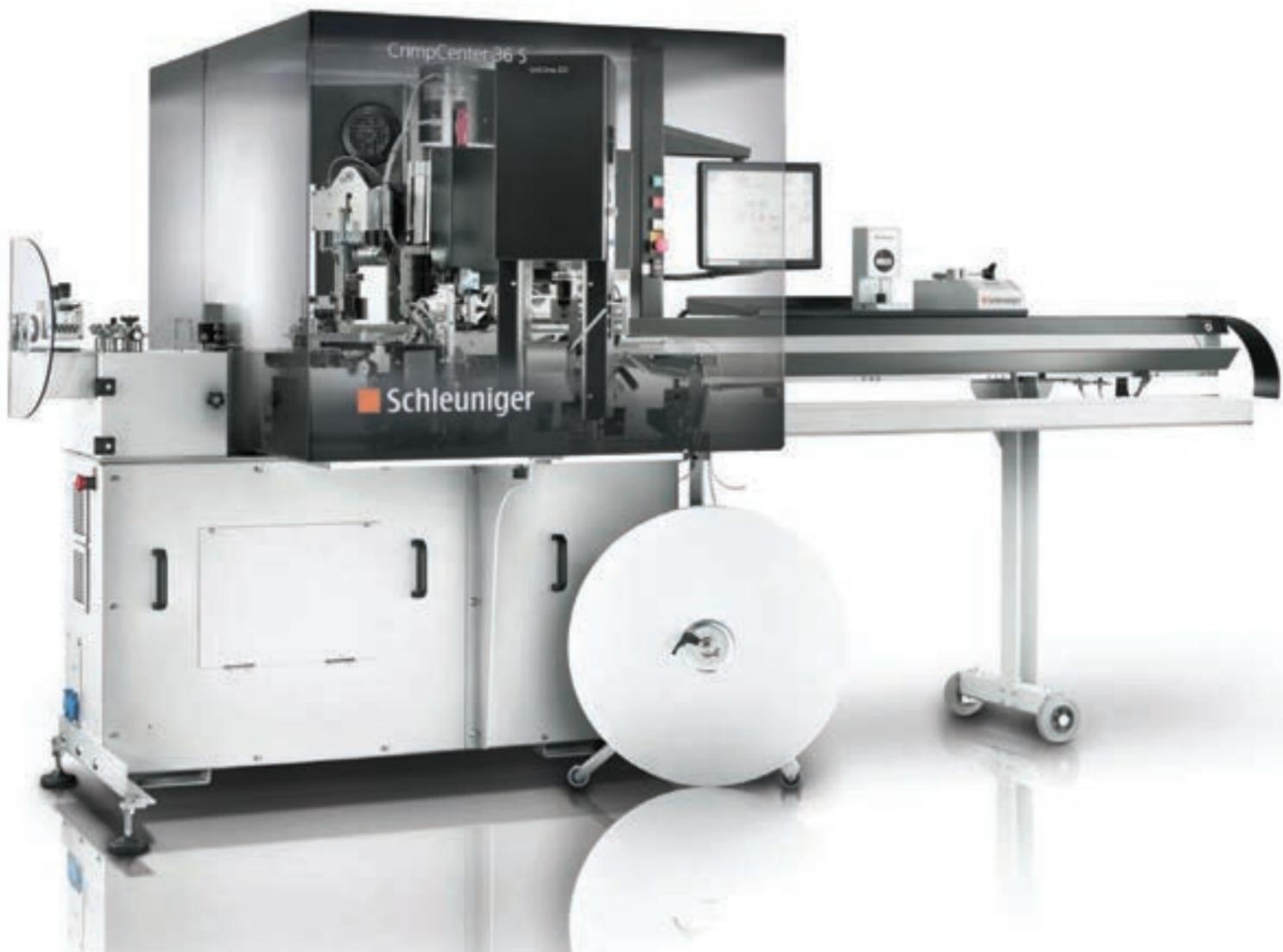
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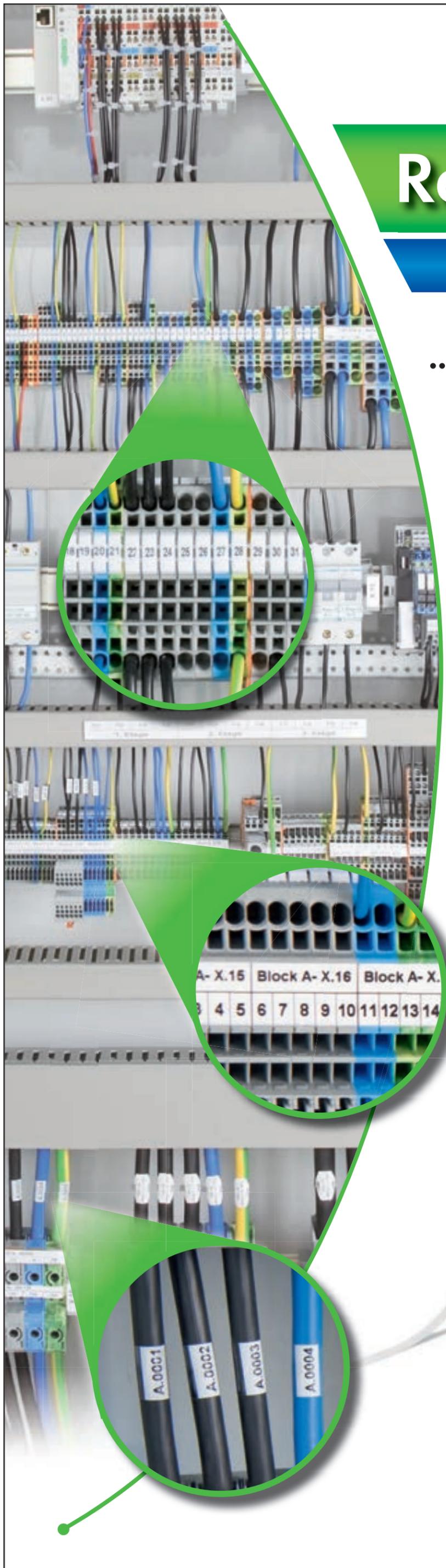
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NEWS PLUGS continued



Continued from page 28

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Wire Ties, Accessories Complement Cabinet and Tools

Phoenix Contact now offers wire ties and accessories to complement its Cabinet add-on and TOOL fox cable management product range. Cable ties are available in a wide variety of options, including stainless steel, UV-resistant, heat-resistant and identifiable ties. Bases, rivets and loops round out the offering.

The ties have tapered edges to prevent damage to wires and protect the hands of the installer. A round tip provides faster initial threading and speeds installation, and also makes it easy to pick up the ties from flat surfaces.

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NEWS PLUGS continued

VIDEOJET® Introduces Next Generation 1550 and 1650 Ink Jet Printers

Videojet Technologies Inc., a manufacturer of coding, printing and laser marking products, fluids and accessories for the product identification industry, introduced two next generation printers to its reliable 1000 Line – the 1550 and 1650 ink jet printers. Designed with new features to promote productivity and profitability, the 1550 and 1650 ink jet printers provide metrics to measure availability as well as the tools to measure and improve uptime and Overall Equipment Effectiveness (OEE). Simple to operate, the 1550 and 1650 also include Code Assurance features to help reduce coding errors and

ensure the right code is printed on the right products.

With an innovative design to provide customers with high Availability for production lines and the right metrics to track it, the Videojet 1550 and 1650 printers reduce unplanned downtime through features like the patented CleanFlow™ printhead and Dynamic Calibration™ ink flow system. Designed to resist ink build-up that can lead to a shutdown, both the 1550 and 1650 possess an auto-cleaning function, meaning there are less frequent printhead cleanings and positive flow of filtered air for more reliable, clear and consistent codes, even at the end of long production runs. The unique printhead design and long-lasting core minimizes planned downtime due to long intervals – up to 14,000 hours – between planned routine maintenance cycles.

The 1550 and 1650 ink jet printers also

help customers measure Uptime by providing OEE Availability metrics. The Availability measure is also configurable to more closely reflect how customers operate production lines and measure Availability across their plant.

“Every company strives for 100 percent production line uptime. A recent survey by Videojet of customers representing over 400 1000 Line printers on active production lines showed an average 99.9 percent Availability in the previous month.1 Videojet’s 1550 and 1650 ink jet printers allow customers to shrink downtime and expand Availability,” said Dennis Howe, vice president of business management for Videojet.

Beyond providing an Availability metric, users need to be able to identify and eliminate the major root causes of unplanned downtime to improve it. The Videojet 1550 and 1650 printers present

downtime information in a logical way to support efficient and effective problem solving. The printer enables drilling into Availability data to help discover technical and operator causes of downtime. Understanding root cause is critical to implementation and achieve sustainable process improvements.

Coding errors are common – codes that are one digit off, dates that don’t exist, codes on wrong products, typing errors. These mistakes can mean waste, rework, regulatory fines and potential damage to a manufacturer’s brand. Operator error is the most prevalent cause of coding mistakes. The Videojet 1550 and 1650 possess Code Assurance features to foolproof and help prevent mistakes, keeping customer production lines productive and ensuring brand integrity.

The Videojet 1550 and 1650 are designed for limited and simple interac-

tion so users can focus on production. Operators can access all common operations in five touches or less on a large, bright touch-screen interface. The 1550 and 1650 help provide improved control of job parameters and efficient, productive line management. In addition, the Videojet Smart Cartridge™ fluid system eliminates waste, mess and mistakes, and when it’s time for planned maintenance, the 1550 and 1650 modular core system is easily replaceable – getting customers right back to production quickly and efficiently.

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For more information about the Videojet 1550/1650 printers and Videojet 1000 Line, call 800-843-3610 or visit http://www.videojet.com/usa/Videojet_1000_line_ink_jet_printers.

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____ Continued on page 40

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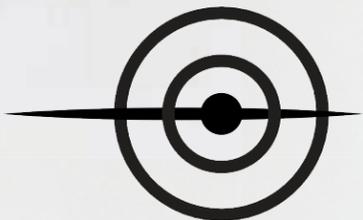
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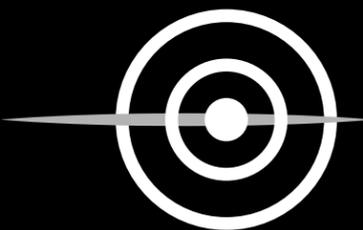
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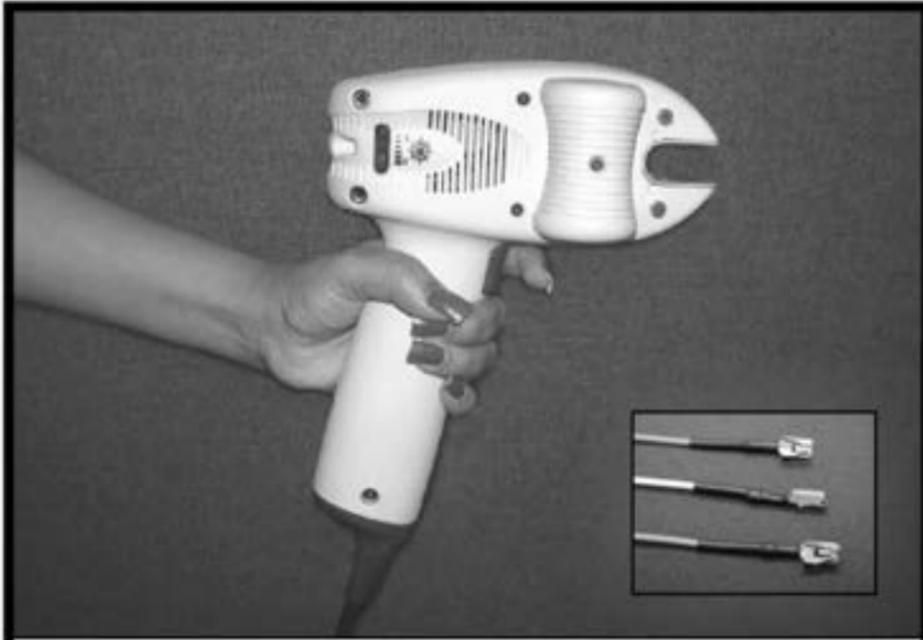
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Focus-Lite™
Heat Shrink Processing Machines

The Methodology of Crimp Validation

Continued from page 31

crimp. You may have to carefully open the insulation crimp without damaging the conductors before performing this test. As with other parameters, the acceptable pull out force for the terminal and wire combination can be obtained from terminal manufacturers, industry specifications, or customer specifications. Forces do vary significantly between these specifications. The specification may dictate the pull rate, thus requiring you to use a motorized pull out force tester that has a consistent rate. Both manual and pneumatic actuated testers can produce less consistent measurement results.

A more recent and extensive inspection method is to perform cross sectioning of the terminal, also known as micro sectioning. It requires a costly piece of equipment to properly prepare the crimped terminal and take the measurements. Several manufacturers make equipment that can perform the preparation task that includes: cutting the terminal, polishing the cut end, and an electrolytic etching or dyeing to enhance the contrast of the polished cut end. You will also need a digital microscope to view the cross-section. Some of these systems include microscopes, computers, and custom software thus providing you the tools necessary to take the measurements. As with measuring the crimp height, it's important to make the cross-section at the proper location. If you are off by a little bit, you may be sectioning the terminal where there is an internal serration and, therefore, you will not be able to make the proper measurements. In addition, incomplete polishing can give the appearance of cracks in the terminal and improper etching or dyeing can make it more difficult to focus on the specifics of the crimp. To avoid these issues, start by closely following the recommendations of the equipment manufacturer. You may also need to experiment to determine the optimum process for each crimp.

Visual inspection of the cross-section image is one way to start the validation process. By visually inspecting a cross-section, you should be able to identify crimp symmetry where you want to see a fairly equal distribution of strands across the terminal as well as a significant compaction of the strands. Voids are permissible in some specifications as long as all of the strands show evidence of compression, but other specifications do not allow any voids in the cross-section. You can also quickly assess if the wings touch the inner walls, if there is extreme ram-horning of the legs with no strands captured, open legs at the top of the crimp, legs folded back over itself and/or cracked or broken terminal stock. So, as with the various visual criteria for the outside of the crimp, there are almost as many items to look at inside the crimp.

Now let's look at the measurements you can take of a terminal cross-section

(refer to figure 2). These detailed measurements in this figure come from TE application specification 114-18022. The measurements are easy to perform with the software tools included with the cross-sectioning equipment. Crimp Height (CH) is measured as long as the terminal is sectioned at the correct location. Measuring the crimp height in this manner is also more repeatable than using a hand held crimp height micrometer. Crimp width is a feature that should be consistent and in control between different crimpers of the same part number. It can be looked at in two ways in the cross-section: the crimp width (CB) being the tool dimension of the crimp profile that denotes the distance of the tangential points of the crimper radius to the vertical segment, and the measureable crimp width (CBm) that is obtained at the bottom of the crimp. Prior to the introduction of cross sectioning only the measurable crimp width was easily performed. The following measurements are not possible without the use of a cross-section. The support angle (SA) is measured at the crimp barrel seam formed by the two legs. An excessive nonsymmetrical roll in the crimp barrel legs can cause the support angle to deviate from vertical and exceed the specification. Along with the support angle the other measurement specific to the legs is the support length (SL) or support height. This is the length of the crimp barrel seam and it must be sufficient to fully close the crimp. The crimp barrel legs cannot touch the inner bottom or be rolled to the extent where it touches the inner wall of the crimp barrel. In some specifications the tip of the leg known as flank end distance (R) or face end clearance must remain a minimum distance from the inner bottom of the crimp. With a cross-section it is also much easier to inspect the flash or burr. The flash height (GH) and flash width (GB) must not exceed specified dimensions. Excessive flash can damage subsequent operations such as inserting a crimped terminal into a sealed housing. Excessive flash can be an indicator of worn tooling, misaligned tooling if the flash is primarily to one side, or over crimping. Measuring the bottom thickness (SB) of the crimp barrel stock can also be an indicator of an over crimped terminal. And, lastly, with a cross section and the software, you can measure the compaction of the strands or the crimp area.

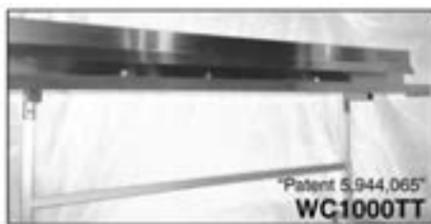
The cross sectioning system also allows you to evaluate the insulation crimp much better than an overall visual inspection. With it you can make a better assessment on how much of the insulation is actually in contact with the insulation legs, whether the tips of the legs penetrate the insulation and whether the tips penetrate and damage the conductors, which is not permitted in any specification.

It takes a lot of time and effort to provide a quality crimp. One way to help your crimping process on bench termi-



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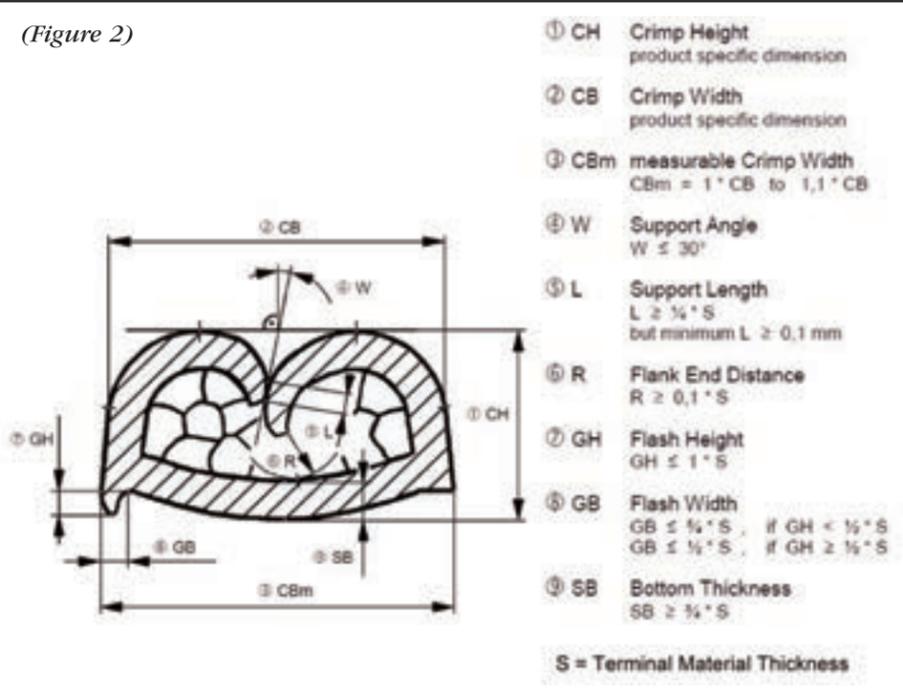


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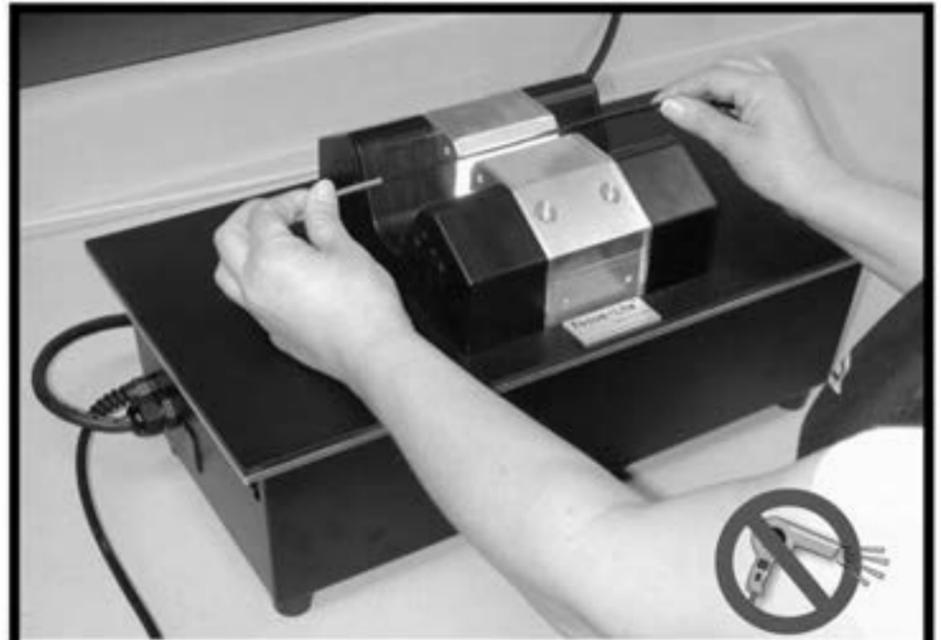
(Figure 2)



nation equipment and lead makers is to use Crimp Quality Monitoring, CQM, also known as Crimp Force Monitoring. In real-time these systems monitor the forces of the crimp and, in some cases, the physical displacement. They use mathematical algorithms to evaluate the crimp signature and decide the condition of the crimp. After they are calibrated or learn the crimp process, they continuously evaluate each crimp and are able to detect a variety of crimp failures such as missing wire strands, insulation in the crimp, sudden changes in crimp height, damaged crimp barrels, missing terminal, no wire in the crimp, and wrong size conductors. The TE CQM-II also offers the ability to calculate the crimp height in real-time during the process, an added benefit for your records. Of course the success of any

crimp monitor depends on several factors including the stability of your entire crimping process, which we initially discussed, and the percentage of force to crimp the wire versus the terminal, also known as headroom. If you have a sloppy crimping process, bad tooling, or are running too small of a wire for the terminal, a CQM crimp monitor will not help you very well. You must have an in-control process and sufficient headroom for a CQM crimp monitor to do its job.

So for you to provide quality crimps, you have much to consider with respect to your crimping process and validation. You're not alone in these tasks, and there are a lot of resources and all types of training available to help you improve your crimping process. Just contact your terminal manufacturer or equipment manufacturer and get started.



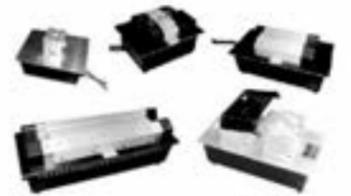
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NEWS PLUGS continued

Continued from page 36

everyone at Marsh Electronics have been unwavering since the company's founding. Proudly celebrating its 75th anniversary, Marsh Electronics remains focused on delivering the highest quality products, service, and best value to its customers. For more than seven decades, this philosophy has helped the company grow into a regional leader, distributing a wide range of electronic components and solutions throughout the North Central United States.

"It's really pretty humbling to look back on how far this company has come," said Jim Banovich, vice pres-

ident of sales and marketing for Marsh Electronics. "Of course, our evolution and continued growth wouldn't have been possible without the effort of our employees and the dedication and support of our loyal customers. We send heartfelt thanks out to everyone who has stood behind us over the years. All of us at Marsh are proud to have been around for 75 years and we're certainly excited as we look ahead to the next 75 years and beyond."

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agement programs, have helped position the company as a trusted, single source for a diverse array of electronic components.

"Through the years, we've certainly come to value the critical importance of having the right systems and procedures in place," Banovich said. "But, we've been careful to also never lose sight of how important it is to have the right people here. At Marsh, we believe in developing long-term relationships and we work hard to be the most welcoming, convenient, and cost-effective partner."

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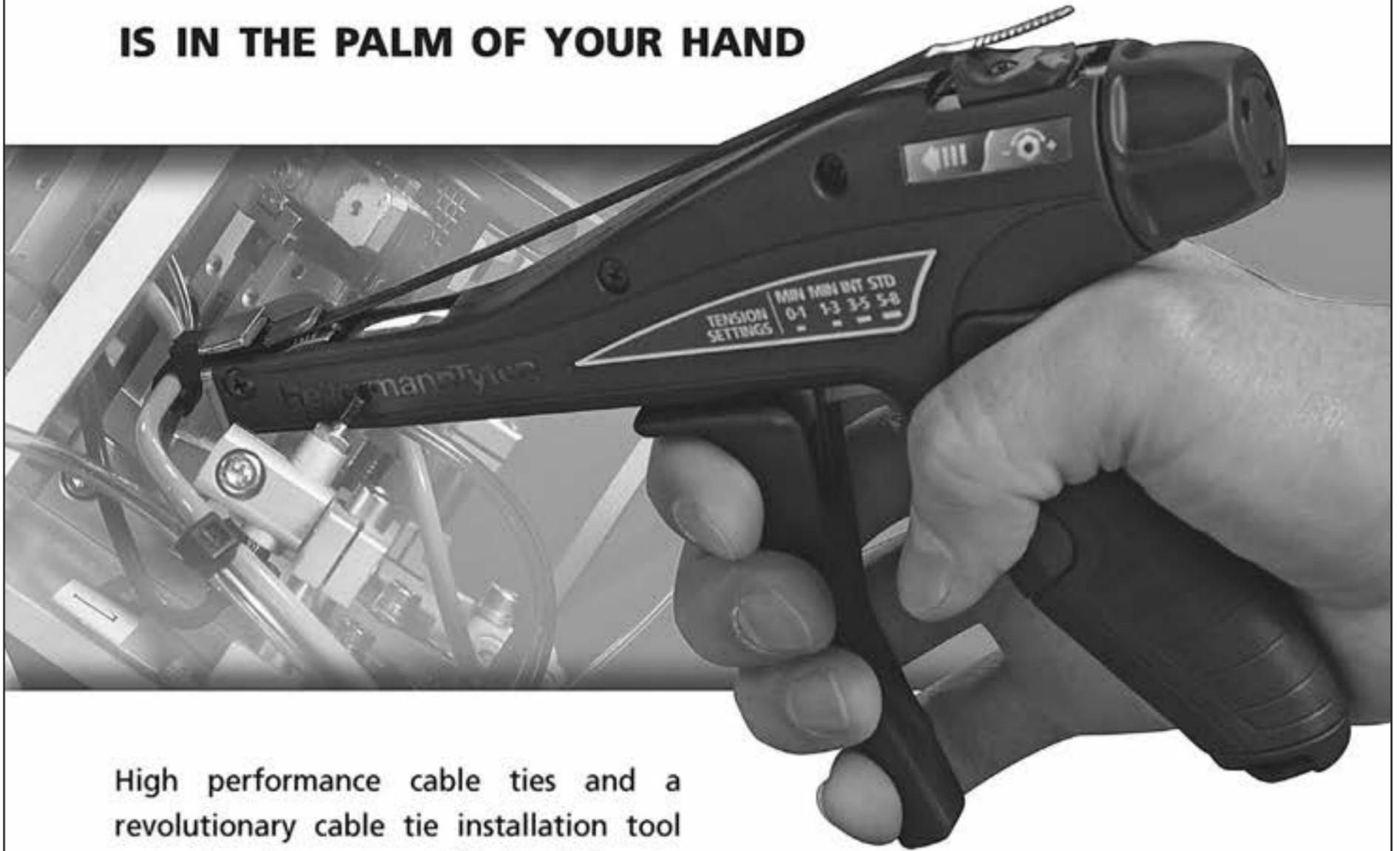
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Like many suppliers, Anixter receives frequent inquiries from customers regarding the environmental, health and safety characteristics of the products we carry. These inquiries are most often the result of Government regulations that ban or limit the use of certain substances in commercial products in various parts of the world. This Wire Wisdom provides a summary of three key regulations that

apply to products used in the European Union. Because many OEM wire and cable products sold by Anixter in North America and elsewhere are ultimately used in the EU, compliance with these regulations (called "directives" in Europe) is essential for many of our customers.

RoHS and WEEE

The RoHS and WEEE directives (Directives 2011/65/EU and 2012/19/EU) are two European Union regulations that require the elimination of certain heavy metal and bromine substances from electrical and electronic equipment since July 1, 2006. RoHS (sometimes pronounced as "roe haas") is

| Substance | Maximum Amount Permitted in Parts per Million (PPM) |
|--------------------------------------|---|
| Lead (Pb) | 1000 |
| Cadmium (Cd) | 100 |
| Mercury (Hg) | 1000 |
| Hexavalent Chromium (CrVI) | 1000 |
| Polybrominated Biphenyl (PBB) | 1000 |
| Polybrominated Diphenyl Ether (PBDE) | 1000 |

Table 1

Additional information on the RoHS and WEEE directives can be found on the Internet at ec.europa.eu/environment/waste/rohs_eee/index_en.htm or ec.europa.eu/environment/waste/weee/index_en.htm.

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an acronym for “Restriction of Hazardous Substances” and WEEE (rhymes with “flee”) stands for “Waste Electrical and Electronic Equipment.”

Together, the two directives are intended to promote the recycling of electrical and electronic equipment by reducing their hazardous substance content. To that end, these directives limit the use of six substances as shown in Table 1 (page 42).

Of the six regulated substances, lead is the only one that is commonly used in the wire and cable industry. Lead oxide (litharge) is sometimes used in cable insulation and jacket materials such as PVC (polyvinyl chloride), neoprene, EPR (ethylene propylene rubber) and CPE (chlorinated polyethylene) to improve electrical performance in wet conditions as well as to improve other properties. However, because of the many environmental regulations banning or controlling the use of lead, the industry has successfully found acceptable lead-free alternates. In many cases, lead-free alternates are made with materials such as PE (polyethylene), XLP (cross-linked polyethylene), PP (polypropylene), FEP

(Teflon[1]) or ETFE (Tefzel[1]). These materials are inherently RoHS compliant unless additives are introduced into them. Many currently “leaded” materials can also be reformulated to be lead-free at a reasonable cost and without significantly degrading performance.

End of Life Vehicles (ELV)

The ELV directive (Directive 2000/53/EC) is aimed at increasing the recyclable content of vehicles manufactured or sold in the European Union. ELV is an abbreviation for “End of Life Vehicles.” This directive only applies to components used in automotive vehicles— such as automotive wire and cable. It went into effect July 1, 2003, and bans or limits the use of lead, mercury, cadmium and hexavalent chromium. As a rule of thumb, XLP (cross-linked polyethylene) insulated automotive wire such as SAE (Society of Automotive Engineers) types SXL, GXL and TXL comply with this directive. However, PVC insulated automotive wire types such as GPT, TWP, SGT and SGX may contain lead and may not be compliant unless specifically requested in purchase specifications.

| Substance | Maximum Amount Permitted in Parts per Million (PPM) |
|----------------------------|---|
| Lead (Pb) | 1000 |
| Cadmium (Cd) | 100 |
| Mercury (Hg) | 1000 |
| Hexavalent Chromium (CrVI) | 1000 |

Table 2
Additional information on the ELV directive can be found on the internet at ec.europa.eu/environment/waste/elv_index.htm.

This directive limits the use of the four substances shown in Table 2.

Summary

The growing need for products that are free of potentially hazardous substances is likely to continue. In the case of wire and cable products, they are usu-

ally already available, will soon be available or are available by special order to replace products that no longer comply with increasingly strict Government regulations around the world.

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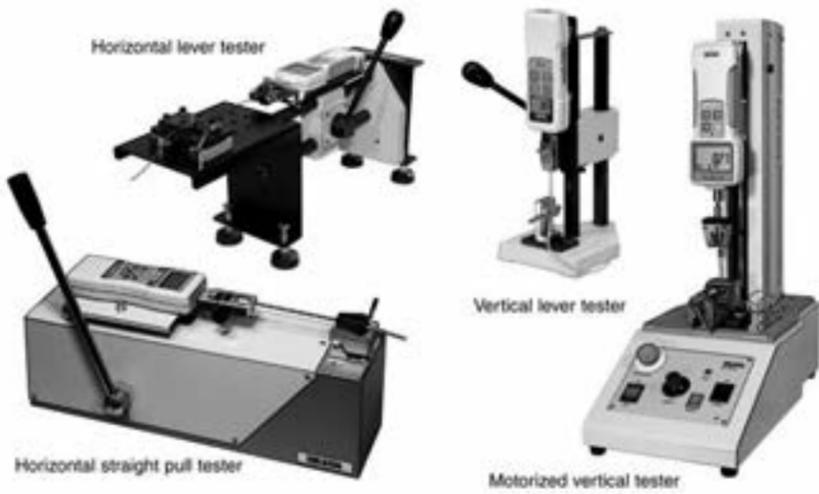
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NEWS PLUGS continued



General Cable and Dow Inside Alliance Introduces Empowr® Link+ Medium-Voltage Cable

General Cable and Dow Electrical & Telecommunications (Dow E&T), a business of The Dow Chemical Company (NYSE: Dow), are pleased to introduce BICC® Brand Empowr® Link+, an enhanced tree-retardant cross-linked polyethylene (TRXLPE) insulated medium-voltage cable that sets the new standard for reliability and asset management.

This powerful General Cable—Dow Inside alliance brings together two long-standing innovators with more than two centuries of combined technical expertise. General Cable and Dow are committed to providing valued solutions to customers by combining advanced materials

with advanced manufacturing. EmPowr Link+ underground medium-voltage cable offers longer service life and the potential for a lower total system cost, offering peace of mind now and for decades to come for consumers and utilities alike.

EmPowr Link+ utilizes DOW ENDURANCE™ HFDC-4202 EC next-generation insulation compound, which offers enhanced dielectric performance with improved water tree-retardant technology, and is coupled with advanced conductor and insulation shield technologies that help reduce electrical stress and enables easier accessory installation over a broader temperature range. These components, combined with exceptional material processing and state-of-the-art cable manufacturing capabilities, deliver a medium-voltage cable proven to provide extended cable life over existing TRXLPE cables.

“Backed by the General Cable—Dow Inside alliance, EmPowr Link+ delivers reliable power that allows our utility customers to lower operating costs and ensure an expected system lifespan in excess of 40 years,” said Jay Lahman, Vice President and General Manager of General Cable’s Electrical Utility Business.

Through Class 10,000 clean room material handling and 100 percent new-generation optical pellet inspection, EmPowr Link+ compounds avoid contamination that can adversely impact performance and service life. General Cable’s true triple extrusion dry cure technology and state-of-the-art computerized process controls further prevent exposure to contamination



EmPowr Link+ medium-voltage TRXLPE insulated cables

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and moisture ingress while ensuring consistent quality and reliability.

"Working together, Dow and General Cable are driving innovation forward and establishing new standards for reliability that improve the total system economics and offer enhanced peace of mind throughout the value chain," said Kim Ann Mink, Ph.D., Business President, Dow Elastomers, Electrical & Telecommunications.

EmPowr Link+ medium-voltage TRXLPE insulated cables meet or exceed industry standards and specifications while offering proven extended cable life as demonstrated by extensive wet aging comparisons and time-to-failure ACLT testing. For more information, email empowrlink+@generalcable.com or call 1.888.222.6584.

General Cable headquartered in Highland Heights, Kentucky, is a global leader in the development, design, manufacture, marketing and distribution of copper, aluminum and fiber optic wire and cable products for the energy, industrial, specialty and communications markets. For further information about General Cable visit at www.GeneralCable.com.

Dow Electrical & Telecommunications, a business unit of The Dow Chemical Company ("Dow"), is a leading global provider of products, technology, solutions and knowledge that sets standards for reliability, longevity, efficiency, ease of installation and protection that the power and telecommunications industries can count on in the transmission, distribution and consumption of power, voice and data. For more information, visit www.dow.com/electrical.

More information about Dow can be found at www.dow.com.

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A complete line of ergonomic cutters and pliers that feature static dissipative hand grips and conform to ANSI/ESD S20.20 and DOD-HDBK-263 specifications is available from Xuron Corp. of Saco, Maine.

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Xuron® ESD-Safe Cutters & Pliers

offered in 10 head styles for crimping, forming, and bending wires and leads including the Tweezer-Nose™ model for precision PCB work. Suitable for electronics assembly, production, and field repair

applications, these static-safe tools hand grips exhibit 106-109 ohms surface resistivity.

Xuron® ESD-Safe Cutters & Pliers are priced from \$14.25 (sugg. list), depending upon model, and manufactured in the

U.S.A. A catalog and pricing are available upon request.

For more information contact Xuron Corp., 62 Industrial Park Road, Saco, ME 04072-1840. Phone (207) 283-1401 or Fax (2078) 283-0594. Visit www.xuron.com



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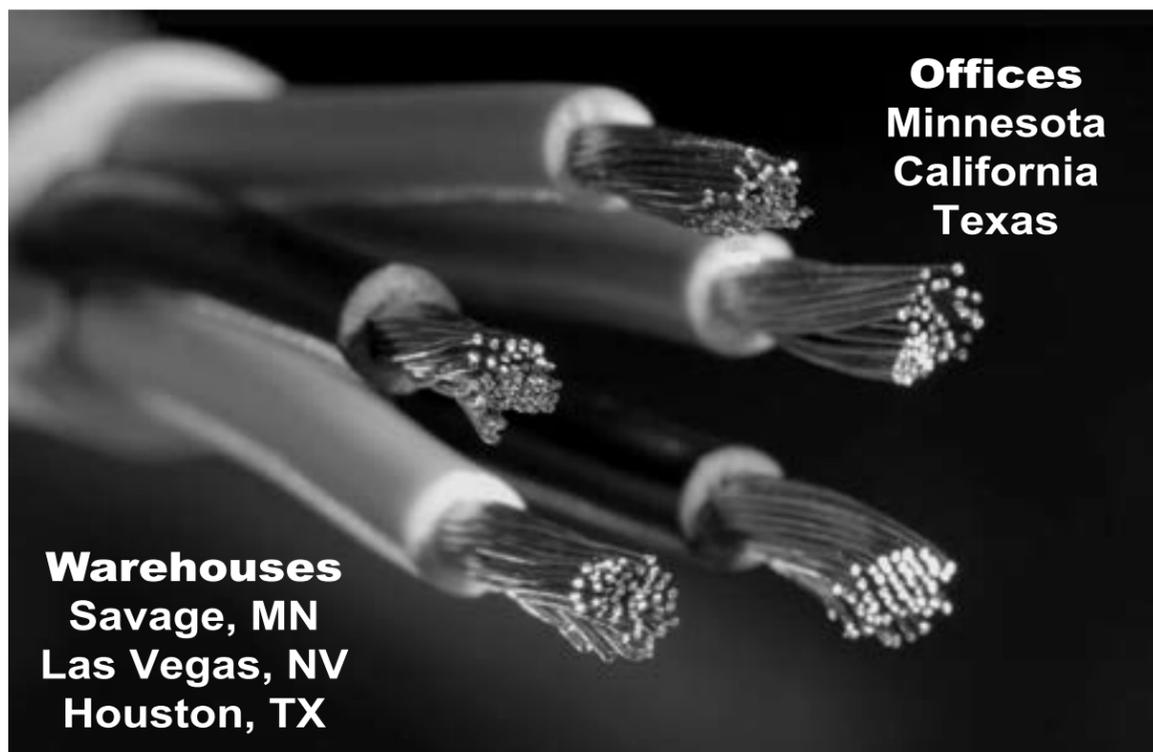
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NEWS PLUGS continued



Modular Power/Signal Connector Maximizes SWaP Reduction

Positronic Industries is proud to announce the addition of an 8.20mm low-profile version to the popular Scorpion power/signal connector series. The Scorpion product is unique for three key reasons: 1) Its modular tool design allows for a nearly limitless variety of customer-defined contact arrangements; 2) The molding process yields a one-piece insulator; and 3) The customer can define the connector width as long as the maximum envelope of 101.00mm is not exceeded.

Due to the modular tooling, customers can achieve optimum size, weight and power by configuring a power/signal



Low-profile Version of Scorpion Power/Signal Connector Series from Positronic Industries

connector from a wide selection of modules. In the low-profile version, the module options include size 12 contacts, size 20 contacts, size 22 contacts and blanks/spacers. Contacts are rated up to 55 amps for size 12, 12 amps for size 20 and 3 amps for size 22 contacts. Contact resistance values are as low as 1 milliohm for standard conductivity contacts and 0.7 milliohms for high conductivity contacts. The blanks/spacers allow the user to space power and signal contacts to tailor creepage and clearance values to meet design criteria. Contact terminations include board-to-board, board-to-cable, cable-to-cable, and panel mount options. Additional features/accessories include ventilation slots in the connector housing, integral blind mate system, integral locking system, float mounts, panel mount clips, and board locks. The Scorpion Series is the solution to maximize power throughput and minimize space claim.

For more information about the Low Profile Scorpion connector visit www.connectpositronic.com/scorpion.

Information on the full Positronic connector line can be explored by visiting our web site at www.connectpositronic.com/products. To locate the nearest Positronic sales office, visit www.connectpositronic.com/contact/sales_offices.

Wiring Harness News

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Industry Problem

In today's global manufacturing sector, a common problem is the leaking (leak paths) of over-molded electrical components, such as connectors, coils, cables, wire harnesses, conductors, etc. Multiple factory recalls have taken place due to this issue, compromising the quality stature of many top manufacturers. The most common solution is the use of potting compounds that can only give a potential end seal vs. 100% seal. Dimensional allowances have to be tolerated in the design of components using potting compounds.

With industry standards demanding high quality componentry in a world of precision high performance parts, this problem exists under demanding conditions, and causes fluid leakage, moisture penetration, and fluid migration. The solution has not grown with precision componentry until now...

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Anaseal[®] Vacuum Impregnation Processing provides a global solution with an anaerobic sealant that cures to form a tough thermoset plastic. The primary use of the process is to seal internal leak paths in and throughout the over-molded electrical components without effecting dimensions and cosmetics. The Anaseal[®] process is especially well suited to applications involving adverse temperatures up to 232°C and long-term resistance to solvents and hydrocarbons.

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| Hydrocarbon Fuel Resistant | Solvent Resistant |
| Component Flexibility Is Retained | Solderable |
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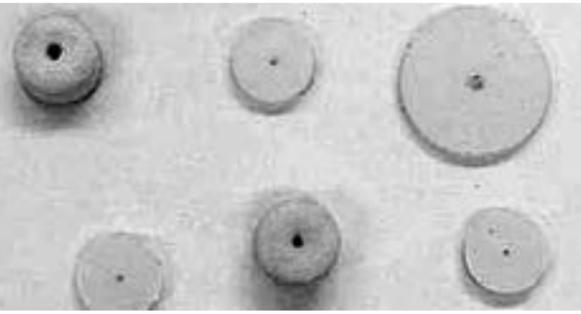
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NEWS PLUGS continued

Extreme Frigid Flex Cable Meets Arctic Temperature and Flexibility Requirements for Marine Shipboard Applications

Northwire is pleased to announce the release of Extreme Frigid Flex cable. As the next generation in Marine RIG wire and cabling, Extreme Frigid Flex is ideally suited for the demands of a wide range of marine based applications, including offshore and fixed oil rigs, marine vessels and offshore structures.

Extreme Frigid Flex Cable is an ideal solution for custom Marine Shipboard RIG Cable applications. Unlike other marine wire and cable on the market, Extreme Frigid Flex

offers:

- Superior bend flexibility across the temperature range of -60°C to 105°C
- 1,000 hour weatherometer compliance
- Optional shield, over-braid, foil and composite designs allow for full cable customization
- Available distribution ratings for 300 volt signal, 600 and 1,000 volt control and low power distribution
- Oil resistant to marine standards, weld slag, water and UV
- Flexibility for retractile cable applications
- Wide gauge range of 22-2 AWG
- Meets REACH and RoHS2 compliance standards
- UL 1309, CSA 245, IEEE 1580 and American Bureau of Shipping (ABS) compliant

Due to its flexibility and durability, Extreme Frigid Flex cable is uniquely suited to applications in cold climates where space is limited, reliability is mandatory and high performance is required.

As with all stock and custom cable orders, Northwire provides quotes within 24 hours for Extreme Frigid Flex cable orders, rapid cable prototyping and shipping and no minimums. Northwire also offers expert advice on custom cable solutions for connectors, assemblies and harnesses.

For more information, or to request a quote for Extreme Frigid Flex cable, contact Northwire at 1-800-468-1516 or email cableinfo@northwire.com. Visit www.northwire.com.



METRIC RING TERMINALS

Introducing high-quality metric-size solderless ring terminals featuring insulated Avikrimp™ and un-insulated VersaKrimp™ seamless barrel types. The terminals provide maximum electrical performance for metric crimps using studs up to 10mm in diameter and wire size up to 6mm².

Solderless ring terminals meet UL requirements only when crimped using Molex recommended tooling; however terminals may be crimped with a variety of industry-standard tooling.

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Consumer - Appliances / white goods, Consumer electronics / brown goods



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Marsh Electronics Celebrates 75 Years in Business

There have been many changes since 1937. But, the dedication, commitment and category expertise of everyone at Marsh Electronics have been unwavering since the company's founding. Proudly celebrating its 75th anniversary, Marsh Electronics remains focused on delivering the highest quality products, service, and best value to its customers. For more than seven decades, this philosophy has helped the company grow into a regional leader, distributing a wide range of electronic components and solutions throughout the North Central United States.

"It's really pretty humbling to look back on how far this company has come," said Jim Banovich, vice president of sales and marketing for Marsh Electronics. "Of course, our evolution and continued growth wouldn't have been possible without the effort of our employees and the dedication and support of our loyal customers. We send heartfelt thanks out to everyone who has stood behind us over the years. All of us at Marsh are proud to have been around for 75 years and we're certainly excited as we look ahead to the next 75 years and beyond."

Today, Marsh Electronics is a broad line stocking distributor offering electronic components from leading manufacturers of passive, electromechanical and power semi-conductor products. The company's willingness to stock inventory tailored to its customers' specific needs, as well as

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Marsh's unique ability to provide customized management programs, have helped position the company as a trusted, single source for a diverse array of electronic components.

"Through the years, we've certainly come to value the critical importance of having the right systems and procedures in place," Banovich said. "But, we've been careful to also never lose sight of how important it is to have the right people here. At Marsh, we believe in developing long-term relationships and we work hard to be the most welcoming, convenient, and cost-effective partner."

For further information visit www.MarshElectronics.com or call 800-236-8327.

WireMasters Expands With a West Coast Regional Location

WireMasters has recently expanded its operation to include a new warehouse facility located in Mesa, Arizona. Over the past several years, WireMasters has recognized strong customer demand and has experienced consistent growth within the Western United States, Western Canada and Mexico. The opening of the Mesa location will allow WireMasters to improve services provided to the West Coast Region, while raising their presence within the aerospace industry. For 25 years WireMasters has endeavored to exceed customer needs and enhance customer satisfaction for its over 6,000 customers worldwide.

"WireMasters focuses on exceeding customers expectations", said David Hill, President and CEO of WireMasters. "By establishing the Mesa location, we will be able to continue and accelerate our growth trend in the Western Region. In addition to the new Mesa facility, we have added Ryan Barnhart as the National Account Manager for the West Coast Region. With a degree in Electrical Engineering and his experience in the aerospace industry we feel he will be a great asset to the WireMasters team and the Mesa location."

November 2012 will mark the opening of the Mesa location. Located at 5456 E. McDowell Road, the 10,000 square foot warehouse will stock approximately \$1 Million dollars worth of Mil-Spec wire, cable, connectors, and tubing available for same day shipments.

Founded in 1988, WireMasters Inc. is a leading international distributor of high performance and high temperature military specification wire, cable and associated accessories. The company's headquarters in Columbia, Tenn. warehouses millions of feet of wire and cable inventory. For more information visit www.wiremasters.net.

IEWC Announces Changes to Sales and Marketing Leadership Positions

IEWC has restructured several areas of its sales and marketing leadership, including the expansion of its U.S. division from three operating regions to four, as the company continues to position the business for dynamic growth.

Mike O'Donnell has transitioned

from Vice President of North American Sales to Senior Vice President of Global Sales. In this position, Mike will work collegially with IEWC's country leaders and sales representatives around the world to ensure the company continues to offer products and services into the OEM and Sub-Assembly markets in a highly focused and orderly manner. Mike will report to Paul Bryant, EVP & CCO and be based out of the Milwaukee head office location.

Mark Christie has transitioned from Vice President of Wire Management Products to Vice President of Sales, US Division. In this position, Mark will champion the sales initiatives for IEWC's four sales regions in the USA. Mark has done a nice job of working with both supplier contacts and customer contacts over the past 4 years to firmly establish IEWC's wire management products and services in the marketplace. Mark will continue to oversee the ongoing growth of that activity within the USA as part of his newly expanded responsibilities. Mark will report to U.S. Division President, Kyle Spader and be based out of the Milwaukee head office location.

JR Dubovick has transitioned from his

leadership role in Aerospace & Defense to Regional Sales Director of the East Region of the USA that includes the geography bounded by New England, Maryland, Delaware, Pennsylvania, New Jersey, New York, Michigan, West Virginia, Kentucky and Ohio. Over the past six years JR has successfully transitioned the Aerospace and Defense Business into the mainstream activities of the company. JR will continue to provide insight and support internally as the aerospace and defense initiative becomes a market vertical activity housed within IEWC's Marketing Department. JR will be responsible for the sales responsibilities of both the Cleveland and Boston Sales Offices, report into Mark Christie and be based out of the Boston location.

Jim Clarke will redirect his primary focus as Regional Sales Director of the South Region which will include the sales activities of both the Greenville, SC and Dallas Sales Offices. Jim will also report to Mark Christie and operate out of his current Charlotte, NC location.

Joe Crum has recently joined IEWC as Marketing Director. Prior to joining IEWC, Joe held various positions during an 11

year period with Direct Supply including Senior Director of Product Management. Since joining IEWC, Joe has established several new Product Manager positions to maintain IEWC's current product portfolio and champion the growth and development of various market verticals, including Aerospace & Defense, Wire Management Products and Audio & Broadcast. Joe will report to Paul Bryant, EVP & CCO and be based out of the Milwaukee location.

Christie Vick has recently assumed the position of Product Manager, Aerospace & Defense and will report to IEWC's Marketing Director, Joe Crum. Christie joined IEWC in 2011 and has made several significant contributions within the marketing group that include product portfolio management, enhanced product introduction processes and functioning as a liaison between suppliers, sourcing, inventory management and sales. Christie is located at IEWC's head office facility in Milwaukee. IEWC is a global supplier of wire, cable and wire management products, with distribution centers strategically located throughout the world.

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NEWS PLUGS continued



Ty-Rap® Polyester-Coated Stainless Steel Ball-Lock Cable Ties

Ty-Rap® Polyester-Coated Stainless Steel Ball-Lock Cable Ties from Thomas & Betts provide greater safety than other stainless steel cable ties by featuring a low-smoke, halogen-free polyester coating, which releases fewer toxins if burned. Additional safety features include rolled edges on the strap, which eliminates the risk of damage to cables and injury to installers.

The polyester coating also provides the cable ties, constructed of marine-grade 316 stainless steel, with additional protection against corrosion, including corrosion from contact with dissimilar materials, as well as against impact, abrasion and cracking. Ty-Rap® Polyester-Coated Stainless Steel Ball-Lock Cable Ties also are resistant to extreme temperatures, with an operating range of minus 40 F to 302 F (minus 40 C to 150 C).

"These cable ties add an extra level of safety, while operating under continuous exposure to extremely harsh environments," said Chad Smith, director, product management at Thomas & Betts. "These products are ideal for the demanding applications of offshore drilling rigs, petroleum refineries, shipyards and chemical processing plants. The unique design features and materials also reduce risks to personal safety and cable integrity."

As with all Ty-Rap® stainless steel ball-lock ties, Ty-Rap® Polyester-Coated Stainless Steel Ball-Lock Cable Ties feature a pointed tail to enable fast and easy insertion and a low-profile ball in a wedge-shaped head that locks the tie securely in place.

For more information about Ty-Rap® Polyester-Coated Stainless Steel Ball-Lock Cable Ties from Thomas & Betts, visit www.tnb.com and look for Ty-Rap® on the "Brands" tab, or call (800) 238-5000.

Thomas & Betts Corporation is a global leader in the design, manufacture and marketing of essential components used to manage the connection, distribution, transmission and reliability of electrical power in utility, industrial, commercial, and residential applications. With a portfolio of more than 200,000 products marketed under more than 45 premium brand names, Thomas & Betts products are found wherever electricity is used. Thomas & Betts' headquarters are in Memphis, Tenn. For more information, please visit www.tnb.com.

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Finally, a lightweight tool that delivers the power required for crimping! The small head offers incredible flexibility and the ability to reach into tight spaces. As an added convenience, the crimping head can be rotated to nearly any angle, allowing the operator to identify the most comfortable position for the job.

Despite the lightweight of the power unit, the tool can produce approximately 250 crimps between charges. This is made possible through a ten ounce, 10.8 Volt Lithium-Ion battery that can re-charge in only 25 minutes, thereby giving plenty of time for production.

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Genco Industries

Continued from page 1

Besides owning Genco, Dombrock, 64, operates his Waukesha accounting and financial services firm, which he started in 1991. For 15 years he handled the accounting for Genco when it was owned by Fred Gearing, who bought the

business in 1980. It was started in 1975 in nearby New Berlin, Wis., initially specializing in kitting parts for GE Medical, now GE Healthcare.

When Gearing wanted to sell Genco, Dombrock decided to buy it. He and his wife Laura own 90 percent, and some of their friends own 10 percent. Although



Dave Hajdaz assembles one of Genco's custom box build assemblies.

he is the president, he primarily oversees the finances and is not involved in the day-to-day operations, leaving them to Lusic.

Before Genco, Lusic worked six years at Pepin Manufacturing in Lake City, Minn. The firm with 30 employees made disposable medical products and laundry care items and had three divisions. He worked in all three, growing each by \$1-2 million from the ground up.

Lusic's previous stint was 20 months at a Trane commercial HVAC sales office in La Crosse, Wis., handling marketing communications. He received a marketing degree from the University of Wisconsin - La Crosse in 1999 with an emphasis on sales and promotion.

A week after Lusic started at Genco-

he was faced with eliminating Genco's second shift and its 10 employees because of the major customer's departure. He stated that he realized his action compromised the trust he tried to establish in the staff members while addressing them on his first day on the job.

Lusic wanted to instill a focus on Genco's customers. "I came from the sales arena where we believe the customer pays the bills and we do what we do for the customer," he said. "But when I came on board the culture was not customer-centric but employee-centric. For some at Genco it wasn't 'What can we do for the customer?' It was 'What can I get out of the company?'"

"The company exhibited good product margins, but it was covering up ineff-



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iciencies," Lusic said. "We were top heavy and overstaffed at the time, and didn't have the sales volume." He was willing to re-assign people to different positions and change policies, too.

"Getting buy-in to our philosophy from everybody was key," Lusic said. "We knew we had to earn their trust. Some employees saw Steve's purchase as a breath of fresh air because they saw change was needed. Others liked the old way, so there was some turnover. Eventually people saw the direction we were heading to be successful, make money and grow the business."

"It was a challenging first two years," Lusic said. "The 2009-10 recession could have put us out of business if we had not laid the groundwork in 2007 and '08. Today everybody works hard here and understands their role. Nobody is micro-managed. People take pride in what they do and are all pulling in the same direction."

Sales for 2012 totaled \$5 million, and Lusic predicts they will increase this year approximately 10 percent. Growth has been 10-20 percent the last three years. The recession caused a 15-percent drop.

"We built the business back up after losing the large customer in 2006 and then losing volume in the recession," Lusic said. "At the peak in the 1990s the sales were \$8-9 million, but this was a whole different company then, and there were higher margins on products. It is healthier now because of the processes, people and culture. We are more confident we will be here 15 years from now than we were in 2006-07."

Lusic and the Genco staff always have had Dombrock's support. "Risk has never scared him that much," Lusic said. "Once he believes in people, he puts his

trust in them. He believes that with the right people they can turn it around."

In addition to Dombrock and Lusic, guiding Genco is a management team consisting of: Scott Klotz, production; June Campbell, purchasing; Larry Gillis, quality; Julie Howard, office and customer service; Tim Kohman, engineering; Kari Lusic (Paul's wife), human resources; and Jesse Gonzales in customer service; Diane Hughes, inventory and Rita Steffens in quality.

Genco's production consists of 40

Continued on page 54



Lead QC Inspector Rita Steffens is performing a functional and voltage monitoring test on an assembly with a Genco designed and built piece of test equipment.



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Genco Industries

Continued from page 53

percent cable assemblies, 30 percent wiring harnesses, 20 percent electro-mechanical assemblies and box builds and 10 percent wire processing. All orders are custom, and 70 percent are shipped to customers in the Midwest, primarily in southeastern Wisconsin.

Other customers are throughout the United States and in India, Mexico, China, UK, and The Netherlands.

The most basic cable assembly is for Harley-Davidson in Milwaukee for motorcycle diagnostics and performance tuning. A complex cable measuring 40 feet and having multiple breakouts could go on a piece of farm equipment that



Lauren Wilson does a short and continuity test on a harness assembly.

weighs grain to determine crop yields.

A simple wiring harness contains two pins for an industrial oven. A complex harness has 30-40 breakouts for a generator made by Generac in Waukesha.

GE Healthcare, which has several facilities in the Milwaukee metropolitan area as part of the company's worldwide operations, is Genco's first, largest and longest-term customer. Among many other parts made for GE Healthcare, Genco makes a simple electromechanical assembly that is used in x-ray machines. A larger, more complex assembly is a turnkey piece of test equipment for a university that has over 200 components.

Products for the medical industry comprise 40 percent of Genco's volume. Industrial products rank second at

30 percent, and agricultural, transportation and miscellaneous are 10 percent each.

Genco has approximately 100 active customers, and a group of key accounts has been with Genco more than 15 years. Customers produce such things as military aircraft, battery storage cabinets for alternative energy, wash fountains, hydraulic lifting devices for industrial use and computer equipment.

Genco fulfills orders between one and 10,000 pieces, averaging 100-500. All are made in Waukesha except the five percent of harnesses and subassemblies with high labor content produced by a subcontractor in Mexico.

The highest-priced items are intricate electromechanical assemblies in fabricated metal or molded plastic housings

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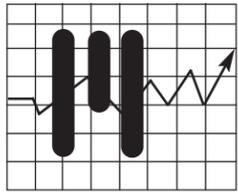
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with harnesses, cables and printed circuit boards. The box builds cost between a few hundred and a few thousand dollars. Although the largest piece is 4x5 feet, the average size is a hand-held item.

Production is according to lean manufacturing, which was undertaken in November 2007. 5S methodology also is used. "We did a complete re-layout of the production floor for more efficient material movement," Lusic said. "We 'found' 25 percent more space in the plant. A quarter of the production floor is used as a temporary cell for projects with lots of parts that have to be spread out. That area is empty when it is not used for special projects."

Equipment has been purchased from Artos, Schleuniger, Komax, Amp/Tyco, Cirris and Molex. More cable-processing and testing equipment is being considered, as is a machine for overmolding.

Approximately 65 regular suppliers serve Genco, and an equal number is used occasionally. Contract pricing is in place with key suppliers, and Genco keeps a score-card on each supplier.

"We expect a lot from our suppliers, just as our customers expect a lot from us," Lusic said. "Each supplier must go the extra mile long term for pricing, delivery and communication. Communication is so key to running a business efficiently. A supplier saying 'I don't know' or 'I'll get back to you' and who does not leaves us in a position we don't want to be in."

Genco has ISO 9001:2008 certification and is UL recognized and follows IPC A-610 and IPC-WHMA A-620 standards. They have helped to result in a parts-per-million defect rate of 1,066 in 2012. Continuity testing is done as often as possible.

Production is carried out in a building constructed in 1991. Originally 3,000 square feet, the facility received a 12,000-square-foot addition in 1993 and 3,500 more square feet two years later. Lusic said 30-40 percent more business could be accommodated before further expansion is necessary.

To increase sales, Lusic is hiring a salesperson and an estimator in the near future. Lacking someone else to handle sales the past two years, Lusic has done it with support from his two customer service associates and estimating department. "Because my background is in sales, I enjoy working with customers and fulfilling their needs," he said. "It's fun, but it's a challenge keeping up with everything else. I need to get back to working on the company rather than in the company to see



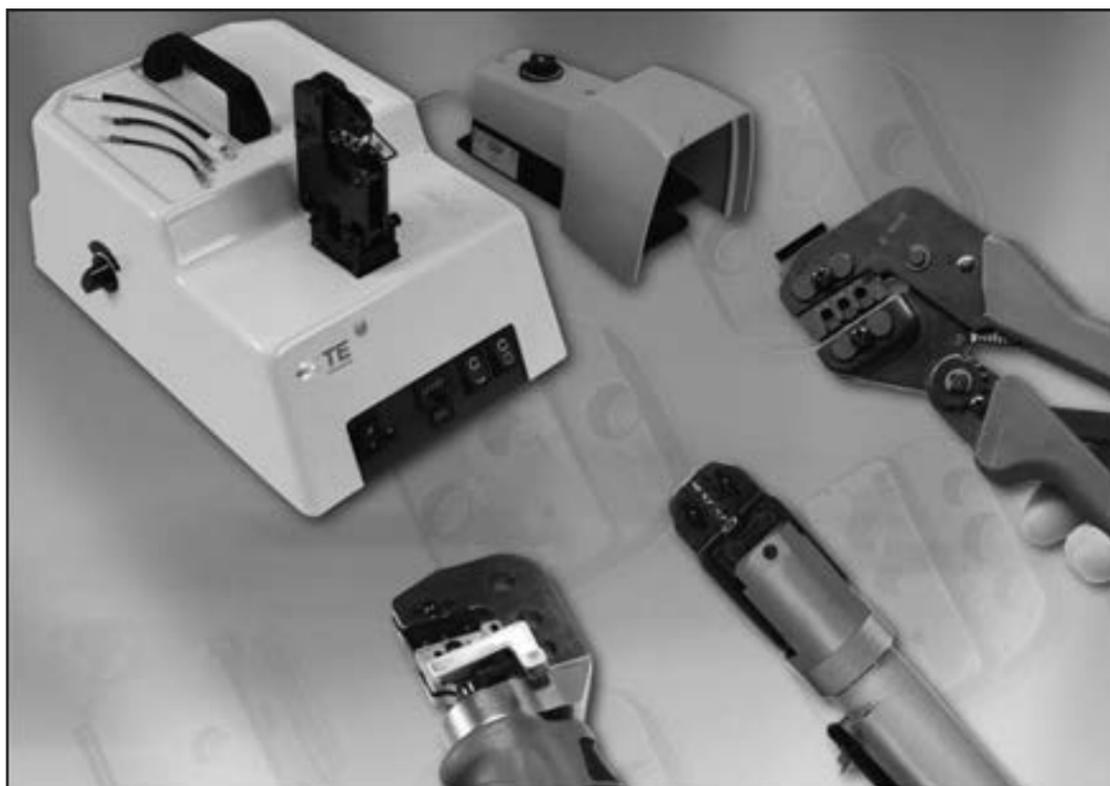
Genco's day to day management team Larry Gillis, Julie Howard, Tim Kohman, Jesse Gonzales, Kari Lusic, June Campbell, Paul Lusic, Scott Klotz.

where our needs are for 2014 and beyond."

Lusic stated that Genco's emphasis is on customer communication and overall customer satisfaction. "That is what is

driving us," he said. "We track all metrics for delivery and quality and bring them to meetings with our customers. It's a matter of pride that we have a retention rate of 95 percent with our customers."

For more information, call 262-548-8890, e-mail genco@genco-industries.com, fax 262-548-8891, visit www.genco-industries.com or write 209 Wilmont Dr., Waukesha, WI 53189.



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NEWS PLUGS continued**SEA Wire and Cable, Inc. Announces Promotion**

SEA Wire and Cable, Inc., a leading Military/Aerospace Wire and Cable distributor, announced the promotion of Chase Layton to Operations Manager effective January 1, 2013. Chase will be responsible for warehouse and daily operations for SEA.

"Through his hard work and dedication, Chase has proven to be a valuable asset to the SEA management team. We expect Chase's commitment and quantitative skills to prove to be a key component in SEA's future growth. Chase will provide that critical vision to help shape our tactical and strategic plans" said Marty Clark, President and COO of SEA.

Chase started with SEA working summers to help finance his college expenses. After graduating from University of Alabama in 2008, Chase joined the sales organization where he honed his skills and learned the basics of the business. Chase is currently graduating with his MBA from University of Alabama Huntsville with emphasis on operations management. In addition to providing support to the warehouse over the past several months leading to new programs, systems, and efficiencies - he has also been instrumental in technology updates with new ERP P21 system.

SEA specializes in supplying wire, cable, tubing, termination sleeves, cable ties, EMI/RFI backshells, and other cable assemblies for the most demanding electronic applications. To provide fast service and to meet a wide range of client needs, the company currently stocks over 11,000 items and 50 million feet of wire in its modern 88,000-square-foot facility.

Russtech Engineering Receives Gold Boeing Performance Excellence

RUSSTECH Engineering Co., Inc. announced that it has received a 2012 Boeing, Gold Level, Performance Excellence Award. The Boeing Company issues the award annually to recognize suppliers who have achieved superior performance. RUSSTECH Engineering Co., Inc. maintained a Gold performance composite performance rating for each month of the 12-month performance period, from October 1, 2011 to September 30, 2012.

This year, Boeing recognized 594 suppliers who achieved either a Gold or Silver level Boeing Performance Excellence Award. RUSSTECH Engineering Co., Inc. is among 153 suppliers to receive the Gold level of recognition.

This is RUSSTECH's sixth consecutive Performance Excellence Award and our third Gold. RUSSTECH joins a unique club of only 16 Boeing suppliers to achieve this

consistent level of performance out of the 23,000 companies in the Boeing global supply base.

RUSSTECH Engineering Co., Inc. is a leading specialist manufacturer/ supplier serving the aerospace, military, transportation, and electronic industries. Founded in 1974, RUSSTECH is known for an innovative approach to design and manufacturing solutions.

RUSSTECH is an innovator in quality and reliable Aircraft Electrical Components. We hold FAA / PMA for many current production and legacy aircraft programs with a focus in flight deck switching, light dimming controls, windshield heating terminations, encapsulated diodes, resistors, flexible bus assemblies, extruded terminal track, and hardware.

RUSSTECH Engineering Company, Inc. entered the IFE market with our inflite® line of light weight, EMI rated, composite Back Shells for D-Sub connectors. This innovative product is less costly and up to 50% lighter compared to competitive metal systems and is EMI rated to 10GHz.

RUSSTECH Engineering Co., Inc. offers Connector Tooling Solutions, advancing the art with many ergonomic, efficient and patented designs. As an example, our RTCRT™ patented Contact Retention Test Tool and associated process has become an industry standard, greatly improving connector reliability and first time quality.

RUSSTECH maintains a quality system that is ISO 9001:2008 / AS9100 REV C registered. All products are manufactured in California.

In the Black:**WAGO 2060 Series**

A new, black housing for WAGO Corporation's 2060 Series SMD Push-Button Terminal Block helps ensure correct LED device wiring. Offered as a 1-pole unit (2- and 3-pole upon request), the black housing provides on-board "+" and "-" color-coding when paired with light gray 2060 Series blocks.

Beyond clear inputs/outputs, the new block also offers WAGO-exclusive push-button terminations to streamline LED device assembly, e.g., downlights.

The new housing also supports higher-temp applications, such as high-output, outdoor LED fixtures for roadway and stadium lighting.

The black 2060 Series features the same ratings as its UL/cUL Recognized siblings — 600 V (1-pole), 250 V (2- and 3-pole) and 9 A nominal current (all models).

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2060 Series' push-button terminations are a labor-saving alternative to hand-soldering PCB leads. Push-buttons also permit wiring error correction — no costly scrap/rewiring. 2060 Series accommodates the broadest range of solid/stranded conductors (AWG 24–18) within one unit — even tinned, top-coated or pre-bonded ones.

LED applications include: recessed luminaires, emergency lighting and signage. Just 4.5mm high, 2060 Series also serves electronics requiring low-profile SMT components, such as alarms and HVAC controls.

WAGO is a leader in spring pressure connection technology that eliminates loose wires resulting from vibration and temperature cycling, while providing highly reliable, corrosion-resistant and maintenance-free connections. Products: DIN-rail, PCB and chassis mount terminal blocks; signal conditioners; the WAGO-I/O-SYSTEM and more.

For more information, visit www.wago.us. Contact WAGO at 1-800-DIN-RAIL

Catamount® Twist Tail® Cable Tie Wins Innovation Showcase Award

The Catamount® Twist Tail® Cable Tie from Thomas & Betts was recognized with an Innovation Showcase Award at TESCO Technology Inc.'s Innovation Showcase, a trade event held in Baltimore.

TESSCO Technology Inc., a Thomas & Betts distributor, provides products and services for the construction, operation and maintenance of wireless and broadband communications and data systems. The event drew more than 50 vendors and more than 500 attendees, most of whom

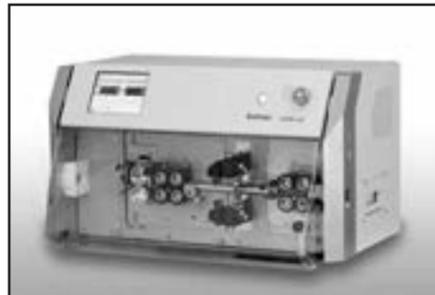
were contractors, buyers and specifiers in government, fossil fuel, rail and transit, internet service provider and retail industries. The awards were determined by a poll of the attendees.

"The Catamount® Twist Tail® Cable Tie allows the removal of the excess tail without the use of tools, which substantially reduces installation time," said Chad Smith, director, product management at Thomas & Betts. "All the installer needs to do is grasp the excess tail between his thumb and forefinger, bend it in the other direction and twist. It's also safer, as removal of the tail doesn't leave sharp edges." For more information about Catamount® Twist Tail® Cable Tie, visit www.tnb.com/contractor/docs/cata

Kappa Cut-and-Strip Machine Speeds Wire Processing

Advanced sensor technology gives the new Kappa 322 from Komax a powerful advantage for easy cable setup and changeovers without tools. Even difficult to process materials can be setup quickly.

The Kappa 322 carries a patented swivel technique in the wire drive allowing for different processing positions. The



Kappa 322 Strip and Cut Machine

machine is designed for a wide variety of special applications, or the separation and processing of inside wires in multi-pole cables.

The intuitive touch-screen and integrated user prompts make it extremely easy to operate. Plus, the Kappa 322 covers a broader processing range than ever before with a diversity of available solu-

tions, including inkjet, part list production and networking options.

For more information contact Komax Corporation. 1100 E. Corporate Grove Drive, Buffalo Grove, Illinois 60089/USA. Toll-Free: 1-888-GO-KOMAX (1-888-465-6629). Phone: 1-847-537-6640. Fax: 1-847-537-5751. Web Site: www.komaxusa.com



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wire Russia 2013

June 25-28, 2013

General economic conditions are improving for the Moscow wire/Metallurgy-Lit-mash, Tube Russia and Aluminium/Non Ferrous trade fair duo: despite the extremely tough economic climate of recent years, the metallurgy, wire and cable sectors are viewing the future with relative optimism, thanks to an ongoing increase in investment in Russia. Many sectors rely on products from the wire, cable and wire-processing industry, essential as they are for transmitting electrical energy, electronic data, or mechanical forces. In order to meet increased product requirements, machinery and plant is needed that can adapt to a whole range of specifications, while continuing to offer the same high degree of production quality with a minimum consumption of resources. As a result, the current modernization requirement of the country's overall economy is enormous. Against this background, the cutting edge technologies provided by international companies is full of business expansion opportunities within the wire and cable industry. *For further information contact Messe Dusseldorf North America, tel. 312-781-5180 or fax 312-781-5188. Email info@mdna.com or visit www.mdna.com.*

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wire Southeast Asia

September 17-19, 2013

wire Southeast ASIA will continue to be Southeast Asia's leading trade fair for the wire, cable, fiber optic, spring and fastener industries, and has become an important platform for those who seek to find and to keep in touch with the opportunities available in Asia. Premiered in 1995 in Singapore, wire Southeast ASIA is the regional version of wire Düsseldorf, the world's no. 1 trade fair for wire and cable. wire Southeast ASIA is established as the most effective and efficient forum to gain access to the markets of southeastern Asia. More and more serious buyers from this important region are congregating at this biennial event in search of wire and cable technologies, wire manufacturing and wire finishing machinery, spring making and fastener machinery. *For further information contact Messe Dusseldorf North America, tel. 312-781-5180 or fax 312-781-5188. Email info@mdna.com or visit www.mdna.com*

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All the major design software providers are here, and scores of topnotch board fabricators and assemblers are represented. We see a real trend whereby OEMs are reconsidering their outsourcing strategies, and in many cases moving product design and build back to North America. The Silicon Valley remains the world's most vibrant electronics engineering community. For 21 years, PCB West has been the best place in the Silicon Valley to extend that community. *For further information visit www.pcbwest.com*

39th TAITRONICS 2013

October 8-11, 2013

The 39th Taipei International Electronics Show will focus on Electronic Components, Batteries & Power Supplies, LED Components & Applications, Meters & Instruments, Process & Manufacturing, Wires & Cables, Consumer Electronics, Safety & Security and RFID Equipment & Applications. *For further information contact the Taiwan External Trade Development Council (TAITRA) or Taiwan Electrical and Electronic Manufacturers' Association (TEEMA). E-Mail: taitronics@taitra.org.tw*

The Assembly Show

October 28-30, 2013

The ASSEMBLY Show is an event connecting manufacturing suppliers, buyers and users of assembly equipment in a forum exclusive to assembly technology, equipment and products. At this tradeshow attendees will experience assembly equipment hands-on with large exhibits and working equipment that you can interact with in-person. Attendees can explore alternative product solutions that are efficient and cost effective. Attendees can evaluate the latest technologies and products in custom automated assembly systems, robotics, screwdriving, adhesives, dispensing, plastics assembly, presses, conveyors, fasteners, packaging, workstations, welding, vision systems... and much more. *For further information visit www.theassemblyshow.com*

MD&M Minneapolis 2013

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For 21 years, MD&M Minneapolis has been the trusted resource for what's next in medical design and manufacturing. Regardless of your particular design and development objectives, MD&M offers everything you need to drive your project to the finish line. *For further information visit http://MDMminn.com*

Productronica 2013

November 12-15, 2013

productronica is THE leading trade fair for electronics production. It showcases the entire value chain for electronics manufacturing- from software to process control, from technology to applications, and from products to system solutions - under a single roof. It also focuses on the latest innovative and future-oriented highlight themes. Take advantage of this added value and profit from the effects of synergy. In short: productronica is an outstanding gathering for leading German and international manufacturers and newcomers who give other participants a look at both the present and the future. *For further information email info@productronica.com*

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