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- Four Tips for Sustainable Growth for Wire and Cable Companies
- How Raising the Minimum Wage Could Affect Manufacturers



The 17th Annual Electrical Wire Processing Technology Expo – Another Success!

By Joe Tito
Wiring Harness News

With social media, FaceTime, Skype and text messaging, we live in the age of immediate connectivity. It's easy to lose sight of the fact that the most effective form of communication is face to face. And nowhere is this more evident than the Electrical Wire Processing Technology Expo held every May at its home in the Milwaukee Center in downtown Milwaukee. This year's event was held May 10th and 11th, and was nothing shy of another hit. The event continues to pull decision makers for harness contract manufacturers, as well as OEM harness shops from around the globe.

With over 165 exhibitors, the EWPT Expo is the world's largest showcase for components, processing equipment, design tools, testing technology, and all the elements

Four Tips for Sustainable Growth for Wire and Cable Harness Companies

By David Oeters
Corporate Communications
with CIMx Software

For wire and cable harness companies, a successful growth strategy must be more than a long-term plan for increased business. Sustainable growth requires a solid foundation for increased production. Without it, inefficiencies and errors are magnified as demand surges on the shop floor. New orders and production require-

that function in wire and cable harness production. The Expo was once again co-located with The Electrical Manufacturing and Coil Winding Show, exhibiting coil winding and testing products for electrical manufacturing.

In addition to all the latest equipment, tools, and support technology available to the wire harness industry, attendees were able to attend free industry-specific seminars where they learned advanced techniques for solving wire harness problems. The 2017 seminars did not disappoint. Patrick Boyer of Komax highlighted ways to increase efficiencies in electrical cabinet building. Gary Wasch of Radix Wire spoke about high temperature wire for appliance applications, and Bernd Jost presented on manufacturing execution systems.

Need help inspecting your crimps? Terry Curtis from Crimping & Stamping Technologies had you covered, while Paul Hogendoorn instructed folks on using the Internet of Things

ments can then overwhelm archaic processes.

When pressure mounts, many businesses avoid opportunities for growth, turning down new customers rather than risk losing existing business.

As a manufacturer, your growth strategy should address production as much as new customers. Consider the following tips as you plan for growth.

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For the past few years, visitors have been treated to some special Pheasant Appetizers presented by Artos, KM USA, and Schleuniger. The pheasant is provided by The Wire Processing Expo Hunt Squad, John Olsen, Charlie Ross, John Szczepanski, DJ Cartledge, Stash Szczepanski, Chris Mikulski, Jay Partington, and loyal dogs, Axel, Millie and OZ. The group organizes the hunt each year, usually at Wild Ridge Game Farm in Watertown, WI

to improve plant floor productivity. Patrick Moroney, also of Komax, talked about best practices for wire twisting and taping, and Matt Houser of TE Connectivity rounded things out presenting advanced theory for crimping small wires. As always, seminar attendees received Certifications of Completion that count towards Continuing Education Initiatives.

Many thanks to our friends at Wire & Cable Technology for another outstanding job at arranging the speakers and sponsoring the seminars room. Special thanks also to Carrie Seibel of EPI Shows for helping with speaker selection, and for making sure everything ran smoothly.

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Qualtek - From Fan Guards to Cable Assemblies

By Joe Tito
Wiring Harness News

Qualtek Electronics Corporation is a major supplier of cable assemblies and cord sets. In addition to DVI, HDMI, and USB (2.0 and 3.0) cables, they also produce power cords (International and Hospital Grade), Ethernet Patch Cables (Cat 5 and Cat 6) as well as Fiber Optic assemblies. The cables are available at predetermined lengths through their online catalog, but Qualtek will also custom produce these assemblies for bespoke applications.

Through their global manufacturing platform and procurement specialties, Qualtek also produces AC and DC Fans and Accessories, EMI Filters, Power Supplies, and Thermal Circuit breakers. They also manufacture and supply ancillaries to the industry such as Heat Shrink and Cable Ties.

Wiring Harness News recently spoke with Laura Yano, Operations Supervisor, RJ Nuti, Chief Engineer, and Dimitri Povozaev, Warehouse Manager, to learn more about the company's history, and what makes them a work-class supplier of as-

semblies and related accessories. The company was founded in 1979 by John Hallums. "At the time, he was working as a rep for GE and basically living out of his car, as he likes to tell," mentioned Laura. John saw a simple but strong need for wire-formed fan guards. Along with a friend and partner in Taiwan, he began to supply the fan guards under the name Qualtek, and his adventure began. "From there, he began to introduce Power Cords and AC Receptacles, and other items," she instructed.

The company has 30 employees in Mentor, Ohio where it has been since its inception. "All manufacturing is done overseas," Laura noted, "except for a few key parts which are still done here in the US, and a couple that are done in Germany." They are in their third location in Mentor where they occupy 60,000 Sq. Ft. They have been in the current location since 2011, and the team was quick to mention they are growing out of that space.

As far as actual manufacturing operations, Qualtek has a unique structure. "It's really a mix," RJ said, "some

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July/August 2017

1 17th Annual Electrical Wire Processing Expo
See highlights from another stellar show.

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A solid plan to cover increased production helps avoid errors and inefficiencies.

1 Qualtek - From Fan Guards to Cable Assemblies
Learn how Qualtek advanced to a premier supplier of cord sets and cable assemblies.

4 The Power of Women of the Wire Harness Industry
Another in her series, Melissa Famia interviews Cristina Koroll. Find out about her experience as a woman in the harness industry.

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The Power Women of the Wire Harness Industry

Spotlight on: Christina Koroll

By Melissa Famia

I recently attended the Electrical Wire Processing Technology Expo in Milwaukee, Wisconsin. Not only was I interested in the latest equipment and tooling developments, I was also on a reconnaissance mission hoping to meet female engineers in our field to highlight for future editions of this newspaper series. While I had no grand illusions that I would find hundreds of candidates, I was disappointed in the ratio of females to males. More so than expected, females in general, and more specifically females in engineering, appeared highly underrepresented in terms of show attendance.

At the recommendation of a colleague, I introduced myself to Christina Koroll, who attended the show as an exhibitor with OES as a Sales and Technical Support Specialist. A native of Colombia, Christina attended the Universidad Pontificia Bolivariana in Colombia where she earned a degree in Electronics Engineering and graduated with honors. While in the program, she applied for and was granted an international internship with AIESEC. Previously an acronym,



Melissa Famia

AIESEC now exists as the name of a non-political, independent, non-profit organization run by current and recent students representing a global platform for young people to explore and develop their leadership potential (aiesec.org, 2017). While on her international internship in Canada, Christina worked as a student with OES Technologies. After graduating, she returned to Canada after being offered an engineering position

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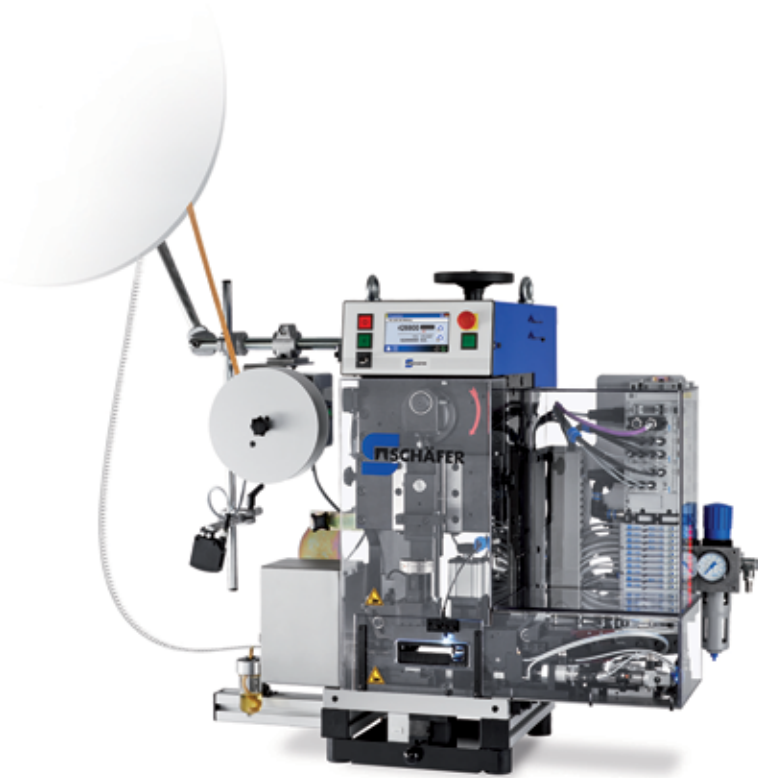
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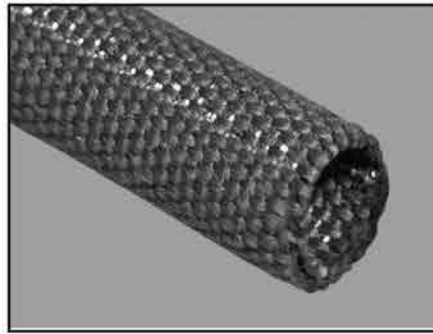
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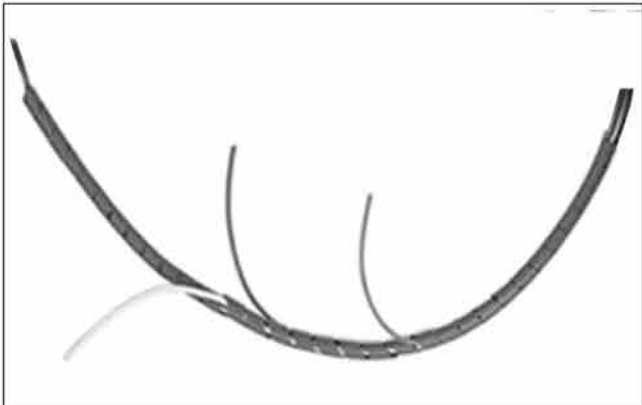
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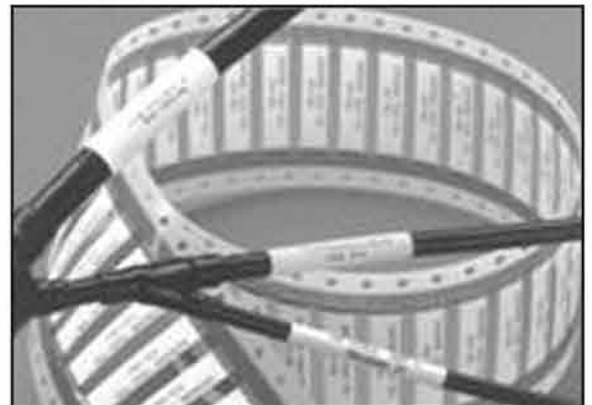
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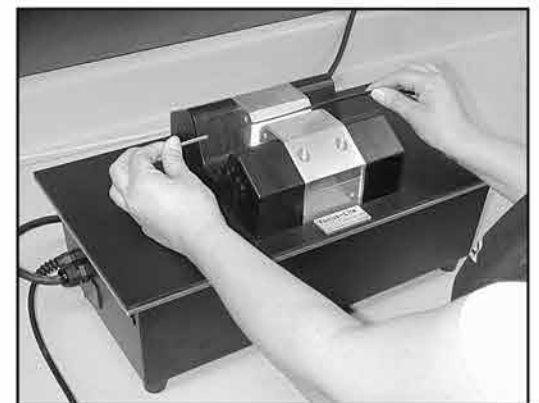
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The Power Women of the Wire Harness Industry

Continued from page 4

at OES. During Christina's 13 years with the company, she held various positions from product designer and manager to sales. After working on the hardware design for the LPA56B Laser Profile Analysis product for which she is a patent owner, she now has the opportunity to sell and support the product in the marketplace.



Christina Koroll

When I asked about her experiences as a female engineer in the wire harness support industry and what advice she might give to young professionals entering the field, she advised that there is a great sense of pride and accomplishment in developing a product and seeing it flourish in the industry. As common with females in any industry, however, there can be potential employment challenges or changes upon becoming a mother. In Christina's case, she opted to assume a different role requiring less travel. While she enjoys traveling, she prefers spending after hours with her two young daughters rather than being on the road away from them. Her decision has led to both professional and personal successes.

If you (or the proverbial "someone you know") are a positive, female role model in a leadership position in the wire harness industry, I ask you to contact me at melissa.femia@jana-diversity.com as I would like to highlight your story as a 'power woman' in wire harnessing in an upcoming article.

Thank you to Christina Koroll for sharing her story. Christina can be reached at ckoroll@oes-inc.com or [1] 519-652-5833.

Spotlight story written by Melissa A. Femia, President of Jana Diversity Solutions (J-D). J-D is a female-owned small business that manufactures wire harnesses and supplies warehousing & logistics as well as engineering services.

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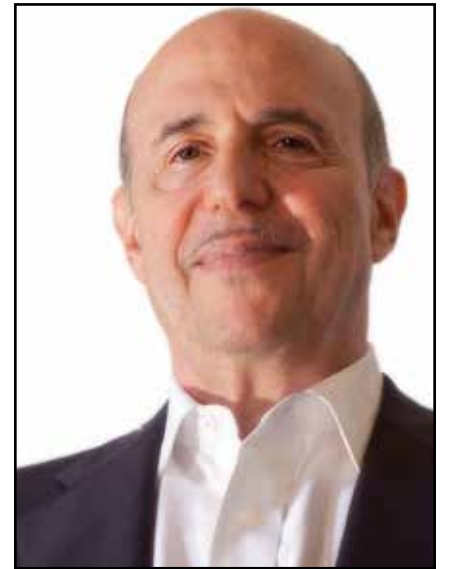
By Loren Smith

Many prospective sellers have asked me if they need to spend the time and money to put together an information memorandum—a book—to sell their company. This is a core question because creating a book is, of course, optional, and it does entail some expense and a chunk of time.

If you are guessing that I recommend making the investment, you are correct, and here's a case study to illustrate why.

We were retained to sell a \$30M wire harness business after the owner received an unsolicited offer to buy her company. When we told the owner we thought we could substantially improve on the deal she had received, she bought time by telling the buyer she'd consider his offer after giving us 60 days to see what we could bring to the table.

We then needed a full month to produce a comprehensive, persuasive book because the seller and her staff needed most of that time to compile all the information we had requested. That gave us only about three weeks to share the completed information with the prospective buyers we had lined up, which, in turn left us only



Loren Smith CEO
Blue Valley Capital

one week to either bring an attractive letter of intent (LOI) to the table or lose the sale to the original buyer.

After gauging the level of interest and other attributes of the potential buyers who had entered the picture, we selected our best candidate. But by now that buyer had an extremely tight window to submit an LOI. He responded that was he was prepared to do that, but he first wanted to see the plant and meet with management. Down to the wire now, we were unable to schedule a visit within the

Continued on page 10



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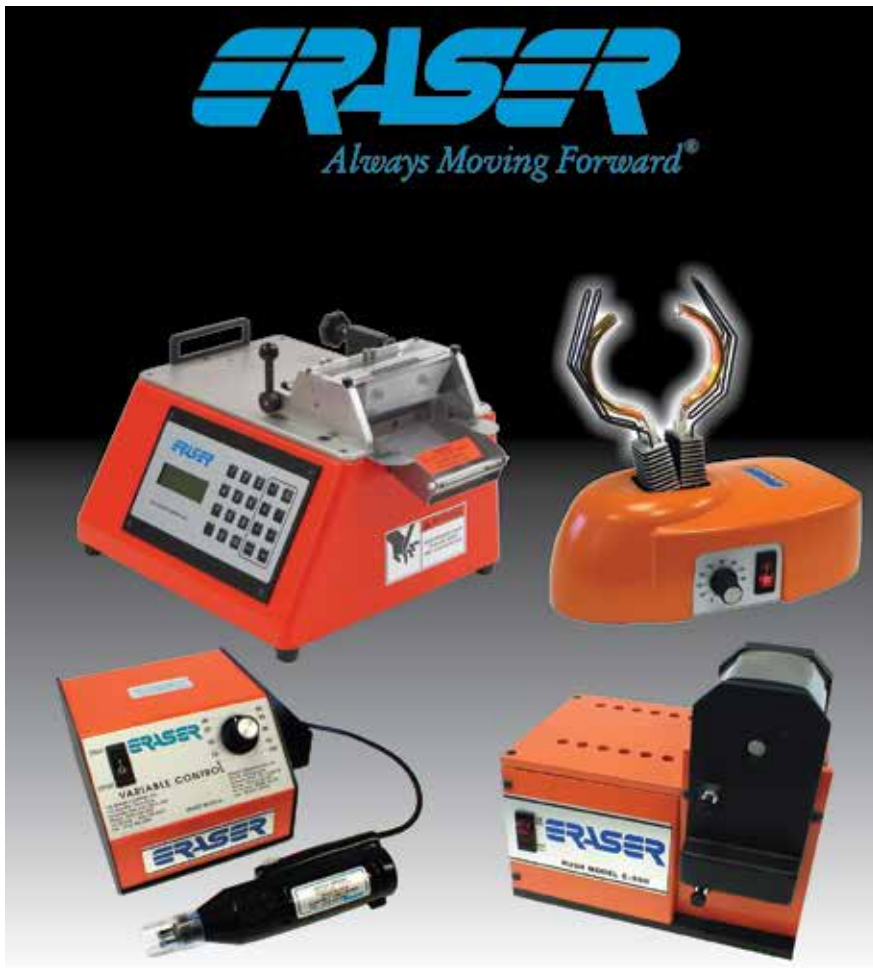
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limited time frame and forced to give the buyer the choice of providing an LOI without a visit or walking away.

Faced with a tough choice, our buyer decided to give the seller an LOI—one that was considerably better than the one she had in hand. Fortunately, the contents of our information memorandum and the many discussions he had engaged in with me had saved the day.

So just what did the buyer find in the book that enabled him to make such a critical decision without seeing the plant or meeting the owner? Certainly the financial background and forecast, customer listings and plant photos were helpful, but those items alone probably would not persuade a prospective buyer to take the plunge on submitting an LOI.

The clincher was likely the picture we painted of what a new owner might do with this business. Poten-

tial buyers want to know how they can grow a business, so we drilled into each market the company serves and provided detail on how the new owner might leverage the company's current footholds to expand its share in those markets.

One more point: Even an exceptionally promising book needs to transmit something beyond favorable data. Credibility. I am very grateful that the extensive relationships I've formed in my years in the wire harness industry provide me with the credibility to validate the book's content.

Most harness businesses have far more value than one can glean from several pages of data. We have found that the time and effort required to put together a “book” reaps significant dividends.

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

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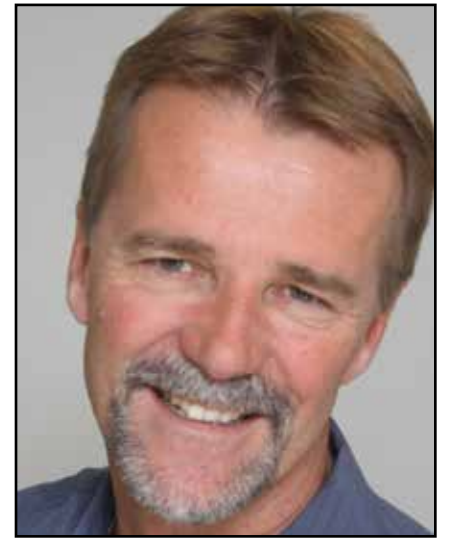
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How Raising Minimum Wage could affect Manufacturers

By Paul Hogendoorn



Paul Hogendoorn

The province of Ontario just announced that minimum wage will be raised to \$15 per hour by January 1, 2019, up from the current minimum wage of \$11.40. Predictably, the announcement caused instant and intense debate, along equally predictable lines. Since the same arguments get replayed every time without changing anyone's established opinion, I think it's a good time to look at things differently, and in particular, how they could (or should) affect manufacturing.

First of all, there is an unappreciated underlying positive effect that even opponents may like. Radically raising the minimum wage for working people increases the gap between working people and non-working people. I know that there will soon be a follow on cry from many folks in the non-working community, but when it makes little difference to people whether they work or not, many choose not to work. Some would argue that decreasing benefits or support to the non-working group is the answer, but of the two possibilities, I'd rather reward those that choose to work rather than penalize those that don't. (Give people a fair

and legitimate opportunity to look after themselves and their families, and there will be less reliance on society's safety nets. Even Conservatives should like that!)

From a manufacturing point of view, this issue may be a wakeup call for many. Manufacturing is a "value creating" industry, the largest single value creating sector in our economy. It's the economic engine that is responsible for the standard of living that North America has enjoyed for most of the last century. Whereas the service sector exchanges value (and the retail sector largely exports value), the manufacturing sector creates

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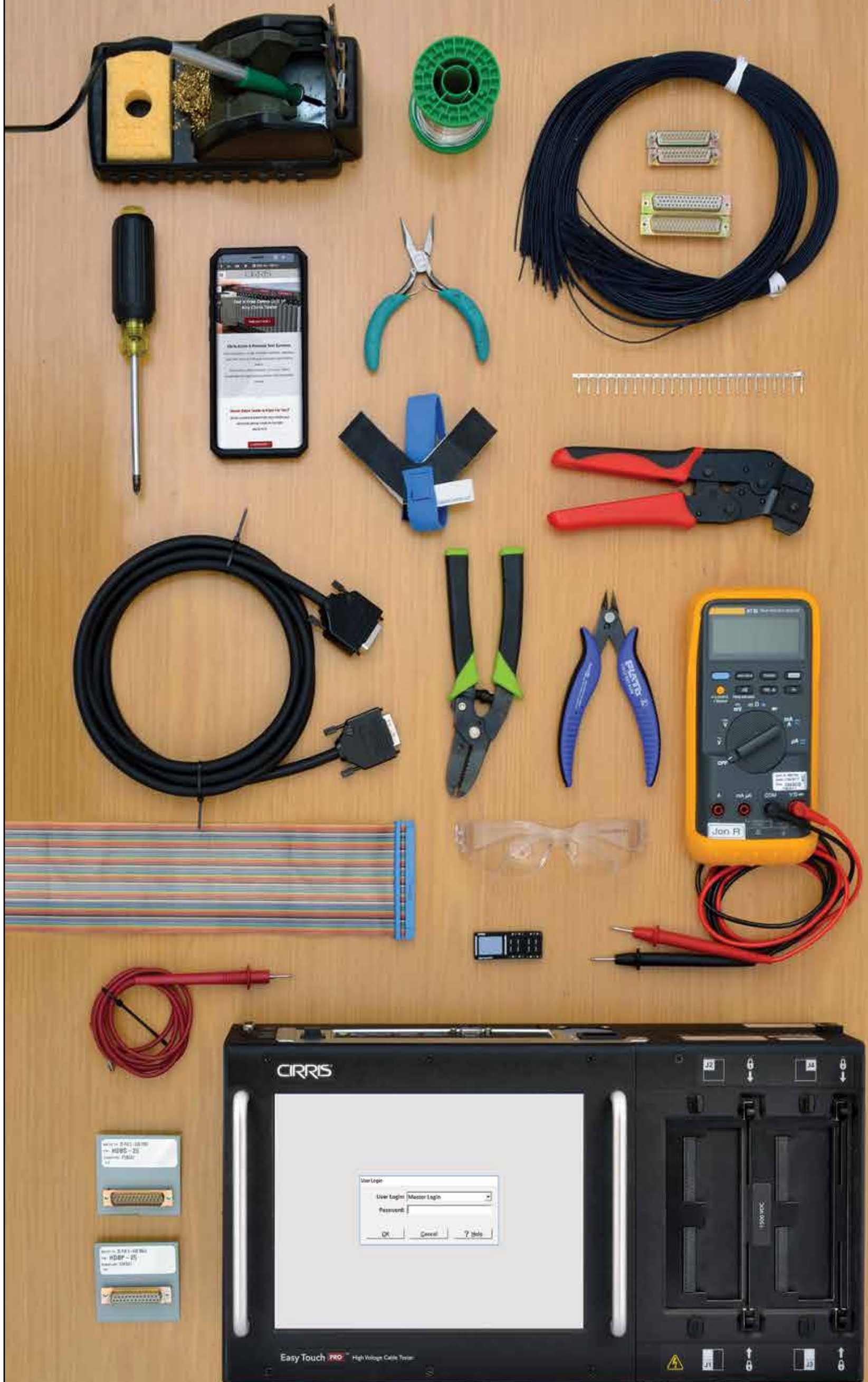
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How Raising Minimum Wage Could Affect Manufacturers

Continued from page 12

value. Every hour of labour added to anything we produce increases the value of the thing we produce. Workers in manufacturing are not simply expenses or costs on the company's accounting ledgers, they are "value creators" - every hour they work on the product creates additional value. The thought that some manufacturers may pay close to minimum wage for value creating activity astounds me.

I know the push back that I am certain to get from some from that last statement, but let me continue to take this conversation in a dif-

ferent direction. Henry Ford (in my opinion) created the middle class by paying manufacturing workers nearly twice as much as workers outside of manufacturing were making. Whether it happened by design or by consequence, the result is that it helped build a national economy that could afford the products being produced. Before we start arguing the pros and cons of our society's reliance on government and government policies, let's examine the core issue leading up to this growing reliance; the failing or decline of the other institutions in our society - our families, our churches, our communities, and yes, our companies. And it's that last

one that we in manufacturing need to look at closely right now. If a raise in the minimum wage threatens the viability of a manufacturing company, there are other things that obviously need to be looked at.

Let's start with "value". Right now, we measure people's time and that's what we pay them for - how much time they spend on the job. The whole productivity conversation is primarily a management conversation; when it's brought up with the workers, it's usually as a measurement of their lack of performance, or the need for an increase in performance, or as a factor affecting the company's profit and loss, or perhaps

even the primary sustainability issue of the company itself. But, those conversations have nothing to do with creating value through the work they do on an hour by hour or day by day basis, not directly anyway. My belief is that when we (everyone in the plant) put more attention on the measurable "value" being created by the efforts of each employee with the production of the product, there will be more focus put on the value adding activities of every job, and less on all the other things we associate with "work". Sound too altruistic? My reply to that is that it does in fact work that way. In manual or operator dependent operations, we have seen

"value adding activity" (i.e. "productivity") increase by often more than 30% simply by better connecting the efforts of the workers with the work they are doing. (What gets measured gets improved, right?) These are typically the lowest paying jobs in manufacturing - the closest to minimum wage - but they are also the ones where the effect of engagement is the greatest.

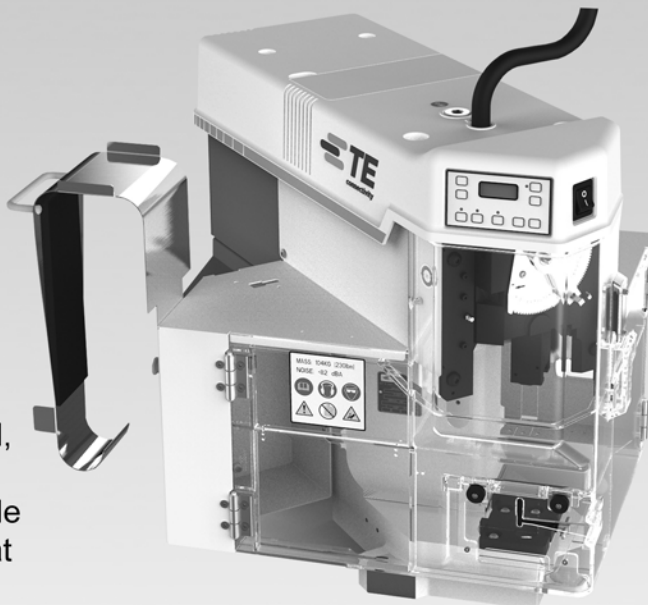
As manufacturers, before we start arguing the potential negative effects of an increase in minimum wage to our industry, we need to first examine why we might be paying wages close to minimum wage in the first place. Remember, ours' is a "value creating" industry, unlike the service industry or retail sectors. The other sectors do not have the advantage of adding real value to their product by applying human effort, but we do. We have more options and opportunities to do better, and engaging our people in the value adding process is one of them. Before we examine and debate policy, let's be sure to examine ourselves. Our future is not in the hands of our governments, it's in the hands of our customers and our employees. Let's work with them first.

Paul Hogendoorn is co-founder of FreePoint Technologies. "Measure. Analyze. Share." (Don't forget to share!) He can be reached at paul.hogendoorn@get-freepoint.com or www.getfreepoint.com

AMP-O-LECTRIC MODEL G II TERMINATOR

TE Connectivity's (TE) Model G II is the latest and most advanced design in the long-standing series of their AMP-O-LECTRIC machines for terminating wire using reeled terminals and contacts. This unit is designed and built to continue the tradition of work-horse terminators from TE.

The new terminator improves key performance areas for operators. For operator convenience, TE improved access to, and significantly updated, lighting in the under cabinet and target area. A variable speed option was also added to provide more flexibility for those complex applications that benefit from slower ram and feed speeds.



The Model G II terminator is one of the quietest machines available and the improved guarding meets applicable CE and domestic safety requirements. The improved guarding also creates open access for quick and smooth installation of both end-feed and side-feed applicator styles.

User Friendly

At the push of a button, you can power the motor on or off, jog forward or reverse, switch to split-cycle operation, turn the work light off or on, power the air feed on or off, or reset the batch counter. And, it's all reported on an LCD display. The controls will also detect and report errors in the machine, and stop cycling when a bad crimp is detected by the CQM II. The operator must then push the reset button to continue. The Model "G II" will accept all existing TE miniature applicators.

Product Features

- Quiet operation
- Improved guarding and lighting
- Tool-less changeover of applicators
- Precision manual adjust for crimp height
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- Accepts all existing TE applicators, with minor modifications
- Reduced maintenance requirements
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Qualtek - From Fan Guards to Cable Assemblies

Continued from page 1 _____

are our own facilities, some we have joint ventures with, and some are contract manufacturers." All facilities are ISO 9001 and some are registered to TS 16949. There are Qualtek distribution locations in Mexico, Taiwan, Hong Kong, and Shanghai.

Qualtek sells through a network of representatives and distributors such as Mouser, Sager, Digi-Key, Waldom, Future, Allied, Heilind, and Master. They also have some regional and industry specific distributors.

When asked about the typi-

cal customer, the team agreed it really runs the gamut from small mom and pops, all the way up to automotive OEM's. "We have a pretty wide product line," Laura described, "so we cover many different types of customers in different industries."

The discussion turned to marketing efforts at Qualtek. "We do some trade shows and the biggest is EDS in Las Vegas," Laura revealed, "and that's where we meet with all of our distributors and reps and talk about new products, prior business, and upcoming opportuni-

ties." The company also does Electronica in Munich, The IPC Apex Expo, and partners with distributors and reps in regional and industry specific shows.

When queried about Qualtek's biggest challenge, there was a simultaneous roar, "lead times!" "People are demanding shorter and shorter lead times," RJ explained, "and everybody wants their parts immediately." The team maintained that's it's a priority, and Qualtek is meeting the challenge.

The subject turned to new or expanding product lines on the horizon, and RJ revealed,

"One of our big product lines right now is heat shrink tubing, and we are looking at expanding that product line, and adding fiberglass and corrugated sleeving." He also mentioned the company is keeping a close eye on the Internet of Things (IoT). "We sell to those customers now as far as power supply and power cords," he mentioned, "but we are trying to see if we can expand more into that market."

The crew were asked what makes Qualtek stand out, and all agreed it was customer service. "We truly have impeccable customer service," Laura proudly said. "We are still a small company so we are able to react, and you don't have to go through a lot of red tape to get an answer."

John Hallums is still very involved in the business, but travels a great deal to the various facilities. Because he can't always be there, he empowers his people to make spot decisions. "One thing John will never go to is an automated answering system, so you are never punching numbers trying to get someone." John encourages all team members to go ahead and take a call, versus letting it go to voice mail, even if only to let the caller know they can expect a quick call back. "We have really great relationships with every one of our distributors as well as our reps," Laura concluded, "and that has gotten us where we are today."



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The 17th Annual Electrical Wire Processing Technology Expo

Continued from page 1

Hospitality

Whether you're a long-time exhibitor, or a first-time visitor to the show, the crew at EPI Shows and the staff at The Wisconsin Center do their best to make you feel like family. Special thanks to the following hospitality sponsors:

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Thursday Bloody Mary Bar

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Thursday Morning Break

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Thursday Afternoon Break

And this year, as a special feature, *WHN* had a photo booth on hand where folks could have group photos taken with various Milwaukee themed backdrops.

If you really want to reach those who design, specify, sell, maintain or manufacture electronic cable assemblies; you really need to be exhibiting at this event. Space for this event has sold

out quite early in the past several years, so contact Cheryl Luck at cheryl@epishows.com now for information, and to reserve your spot.

Wiring harness News has something very special planned for next year, so see you next May in Milwaukee!!

Inside EWPT

For the past 12 years, visitors to EWPT have enjoyed the sounds of the band CITYSCAPE. CITYSCAPE is led by saxophone player Tom Newburg who has played with bands all over the world including The Tommy Dorsey Band. He is sought after by traveling musicians like The Temptations, Frank Sinatra, Jr., Aretha Franklin and many more. The piano player, Dennis Klopfer, is a Professor at Mount Mary College and plays many Milwaukee events. Tom Hutsckeg, the drummer, has a studio in Milwaukee and plays with many visiting top line acts. On the guitar is Bill Stone who has traveled around the world with blues band LeeRoy Airmaster. Another renowned studio musician around Milwaukee and Chicago, Todd Homes plays the bass and does vocals. The band members are all college friends of Jay Partington, President of EPI Shows.

Each year, visitors to EWPT consume some 20 kegs of Milwaukee's finest brews over the 2-day course of events.

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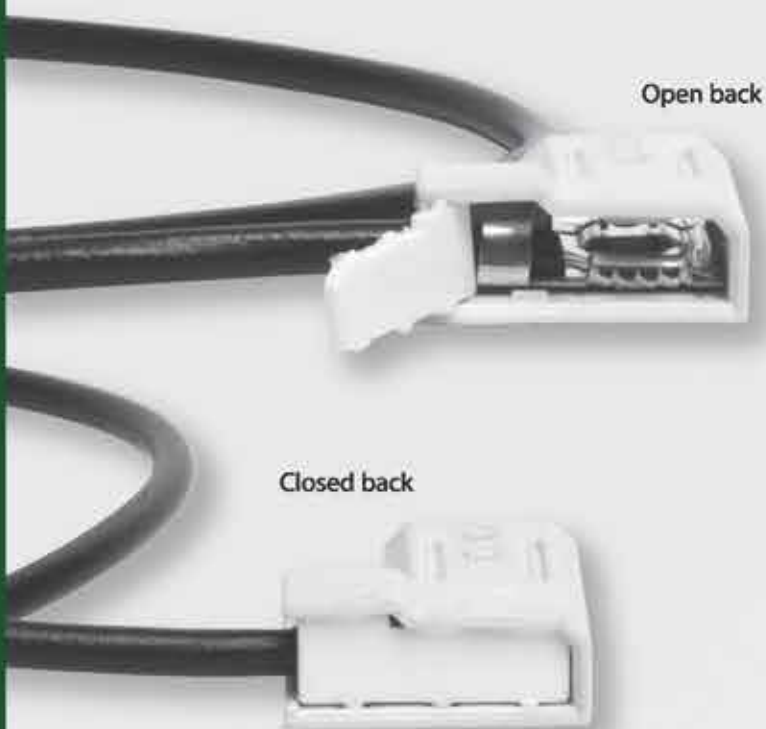
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MADE IN THE USA

Four Tips for Sustainable Growth for Wire and Cable Harness Companies

Continued from page 1

1. Use Your Production Data

Many companies collect production data as an afterthought, with workers pencil whipping results after a job is complete. These businesses make decisions based on inaccurate information. Growth requires sound decisions based on real-time production data. For example, labor data provides the basis for more accurate estimates and fuels process improvement. Real-time production visibility identifies bottlenecks in workflow that, when eliminated, shorten the lead time and increase capacity.

2. Empower Production with Accurate Scheduling

Without an effective system, scheduling issues will

explode as production copes with more orders, shifting priorities, and streams of Engineering Change Orders (ECOs). Efficient operations require accurate scheduling. Capacity planning and finite scheduling allow manufacturers to increase production and manage growth. On-time delivery, realistic shipping estimates and shorter lead times are the result of synchronizing operations in real-time using data and not guesswork.

3. Fill the Gaps in your ERP

While the ERP provides the foundation of your business, it struggles to support manufacturing and production workflows. It focuses on business, not manufacturing. Companies need to integrate the shop floor with the front office. You can fuel business growth by optimizing produc-

tion and syncing your ERP and manufacturing processes with manufacturing software. Track orders accurately with the enterprise software working hand-in-hand with the shop floor system, cutting lead time and reducing errors. Let your manufacturing software increase the capability of the ERP by identifying production issues before they become crippling problems.

4. Invest in your Shop Floor

Growing your business requires hiring and training new workers. As your most valuable resource, your workforce shouldn't be an afterthought for investment. A shop floor software system will not only manage work and automate routine tasks for new employees, but also provide process enforcement to eliminate errors common with new workers. Other benefits include collecting and implementing best practices from more experienced workers and identifying opportunities for additional training.

The Foundation of Manufacturing Growth

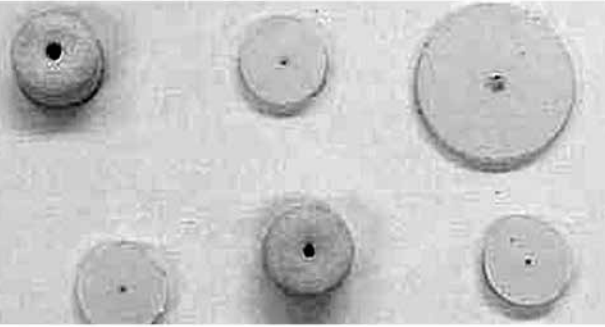
Successful companies craft a strategy for sustainable growth that addresses all aspects of the business.

For wire harness manufacturers, that starts on the shop floor. Take a look at your production data and manufacturing analytics to identify gaps and risks in your processes. Develop a strategy to bridge those gaps and strengthen production.

Many wire harness manufacturers find paper-based manufacturing processes can't support the production demands required for sustainable business growth. Investing in software solutions such as Paperless Manufacturing will ensure your shop floor can manage the increased workload and capacity that accompany sustainable growth.

Contact CIMx Software today at info@cimx.com for more information on Paperless Manufacturing for wire harness manufacturers, or visit us on the web at www.cimx.com/wire-and-cable-harness-assembly.

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NEWS PLUGS continued


New Environmentally-Sealed BWT Connector from BlueWater

(Miramar Beach, FL) BlueWater Enterprises announces the introduction of their All-In-One BWT Connector for Marine, Agriculture, Automotive, and Military Equipment. This environmentally-sealed connector makes one-person wiring jobs much easier than the industry standard AT, XT, and DT connectors. Unlike the current industry standard connectors, the patented BWT Connector requires no crimping, and each connector accepts 12-22 gauge wires. In addition, the BWT Connector is designed to mate with the AT, XT, and DT connectors.

Assembly is very easy. Just slide the waterproof seal onto the wire, strip the wire, then insert the wires in the male or female end of the connector. Tighten with a screwdriver, and slide the seal up into the connector. Then just cover the screws with the cap, and you're ready to connect. As mentioned, the BWT series connector requires no crimped terminations, so no expensive crimping tools are required. The only tools are a wire stripper and pocket screwdriver.

David Worsham, President of BlueWater Enterprises mentioned, "with the AT, XT, and DT connectors, you have to use stamped and formed or


All-In-One BWT Connector


machined contacts; plus you have the separate wedge lock, so you have a bunch of different part numbers." He added, "but with ours, you don't have to crimp anything; just strip the wire, insert to the connector, screw it down and your done." In addition, Worsham noted that the BWT series will accept 12 gauge wire, where the competitors will not. "This is a big advantage where you have longer runs where 12 gauge is needed to overcome voltage drop," he detailed.

The BWT is completely reusable, and beats or exceeds the standards of the comparable connectors. It meets testing for IP69K, is tested at 13 amps, and sustains 23 pounds of pull force. The thermoplastic housing meets UL 94V-0, and is available in multiple finishes.

For more information, contact BlueWater at 855-BLUE-700 or visit their website at bluewatergadgets.com. You can also check out the video by searching YouTube for BlueWater BWT connector.

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NEWS PLUGS continued



All States Inc Announces All-Weather Polypropylene UV Black Cable Ties for All Sizes

All States History

All States History In 1968, All-States designed, patented, and began manufacturing the first one-piece all nylon cable tie in the United States. Prior to this, industry cable ties were "two piece" with either a separate inserted metal pawl, or a two piece all nylon design. The new one-piece tie offered a sig-

nificant improvement over two piece ties. They were easier to install, stronger, more durable, and cost less to manufacture. Other manufacturers quickly followed All-States' lead, and today the one-piece cable tie is the industry standard.

Polypropylene UV Black Cable Ties

Here is a common scenario: Your field technicians come back to the warehouse complaining about Nylon 66 cable ties that were just snapping. They couldn't finish the job, it is late, and they want to go home. The customer is calling to complain about the installation time. The

job has to be done on time, and now you faced with an overtime situation for what should have been a simple field installation.

In today's market, All States Inc. has the perfect alternative with a more flexible material that never requires moisture to perform well. Polypropylene UV Black Cable Ties perform well under all weather conditions, even in extreme cold northern cities like Chicago, New York, or Boston. You'll find applications in the oil sands fields of northern Canada and in the driest of climates like Arizona, New Mexico or Texas.

Sacrificing some of the original tensile strength, Polypropylene UV Black Cable Ties will endure without problems, especially when wrapping light cables in harsh dry environments like exterior electrical industrial installation.

Polypropylene technical specs:

- Continuous use temperature range: -40F – 221F
- Underwriters Laboratories' UL94V-HB flammability rating (Horizontally burns.)
- Melting point: 334F
- Specific gravity of 0.9
- PP UV black sun light protection.
- Suitable for use in drier/colder environments.
- Not affected by variations in moisture levels.

Available sizes:

- 4 in by 9lbs
- 5.6 in by 20lbs
- 7.5, 11 & 14 in by 25lbs
- 8, 14 & 28 in by 60lbs

With over 50 years in the market, All States Inc. has been supporting many US OEM's, wholesale distributors, government agencies including military operations, etc. delivering a wide variety of exceptionally high quality cable ties every day.

For more information on All States US Made cable ties, and to place orders, please contact your local distributor or visit the website: www.cable-ties.com. You'll find general product information, specs, certificates and any specific documentation related to cable ties, accessories and materials.

WINTOTAL V6 IDENTIFICATION LABEL PRINTING SOFTWARE FOR RAIL, MASS TRANSIT AND INDUSTRIAL EQUIPMENT MARKET

TE Connectivity's WinTotal Version 6 is the new version of WinTotal software, supporting high quality wire and harness identification and basic label printing applications. WinTotal v6 software has a number of new user benefits like auto font sizing and comes with 2,500 standard TE Connectivity Identification products pre-installed. This makes the creation and printing of Identification sleeves or labels a quick and simple task.

Double Sided Print

WinTotal v6 allows both sides of a product to be viewed at the same time. This enables the user to see how the product will be printed and, with the active updating of the print preview screen, it is also possible to make orientation and order changes.

Key Benefits:

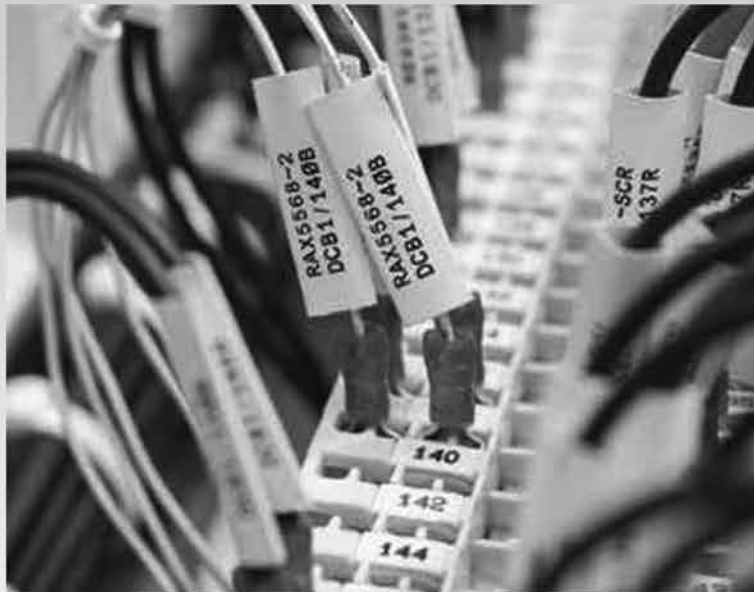
- Enable faster set up with the ability to view prior to printing
- Provide greater print accuracy with the ability to position text on TE product templates
- Improve efficiency with multiple label sizes with auto font sizing
- Enable printing in any language with Unicode support
- Enable ease of use with ribbon control for all functions
- Improve efficiency with new customizable quick access toolbar

Target Markets:

- Rail & Mass Transit
- Industrial Equipment
- Infrastructure
- Aerospace/Defense
- Offshore/Marine

Applications:

- Wire & Cable harness identification - Office environment & Industrial environment



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Remembering Don Malinovsky

It is with great sadness that we report the recent passing of Don Malinovsky, who lost a short battle with pancreatic cancer. Don was the “hands-on” General Manager at Daniels Manufacturing Corp. (DMC) for three decades.

Don graduated from DePauw University in 1965 and joined the Peace Corp where he served in Cameroon, Africa until 1968. He then served in the U.S. Air Force and was stationed in Ubon Ratchathani, Thailand beginning in 1969, during the Vietnam War. While in Thailand, he met his wife of 38-years, Ann Bua Malinovsky, and returned to the U.S. in 1975. He continued his education, earning an MBA from Keller Graduate School of Management and a JD from the John Marshall Law School.

Don’s history in the wire termination and assembly tool business precedes his thirty-year employment at DMC. Don was the Application Tool Product Manager at Amphenol Corporation, when it was located in Chicago, and before Amphenol was purchased and moved to New York State. Don was tireless at solving connector assembly problems for Amphenol customers, and he spoke frequently with DMC who was his main supplier for tooling. When Amphenol moved to NY, Don opted for the warmer weather and laid-back lifestyle in Orlando. His golf game improved, his family adapted well, and



he accomplished many impressive goals during his career at DMC.

Don was passionate about his career at DMC and sincerely enjoyed working with people. He remained the steady “hand on the throttle” at DMC as General Manager until his passing. An enthusiastic golfer, he was a member of the Bay Hill Club for the past 29 years. He was a devoted husband, loving father, and role model of integrity.

Don will be remembered for his special sense of humor, his deep desire to develop great friendships, and for being a professional business leader in the wiring industry.


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Mini style applicators with mechanical feed mechanisms are supplied in a variety of feed configurations. Adaptable to most crimping presses.

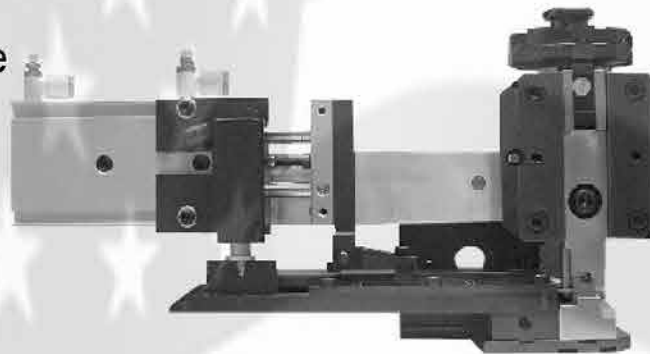


Model 1700

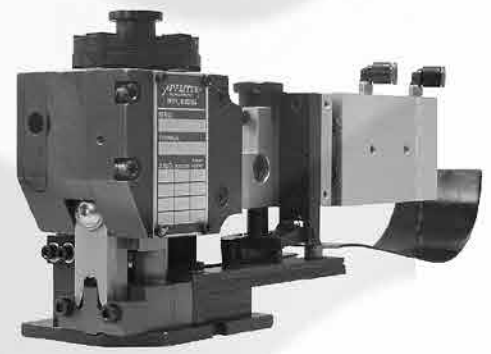


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Pneumatic feed mini-style applicators can accommodate terminals with center to center distances up to 2 inches.

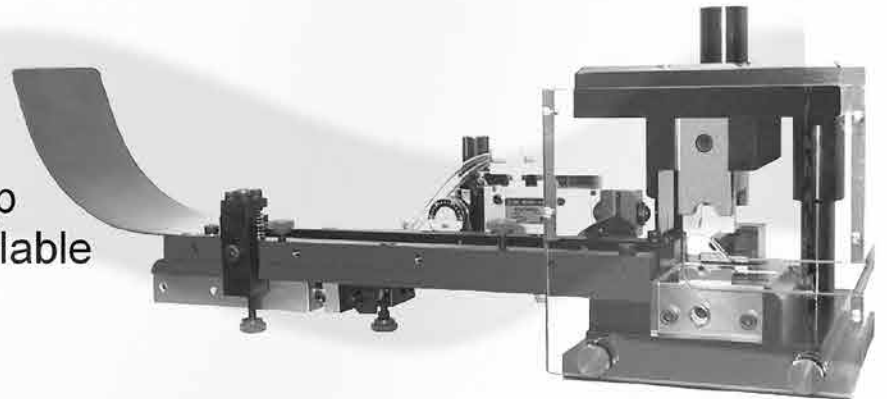


Model 1500



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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NEWS PLUGS continued


Revolutionary New Laser Wire Marker from Tri-Star

Tri-Star Technologies, a leader in laser wire printing technologies unveiled its ECONOLASE UV portable Laser Wire Marker at the National Electrical Wire Processing Technology Expo in Milwaukee Wisconsin. This is the world's lowest-price laser wire and cable marking system. Besides its low cost, it is a completely portable tool (less than 45 lbs) that can be easily taken directly to the job site.



**ECONOLASE UV
Portable Laser Wire Marker**

Alex Kerner, President of Tri-Star Technologies, said, "The reception at the show was phenomenal. . . We had scores of customers stating this was the tool they had been waiting for." He added, "They were particularly im-

pressed with its ease of use and quality of print especially at this low price point."

This tool allows for manual feed of wire and cable, making it perfect for low/medium print jobs and marking of already terminated cable assemblies, a first for the industry. The UV laser system is fully compliant with both common military and commercial specifications, making it the perfect tool for aerospace, automotive and electronics industries. The system has full graphics capabilities that can print any alphanumeric character in any font, language or size. It can also print bar codes and company logos. Delivery of this new laser marker will begin within the next few weeks.

To see a demonstration, go to YouTube and search ECONOLASE. For more information, contact Roger.Lewin@carlisleit.com, phone: 917.972.4133, or visit www.tri-star-technologies.com.

Control Cables Pass UL Cold Bend Test & Enhance Temperature Rating

HELUKABEL, a world-leading cable manufacturers, announced that seven TRAYCONTROL family of products have passed the UL -40°C Cold Bend Test and have enhanced their conductor temperature ratings from 90°C dry/75°C wet to 90°C dry/wet.

Electrical cables are exposed to harsh temperature extremes, where both low and high temperature fluctuations impact a cable's performance.

Continued on page 26

★★★ FOR SALE ★★★

- 3 - AMP 'K' Presses
- 1 - ARBURG 270M 'Allrounder' Injection Molding Machine
- 1 - ARTOS MTX10 Multi-Task Wire Processor
- 1 - ARTOS STX5 Single-Task Wire Processors
- 2 - ARTOS CS337 Cut & Strip Machine
- 1 - ARTOS CS336 Cut & Strip Machine
- 1 - ARTOS CS326 Cut & Strip Machine
- 1 - ARTOS CS29 Cut & Strip Machine, #42774A
- 4 - ARTOS CS26, CS26A Cut and Strip Machines
- 1 - ATS Crimp Press, Series T3000, with Applicator
- 1 - AUTOJECTOR HS30-S Injection Molding Machine
- 1 - AUTOJECTOR VS10-S Vertical Injection Molding Machine
- 1 - BLUE M Oven, Model POM-1406G1
- 1 - BRADY Wraptor Label Machine
- 1 - CARPENTER 93 Automatic Cut & Strip Machine
- 1 - CARPENTER 56A Dereeler
- 3 - CARPENTER Model 70B Strippers
- 1 - ERASER Model 1256 Wire Stripper, Part #RC-1071
- 1 - EUBANKS 4000-04 Tandem Cut and Strip Machine w/extra Blade Sets
- 3 - EUBANKS 8000-01 Cut and Strip Machines
- 1 - FELINS PakTyer 2000 Semi-Automatic Tying Machine
- 1 - IDEAL 'Stripmaster' Model 940 Wire Stripper, Part #45-940
- 2 - J.B. HYDE 24-C, 48-C Braiding Machines
- 2 - KAWA Splicing Machines, Model KW-IT, New
- 1 - KINGSLEY Model MCM-650 Sleeve and Tube Marker
- 2 - KODERA Model C556 Seal, Crimp and Tinning Machines
- 1 - KOMAX DPS 272 Coiler, 2012
- 1 - KOMAX Gamma 333PC Automatic Crimping Machine
- 2 - KOMAX Alpha 411 Automatic Crimping Machines
- 1 - LOCTITE Model 10-50 Posi-Link Volumetric Dual Cartridge Dispensing System
- 2 - MEGOMAT ASM3001 Wire Cutting/Crimping Machines
- 1 - METRONIC Alpha Jet C Inkjet Printer, 2006/07
- 1 - MORGAN Injection Molding Machine, Model G-100T
- 5 - MORGAN Injection Molding Machines, Model G-125T
- 1 - NEW ENGLAND BUTT 72-Carrier Braider (w/flat strap capability)
- 1 - NEW ENGLAND BUTT 48-Carrier Harness Braiders, rear delivery chute
- 1 - PANDUIT CP-861 Crimp Press
- 1 - RAMATECH Model ABW 800/300 Prefeed, 2005
- 1 - SCHLEUNIGER CC36S Automatic Crimping Machine
- 1 - SCHLEUNIGER CP1500 Heavy Duty Coiler
- 1 - SCHLEUNIGER CS9100 Cut/Strip Machine w/PF2000 Prefeed
- 1 - SCHLEUNIGER CT32 Crimp Press, 2008
- 1 - SCHLEUNIGER MS0600 MegaStrip w/PF4000 Prefeed
- 1 - SCHLEUNIGER OS9400 OmniStrip
- 1 - SCHLEUNIGER PT26 Pull Tester, 2008
- 4 - SCHLEUNIGER US2015 Bench Strippers
- 2 - SCHLEUNIGER US2100 Bench Strippers
- 2 - SCHLEUNIGER US2500 Bench Strippers
- 4 - SCHLEUNIGER WS1000 Wire Stackers
- 2 - SCHLEUNIGER Uni-A Applicators
- 1 - SONOBOND Sonic Welder
- 1 - SPECTRUM 'Sienna 210S' Radial & Axis Laser Wire Stripper (modified to Model 210D)
- 1 - TAYMER Hot Stamp Marker, Model SM1000
- 1 - TRI-STAR TECHNOLOGY Table Top Laser Marker, M100L FG-TT



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NEWS PLUGS *continued*



Continued from page 25

The TRAYCONTROL 500, TRAYCONTROL 500-C, TRAYCONTROL 530, TRAYCONTROL 550 TPE, TRAYCONTROL 600, TRAYCONTROL 600-C, and TRAYCONTROL X cable products are now tested in accordance with UL, CSA and NEC for applications where bending in cold temperatures is required in temperatures as low as -40°C (-40°F).

Cold bend testing determines how the entire cable (conductors, insulation, jackets, etc.) might react to cold temperature bending, which is often required when installing

or working on electrical cables during cold weather conditions. Cable samples are frozen to a specified temperature for a set number of hours. Once the freezing process is completed, the samples are wound around a steel mandrel determined by the cables outer diameter. After winding, the cable is removed and examined for surface damage, i.e. cracks, splits, or tears. If there is no visual surface damage, or issues after undergoing further electrical tests, the cable passes the UL cold bend test.

With new innovations in plastics, HELUKABEL is able to offer its TRAYCONTROL products with a UL tray cable, exposed run (TC-ER) 90° dry/wet approval. Products with the 90°C dry/wet ratings allow engineers and integrators to design electrical

systems for maximum ampacity without concern for the environment (dry/damp/wet) where the cable will be located.

HELUKABEL's TRAYCONTROL 500, TRAYCONTROL 500-C, TRAYCONTROL 600, TRAYCONTROL 600-C are UL 1277 and 2277 flexible, shielded and non-shielded, oil-resistant (Oil Res I and II) control power cables that have various TC-ER ratings that allow them to be installed in or outside of a cable tray to connect control panels to machine equipment. The main difference is the coloring of the outer jackets – TRAYCONTROL 500 and 500-C are gray (RAL 7001), while the TRAYCONTROL 600 and 600-C are black (RAL 9005).

The TRAYCONTROL 530 (PVC) and TRAYCONTROL 550 TPE are UL 1277 and 2277 flexible, oil-

resistant (Oil Res I and II) control power cables that have a special combination of TC-ER, PLTC-ER and ITC-ER allowing them to be used as connecting cables for AC, DC or control wiring in accordance with NFPA 79. The blue-colored conductors are ideal for machine tool and production line suppliers to the automotive industry.

The TRAYCONTROL X is a NFPA 79 compliant flexible control power cable with cross-linked (thermoset) polyethylene (XLPE) insulation. It is ideal for applications that require long cable runs due to its low capacitance. A higher current load rating is possible due to a conductor temperature resistance of 105°C. The TRAYCONTROL X series is 600 V and WTTTC 1000 V rated allowing them to be used in both industrial plant machinery and 1 kV wind turbine cable tray applications.

HELUKABEL USA, Inc. is the wholly owned U.S. subsidiary of HELUKABEL GmbH, an international manufacturer of cables and wires with 28 locations throughout the world. HELUKABEL USA stocks over 4,000 cables, wires and accessory line items for a multitude of industrial and commercial applications across a wide range of vertical market segments. Direct access to a 1.72 million-square-foot, fully automated warehouse with 33,000 line items, enables HELUKABEL USA to provide extremely short delivery times.

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Apex's Xcelite Brand Crimping/Stripping Tools Now Available Through Pressmaster

The Xcelite line of Stripping and Crimping hand tools will be discontinued by Apex Tool Group. Pressmaster, being the original manufacturer, is now providing a direct replacement for these tools. Pressmaster has produced these tools under a private labeling agreement for 25+ years, so customers can expect the same superior quality and durability. "Apex has given Pressmaster permission to reach out to current customers of the Xcelite brand of wire/cable termination tools to let them know they are now available through Pressmaster with the same unparalleled quality and function," said Hidenori Araki, National Sales Manager at Pressmaster.



Pressmaster develops and manufactures high quality crimping and cable termination tooling for professionals in electrical, electronic, optical, and other applications. They work in close partnership with many of the world's leading connector manufacturers and distributors. It's not typical for Pressmaster to sell directly to end users,

but feel free to contact them for more information about how you can purchase their products.

For further information, visit the Pressmaster website at Pressmaster.se, contact the USA Sales Office at 630-456-1717, or email to mail@pressmaster.com.



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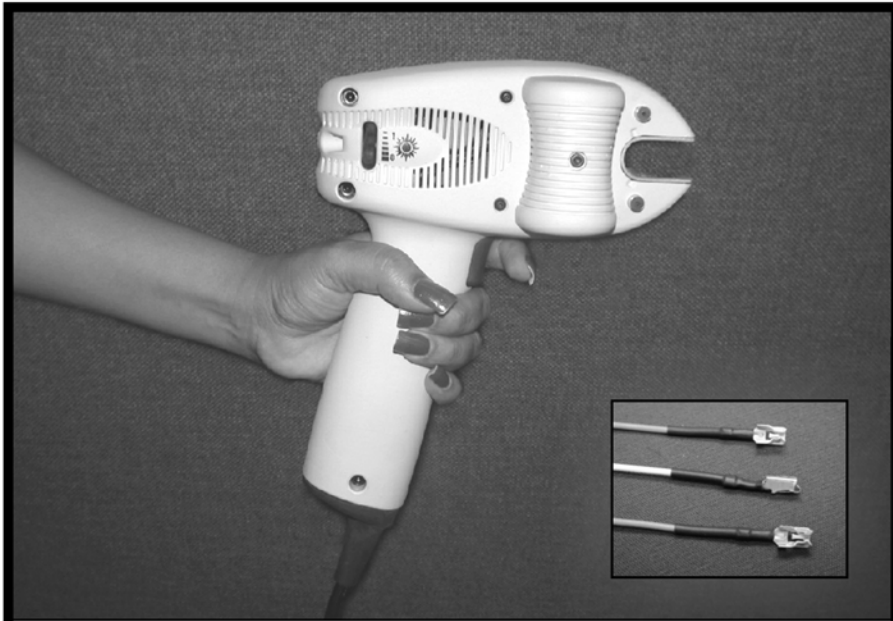
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Focus-Lite™ technology uses radiant energy to shrink heat-shrink tubing in a fraction of the time of traditional methods.

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Focus-Lite™
Heat Shrink Processing Machines

WIREwisdom™ ANIXTER

In every issue of Wiring Harness News Anixter will bring you informative articles about wire and cable technology.

WIRE STRIPPABILITY

The ease with which a slug of insulation can be cleanly stripped from an insulated copper or aluminum wire is a characteristic that can impact the efficiency of the stripping process as well as the quality of the termination. Wire strippability is often taken for granted, but it quickly becomes a major concern if difficulties arise—especially with high-volume production. The characteristics of wire and automated stripping equipment interact in subtle and complex ways. As a result, troubleshooting can be difficult and time-consuming. Below is an overview of some of the key characteristics that influence wire strippability.

STRIP FORCE

The strip force of an insulated wire is the axial force required to remove a given length of insulation from a conductor in preparation for termination. The amount of friction or adhesion between the insulation and the copper conductor must be low enough for the slug to be easily and cleanly removed, yet high

enough so the remaining insulation does not slide during stripping or during subsequent processing. Industry standards provide test methods to measure this force.

A typical strip force measurement method consists of the preparation of a sample of wire with a short length of insulation removed from one end of the wire while leaving a precise length of insulation undisturbed. The end of the wire is then inserted through a hole in a metal plate that is slightly larger than the copper conductor. The remaining length of insulation is pulled from the conductor by pulling the conductor through the metal plate using a tensile testing machine pulling at a specified rate. The maximum force reached during stripping is measured and recorded.

The strip force of a wire varies with length of slug, wire size, insulation type, type of stranding and other variables, but it is typically in the range of 5 to 25 pounds (22 N to 111 N). Wire manufacturers can control strip force within reasonable limits by careful control of conditions during extrusion of the insulation including conduc-

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tor surface cleanliness and texture, conductor preheat, extrusion temperature, extrusion pressure, extrusion tooling and cooling rate.

CUT-THROUGH RESISTANCE

The cut-through resistance of wire insulation must be high enough to withstand the mechanical forces of installation and usage and to comply with industry standards. At the same time, it must be low enough to permit the knives of a stripping machine to reliably cut the material. PE (polyethylene) and XLPE (cross-linked polyethylene) are common materials with relatively high cut-through resistance, while EPR (ethylene propylene rubber), silicone and polyurethane have relatively low cutthrough resistance. PVC (polyvinyl chloride) typically has a cut-through resistance somewhere between these two extremes. The knives of the stripping equipment must, of course, be sharp enough to cut cleanly through the insulation or jacket and must also be properly adjusted so the insulation is cut all the way through without nicking the copper or aluminum conductor.

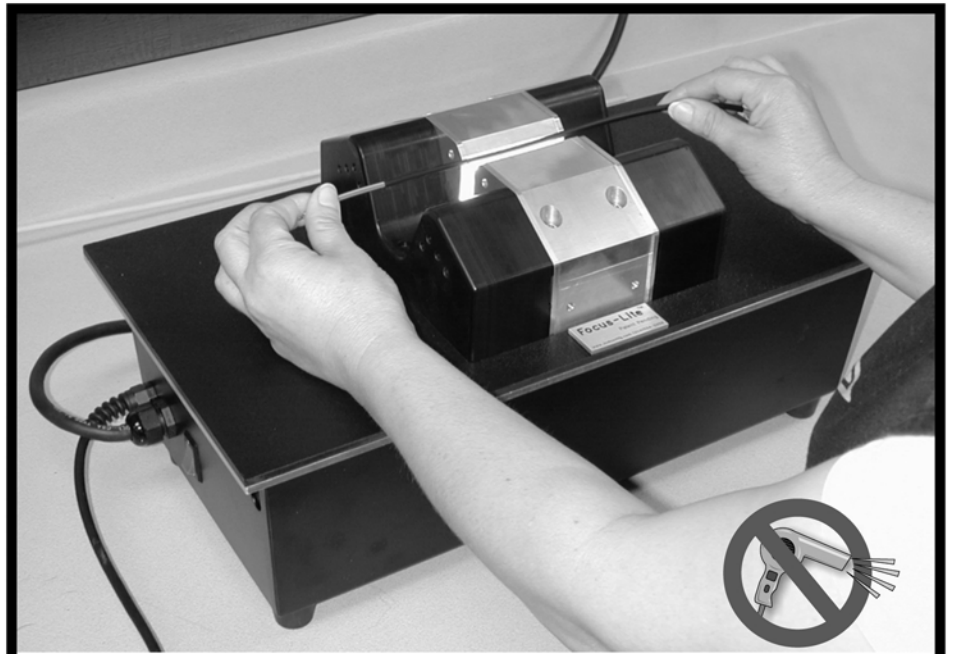
CRUSH RESISTANCE

As with cut-through resistance, the crush resistance of wire insulation must be high enough to withstand installation and in-service

mechanical forces and to comply with industry standards. The crush resistance of a wire must also be high enough to withstand the force applied by the grip of automated stripping equipment. This force is often adjustable and must be set high enough to prevent slippage as the insulation slug is pulled from the conductor, but it must be low enough to not damage the wire insulation. The crush resistance of a wire depends primarily on the type of insulation, but conductor material and stranding also has an effect. Wires with finely stranded conductors typically have better crush resistance than solid or coarsely stranded conductors because the conductor strands will compress.

INSULATION HARDNESS

Insulation hardness can also affect strippability. Soft, rubbery insulations such as EPR, silicone or CSPE (chlorosulfonated polyethylene) can buckle and thus bind as they are being pulled from the conductor if adhesion to the conductor is too high, especially if the strip length is long. This phenomenon is seldom an issue with harder polymers such as PE, XLPE and FEP (fluorinated ethylene propylene). Polymer hardness is often measured and reported using a method called durometer hardness testing.



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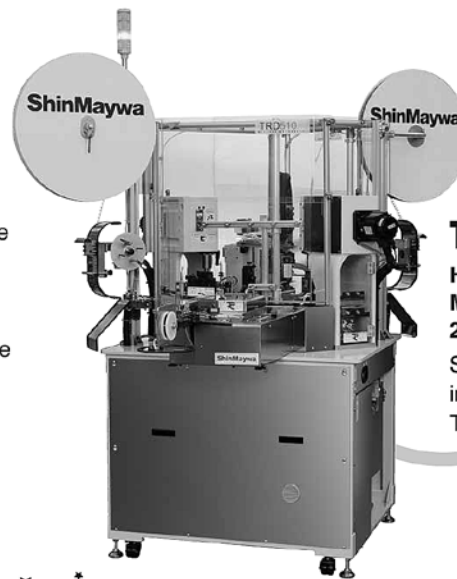
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NEWS PLUGS *continued*



PullTester 320: Reliable and Precise Measurement of Pull-test Forces

Schleuniger's PullTester 320 is a motorized device for use with Schleuniger's CrimpCenter automatic crimping machines to measure pull-test forces of wire terminations. Pull-test values are critical parameters for quality control and assurance. This versatile machine has three measuring ranges, which are individually calibrated. Multiple pulling ranges offer a higher accuracy over a wider range of applica-

tions than single-range devices. The standard measuring ranges are 0 – 100 N, 0 – 200 N and 0 – 1,000 N (22.5 lbf., 45 lbf., and 220 lbf.).

The standard 12-position terminal holder accommodates a wide variety of terminals to handle most applications. The machine will test pull forces up to 1,000 N (220 lbf.) and is especially suited for quality assurance in a production environment.

More information about this new product 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's Pull-Tester 320



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WireCam – The New Option for Quality Assurance with Schleuniger CrimpCenters

WireCam is another new, innovative quality assurance option for the CrimpCenter machine family.

WireCam is a highly innovative quality assurance option for Schleuniger CrimpCenters. The system monitors the stripping results and certain properties of positioned seals. A camera takes a picture of the processed wire end while the wire is in motion, or “on-the-fly.” Based on a two-dimensional top view picture, the software inspects each single wire end and compares it with the reference in real time. Therefore, the production quality is increased while maintaining high machine performance.

The complete integration of WireCam in “EASY”, the CrimpCenter’s user interface, ensures simple programming and control. The tolerance settings refer to physical units such as millimeters or inches, thereby making the system understandable and easy to use. In combination with SmartDetect and CFM20, all quality relevant processes of the wire processing can be monitored in real-time.

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

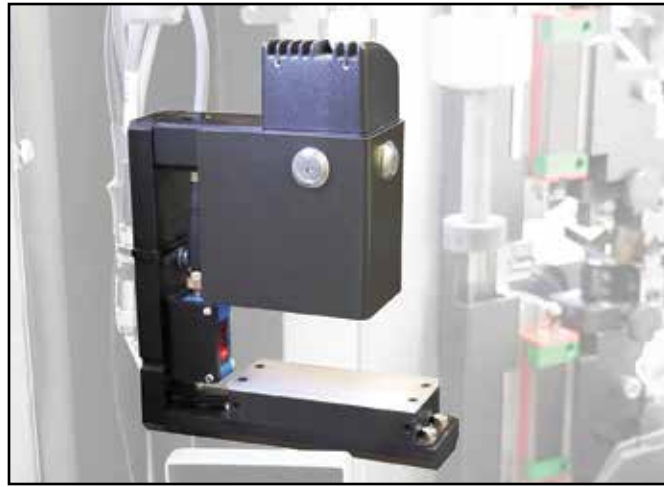
About Schleuniger

The Schleuniger Group in Thun is a globally active technology company and a leading supplier in the Wire Processing industry. Customers of the Schleuniger Group primarily supply the automotive, entertainment, and information industries as well as the communication sector. Schleuniger products are used whenever precise wire processing plays a role.

Development and production are located in Switzerland,

Germany, and China. Schleuniger is always close to its customers - with four Sales and Service companies in the US, Germany, China, and Japan as well as with 40 distributors worldwide.

The Schleuniger Group represents the Business Unit Wire Processing of the listed Metall Zug Group and has about 640 full-time employees and 30 trainees worldwide.



Schleuniger introduces WireCam.

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Equipped with high precision technology, the CrimpCenter 36 S features a compact modular design offering space for up to six processing stations. Various configuration possibilities allow for a variety of applications to be processed with cross sections from 0.13 to 6 mm² (26 - 10 AWG) for maximum productivity. The CrimpCenter 36 S has the most intuitive touchscreen interface for fast changeovers, making it ideal for low volume, high-mix jobs as well as larger production runs.

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MultiStrip 9480

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The MultiStrip 9480 cut & strip family offers six machine versions to cover a wide range of applications and budgets. Its high speed indexing cutter head and programmable rotary incision capability set the benchmark for high precision processing of coaxial and other shielded cables. Designed with efficiency in mind, the SmartBlade system and magnetically held guides increase output and maximize production by reducing changeover times.

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To Be Precise.

Not Your Father's Flat Cable

Cicoil, a leading manufacturer of High Performance Flat Cables, is pleased to announce the release of its New White Paper entitled: "Not your Father's Flat Cable". Available at <https://www.cicoil.com/special/not-your-fathers-flat-cable>, the Authoritative Guide explains how much has changed since Cicoil invented the Flat Cable in 1956 and how this technology has helped numerous industries to advance their technologies as well.


The five page Report discusses Flat Cable History; The Top 10 Reasons to use Flat Cable; Flat Cable for a Round World: EZ-Flexx™; Flat versus Contoured Cables; What is Flexx-Sil™?; and lastly analyzes the design differences between Flat and round cables.

For years, the conception was that round cable was the natural choice for continuous flex, confined area and mission critical applications. However, the Paper substantiates that

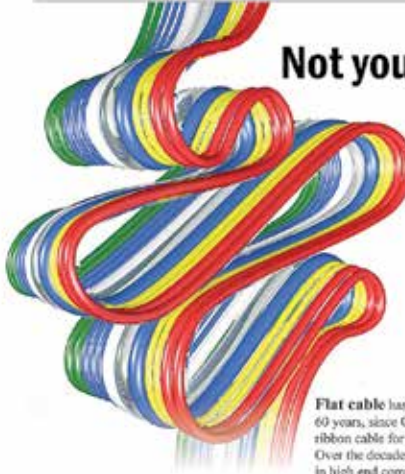

Flat cables have the ability to perform in just about any application and are an excellent alternative to cumbersome round cables. This proves that the cable world is not just a round one anymore, but is a flat world too.

Unlike round cables, Cicoil's patented computer-controlled extrusion process allows individual power conductors, twisted shielded pairs, and even tubing, to be placed in a flat parallel profile, precisely controlling the spacing of each component, insulation thickness and the overall cable shape. This ensures that each of the internal contents do not rub against each other and wear during operation. The Flat cables also have greater surface-to-volume ratio than round cables, consequently having higher efficiency in dissipating heat. This allows a higher current level for a given temperature rise and conductor cross-section

If you would like to learn more about our Innovative Flat Cable Tech-

Cicoil


Not your father's flat cable





Innovative design enhancements make flat cables strong candidates for applications where round cable was once the natural choice.

Flat cable has been around for about 60 years, since Cicoil invented the ribbon cable for IBM computers in 1956. Over the decades it has been a favorite in high end computing, military and aerospace, robotics and motion control devices. Its advantages include superior flexibility, electronic noise abatement, and packaging efficiency. Its limiting factor over this time has been the need for unique termination techniques—prepping for connectors has largely required hand work. A new type of flat cable has been developed by Cicoil Corporation that promises to put this last hurdle into the past, opening the potential for engineers to take advantage of flat cable advantages while utilizing the common cable prep tools and automated processes currently in use with round cables.

to retain a round profile and to minimize frictional heating as the cable moves. Surrounding the wires and fillers is an outer jacket that holds it all together and provides some level of protection against outside elements. But, while round cable is normally fine for general use, there are drawbacks with this construction. Because it incorporates these multiple layers of wires, insulation, and fillers, heat dissipation from the wires can be problematic in round cable. Despite measures to reduce it there is still frictional heat produced inside the cable during repetitive motion cycles. Add to this the issue of electrical impedance alteration as conductors inside the cable move relative to one another. With flat cable each conductor is kept parallel with neighboring conductors to form the flat profile. Unlike round cable, conductors in flat cables don't move within the encapsulating jacket so their electrical qualities remain constant.

Typical Round Cable Components



Flat vs Round
Most cable is round, which is a generally useful geometry. Examine an ordinary round electrical cable and you'll typically find insulated wires in a bundle surrounded by several layers of other "filler" material. These layers are there

3M™ CABLE-TO-BOARD 1.27MM (.050") CONNECTOR SYSTEM, 450 SERIES

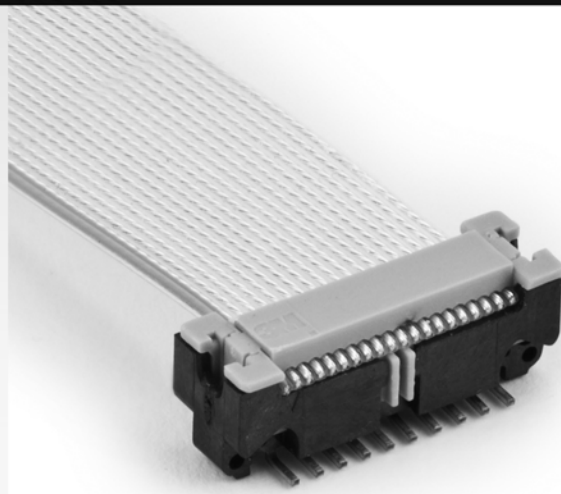
The 451 and 452 Series interconnect products from 3M also deliver on performance, reliability and cost savings. The ribbon cable wiremount socket assembly incorporates 3M insulation displacement contact (IDC) technology in the connector, helping maintain secure connections and high signal integrity. The IDC connector's mass termination capability allows the termination of 30 lines in a single cycle, reducing the need for expensive automated termination equipment and allowing manual cable assembly operations. Available friction-latch configurations and an optional strain-relief accessory can further increase connection reliability. An optional, unique header ejector latch mechanism provides positive latch and ejection capability with minimal size addition.

The shrouded boardmount header is available in a variety of configurations in order to maximize design flexibility while minimizing PCB footprint. Tape-and-reel packaging for the SMT version of the header is available for automated placement applications, and PCB standoffs help enable pin-in-paste processing capability. The 1.27mm 451 and 452 series interconnect products from 3M deliver on performance, reliability and space savings.

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nology and how Cicoil developed the First IDC Ribbon Cable, helped put a Man on the Moon, and designed the first Class 1 Clean Room Cable, please contact our office at 661-295-1295 to get your free White Paper, discuss your application or to set up an on-site visit to your location.

Cicoil has been a leader in designing and manufacturing high performance Flat Cable assemblies for more than sixty years. The company's Patented Flexx-Sil™ Flat Cable Technology provides high flexibility, extremely long life, and they can withstand temperature extremes from -65 degrees to +260 degrees Celsius. Cicoil's flat cables are used in thousands of demanding applications; including aircraft fuel control cells, semiconductor automation, and the Space Shuttle. Cicoil designs and manufactures its Flexx-Sil™ jacketed cables and cable assemblies in an automated facility in Valencia, California. Cicoil's quality assurance system is certified to the ISO 9001 (AS9100) standard. Visit www.cicoil.com for more information, or call 661-295-1295 to speak to an application engineer.



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Heilind Electronics Receives Amphenol North American Distribution Award

Heilind Electronics, a leading global distributor of electronic components, was presented the Best North American Performance in Distribution award by Amphenol. The award was presented to Heilind executives by Amphenol CEO Adam Norwitt at the company's annual EDS reception held on May 17 in Las Vegas, Nevada. This is the second consecutive year that Heilind has earned this distinction.

"We are honored to be recognized by Amphenol as one of the most prominent electronic distributors for 2016," said Alan Clapp, Vice President of Supplier Business, Heilind Electronics. "To be acknowledged for our continued performance amongst Amphenol's many North American distributors, for the second year in a row, is a testament to our ongoing commitment to innovation, supply chain integrity and service excellence."

As an authorized distributor for over a dozen Amphenol divisions, Heilind Electronics is one of the manufacturer's leading distributors globally.

Founded in 1974, Heilind Electronics, Inc. (<http://www.heilind.com>) is one of the world's leading distributors of connectors, relays, sensors, switches, thermal management and



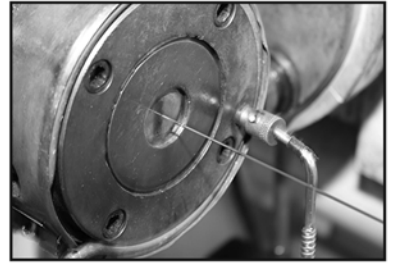
circuit protection products, terminal blocks, wire and cable, wiring accessories and insulation and identification products.

Heilind has locations throughout the U.S., Canada, Mexico, Brazil, Germany, Singapore, Hong Kong and China. Follow Heilind on Facebook at [facebook.com/Heilind](https://www.facebook.com/Heilind) and on Twitter at twitter.com/Heilind

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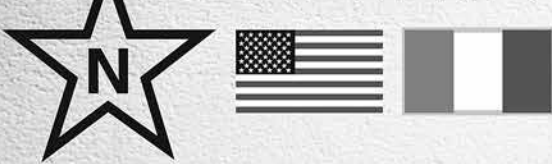
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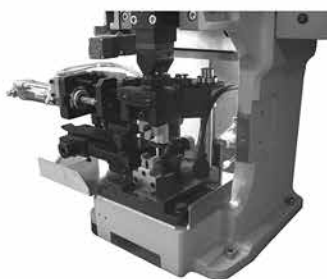


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NEWS PLUGS continued



Indium Corporation Offers One-Source Solution for High-Purity Tin (Sn) Metal Applications

Indium Corporation delivers a single-source solution, from mine to packaging, for high-purity tin materials. The company offers tin in a number of

Typical Impurities (ppm)

Impurity	Grade			
	3N5	4N	4N8	5N*
Ag	15	<1	<1	<1
Al	5	<1	<1	<1
As	25	10	10	3
Bi	28	2	<2	<2
Cd	5	<0.5	<0.5	<0.5
Co+Ni	18	<1.5	<1.5	<1.5
Cu	8	2	<0.5	<0.5
Fe	20	7	1	2
In	39	16	1	<1
Pb	20	22	3	3
S	22	-	-	-
Zn	5	<0.5	<0.5	<0.5
Total ppm level	<500	<100	<20	<10

*Limited availability

Indium Corporation has the production capability to deliver levels of up to 99.999%-pure (5N) tin. Testing is available upon request for specific impurities.

physical forms and purity levels of up to 5N or 99.999%-pure.

With a melting point of 505.08 K (231.93°C or 449.47°F) as well as its corrosion-resistant nature, tin is becoming increasingly popular for a

number of new and innovative applications, including aerospace and semiconductor.

Indium Corporation delivers tin in grades of 99% (2N) through 99.999%-pure (5N) in a number of physical shapes and geometry, including:

- Ingot
- Shot
- Powder
- Customer fabrications (sphere, wire, tubing, and more)

For more information, visit www.indium.com/tin or contact Donna Vareha-Walsh, Director Metals Business Unit, at dvareha-walsh@indium.com.

Indium Corporation is a premier materials manufacturer and supplier to the global electronics, semiconductor, thin-film, and thermal management markets. Products include solders and fluxes; brazes; thermal interface materials; sputtering targets; indium, gallium, germanium, and tin metals and inorganic compounds; and NanoFoil®. Founded in 1934, Indium has global technical support and factories located in China, Malaysia, Singapore, South Korea, the United Kingdom, and the USA.

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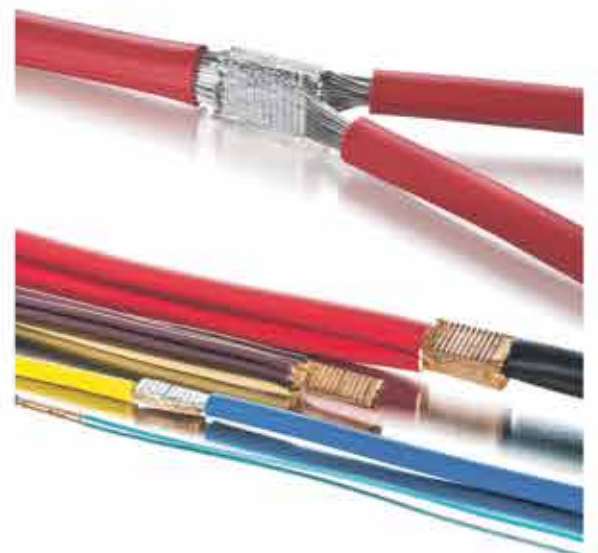
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NEWS PLUGS continued**LUTZE Expands EMC Cable Fittings**

LUTZE Inc. expands its industrial cable fitting offering and introduces large diameter EMC (Electro Magnetic Compatibility) fittings to include sizes for large diameter cables up to 500MCM (75mm OD).

These NPT and metric thread fittings provide effective strain relief and 360° shield termination. They use the same clamp style shield termination method as our smaller EMC fittings for best contact with the shield. They are designed to make terminating large drive cables quick and easy, and are a per-

fect complement to LUTZE DRIVEFLEX® VFD cables.

LUTZE's new EMC fittings feature wide sealing and clamping ranges as well as a temperature range of -40°C-+80°C suitable for various industrial applications.

LUTZE Inc designs and manufactures control products for factory automa-



tion and specializes in flexible industrial cable such as LUTZE Silflex®, Superflex®, Superflex® Plus, DRIVEFLEX®; grounding and wire management products, compact power supplies, LSC-Wiring System for control cabinets, current control system LOCC-box and LCIS relays.

LUTZE Inc located in Charlotte, NC, is part of the LUTZE International Group. Founded in 1958, LUTZE International Group has manufacturing and distribution operations in Germany, Austria, France, Switzerland, Great Britain, Czech Republic, Spain, China and the USA. Efficiency in Automation!

For more information or samples, please contact LUTZE Inc., 13330 South Ridge Dr. Charlotte, NC 28273. Phone (800) 447-2371 or visit www.lutze.com

Fairview Microwave Releases New Series of BMA Connectors and Adapters with VSWR as Low as 1.15:1

Fairview Microwave Inc., a supplier of on-demand microwave and RF components, has launched a new product line made-up of 45 BMA connectors with VSWR as low as 1.2:1,

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You can be sure your dies will fit your long-term needs, because they are completely compatible with all tools in the SDE system. They move with you as your needs grow.

and seven BMA adapters with VSWR as low as 1.15:1. Typical applications include blind mating, RF backplanes, rack and panel connectivity, high-speed switching and use in phased array systems.

Fairview's new line of 54 BMA connectors and BMA adapters provide a maximum operating frequency of 22 GHz. They feature 50 Ohm impedance, gold-plated BeCu contacts and an operating temperature range of -65°C to +125°C. Radial and axial float is offered in many of the models to help with alignment. Commercial versions are constructed of brass and military versions are made of stainless steel. Hermetic versions are also available. These BMA connectors and BMA adapters are ideally suited for telecommunications and military electronics applications.

"Our new BMA connectors and adapters make a great addition to our already extensive interconnect product line. As BMA interfaces are deployed globally, and have been for years, there is great need for these products across a wide variety of applications," said Dan Birch, Product Manager.

Fairview's BMA connectors and BMA adapters are in-stock and ready for immediate shipment with no minimum order quantity. For detailed information on these products, please visit <https://www.fairviewmicrowave.com/rf-products/bma-interconnects.html>



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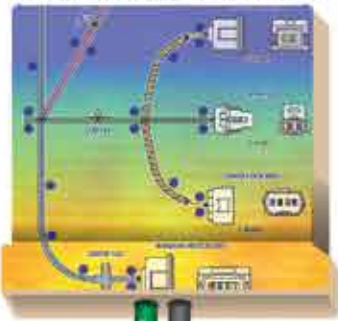
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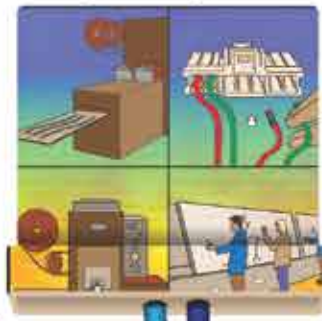
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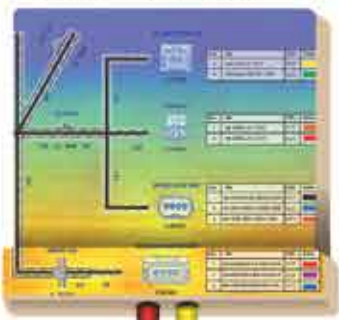
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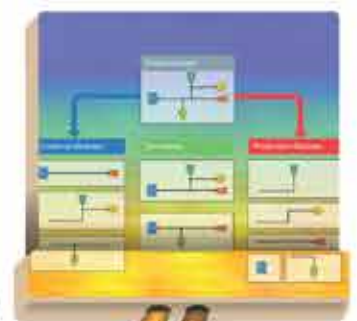
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New Artos Cr.01 Single End Processor

Artos Engineering Company, a Brookfield-based manufacturer of wire processing equipment, has introduced the Cr.01 Single End Processor, a small-footprint, mid-range wire processing solution that's a fully-automated, affordable upgrade from benchtop-level productivity.

The Cr.01 enables operators to measure, cut, strip both ends and crimp one end of a wire lead with a single machine without investing in a more expensive double-ended processor. The new machine can increase throughput by approximately four times when compared to a standard wire prep and benchtop unit.

"The Cr.01 enables companies, particularly automotive wire harness manufacturers, to automate wire processing affordably," says John Olsen II, Artos Engineering Company president. "By segmenting production to use single-crimp units instead of the larger double-crimp machines, automotive companies can improve production efficiency and reduce inventory, capital expenditures and floor space."

The Cr.01 features a footprint that is 20% smaller than a double-ended processor. It



Artos Cr.01 Single End Processor

handles wire sizes from 30 to 12 awg and open to closed-barrel terminals. Easy-loading dual wire straighteners improve processing and a smooth belt drive handles all wire types. A patent-pending Sencor System automatically sets stripping diameter.

Scrap collection and clean-up is simple: there's a conveniently-located bad crimp separator, slug collection unit, empty terminal strip collector and waste-paper take-up reel.

The Cr.01 offers easy guide changes with handy guide storage, automatic programmable base height adjustment, an easy out and in servo driven terminating unit, an intuitive pc

interface and built-in splice detection.

Numerous accessories are available for the Cr.01, including a crimp force monitor, paper take-up, sensor system, programmable Z-axis, integrated crimp height micrometer, wire splice detector, articulating wire infeed roller, manual and automatic testers and motorized collectors with batch tray.

Founded in 1911 and based in Brookfield, Wis., Artos Engineering Corporation is an independently-owned manufacturer of wire processing equipment serving the aerospace, automotive and manufacturing industries. For more information, visit www.artosengineering.com.

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Global Wire and Cable Industry Community Fully Engaged During Interwire Week

The Wire Association International (WAI), Inc. reports that it had a successful showing of the Americas' wire and cable industry fair, which, this year comprised three of its events: Interwire 2017; WAI's 87th Annual Convention; and its first Global Ferrous Rod & Wire

Symposium. Interwire week was held May 8-11, 2017, at the Georgia World Congress Center (GWCC), Atlanta, Georgia, USA. 3,807 people participated.

Remarking on the event, WAI 2017 President David Hawker said, "Interwire was a success and it accomplished a number of our objectives. The training

and technical programs and the Ferrous Symposium helped educate a cross section of industry professionals.

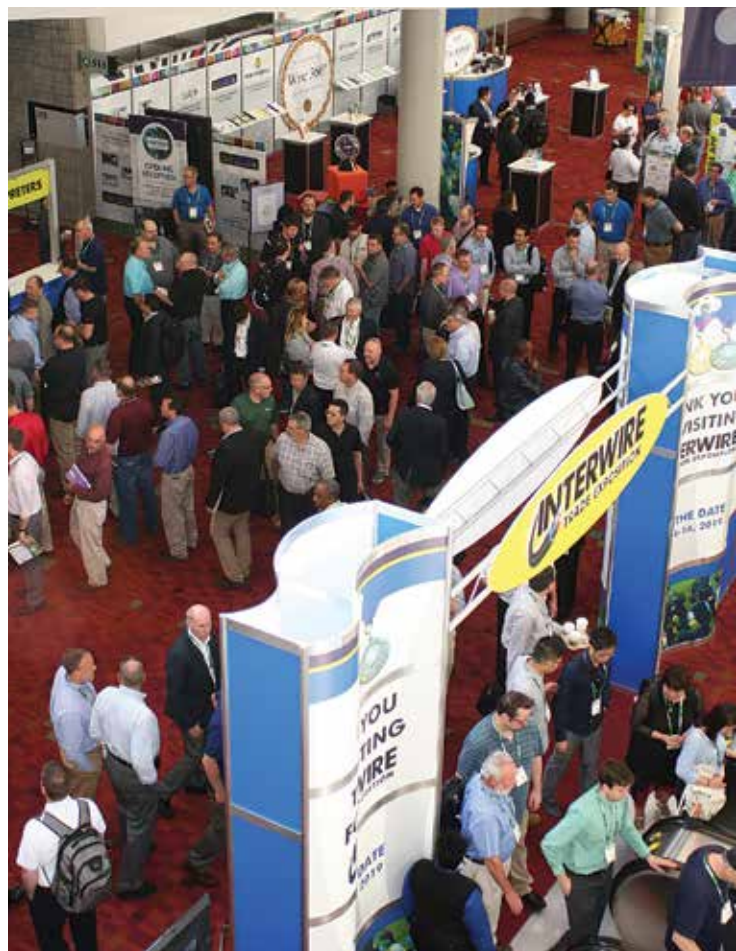
We had a sold-out exhibit floor, tremendous involvement of corporate sponsors, and incredible level of volunteer participation, which all point to the health and commitment of WAI's support network.

The level and stature of the attendees confirm that Interwire is a core event in our industry. During the show, we recognized four individuals from our manufacturing base for their contributions to the industry. I thank all who contributed to and attended the event and I look forward to Interwire 2019."

Highlights included:
THE EXPOSITION

The Interwire Exposition comprised more than 400 exhibitors from 25 countries that participated to showcase wire and cable products, machinery, ancillary equipment, and services. Sixty-five companies were first-time exhibitors. The footprint of the show consumed 110,000 sq. ft. of exhibition space in Hall A of the

Continued on page 44



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Global Wire and Cable Industry Community Fully Engaged During Interwire Week

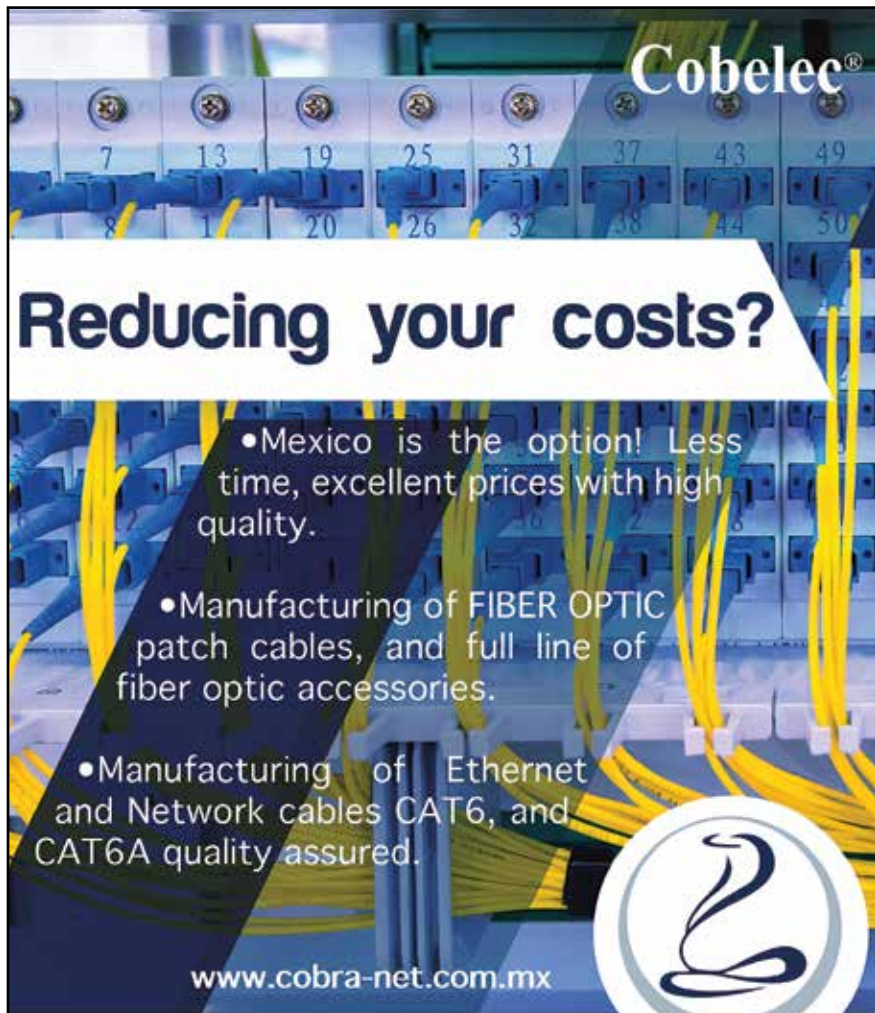
Continued from page 43

Georgia World Congress Center.

"This was one of the best Interwires on record!" said MGS Sales Director Jeff Swinchatt, director of sales and marketing for The MGS Group. "We were excited to see all our friends from the industry and meet some new ones. This year's

event highlighted serious conversations and enthusiasm for our newest system capability. It was a great opportunity to show off our latest accomplishments and catch up with our friends."

Exhibitor Orlando Martinez of Davis-Standard LLC said, "The overall impression of the D-S team is that Interwire 2017 was a solid show



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and provided us with good leads. We learned about good projects we did not know about, and had a chance to meet with customers we're currently working with in a more relaxed setting. Atlanta is such a great venue for this show."

THE GLOBAL FERROUS ROD & WIRE SYMPOSIUM (GFRWS)

This first-time, "conference within a conference" was a discrete program focusing exclusively on topics of interest to the ferrous industry. The GFRWS schedule ran concurrently with Interwire offering technical presentations on processing, equipment improvements, testing, quality, and measurement techniques. The program also featured a Reception at the College Football Hall of Fame.

WAI 87TH ANNUAL CONVENTION

WAI issued its top honors to Richard R. Miller, a former Southwire Company executive and winner of the Donnellan Memorial Award; and to Harold Moss, Mordica Memorial Award winner.

Keynote speaker Rick Smith, a 3D printing expert and best-selling author, had the full attention of the audience during his talk: "Our 3D Printed Future: How to Position Yourself and Your Organization to Successfully Navigate this Historic Shift."

The conference program included more than a dozen technical and practical presentations on nonferrous

and general topics; the Fundamentals of Wire Manufacturing primer course; a panel presentation on Industry 4.0; and a workshop on fines and annealing. The Manufacturing Management Workshop provided tailored instruction for operations managers and supervisors to pick up where on-the-job training leaves off.

Additional highlights included a two-part tour of Southwire Company LLC in Carrollton, Georgia, where visitors saw its Utility Products Plant and its Building Wire Cable plant; WAI's Welcome Reception at the Omni Hotel; a member rewards luncheon and raffle; and Association leadership meetings.

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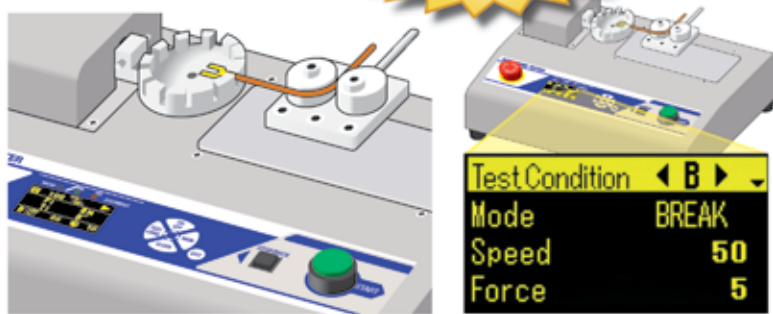
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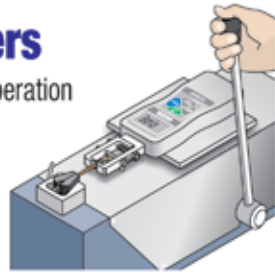
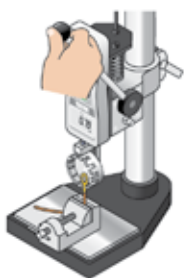
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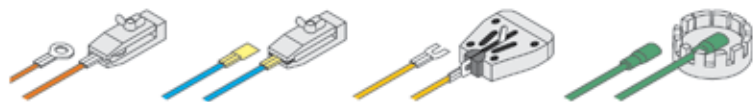
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NEWS PLUGS continued**2017 Marks Third Year in a Row TE's Leading Ethical Business Practices Have Been Recognized**

TE Connectivity (TE) (NYSE: TEL), a world leader in connectivity and sensors, has again been recognized by the Ethisphere Institute, a global leader in defining and advancing the standards of ethical business practices, as one of the 2017 World's Most Ethical Companies®. This is the third consecutive year TE has earned this recognition.

"We are honored to once again be an Ethisphere World's Most Ethical Company," said TE Connectivity Chief Executive Officer Terrence Curtin. "This

distinction underscores our commitment to our values and high ethical standards by which we operate. Ensuring compliance in the more than 150 countries in which we do business is not just the minimum for TE -- we owe it to our customers, partners, employees and shareholders to go beyond that by living our values of integrity, accountability, teamwork and innovation and always to do the right thing."

"Over the last 11 years, we have seen the shift in societal expectations, constant refinement of laws and regulations and the changing geopolitical climate. We know how companies honored as a World's Most Ethical respond to these expectations. They invest in their local communities around the world, embrace strategies of diversity and inclusion, and focus on long term-ism as a sustainable business ad-



vantage," explained Ethisphere's Chief Executive Officer Timothy Erblich. "Congratulations to everyone at TE for being recognized again as a World's Most Ethical Company."

Ethisphere's World's Most Ethical Company designation honors companies who recognize their role in society to influence and drive positive change, to consider the impact of their actions on their employees, investors, customers and other key stakeholders and to use their values and culture as an underpinning of the decisions they make every day.

The Reshoring Initiative and PMA Launch First National Reshoring Award

The Reshoring Initiative, in conjunction with the Precision Metalforming Association (PMA), invites companies that have successfully reshored parts or tooling made primarily by metal forming, fabricating or machining to apply for the first National Reshoring Award. There will be one award for buyers and one award for suppliers. To be eligible for the award, the reshoring work must have occurred between January 1, 2012, and August 1, 2017, and the work must have come back from outside North America to North America. A complete definition of reshoring is available here. Applications must be submitted by August 1, 2017. To view award details and enter to win, visit www.pma.org/sourcing-solutions/reshoring.asp.

In 2016 about 27,000 more manufacturing jobs were brought back to the U.S. than were offshored, said Harry Moser, founder and president of The Reshoring Initiative. We anticipate that this award will motivate more companies to reevaluate their offshoring and see that it is often more profitable to produce or source domestically. We also hope that other associations will choose to support similar awards to show that their industries are now successfully reshoring. Questions about the first National Reshoring Award can be directed to Harry Moser at 847-726-2975 or harry.moser@reshorennow.org. The awards will be presented in Milwaukee, WI, on September 28, 2017, at Sourcing Solutions™, a popular procurement program hosted by PMA. The event is designed to enable buyers and suppliers of metal stampings, tooling and dies, assemblies and other fabricated metal parts to have numerous in-person meetings all in one day, in one location. Visit www.pma.org/sourcingsolutions for details about Sourcing Solutions, or contact Ilene Schwartz at 216-901-8800 or ischwartz@pma.org. The Reshoring Initiative, founded in early 2010, takes action by helping manufacturers realize that local production, in some cases, reduces their total cost of ownership of purchased parts and tooling. The Initiative trains suppliers how to effectively meet the needs of their local customers, giving the suppliers the tools to sell against lower priced offshore competitors.

UNIQA-PRO SINGLE CRIMP WIRE PROCESSOR

This lead making machine combines a proven platform, with a cost-effective, multiple station design and a wide range of customer options.

TE Connectivity's UNIQA-PRO Single Crimp Wire Processor is an ideal cost-effective solution for companies looking to ramp up production from multiple bench top machines without making the large capital investment of a double ended lead maker. With this single ended-lead maker, you will be able to save labor costs by measuring, cutting, stripping both ends, and crimping one end of a wire lead all with a single machine.

Features:

- 20% smaller footprint than a typical double ended lead maker.
- The UNIQA-PRO can ramp up your throughput by approximately 4X over a standard wire prep. and benchtop applicator.
- User-friendly PC control.
- Available in three different models to fit your needs: Basic machine with a passive wire collection system, basic machine with a passive wire collection system, crimp force monitor, and terminal scrap chopper, and a high force machine with an active wire collection system, crimp force monitor, and terminal scrap chopper.

Applications:

- Appliance industry
- Medical equipment
- Wire sizes ranging from 12 AWG – 26 AWG
- Anywhere manufacturers want to keep labor costs down without a large capital investment



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Reducing Cost of Solar with Wiring Harnesses

By Immanuel Umenei
Littelfuse

The build out of renewable energy infrastructure depends on economic drivers and is experiencing increased pressure to achieve parity with traditional electrical power sources. Reducing the cost of installing photovoltaic (PV) systems is high on the focus list of the solar power industry.

This is the context in which a leading supplier to the solar energy market came to its fuse supplier, Littelfuse, with a challenge: how could it improve the method for protect-

ing PV strings from damaging over-currents in a way that would reduce complexity and cost? The supplier sought to add DC fuses to the wiring harnesses that they manufactured for linking solar panel strings to combiner boxes.

Applications engineers at Littelfuse went to work, seeking to fully understand the problem.

- Initially, every string was protected at the level of the combiner box, requiring many costly combiner boxes in especially large scale solar installations

- To reduce the number of combiner boxes, wire harnesses with integrated fuses allowed low amperage

strings to be combined prior to the box. Combiner box reduction could be attained but traditional methods of integrating the fuse protection into the harness created reliability and yield issues.

An Innovative Solution

To reduce the number of inputs (cables) going in to the combiner box, and subsequently the number of combiner boxes required, the fuse supplier wanted to put overmolded fuses in-line within the wiring harness. This would bring about a more streamlined installation and bring protection closer to the panels. Also, with this methodology, the installer could combine many more of the protected strings into one cable, carrying more current into the combin-

er box.

The first technical challenge was how to add the fuses inline without creating cost and reliability issues associated with connections, such as fuses with wire connections made directly to the end-cap or a cap-on-cap. Also, the solution had to be economical and easy to assemble for the wire harness manufacturer. Previous solutions tried by the harness manufacturer created additional costs and poor yields.

After carefully reviewing and fine-tuning the requirements, the engineering team developed a new fuse engineered to integrate into an in-line assembly within a wire harness. The fuses had a “unibody” end cap (i.e., no joints) with a barrel optimized for wire crimping and over-molding.

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Fig. 1. This wiring harness made by Hikam America has eight branches, each protected by a Littelfuse supplied in-line DC fuse.



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Testing proved that the new design solved the manufacturing yield problems encountered previously. The wire harness manufacturer liked the crimped connection because it allowed for a solid contact between the wire and the fuse, reducing the potential for high resistance contacts that can overheat. Additionally, the in-line fuse amperage range goes up to 30A providing relatively high amperage ratings to allow for increasing efficiencies as PV technologies improve.

What's more, the design reduced the number of potential points of failure within the harness.

Dramatic Cost Savings

Even more importantly, the wire harness with in-line fuses offered dramatic cost reductions for EPCs and project investors. By fusing in-line instead of in the combiner box, the harness reduced the total number of inputs into a combiner box. Multiple protected strings are combined in the harness, having fewer inputs with higher ampacity coming into the box.

This greatly reduced the number of combiner boxes required to service the overall installation. For example, instead of having eight combiner boxes handling 16 15-amp inputs for 1.2 megawatts, protected strings would allow four combiner boxes handling 16 30-amp inputs at equal power.

Typically, these boxes, outfitted with fuse holders, cost more than \$800 each, so the cost savings was substantial. In this architecture, the reduced number of combiner boxes also reduced the amount of wire that was required. This impacted the total cost of cable and favorably impacted labor costs.

In the rare occurrence of a fault where the fuse would open as expected, replacement kits provided overmolded in-line fuses with connectors which allowed for quick repair.

Brian Moore, sales representative of Hikam America, Inc., a major manufacturer of wiring harness assemblies, said that his

customers have found that the in-line fuse protection solution reduces installation time of solar fields by up to 40 percent and overall wiring costs by 35 percent.

"The in-line approach is popular among EPCs and installers for protecting systems of all solar panel types, including crystalline, poly/mono crystalline silicon, and thin film," Moore said. "The fuses used in the wiring harness are usually smaller and less costly than the fuses used in panels, and they are easy to replace after a fuse needs to open."

Conclusion

The electrical Balance of Systems (BOS) components required to transmit and convert solar energy, including wire, string and array combiner



Solar Array by Littlefuse.

boxes, and other components represent a significant part of the total cost of a solar installation. By reducing the number of components, as

well as reducing the labor required to build solar installations, in-line fusing helps lower the total cost for EPCs, installers and owners.

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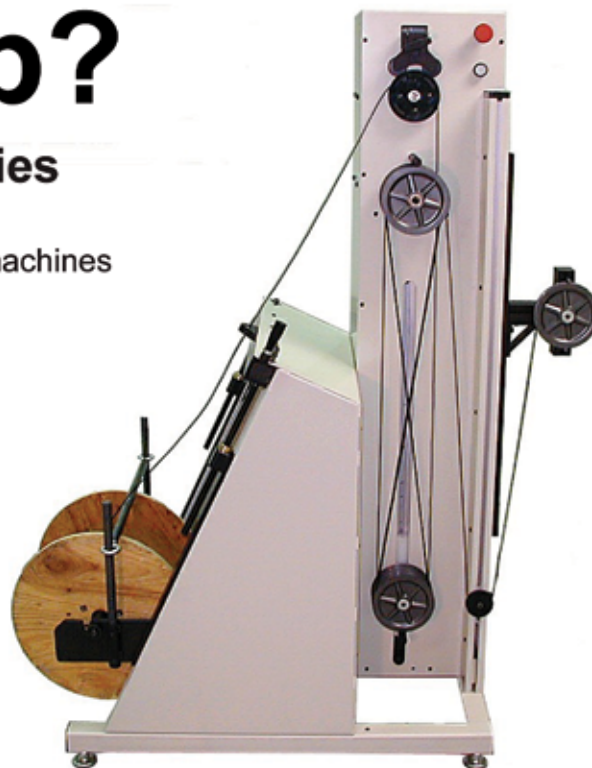
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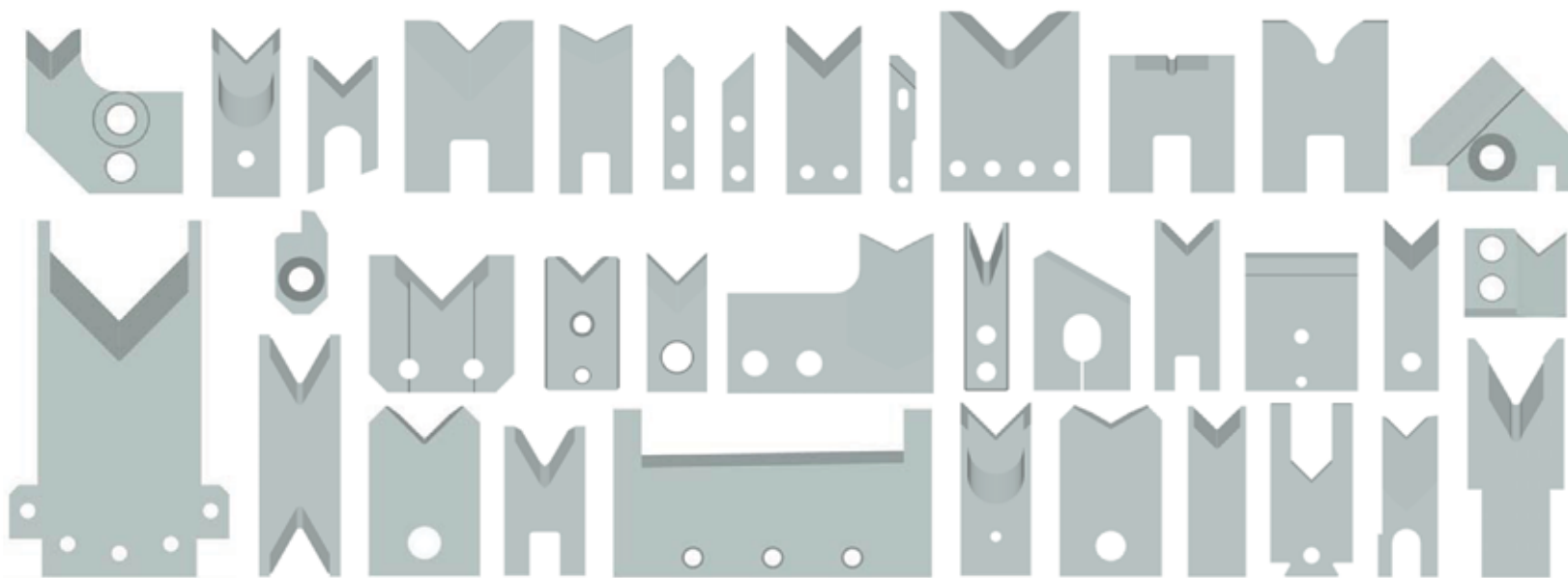
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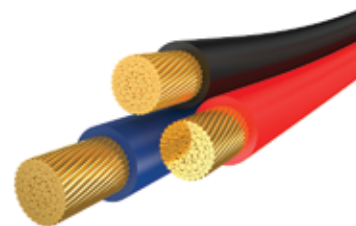
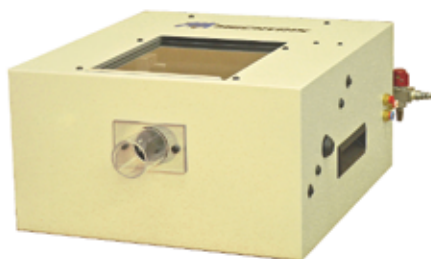
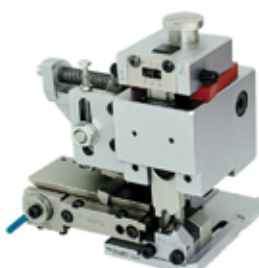
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More information about the 70-3812NC Aluminum Filled Epoxy is available at www.epoxies.com under the resources tab.

Samples are readily available and ship within three days.

BuyStrainRelief.com Offers New Stainless Steel Connectors For Watertight Protection

BuyStrainRelief.com is expanding its line of strain-relief wire connectors to include corrosion-resistant stainless steel connectors.

The wire strain-relief products, sold under the Cantop trade name, are used to insulate and seal control cabinets from water and dust intrusion where wires and tubing enter the cabinets. The connectors also fasten the wires more securely to the cabinets while providing a secure strain-relief connection.



Cantop stainless steel strain relief connectors

The new line of stainless steel connectors provides durability and protection. It's well-suited for the food and car-wash industries – especially for machines that are washed down.

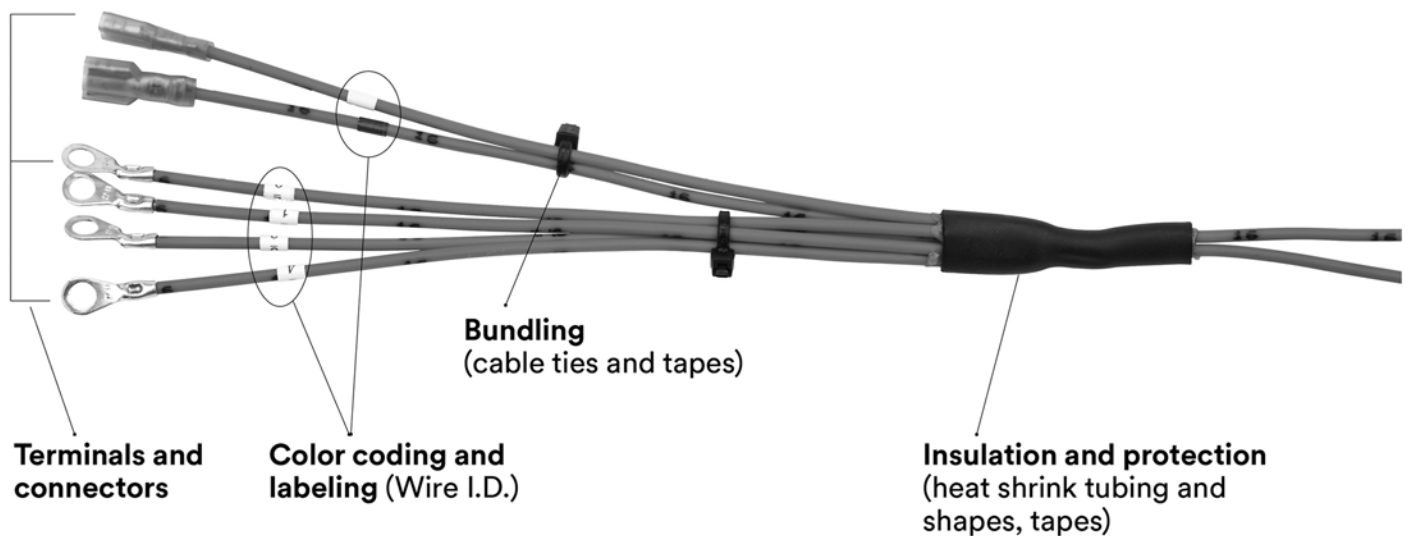
BuyStrainRelief.com also offers strain-relief connectors in nylon, nylon flex and nickel-plated brass.

These products are used by control panel makers, machine builders, process machinery manufacturers and other producers of industrial equipment with cable connections that need watertight, strain-relief protection.

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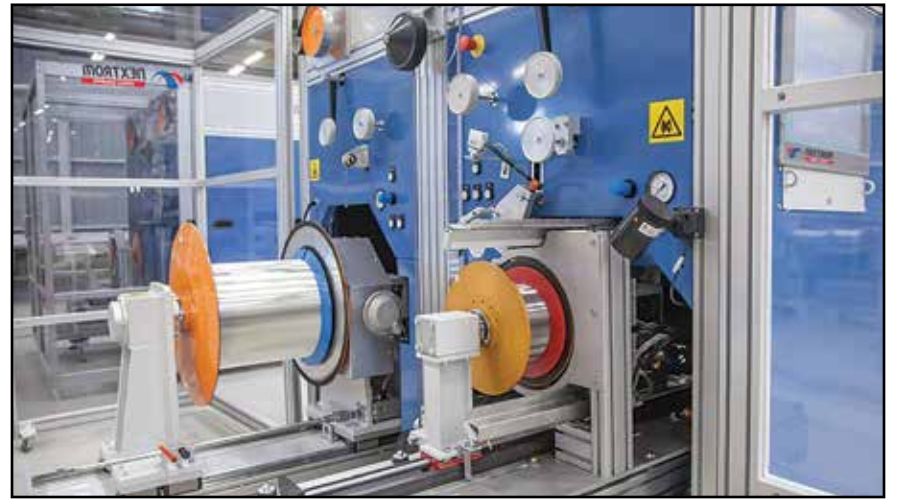
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For specialty fibers we developed it further to the OFC 35SF with extended tension ranges for tensile testing and large diameter proof testing using integrated bending wheels to test fiber strength in 8 directions. It is a highly accurate system where the resolution is maintained with multiple tension gauges for different fiber ranges.

During proof testing, the fiber is

typically payed off, tested by loading the fiber between two capstans with a particular force and is then taken-up with a dancer. In order to meet the requirements of specialty fibers, special attention has been paid to high-quality take-ups and pay-offs, flexible configurations, quick set-ups, easy operation, and maintenance. A top performance level is reached by efficient servo motors, high accuracy tension sensors, and purpose to special design which guarantees effective winding at high speeds. A cutting plan can be keyed in to the unit so that it stops when desired length is reached.

When designing the OFC35SF we have put a special focus on ergonom-



ics and ease of use as well as on safe and comfortable use of the machine. For example, the threading mode and fiber clamp of the take-up make the set-up very easy. The operator then only needs to change full reels in the pay-off and empty reels in the take-up. It is a system that is easy to handle and it fulfills international proof testing standards.

Specifications OFC35SF:

- Speed 300 m/min
- Tensile Pulling Force (machine) 5 – 50 N
- Fiber diameter (glass) at 100 kpsi tension 0.100 – 0.300 mm

- Bending wheel diameter 10 – 75 mm
- Number of Bending Directions 8
- Extended ranges optional with additional tension gauges and fiber pulleys:
- Low range
- Tensile Pulling Force (machine) 0.8 – 5.0 N
- Fiber diameter (glass) at 100 kpsi tension 0.040 – 0.100 mm

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When Armando Zacarias goes out on a Eubanks service call, unusual things happen.

“Once I helped round up a cow that got loose in a customer’s plant.

“Another time, while driving to a customer’s site, our rep’s car caught fire. We eventually arrived there that night and finished the job in time for the morning shift,” Mando reports.

Customers report something unusual too: Mando’s “can-do” attitude.

George Price, vice president of J&M Products, for example, writes how Mando takes time to answer questions, explain machine operation and even gave “tips on stripping some shielded cable that others said could not be done.”

“Can’t be done” is not in Mando’s vocabulary—either English or Spanish. On his own initiative, he solves problems, leads training classes, helps boost plant efficiencies, and makes lasting friendships while doing it.

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Development and Enhancement of Zuken's Harness Builder for E3.series

At a recent event, WHN discussed the genesis of the Harness Builder for E3.series with Paul Harvell, the Director of E3.series. The harness design product was designed and developed by Paul and his team at Zuken USA, based in Westford MA.

Paul mentioned that when Zuken first began visiting the harness shows, they discovered there was no easy way to quickly and efficiently use a graphical interface to create harness cost estimations and labor times for harness manufacturers. This prompted a three-year project to develop a plug-in tool to the E3.series engineering application. The project was specifically geared toward the harness

manufacturing industry, to improve and enhance this shortcoming.

Intelligent Components

It was decided that a large database of "smart/intelligent" components should be created. This task was accomplished and these parts were loaded along with information to aid the harness manufacturer in piecing together the harness.

Direct links to PDF documentation detailing the correct crimping tool required for assembly alongside many views, and in some cases, photographs of the part for easy and accurate placement would now be available on the full-size board. Assembly, and labor costs have been

added alongside tooling and material costs to give an accurate estimate of costs associated with the harness. The extent of the database has most visibility when a connector is selected. There is a time saving option to select all the possible associated parts that maybe required when purchasing it. Wedge locks, seals, boots and elbows have all been linked internally in the library to make it easy for the user and take away the time-consuming job of researching the associated pieces for purchase.

The terminal crimps, for example, are automatically selected when the wires are added into the harness; a huge timesaving function that will help build single or multiple bills of

material. Those very same terminals are also linked to PDF documentation detailing how the terminal is crimped or assembled. The manufacturing companies can also link their own important documentation to the parts and drawings; such as the whereabouts in a stock room of a certain tool, or a detailed assembly note for complicated items.

Ease of Use

There was a general realization that the harness manufacturing team would not necessarily have the same skill sets as the engineering companies that were designing the harnesses. There might not be the time or necessity for them to learn the complicated interfaces. For this reason, the "ease of use" tool was created with concise easy-to-locate functions, along with pictures and videos available for online help. That, coupled with Zuken's hotline support and online user community, really make for a quick ramp up time with the new tool.

One of the key features for the product is that it does not require or force the harness manufacturer to create a schematic in order to create a harness. It does, however, offer a schematic dynamically created from the harness after it has been drawn. The single object technology of E3.series makes it flexible enough for a design engineer or a harness manufacturer to detail the same drawing sets, and have a sense of comfort that all views of the same information are updated automatically at the same time. This means that if a connector is added on a schematic, it will also be present on the formboard. Similarly, if a wire is added into the harness, it will appear in the schematic. This single object approach means that all bills of material, and detailed wire cutting instructions, are always in synch.

Import/Export Abilities

One of the more impressive features Paul and his team built into the software, is the ability to import directly to and from a Microsoft Excel connection list. This automatically selects the connectors, terminals, and wires,

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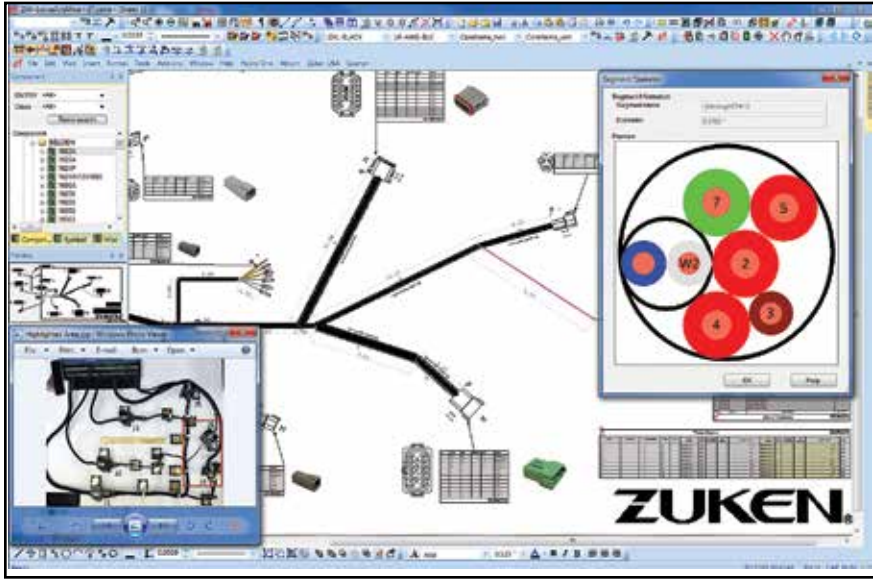
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as well as assigns the signals. It provides yet another opportunity to get an early cost estimation from the tool.

Harvell's Team recognized that once the information was gathered on a formboard, it should also be used to drive the processing equipment without the need to re-enter or re-configure the input information. They started by introducing direct output to labeling machines. Currently, all of the industry-standard machines, like Brady, Brother, Phoenix, Epson, and more, are included.

The export endeavor did not end there given the obvious requirement for output directly to wire cutting, marking and stripping machines. All of the major names in the industry are included in the output capability list, including Komax, Schleuniger and Artos. Drive files are generated inside Harness Builder for E3.series and are exported directly to the machines.

Harness Testing

The next obvious step was creating the ability to send the information directly to the harness test machines. Harvell mentioned they spent a lot of time talking with the companies providing test machines to the industry in order to get the right level of integration. Zuken recently added the Cirris Systems testing machines to the export portfolio of E3.series. The export not only sends test data about the selected harness, but it will also add mating connector information that would be used to plug the harness into the testing machine. This information is added to the bills of materials at the same time, as this is a

cost that sometimes is missed during the initial quotation stages.

Kevin Denning, CEO and President of Cirris Systems, was quoted as saying, "No other system I know of gives us the complete information interchange including the mating connectors for the connection to the testing equipment."

Kevin Ellsworth, Product Manager of Cirris Systems, also mentioned that "by linking Zuken's Harness Builder for E3.series with Cirris Systems' harness test products, we are both now able to deliver a more comprehensive solution to the harness manufacturing industry." At the recent Wire Processing Show in Milwaukee, Zuken also announced support to the Cami-Research testing equipment.

One other unique integration, present in the application was the Splice Barcode naming. This is another useful option allowing E3.series to select directly from an ultra-sonic library of splicing models. It should prove to be a real time saver for companies using ultra-sonic welders.

It was surprising and encouraging to see how an apparent manufacturing quoting tool could be used in all sections of the engineering and manufacturing process. From the initial quoting stage, right through to the final output on a formboard, 1:1 drawing can be printed directly from the application.

More information on this Windows-based application can be sourced from Zuken at www.zuken.com. Thanks to Paul Harvell and Amy Clements, Director of Marketing Communications at Zuken.

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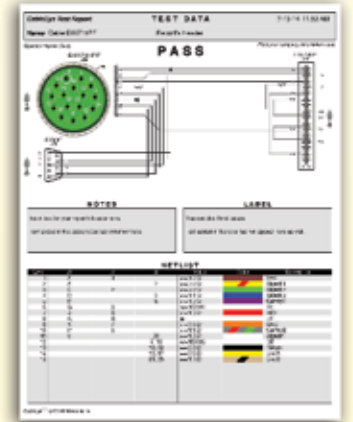
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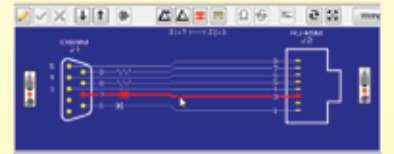
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2	2	2	100 Ω	+15 / -25	Red	Power	
3	3	3	100 Ω	+15 / -25	Green	Power	
4	4	4	100 Ω	+15 / -25	Yellow	Power	
5	5	5	100 Ω	+15 / -25	Black	Power	
6	6	6	100 Ω	+15 / -25	White	Power	
7	7	7	100 Ω	+15 / -25	Grey	Power	
8	8	8	100 Ω	+15 / -25	Brown	Power	
9	9	9	100 Ω	+15 / -25	Purple	Power	
10	10	10	100 Ω	+15 / -25	Pink	Power	

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Relay Control	Lock & Release Latches, Diverter Gates
Printing	Reports & Labels
Speech	Guided Assembly
GUI	Schematic, Netlist
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NEWS PLUGS continued


Allied Wire & Cable Donates \$14,000 to Make-A-Wish Foundation

Atlantic City, New Jersey—Allied donated \$10,000 to the Make-A-Wish® Philadelphia, Northern Delaware & Susquehanna Valley during a recent charity event. An additional \$4,000 was donated through raffle prizes and customer donations for a total of \$14,000. The company achieved their goal to support a child's wish.

Allied Wire & Cable raised and donated a total of \$14,000 to fulfill a child's

wish through the Make-A-Wish® Philadelphia, Northern Delaware & Susquehanna Valley during a recent charity event. The company donated \$10,000 at the event, but raised an additional \$4,000 through raffle prizes and other customer donations.

The event honored Tommy, a four-year-old boy with a cardiac condition, who was granted a wish when he was just three-years-old. After two years of hospital stays and open heart surgeries, Tommy's wish was fulfilled and he and his family went to Disney World. Tommy's father, Will, says, "If I had one wish, it would be to let everyone experience the joy and gratitude I was able to experience by being the father of a son who had his wish come true."

Two Philadelphia Eagles Cheerlead-



ers were also in attendance and presented Tommy with a gift on behalf of AWC. Allied is proud to continually give back to an organization like Make-A-Wish that not only brings hope to the child in need, but also to the families of these children.

Allied Wire & Cable is a family-owned and operated specialty manufacturer and distributor of wire and cable with more than 25 years of experience. Allied serves all major global markets including: government, military, aerospace, automotive, and telecommunications industries. AWC is dedicated to personalized service and assigns an individual sales rep to each and every customer.

AWC is headquartered in Collegeville, PA, with sales and stocking locations in AZ, FL, NH, NY, and WI. Allied is proud to serve customers worldwide and has offices located in Southeastern United States and Canada.

Please visit awc-wire.com

Two Hellermann-Tyton Execs Promoted to VP

HellermannTyton North America announces that Ron Kovac and David Tomashek have been promoted to vice president positions.

Ron Kovac started his career at HellermannTyton as a district sales manager in 1991. He most recently served as director of product marketing until being named VP of marketing in May

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Ron Kovac



David Tomashek

2017. His new role includes overseeing product and project management, marketing communications and e-business activities.

Dave Tomashek joined the company as director of quality assurance in 1998. In January of this year, he was promoted from director of logistics to VP of operations. His responsibilities include operations, logistics and supply chain management.

According to company President Terry Tuttle, "Both these men have fully utilized their strengths and hands-on work ethic to guide HellermannTyton's rapid growth."

HellermannTyton is a global leader in cable management and protection products, identification systems and network connectivity solutions. Its systems and solutions are specified by major manufacturers and contractors in the electrical, OEM, data communications, automotive, heavy equipment, renewable energy and related industries. The company's engineered solutions and innovative products are designed and constructed to meet the

strictest quality standards while delivering reliable implementation at the lowest cost. HellermannTyton operates in 37 countries, with North American headquarters in Milwaukee, Wisconsin. Visit www.hellermann.tyton.com

Molex Technology Makes Keypad Backlighting on Curved Surfaces a Reality

Molex has solved the challenge of backlighting capacitive keys on a curved surface for user-interface designers. Molex PEDOT Clear Conductive Sensors are flexible translucent conductive circuits printed on a polyester substrate that can be implemented on three-dimensional surfaces, allowing for more elaborate designs and greater design freedom. Translucent PEDOT sensors can be used in space-restricted applications where previous methods of backlighting (light guide film or side fire LEDs) are impractical.

"OEMs want to design contemporary backlit capacitive interfaces while

retaining the design freedom to bring their visions to life," said Greg Kuchuris, global product manager, Molex. "PEDOT sensors make the high-end look of backlit keys a possibility for designers in more applications than ever before."

Historically, designers have relied on indium tin oxide (ITO) which is considered too brittle and inflexible to be used on curved surfaces. PEDOT sensors having been shown to endure 50,000+ bend cycles, and offer a more cost effective solution. The ability to use standard pressure sensitive adhesive for mounting also contributes to a lower overall applied cost.

Capable of both touch-sensing and proximity-sensing actuation, PEDOT

Clear Conductive Sensors can meet a broad range of design needs and are intended for any OEM seeking to design capacitive user interfaces with backlit keys.

With the automotive human-machine interface (HMI) market projected to grow at a CAGR of 11.93% through 2021, according to a March 2017 Research and Markets report*, PEDOT sensors can be a key tool for automotive interior designers. Other potential applications include home appliance controls and connected-home thermostats.

For more information about PEDOT Clear Conductive Sensors, please visit www.molex.com/link/pedot.html.

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The Wiring Harness Manufacturer's Association® Re-vamps its Website

The Wiring Harness Manufacturer's Association® (WHMA) has launched a new website, www.whma.org, a site aimed at building membership value to all those already members and possible new members.

The new website combines a comprehensive listing of Member Rosters, Supplier Profiles, IPC/WHMA-A-620 Materials, Events and Annual Conference Information. The site will be of remarkable value to Members and Suppliers. "The main purpose of the new website is to bring more value to existing members and suppliers as well as grow and connect members

with OEMs". Said Rick Bromm, WHMA's Chairman.

The Wiring Harness Manufacturer's Association® (WHMA) was established in 1993 to serve and dedicate their resources to the global cable and wire harness industry. WHMA is the ONLY trade association exclusively representing the cable and wire harness manufacturing industry including manufacturers, their suppliers and customers. The WHMA is dedicated to providing our members the technical support, access to leading edge technology, benchmarking and the ability to network with the leaders in wire processing equipment, services and manufacturing.



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Suppliers Hold Open House in Philadelphia



Visitors enjoy refreshments while the rest enjoyed a guided tour.

Schleuniger, Gem Gravure, Cirris Systems, Panduit, and Telsonic held an Open House viewing of technologies and equipment in the Philadelphia on June 8th. The event was held at the Simeone Automotive Museum and geared towards harness manufacturers in eastern Pennsylvania, northern New Jersey and Metro New York areas. These types of events offer a relaxed pace where attendees can really dig deep into their specific challenges amidst a small but inclusive supplier group.

The group holds several events like this to draw folks who may not have had time to visit national shows.

The Simeone Automotive Museum was a great backdrop for the event. The museum is home to some of the highest pedigreed race and vintage autos in the country. Many cars date back to pre-WWI, with some fully restored, and others left original.

Check the events page on www.wiringharnessnews.com, and on the events pages for these companies for future events in your area.



1966 Ferrari Berlinetta. One of three, it is valued at \$25M.



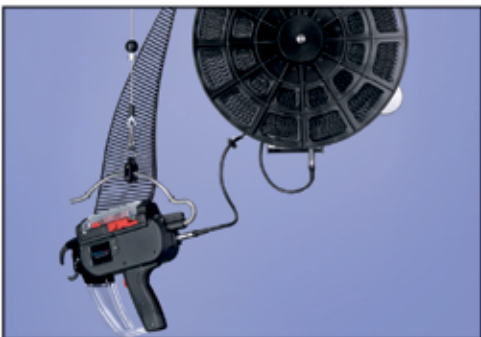
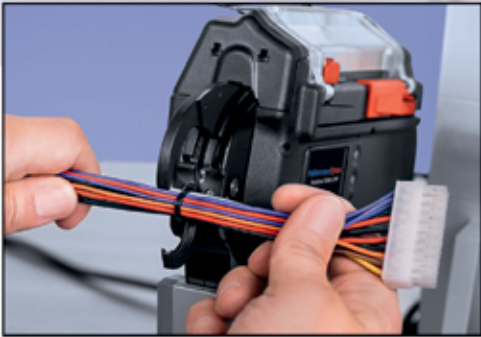
1966 Ford GT. Raced at LeMans that year.



Schleuniger machines set up against the backdrop of an antique gas pump.

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DIT-MCO History - From Drive-Ins to Analyzers

By Joe Tito
Wiring Harness News

If you've ever wondered what DIT-MCO stands for, you're not alone. The name is actually derived from its humble beginnings in 1948 when founder, George P Heller, seeing the need to supply equipment to the burgeoning drive-in theater market, formed the Drive-In Theater Manufacturing Company. In 1951, the name was changed to DIT-MCO as it began to branch into the production of custom transformers and coils for other electronic manufacturers. By 1952, the company catalog (Fig. 1) boasted not only the iconic speaker assemblies, but also lighted traffic control and building signage, EZ Change letter displays, a rotary power mower, and even playground equipment. All of DIT-MCO's products were sold exclusively through theater supply dealers.



Figure 1 - Portions of the original 1952 DIT-MCO Catalog.

The forward-thinking Heller saw a plateau in the construction boon of drive-in theaters in 1953, and began to pursue other avenues to expand his business. Seeking opportunities for his Transformer Division, he called on a nearby General Motors facility that was building aviation cables. It was then that he ran into GM engineer, Warren Hannon, who had been tasked by GM to solve problems associated with testing the complicated aviation cables.

Feeling certain he could design a machine that could simultaneously measure the continuity and shorts (leakage) in a bundle of insulated wires, Hannon approached Heller with the prospect that he would leave General Motors and come to work at Heller's company, Drive-In Theater Manufacturing, Inc. He offered to design and build a tester to automatically test aircraft cables for shorts and opens in a given engineering specification.

In 1952, Heller agreed, and Hannon came to work for DIT-MCO where he began his research and development of the company's new wiring analyzer. The original design became known as the Model 200 Universal Automatic Wiring Analyzer.

The original Model 200 tested 200 circuits at the rate of approximately 10 circuits per second. A matrix chart identified each circuit under test. A fault in an electrical circuit caused the machine to stop, and the faulty circuit was identified on the Matrix Chart. The resistance of the fault was displayed by a meter incorporated in the Model 200 (Fig 2).

In 1954, DIT-MCO sold the first Model 200 to Goodyear to test electronic assemblies for one of their military electronics divisions. Shortly afterwards, Hannon changed his engineering title and became the head of sales for the DIT-MCO. He began calling on other prospective customers of the Model 200 Analyzer.

Boeing Airplane Company in Wichita, Kansas, was building assemblies for the first U.S. jet bomber, the B-47. In 1954, Hannon called on the company and

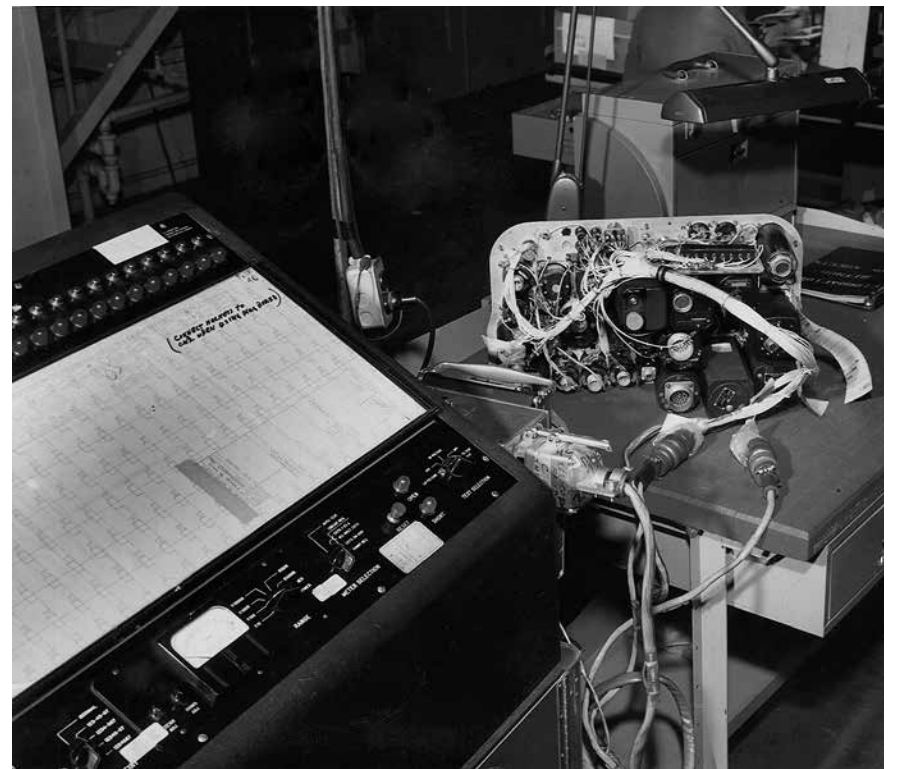


Figure 2 - Original Model 200 Analyzer Testing Panel.

convinced them to allow DIT-MCO to install the Model 200 in their plant for a demonstration to check the B-47 cables. The people at Boeing were so pleased and excited about the analyzer that they not only ordered one, but wrote a favorable report to the Boeing management, which later resulted in orders for the Model 200 at other Boeing locations.

Hannon approached the four Navy Overhaul and Repair (O & R) Facilities at North Island, Alameda, Norfolk and St. Petersburg and piqued their interest in the DIT-MCO Model 200 analyzers. All of the Navy O & R bases purchased the analyzers and together wrote reports and recommendations to their superiors about the speed and abilities of the DIT-MCO Model 200. The U.S. Government adopted the Model 200 specifications which became the specifications for verifying or checking bundles of insulated wires (Fig 3). It became common for the military and its suppliers to say, "This aircraft needs to be DIT-MCOed."

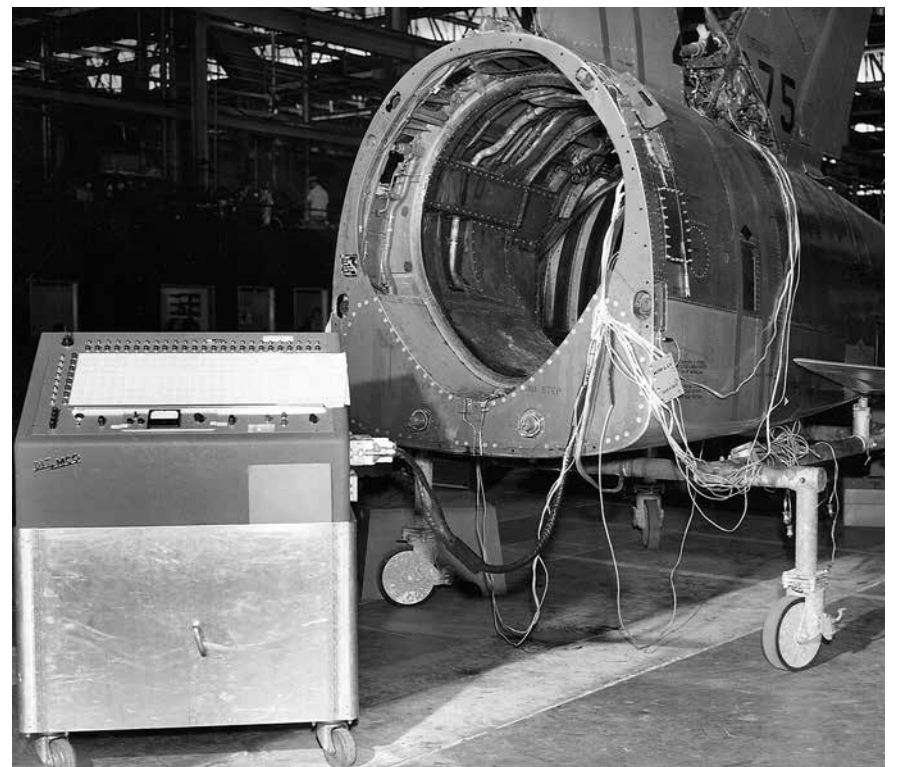


Figure 3 - Checking bundled wire in the tail section with Model 200.

The Model 200 proved to be such a boon to DIT-MCO that by 1959, the Drive-In Theater division was sold to its employees. Simultaneously, the company obtained an order from the Navy for an on-board wiring analyzer known as the DIT-MCO Model 144. It used rugged waterproof construction and 44 units were delivered by the early 1960's.

Hannon resigned from DIT-MCO in 1961 to pursue another one of his inventions related to the newspaper industry, but the company had already built a high level of engineering capability. They continued to create new products to meet ramping technology and the associated testing challenges.

Soon, engineering began on the first random access wiring analyzer. The first units used punch paper tape for control (Fig 4), and were used to test assemblies in support of the Boeing X-20 Dyna-Soar Spaceplane program, Project Mercury that put the first American in space, and the Apollo Saturn V Program that took the first humans to the moon.

In addition to space exploration, DIT-MCO analyzers tested cables in defense missile programs such as the early Hawk Missile, the first intercontinental Atlas Missile, the Polaris Missile for the Navy, and the Titan Missile for the Air Force.



Figure 4 - Model 610 using punch paper controls.

The use of computers on the front end in the 1970s, along with technological advances in switch design and fault detection, greatly increased the speed of the test systems. The integration of integrated circuits in the 1980's greatly reduced the size and complexity of the units.

Throughout the 1990's and 2000's quality improvement highlighted the need for test equipment across multiple industries. The high scrutiny once relegated to military and aerospace manufacturing now existed in the automotive, industrial, computer, telecommunication, and even appliance industries. Constant quality improvement initiatives across these industries has driven the need for enhanced testing solutions.

DIT-MCO has met these challenges with a wide range of modular designs including handheld units, field deployable units (Fig 5), benchtop testers (Fig 6), and the highly configurable model 2650 which can be cabinet mounted or distributed around an aircraft to minimize the length of test adapter



Figure 5 - HT128 and Model 2635 Field Deployable Units.



Figure 6 - Model 2115 Benchtop Tester.



Figure 7 - Model 2650 in full aircraft test configuration.

cables (Fig 7). Additionally, a high concentration on software development and interface cables has allowed the company to excel at customer specific customization.

“The people we have working for DIT-MCO are the greatest asset we have,” says John Kusek, President and CEO. “The future is bright for DIT-MCO. We are partnering with the top companies of the world. And we have over 60 years of experience to draw from. I am confident our greatest achievements have yet to be seen.”

Ten Miles of Wire on the Wing

Flying 2.75 inch rockets in crews of 104, this Northrop Scorpion F-89D can down the largest bomber with a single blast.

DIT-MCO Analyzers Track Down Wiring Errors, Speed Production of F-89D Scorpion Jets!

Complex Cable Systems Are Tested In Seconds at Northrop Plant

Like all modern aircraft, this Northrop Interceptor is actually a flying electrical system. It depends on thousands of complex electrical circuits for every operation . . . from canopy to electronic aiming and automatic triggering equipment. Small circuitry errors could cause disastrous malfunctions.

DIT-MCO Model 200 Automatic Electrical Circuit Analyzers are on the job daily at Northrop, helping to eliminate wiring errors . . . both on the wiring jig boards and after harness installation in the airplane.

The model 200 is capable of checking 200 circuits, for continuity or short resistance, in less than a minute. Making these same tests manually would require 35,800 separate operations.

What's more, the analyzer never makes a mistake, it is so simple to operate that it almost eliminates human error, and it can detect minute flaws which no other machine or human can find. All this speed and accuracy is contained in a package so mobile that some manufacturers check as many as 50 different harnesses, with one machine, in a single day.

It's wasteful to tie up experienced quality control and production line personnel with monotonous, time-consuming hand tests. DIT-MCO does the job better and faster and allows personnel to devote more of their time to actual corrective measures.

The same tester in use on an entirely different cable assembly. Some manufacturers use one DIT-MCO Circuit Analyzer to check as many as 50 different harnesses in a single day!

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Above photo is a DIT-MCO ad from the 1950's.

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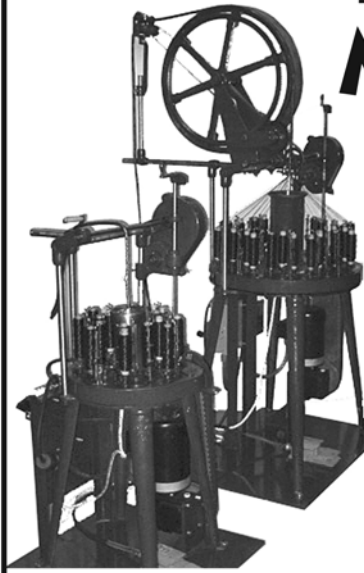
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