Lamcor Group
2014 WHMA Conference
Manufacturing IT – stuck in a rut?
Wire Wisdom - Welding Cable
Corporate Culture: Myth or Must?
Four Most Common Medical Cable Jackets



Lamcor Group

By Fred Noer

For Eryn and Jamie Shepherd, owners of Lamcor Group, the past is a constant presence in their business. And, the past always will help them guide the future of the company.

Such perspectives are due to the fact Eryn Shepherd, 42, whose maiden name is Melugin, is the third generation of her family to be involved in the wiring harness industry. She and her husband Jamie, 40, are carrying on the tradition through their firm in Fullerton, Calif., that manufactures harnesses, cable assemblies, cord sets and fuse holders.

The original Lamcor (without Group

2014 WHMA Conference

By Joe Tito Wiring Harness News

've been to many WHMA Annual Conferences throughout the years, and the seminars have always been informative and entertaining. But I noticed something different last year in Las Vegas, and especially this year at the conference in Orlando, Florida. The board has really hit its stride in selecting timely topics, and dynamite presenters, that make for an unparalleled experience for wire harness producers. I'm a short attention span guy. If you can keep me from drifting through five presentations that last anywhere from 45 minutes to two hours, you have really achieved something. And WHMA did. It's always worth mentioning the invaluable networking that goes on

in the name) was incorporated in October 1952 by Eryn's grandfather Bud Melugin after he worked for McMillan Electric Supply, Anaconda Wire & Cable and Electric Cord & Supply. Lamcor was located in Anaheim, Calif., part of the Los Angeles metropolitan area that includes Fullerton.

"What I like best about our company is that we are carrying on my grandfather's legacy," Eryn said. "I am most proud of the heritage we got from my grandfather."

Melugin, who served as president of Lamcor, operated the firm with the assistance of his wife Jessie, who was the vice president and office manager. Their sons Dennis (Eryn Shepherd's father) and Doug grew up in the business and

behind the scenes at WHMA events; but

you could have attended any one of

these seminars, and walked away with a

valuable idea that would have justified

WHMA membership, AND the trip to

You can't get the flavor and essence

of these presentations by just looking at

the slides, but you can still glean plenty

of of information from them. I con-

vinced WHMA to make them available.

I'll cover each briefly, along with addi-

tional resources offered by the presen-

Orlando. They were that good folks!



Dennis Melugin and his daughter Eryn Shepherd.

eventually took over ownership of Lamcor as equal partners, with Dennis as president and Doug as VP.

Bud Melugin died at age 85 in 1995. He is the Bud in the Bud and Gus Award presented annually by the Wiring Harness Manufacturers Association (WHMA) to someone who has given exemplary service to the organization. Gus refers to Gus Knaack, another industry pioneer who was the father of Fred Knaack. He and Dennis Melugin helped found WHMA and developed the award to honor their fathers and recognize outstanding contributors of service to the association.

Dennis and Doug Melugin operated Lamcor until late in the summer of 2005, when Doug, 68, died due to illness and Dennis, then 66, decided to retire. A decision was made to close the company and put the property up for sale. It was located in the prestigious Platinum Triangle that includes Angel Stadium, Honda Center and The Grove of Anaheim.

The Shepherds were working at Lamcor at the time. Eryn was full time in the purchasing department, having returned to the staff in 1999. Her previous stints were as a production worker and as an administrative assistant. A former mall restaurant manager, Jamie began full time in the Lamcor shipping department in 1996.

Unable to buy the original Lamcor due to legal restrictions, the Shepherds did purchase its inventory and equipment and opened Lamcor Group on Nov. 1, 2005. "We wanted to keep the family tradition alive," said Jamie, noting he and Eryn had the support of Dennis. "Lamcor had long-term employees, so why put all those good people out of work?

Continued on page 16

Four Most Common Medical Cable Jackets

ters. But you can see all of the presentations at: http://whma.org/2014Presentations/2014Presentations.html. I know it's a long link, but it's well worth the effort. If nothing else, I hope this will convince you to attend the WHMA annual conference next year in Las Vegas.

Continued on page 60

By David Galambos DG Interconnect

ot sure which cable jacket to use for your application? Here are the pros and cons of the four most common jackets for medical cables.

When selecting a cable for a cable assembly there are many options in jacket material. Jacket material can depend on where the cable will be used, how it will be used, sterilization methods, and expected life, among other factors. Cables that are being used in the medical field need to meet certain specifications and standards, especially if they are going to be used in a sterile environment. the Spaulding Classification explains sterilization classes, and ANSI/AAMIEC53:2013ECG trunk cables and patient lead wires (previews-AAMI_EC53_1311__pre) is a preview of the first few pages of the standard) discusses the minimum standards for cleaning and disinfection of ECG trunk cables and patient lead wires.

The four most common jackets for cables in the medical industry are TPE/TPR, Polyurethane, PVC, and Silicone.

Polyurethane

Polyurethane is a desirable cable jack-

_Continued on page 48

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Lamcor Group

Third generation of family continues involvement with wiring harness industry.

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2014 WHMA Conference

The 2014 WHMA Conference continues to select timely topics and dynamite presenters for wiring harness manufacturers.

Four Most Common Medical Cable Jackets

David Galambos of DG Interconnect presents the pros and cons of the four most common medical cables

Corporate Culture: Myth or Must?

Culture often spells the difference bertween exceptional performance and just getting by.



When it comes to our in-plant IT, it's time to step out of our comfort zone and experiment.



Read about the latest products on the market and points of interest about companies and people in the industry.

Wire Wisdom -Welding Cable

Welding cable is known for its flexibility and durability, and many automatic and manual welding applications require the cable to hold up to repeated movement over rough surfaces

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Corporage Culture: Myth or Must?

Loren M. Smith, CEO **Blue Valley Capital**

orporate culture" may " seem like B-school hype with few implications for smaller companies grinding it out making wire harnesses, but I believe culture often spells the difference between exceptional performance and just getting by--for companies of any size.

The culture and company service of airlines is one of many easy examples. Whenever possible, I choose a particular US airline because of my consistently hassle-free experiences booking its flights and getting on its planes. And whenever I have needed to change a flight or request any other kind of service, I have encountered thoroughly helpful and pleasant employees. Not so with other airlines. Too many burdensome interactions with them keep me running back to my preferred carrier.

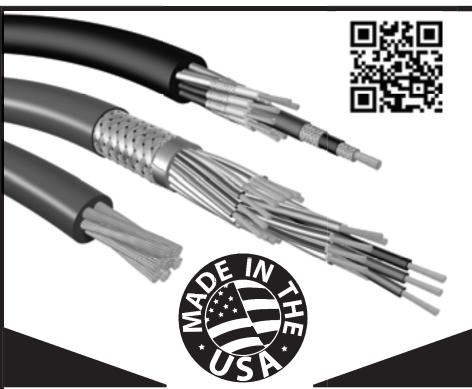
What's going on? Clearly, the founder of this airline established a priority on constructive corporate culture--beginning with the hiring process and reinforced through ongoing communications, training and recognition. This asset became a cornerstone of success.



Loren M. Smith, CEO **Blue Valley Capital**

When I reflect on 25 years in the wire harness business, it's clear that a key attribute enabling us to outperform our competition was our culture. When I acquired a small (under \$1 million) harness company in the late '70s and grew it to \$85 million, I had dozens of competitors trying to do the same thing. With the same material and labor costs, and access to the same processes and IT, how did we do it? Our culture of excellence and strong customer orientation gave us a distinct edge.

Continued on page 6



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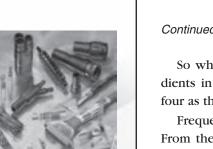


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Corporage Culture

Continued from page 5

So what were the outstanding ingredients in our culture? I would identify four as the foundation.

Frequent expression of appreciation. From the start, I conveyed gratitude to the good folks who worked in my company, and I stressed that managers and supervisors needed to do the same. This wasn't a calculated labor-employee relations strategy; it merely reflected my commitment to making sure the daily challenges of running a company didn't get in the way of consistently recognizing good work. Many studies have shown that employees value a feeling of appreciation over their paycheck in measuring job satisfaction.

Clear and honest communication. I regularly gathered all employees together to discuss a wide variety of work and non-work issues affecting our lives. Openness, even about missteps I had made, built trust--essential to a culture of excellence. Employees quickly learned they could ask anything, in private or in a public forum, and no topic was off base. Employees always got an answer, including some they didn't like. And if time was needed to develop a response, I just said so and always followed up within the time frame I had committed to.

Customer focus. Rather than content ourselves with attaining proficiency in our job descriptions (a lofty aim in itself), we all aspired to complement

expertise with customer orientation. Our attitude was that everyone in the company worked for the customer. I preached that our pay was determined by our customers, and that there were dozens of companies who'd love to get the work we were doing in our plants. If our prices were not competitive, if our quality was not first-rate, and, especially, if our customer service was not distinguished, volume would erode. This approach was consistently communicated, often with examples--including discussion of how we had lost business and how we would try to win it back.

Recruitment from within. We never drew a line between the plant and the office. I made it clear that anyone had the opportunity to apply for other positions, and if someone from the plant tried an office job and didn't like it or it didn't work out, there was no penalty for them to return to their former role. We recruited outside talent only when we had to.

Working with as many harness companies as I do, I generally can get a feel for culture pretty quickly, and I have found a close connection between culture and success. No matter a company's size, corporate culture is crucial, and building an atmosphere of trust, teamwork, appreciation and customer orientation starts at the top.

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



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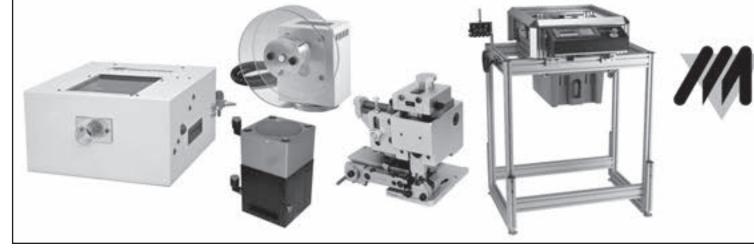
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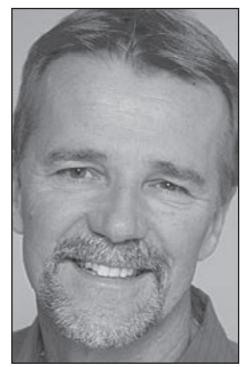
Manufacturing IT – stuck in a rut?

Paul Hogendoorn

In recent decades, it seems to me that the manufacturing industry has been a slow, and often at times, a reluctant adopter of information technology. CAD/ CAM and ERP systems have been a big part of the manufacturing world for quite a while now, but in the majority of plants I visit, this is about the extent of it. Meanwhile, there's a new revolution happening – "M2M" (machine-to-machine) and "the Internet of things" – that, so far anyways, seems to be ignoring the plant floor.

Technology is becoming a high value, low cost commodity. Small, low cost devices are available off the shelf that can do some extraordinary things. Take the technology in a typical cell phone for instance; high definition camera, GPS, enough memory to store a life time's worth of pictures and favourite music, plus inherent communications capability, enabling you to communicate to anywhere, at any time, and with almost anything. From your phone, you can open your garage door, turn up the heat in the cottage, check the whereabouts of your children on their way to school, and do your banking. I like to think of this as "horizontal" information technology. We, in manufacturing however, are still stuck in "vertical" information technology. Let me explain.

Our overall manufacturing industry at large is divided into columns, such as fabricating, machining and assembling, and each of these sectors has their own associations and their own tradeshows. They often operate in isolation from each other, creating their own methodologies, systems,



Paul Hogendoorn

acronyms, and even language. Within companies themselves, these same silos exist: stamping, welding, assembly; lead prep, harness assembly, test; cutting, machining, finishing. This is just at the shop floor level - it gets worse. We have shipping and receiving systems, inventory handling systems, production scheduling systems, and maintenance monitoring systems. We have engineering departments, production management departments, and trying to stitch these all together, we have IT departments. The data that moves through our plants tends to move up and down through these data silos, with the first point of convergence often being at the executive management level.

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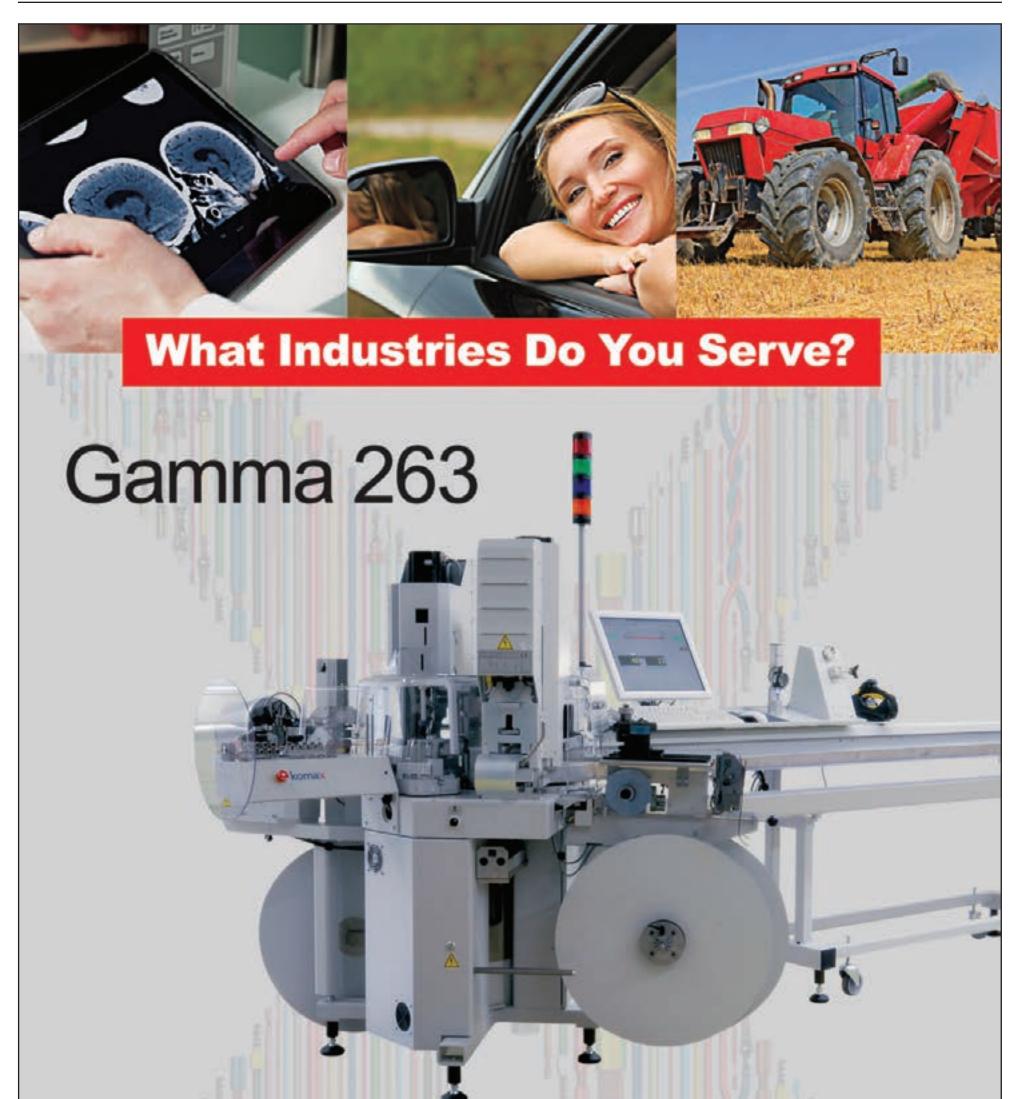
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Manufacturing IT – stuck in a rut?

There are solutions out there designed to do it all, but the two biggest challenges are integration and adoption. Manufacturing machines are typically 25 to 40 years old, and the cost of replacing or upgrading is prohibitive, especially in our current cap-ex sensitive world. Discrete and manual manufacturing processes are equally important to have a handle on, but they too are often too costly to integrate. Adoption would be a challenge all by itself, but it is amplified by the integration challenge; when machines or processes cannot be connected to the management system directly, they have to be connected by the operator entering the information manually. This often changes the operator's job, adding additional tasks - tasks that are thought of as 'administrative', and not real 'work'. Information collected this way is not empirical, and the operator is not

When a manufacturer builds a new plant, they build it to last for 25 to 50 years. There will be improvements to the plant over that time; upgrades, improvements, retrofits, new equipment, methods, training, and of course, continuous improvement efforts, but the basic structure of plant will stay the same, as will its' heavy machinery. The IT components (hardware and software) will likely be upgraded and replaced, but the basic data architecture will likely remain entrenched. Data will still be collected, moved and managed, in silos. Quality departments will have their SPC systems, productivity people will have their OEE systems, maintenance and tooling people will have their own, and finance, administration and production management will attempt to assess the company's day-to-day and month-to-month financial well-being by looking at the data from their own systems.

Every now and then, it's healthy to take a "clean white sheet" approach to reviewing and assessing the established and entrenched processes in our manufacturing companies. I think this is especially true when it comes to our IT systems, specifically because of the emergence of M2M technologies. Powerful and flexible devices, at very low costs, are changing the way we move data. (Currently, there are an estimated 2 billion M2M connections worldwide, and by 2022, this is expected to exceed 18 billion.)

This might sound a bit scary to manufacturers, but it doesn't have to be. My advice would be to start a small pilot or prototype "data project" somewhere in your plant, having it led by someone that knows that process, and your objectives for that process, very well, and then pairing them with someone that is excited about emerging IT. The best innovation doesn't come from a topdown driven initiative, big budgets, or even corporate culture. It comes from organic experiments, such as this. These are exciting times, with exciting possibilities. When it comes to our in-plant IT, it's time to step out of our comfort zone and experiment.

Paul Hogendoorn has worked with leading manufacturers for over 30 years. He recently launched FreePoint Technologies, developing and delivering effective tools for manufacturing companies. For more information on this topic, check out www.getfreepoint.com. He can be reached at paulh@getfreepoint.com

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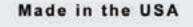


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2014 WHMA Conference

Continued from page 1

Presentation: To Offshore or Reshore: How to Objectively Decide

Speaker: Harry Mosher, President and Founder of Reshoring Initiative.

Big Takeaway: Approximately 80,000 U.S. manufacturing jobs have come home from China due to increasing Chinese wages, high oil prices, lower U.S. natural gas prices, and a host of other reasons. Harry made the point that if companies would look at TCO (Total Cost of Ownership) versus the more common PPV (Purchase Price Variance), 25% of offshore production would come home right now. TCO includes many overlooked transaction costs like overproduction, defects, over-processing (packaging), inventory (in-transit and safety stock), liability, and a host of others. He urged manufacturers to end the practice of awarding business on price tag alone, and urged minimizing the total cost to the company as the goal.

Resources: Check out their website at www.ReshoreNow.org or contact Harry at harry.moser@ReshoreNow.org. He is eagerly looking for case studies of companies who have successfully brought production back home, so if you have a success story, contact him now.

Presentation: "ObamaCare and it's Impact on Business"

Speaker: Jean Kelly. Jean is a Sales Executive in the Employee Benefits Department with Bouchard Insurance

Continued on page 14



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2014 WHMA Conference

Continued from page 12

and serves as Chair to the Tampa Bay Association of Health Underwriters.

Big Takeaway: I think I would rather have a dental procedure than endure a seminar on ObamaCare. But Jean managed to make this a dynamic presentation. The overwhelming conclusion was that companies are navigating towards a moving target with this poorly planned and executed legislation. She had to make major changes to her presentation the night before, based on some "changes" to the law the previous day. She made those changes in red, and it was an astounding illustration on how much the law can change on a dime. Jean has a lot of empathy for small businesses, and the presentation will still be relevant as this article appears, but stay tuned.

Resources: jeankelly@bouchardinsurance.com

Presentation: "Areas of Growth in the Wire/Cable/Harness Business"

Speaker: David Pheteplace, Vice President and Managing Director of the Cable Assembly Division for Bishop & Associates Inc.

Big Takeaway: David pointed to increasing strength where companies are able to niche down into segments, wether by location, product specialties, market sectors, business qualification, or other areas. He projected healthy five year growth patterns in telecom/datacom (8.9%), automotive (7.7%), consumer products (11.7%), and industrial sectors (6.4%).

Resources: www.bishopinc.com

This is going to hurt BAMACARE

Jean Kelley of Bouchard Insurance gave a presentation on "ObamaCare and it's Impact on Business".

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Presentation: "Big Thinking and Hoshin Lean Planning"

Speaker: Joseph Mac-Donald, Director for Strategic Leadership and Organizational Performance at Creative Resolution.

Big Takeaway: It's going to be tough to relate the level of charisma Joseph brought to the room. He gave a fun and informative roadmap for developing a culture of continuous innovation.We did some exercises that got us all thinking about creative ways to solve problems. Fast forward to the slides towards the end of his presentation that show the Strategic Planning Matrices. That's where the meat is.

Resources: www.180-Turnaround.com

Presentation: "Automotive Supply Chain 2014: A NAFTA Perspective"

Speaker: J. Scot Sharland, Executive Director of the Automotive Industry Action Group (AIAG)

Big Takeaway: AIAG's information and trend

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analysis into the automotive market, and what it means to our industry, is without parallel. Scot warned that because of recent supply disrupting events (think Fukushima) there will be increased pressure for subtier supply chain transparency. Auto makers will want to look way down into the BOM. He also spoke about how diminished tool and die capacity in the U.S. could cause problems as companies reshore and nearshore. Increased complexity of vehicles could also lead to further pressures on tool and die capacity. Scot also warned auto makers will seek to spread warranty risk (they call it "sharing") through the supply chain. That means you.

Resources: www.aiag.org

In addition to these speakers, Donnie Hill, WHMA Vice Chairman, gave an update on the A-620 Standard with an in-depth discussion on Revision B changes. Donnie talked about ways they use the A-620 Standard as a marketing tool at his company. It has opened many doors for them and initiated the types of conversations that lead to orders.

I did mention the incredible networking opportunities that go on at these WHMA events, but

it's worth mentioning again. WHMA has always provided an excellent interaction with exhibitors. That tradition carried on this year. There is always an open bar and themed dining stations set up throughout the exhibition room. It really slows the tempo down, and you are able to interact with the exhibitors in ways not possible at a traditional trade show. The depth of conversation seemed even stronger at this years show. And the food was incredible. WHMA asked me to thank the sponsors Cirrus and Schleuniger for the Wednesday evening reception. YRC Worldwide Freight hosted the Thursday breakfast exhibits and DMC (Daniels Manufacturing) covered the Thursday lunch exhibit.

Believe it or not, it was a little chilly for the Thurs-





Attendees of the WHMA Conference are able to interface with leading suppliers in the industry.

day poolside reception held by IEWC and Southwire. But it was great fun with more great food served by the Swan Hotel. Everyone I spoke with fully intends to be at the WHMA Annual Conference next year in Las Vegas. You should plan to be there too!



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Lamcor Group

Continued from page 1

"Customers were only given a twoweek notice about the closing, and we wanted to keep the current customers," Jamie said. "Fortunately, 85 percent of them came with us. Two of the big ones were not happy and dropped away. It took us a year to get them back by reestablishing their trust." Only a week elapsed between closing the old company and opening the new one.

Eryn serves as president and Jamie vice president, with both overseeing the entire company. She focuses on accounting and human resources, and his specialties are inside and outside sales, customer service, quoting and purchasing.

The couple abides by a philosophy of hard work and customer service, with the latter being "the single most important part of our business," Eryn said."People are sometimes shocked at the level of customer service we give."

The Shepherds learned to emphasize customer service while working other jobs. Ervn was employed 10 years at See's Candies in San Francisco, Home

Continued on page 18



Lamcor's fully automated MTX machine crimps wires and has a crimp force monitor to assure quality control.

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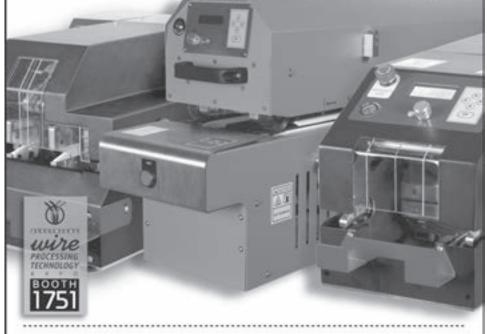
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Lamcor Group

Continued from page 16

Depot and smaller companies, and Jamie had the restaurant job.

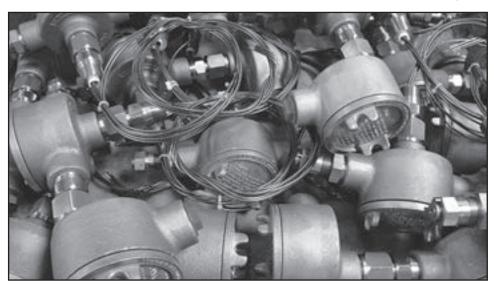
"Those jobs made a big impression on the work we do here today because we learned in retail that you bend over backward for customers," Jamie said. To which Eryn added: "No matter what you do, somewhere a customer is on the other end of it. You've got to make them happy."

For instance, they recalled a problem with an order received by a large customer. "We went there and fixed the problem in house the very next day, and they were shocked by that," Jamie said. "But, we want to fix something as soon as possible because that shows the customer how involved you are." Problems with products are rare, though, since quality is at 98 percent. It is monitored internally through 100-percent inspection of harnesses and assemblies visually, electrically and functionally based on specifications and even testing equipment provided by customers. Proper labeling, documentation and worker training further assure high quality.

The standard lead time is two weeks. "We've turned around stuff the same day," Eryn said. "Sometimes our customers have a line down or are in a pinch, so we stop and do whatever they need, even if it's a partial order."

Total staff at Lamcor Group consists of 17 people, 11 more than when the

_Continued on page 20



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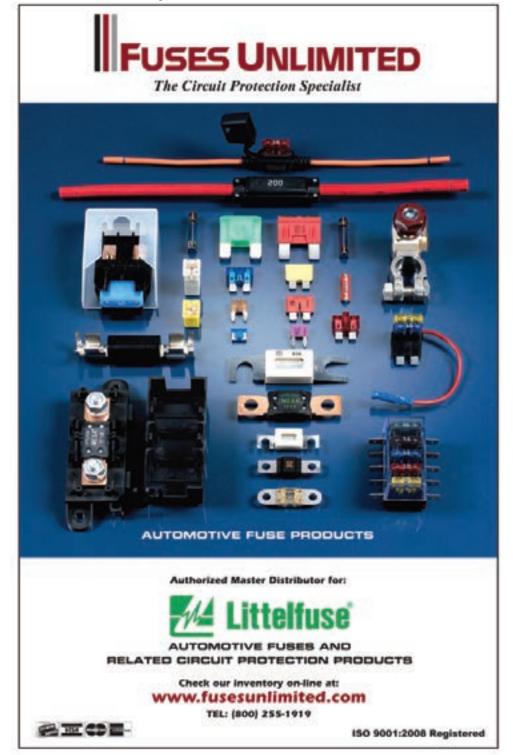
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Lamcor Group

Continued from page 18

Shepherds started their company nearly nine years ago. "We've never had anyone quit," Eryn said. "When we've had to lay people off because this is a seasonal business, they wait to get called back to work when we have more business."

Thirteen employees are in production. They are overseen by terminals lead Alicia Valdez and cutting lead Cesar Escamilla. He has been affiliated with both Lamcor companies since 2000. Office manager Patty Mendoza has been with the two firms since 1973 and warehouse manager Narci Pena since 1986.

Compensation includes health insur-

ance (for which the company pays 75 percent), end-of-year bonuses and monthly lunches. Regular discussions are held between the Shepherds and their staff members about meeting production goals and improving manufacturing processes.

"We are very fortunate to have good employees," Jamie said." The hardest part of this business is finding new people."

One employee is the Shepherds' son Justin, 21. He has worked full time the past two years in shipping, receiving and production. He worked periodically at the company while in high school.

Continued on page 22



Lamcor Group's terminal department currently has 12 automated press machines from Tyco, Molex, Hirose, JST, and Ark-les.



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Lamcor Group

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Harnesses represent 40 percent of Lamcor Group's business, with cable assemblies 30 percent and cord sets 20 percent. Fuse holders are five percent, and the same amount for assembly work.

The fuse holders are unique because they are custom, whereas those from other companies are standard. "Bud was a tinkerer, and he invented a molding machine just for fuse holder," Jamie said. "We get orders worldwide because we can make the holders in any color, with any wire and at any length." A holder can cost 34 cents to \$1.

Assembly work has aided in company diversification, according to Jamie. "The old Lamcor did not do assemblies or contract work," he said. "It has helped us out a lot. We might get reels of cord just to cut or put a piece of cord and a light together for the pool industry."

A harness may be as simple as a lead with two wires and two connectors costing 25 cents to one 20 feet long with 100 wires costing \$90. Cables range from a cut-and-strip for \$1 to one 800 feet long that has been stripped, tinned and terminated. Cord sets to American or international specs are \$2-30. Overmolding of the sets is outsourced.

The production runs are five to

10,000, with an average of 500-1,000. Each month 300 jobs are processed on equipment from Artos, Molex, Tyco, JST and Hirose. A new Artos CS-327 will be added around June 1.

Lamcor Group leases a 6,000-squarefoot building. Production is at 40-percent capacity. The Shepherds would like to move in two years to at least a 10,000square-foot facility.

Active customers number 60, with 20 new ones added in the last two years. The appliance industry accounts for 40 percent of the total. Products are used in food equipment, consumer and commercial dishwashers and commercial conventional and barbecue ovens. Lighting products for medical and dental equipment are 15 percent.

Another 15 percent is in the entertainment industry for large amplifiers and speakers in stadium sound systems such as at the Olympics. The 10 percent in transportation is for trains, golf carts and semis.

At five percent each are the commercial electrical equipment, spa, computer and industrial equipment markets. The latter may expand to 20 percent with a large order for water-pressure controls from a long-time customer that makes water meters. Products in these markets include stoves, food table warmers for

_Continued on page 24

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Lamcor Group

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fast-food restaurants, control panels, fuse holders and ribbon cables.

Customers have been with Lamcor Group since it started. Ten customers have been with both Lamcors more than 20 years. "It's hard to find customer loyalty anymore, but many of ours have stayed with us through the economic downturn," Jamie said.

In addition to being a long-time company in the industry and having two manufacturers reps, word of mouth has been the most effective for Lamcor Group to obtain new customers. Word is spread primarily by engineers, particularly those who move from one company to another, and by 10 suppliers.

Anixter and Bisco Industries, both in Anaheim, are the major suppliers of wire and cable and components, respectively. "They send us a lot of business," Eryn said. "We have good relationships with them.Their pricing is excellent, and they are eager to please us. They are the ones that my father did business with."

Having started with a strong first quarter, including their best January, the Shepherds predict \$1.5 million in sales this year, up 25 percent from \$1.2 million in 2013 and better than flat volumes the five previous years.

"I'm most proud of surviving the

recession and that we are growing again," Jamie said. "It's a major challenge staying competitive. I hate to pass price increases on to our customers. I don't want them to start shopping around. Anytime there is an issue about anything, I take it to heart and stress over it. It's an emotional thing for me."

Eryn regards company ownership as a challenge. "There's a lot of responsibility that can be a heavy weight," she said. "For example, the employees depend on us for their livelihood. But, I see the responsibility as incentive to work harder."

The Shepherds consider their involvement in the previous Lamcor invaluable in managing their company. "I would advise anyone in our industry to start from the ground up and work in every department," Jamie said. "Learning such things as production and inspection made it a lot easier for me when I became an owner."

Eryn concurred. "Setting up or taking apart a machine and getting your hands dirty gives you a greater understanding of the big picture," she said. "It really helps in the long run."

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Molex Incorporated expands its EXTreme Ten60Power™ High Current Connector line of products with the introduction of the EXTreme Ten60 Split Blade contact system, allowing the company to meet an even wider range of power and signal requirements for data communications, telecommunications, and power supply customers requiring high current density and low power loss. The split

blade power modules are part of a robust portfolio of modular, custom configurable, high current hybrid power and signal connectors that achieve up to 260.0A per linear inch in a low profile (10.00mm) housing design that enhances system airflow.

"As computing power demands increase there's more pressure on hardware and power supply manufacturers to custom tailor their power connectors, providing more amps in less space without drastically increasing the cost," said Jeff Torres, global product manager, Molex. "Solving this power equation with maximum design flexibility has been a major focus for the Molex product development teams. By continuing to grow the EXTreme Ten60Power family of connectors, we have solidified our leadership position in providing the largest breadth of modular solutions on the market today that deliver high current and signal density in the smallest overall package."

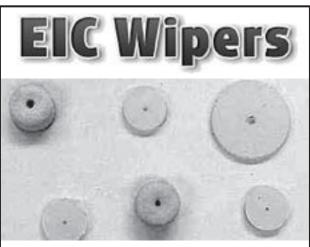
The new EXTreme

need the full 60.0A current rating of the standard Ten60 power contact for all domains. The modular design allows the split blade modules to be easily integrated into hybrid EXTreme Ten60Power assemblies along with standard power modules and high-density signal (HDS) modules to meet specific customer requirements."

Extreme Ten60Power connectors are available in one through nine circuit split blade power modules, one through 10 circuit standard power blade modules, and six through 60 circuit signal modules.All of the modules can be configured to accommodate virtually any design application with no tooling costs or additional leadtime. The high-current contact blades in DC (5.50mm) and AC (7.50mm) spacing options provide

even greater design flexibility. Power blades are available in right angle and vertical orientations to accommodate either coplanar or perpendicular applications. Both the plug and receptacle utilize reliable, proven Molex power and signal contact designs and feature last-mate/first-break (LMFB) or first-mate/last-break (FMLB) capability. The original 3-row signal module comes in 2.54 by 2.54mm pitch signal spacing while the high-density, 5-row signal module (HDS) is available in a 2.00 by 1.65mm pitch for use in space constrained areas.

For more information about the EXTreme Ten60Power connector family please visit www.molex. com/link/ten60.html.



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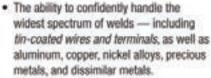
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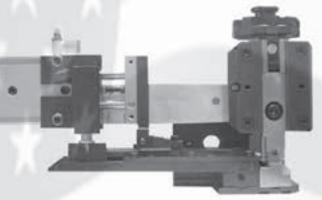




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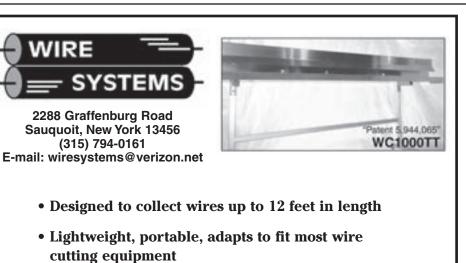
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CAP Automotive: RE'FLEKT Develops Augmented-Reality-Platform Together With International Automotive Supplier

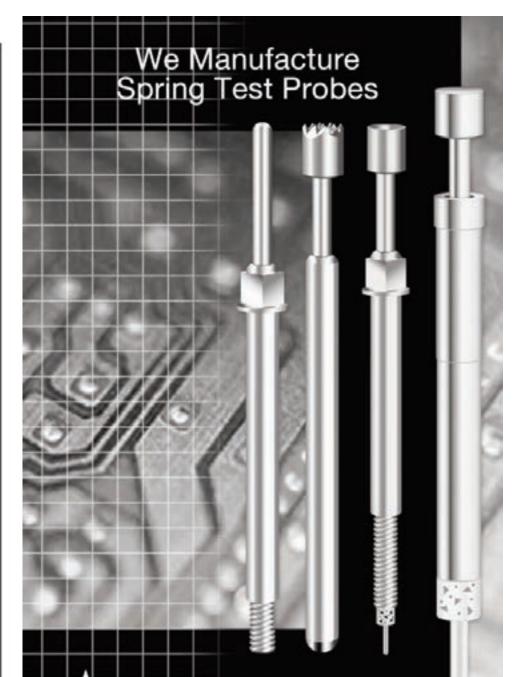


Development for CAP Automotive: RE'FLEKT Managing Director Kai Thomas and Jürgen Lumera, Director Global Product Management and Innovation at Bosch Automotive Service Solutions (from left to right).

RE'FLEKT GmbH and Bosch Automotive Service Solutions concluded a joint development of an IT-platform for Augmented Reality (AR) that leads the way to lean production of visual content. Real-time-access for data simplifies and accelerates industrial processes.

RE'FLEKT GmbH, one of the leading companies in the area of Augmented Reality, and the Bosch business unit Automotive Service Solutions, in the Automotive Aftermarket division, concluded an exclusive partnership for the development of an Augmented Reality platform in the field of technical documentation.

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Reality content, such as virtual annotations and enhancements, 3D objects, graphics and video. Using the platform, companies are able to import existing CAD data and receive completely prepared AR content. Additionally, 3D objects and visuals can be generated from conventional engineering drawings. The big advantage is the real-time access of visual content - the necessary information is easily available for viewing on demand.

Augmented Reality platform reduces costs through standardization

Augmented Reality provides the ability to show a technician virtual tools and parts superimposed into his real working environment.AR shows hidden parts like cables and sensors behind cover panels without spending time on assembly work. Reading written manuals as well as transferring the required information to the work place is not necessary anymore, since that information is already visually obtainable on the tablet. The standardized process does not require specialized technical knowledge and can be implemented in various industry fields, such as assembly, service, maintenance, training, and education

"The added values of the standardized production are high quality content and cost-saving procedures. Up to now, interactive Augmented Reality content had to be programmed individually in a highly time-consuming process with enormous costs. The investment for the platform will pay for itself within two years," says Jürgen Lumera, Director Global Product Management and Innovation at Bosch Automotive Service Solutions.

next step to the digital factory.We create a virtual content library with real-time access. Through AR, we visualize the required data and improve the workflow," explains RE'FLEKT Managing Director Kai Thomas.

To find out more about Augmented Reality: www.re-flekt.com

The Assembly Show 2014 Donald E. Stephens Convention Center

October 28-30, 2014 Rosemont, IL www.theassemblyshow.com

HEAT SHRINK APPLICATION TOOLING

Belt Heater for Heat-Shrinkable Tubing Products

Product Facts

- Closed-loop speed and temperature control
- Continuous controlled process
- Adaptable for different applications
- CE approved for worldwide use
- Heater operation and overtemperature alarm lights

RAYCHEM MODEL 16B TABLETOP BELT HEATER

Applications

The Model 16B is our smallest (tabletop) conveyor type processor which provides a controlled process for a wide variety of heat-shrinkable tubing products.

Double-sided timing belts on the top and bottom of the processing chamber draw the assemblies through a thermally controlled infrared heat zone and then through a fan-cooled cooling zone before depositing them into the unloading bin.

Controlled Heating Zone

The Model 16B processor has two stamped foil heating elements that are manufactured to a strict wattage specification. Consistent temperatures (ambient to 650° C) are controlled by a thermocouple embedded into the upper heating element connected to a closedloop temperature controller. An alarm light illuminates whenever the actual heating element temperature varies from the set point temperature.

Speed Control

The belt speed is selected using a 3-digit thumbwheel via a closed-loop motor controller and DC gear motor.

Minimal Skill Requirements

There are clearly marked guides for aligning the assembly as well as the tubing or device. The operator only has to center the assembly then the tubing and slide it into the belts. The belts carry the assembly through the heating and cooling zone, depositing them into the bin.

Labor costs are reduced significantly because once an operator loads an assembly, that operator can begin preparing another assembly. The throughput rate is usually limited by the rate at which the operator can load assemblies into the



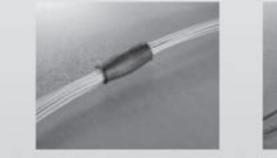
High-end-Technology for the digital factory

Using the latest 3D tracking technologies, smartphones and tablets detect the real objects to map an exact positioning of the visual Augmented Reality content. Therefore, RE'FLEKT and Bosch utilize all available Software Development Kits (SKD) offered by several suppliers in order to assure clients the best choice of tracking system as well technology independence.

"CAP Automotive is for industry companies the process.

Versatility

The processor is designed to process a broad range of heat-shrinkable products up to 19 mm [0.75"] in diameter and 90 mm [3.5"] in length. Heat output can be controlled to accommodate a wide variety of products and substrates.



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Mando Can Do.



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.

Mando exemplifies the Eubanks



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Nordson EFD Offers New Manual, Pneumatic, and Cordless Guns for Dispensing Two-Component Adhesive Materials

Nordson EFD, introduces a new line of manual, pneumatic, and cordless guns for dispensing two-component adhesives. The guns make dispensing even the thickest materials easier and less cumbersome. A 26:1 thrust ratio enables a lighter touch to dispense more material with each trigger pull. The dispensing guns are ergonomic, lightweight, and easy to load with a unique secured snap feature. They dispense two-component materials for applications such as injection into cracks,

concrete anchoring, fixturing, windshield installation/replacement, and bumper repair in markets such as construction, automotive aftermarket, and aerospace.

Nordson EFD has recently established a relationship with Albion to supply the guns, broadening Nordson EFD's product offering. The dispensing guns come in a wide variety of sizes, two-component ratio options, and loading capabilities.

"I am very excited to have Albion as our cartridge gun supplier," said Anthony Martucci, product line manager, Nordson EFD. "I have always admired the Albion business both as a customer of ours and as a knowledgeable source of information for the two-component market. These tools offer legendary quality and state-of-the-art engineering which will assure optimal performance of EFD cartridges, mixers, and other products for the end user.'

These new dispense guns have a longer tool easy, user-friendly maneuvering of the gun. A button just above the trigger lets the user toggle between forward and backward piston rod travel with a quick finger movement.

The cordless guns come with a reliable Milwaukee 18 volt lithium ion battery. The gun is lightweight and, like the pneumatic gun, it has a handle above the drive mechanism. The battery has a digital display that shows the charge level. These guns also feature a speed control dial on the drive mechanism, which assures that the adhesive is dispensed with the proper speed.

For more information, visit Nordson EFD at www.nordsonefd.com





www.eccco.com

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The Lowest Profile Nylon Tie on the Market.



life. In general, as tools get old, they can wear out and replacements must be ordered. Nordson EFD's manual line of dispense guns have an adjustment screw that enables the drive system to be tightened, extending the tool's life and eliminating wasted motion. In addition, double grip plates and a steel trigger protect the drive system if the gun is dropped.

The pneumatic guns, which are activated by air pressure, are rated up to 120 psi operating pressure. The handle on top of the air cylinder enables



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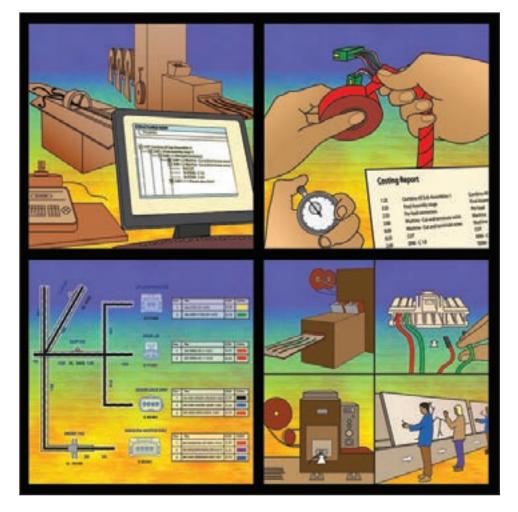
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LEONI Expands use of Mentor Graphics Capital Software Worldwide



Mathematical Control of Capital[®] software throughout the world. LEONI now has significant Capital software deployments in Europe, America and Pacific Rim. This growth is driven in part by increasing adoption of

the modular approach to wire harness configuration management, also known as customer-specific or zero give-away harnessing. This approach is strongly supported by the Mentor[®] Capital ModularXCTM tool, which in turn is tightly linked with other products in the Capital suite and with adjacent applications



Problem #1: Not sure of machine utilization numbers?

Reported claim:

80%

Suspected OEE:

30%

????



Getting the numbers right... Because you can't improve what you don't measure.



info@getfreepoint.com www.getfreepoint.com such as mechanical CAD applications.

"Capital is by far the most capable commercial off-the-shelf software addressing wire harness design, engineering and manufacturing. So it is the natural choice as LEONI's standard environment" said Carsten Wilhelm, Director of Engineering Systems for Manufacturing. "Mentor also has technical depth across multiple relevant domains, excellent geographic coverage, and strong presence at the world's leading automotive and off-road vehicle OEMs. In addition, Capital ModularXC is a really key tool. We are

now seeing the modular approach being taken up in America and Pacific Rim, whereas previously this method was more common in in Europe. Capital ModularXC helps position LEONI as a world-leading supplier of modular harnesses."

The modular approach addresses challenges caused by extreme configuration complexity within vehicle electrical systems, which in turn is caused by the rapid growth of electrical/electronic options and mechanical variants offered to vehicle buyers. Involving the management of harness "fragments" that correspond to vehicle functions, the modular approach can deliver substantial cost savings over the more traditional part number -oriented approach to harness configuration management. The Capital ModularXC tool fully supports both approaches, and also allows harness designs to be re-analyzed in terms of sub-assemblies selected for optimized manufacturing. Coupled with advanced functionality such as configurable diagram styling, the Capital ModularXC tool is therefore very versatile and hence is well suited to harness suppliers adopting common tools across their multiple OEMfacing business units. Nick Smith, product marketing director of the Integrated Electrical Systems Division at Mentor Graphics, noted "Modular harnessing is not the only dynamic driving LEONI's expanded use of Capital. LEONI also makes good use of other tools within the suite, for example to design formboards and perform detailed manufacturing cost analyses. Some of these processes are particularly sophisticated, so the value LEONI derives from the software is very strong."

The Capital suite spans an extended electrical systems "Define - Design - Build - Service" flow and is particularly targeted at transportation applications. The Capital tools are used by many of the world's leading wire harness suppliers, many of whom undertake design work for their OEM customers using

the Capital suite in addition to engineering and manufacturing the harnesses themselves.

For further information contact Mentor Graphics Corporate headquarters at 8005 S.W. Boeckman Rd, Wilsonville, OR 97070-7777.Visit: www.mentor.com

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Innovators in Wire Processing

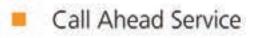
Schleuniger Service

Schleuniger provides you with the equipment you need to produce high precision wire and cable products, making computers, cars, medical equipment and even planes safer, more affordable and more reliable. We put all our effort into producing top quality machines. With our global service products, we will assist you in achieving precision results throughout the entire life cycle of your equipment.

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BURNDY Announces the Release of GP64528G1 Raised Floor Grounding Clamp

BURNDY, is a leading manufacturer and provider of connector solutions to the industrial, energy, construction, telecommunication, petrochemical, data center, and transportation industries. Extending the product line of raised floor grounding clamps for round and square pedestal applications, BURNDY has released a new connector, GP64528G1, that can be used to connect one or two cables of wire range #4 Sol. (25 mm2 sol.) to 4/0 Str. (95 mm2 sol.) cables. It can be used to ground 3/4" to 1" round pedestals or 3/4" to 7/8" square pedestals. The connector, made of bronze, is supplied with DURI-UMTM U-Bolts, nuts and lockwashers.

The GP64528G1 connector is UL467 and can be used to provide a low impedance ground path for raised floor data centers.

BURNDY, The Grounding Superstore™, offers a full line of grounding products in the 3 major methods of grounding: Exothermic, Compression and Mechanical.

Headquartered in Manchester, New Hampshire BURNDY has 90 years of dedicated customer support in both service and product.

Contact BURNDY at 47 E. Industrial Park Drive, Manchester, New Hampshire, 03109, call Customer Service at 1-800-346-4175, or visit our website at www.BURNDY.com.

Connector from Amphenol Withstands Harsh Environments

Amphenol Industrial Products Group, a global leader in interconnect systems, now offers a connector family with 1.5 mm socket contacts featuring Amphenol's RADSOK technology. Tru-Loc's rugged, compact, thermoplastic construction makes it ideal for use in harsh environments where high vibration and caustic fluids are present.

Continued on page 39



GP64528G1 Raised Floor Grounding Clamp

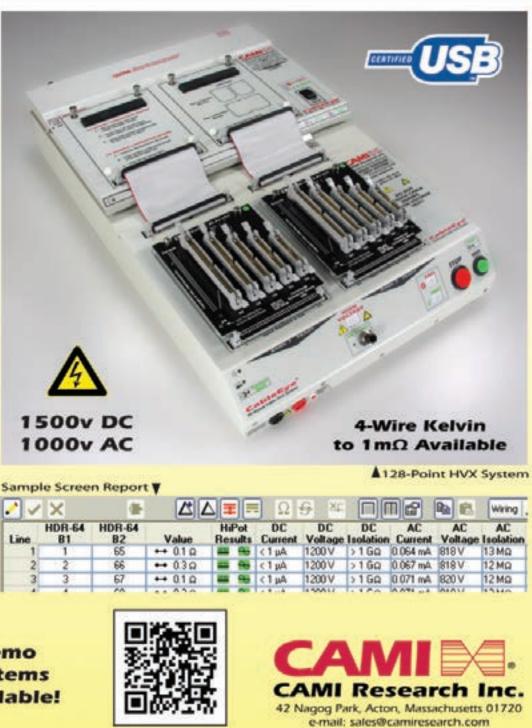
E PROCESSI EOUIPMENT VHITE GOODS AUTOMOT Semiautomatic and Fully automated and control Fully automated and control automatic machines for processing line for: processing line for: electric cables processing: IDC harnesses Airbag cutting, stripping, crimping Multicore harnesses Temperature sensors single-core, multicore, flat, Assembling wires and Module of harnesses twisted and coaxial cables components ABS Termo senso Battery cable Power cords Lighting cabling 11.

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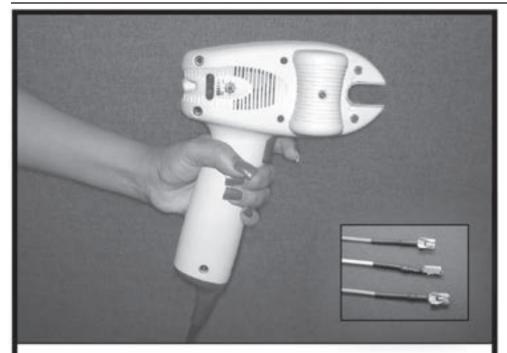
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*polyolefin, 5" length

The Focus-Lite^{**} FLG3^{**} by Judco Manufacturing, Inc., is the solution to all your heat-shrink operations. You can say goodbye to the high labor cost, excessive heat, and inefficiencies of other methods. The Focus-Lite^{**} reduces the time necessary to shrink most types of heat shrink tubing. It also improves the process control and overall quality of your shrink operation. The FLG3^{**} can be used for high volume benchtop applications and is completely portable and mobile for board mounted harnesses and tight space assemblies.

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

Here's why it works: Dual Quartz Halogen bulbs are focused to direct all of the usable radiant energy to the cable/wire diameter covered by shrink tube. This allows for 10 times the average energy expended by the bulbs to be delivered to

the target zone. What you will see is an amazing difference in shrink time!

The Focus-Lite[™] is equipped with an adjustable timer for repeatable shrinking, time after time. It also has a dimmer switch that controls the power for sensitive components. Visit our website at **www.judco.net** and see our full line of Focus-Lite[™] products.

Judeo Manufacturing, Inc 1429 W. 240th St., Harbor City, CA 90710 (310) 534-0959 www.judeo.net



New Composite Material Wire Terminating Applicator

ETCO Incorporated announced the launch of its new EDGE-C Series of composite applicators. The new line of applicators joins a product line already known for rugged quality and durability.

The EDGE-C series of applicators seeks to revolutionize the way wire processing is done by focusing on efficiency and other improvements over its metal-based cousins. In research and development for over two years, the composite applicator represents ETCO's commitment to driving innovation in the wire termination industry while providing top value to its customers.

The EDGE-C series represents a leap in applicator design and function. The patent pending design of the applicator is focused on a lightweight uni-body construction. It is made from the strongest composite materials available.

While it functions identically to heavier metal based applicators, the EDGE-C applicator costs nearly a fraction of the price of those types of applicators and can be manufactured quicker to reduce lead times for end customers.

The long term ownership cost of the EDGE-C composite applicator is significantly less than metal applicator housings.

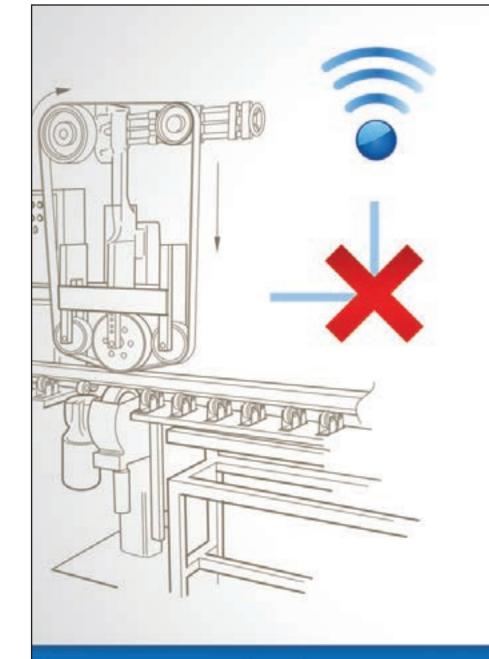
During ETCO applicator performance testing, the level of lubricity extended longer than with metal-based applicators. This was the case in repeated testing over a million cycles. The tolerances provided by the dimensions of the composite applicator allowed for a level of precision not seen with metal based applicators. These improvements in applicator technology amounts to what ETCO engineers believe will be a positive disruptive change in the applicator industry.

ETCO applicator R&D engineer Cris Gravel states, "The EDGE-C applicator is the pinnacle in efficient, cost-effective, quality applicator design." He continues, "Wire harness houses will appreciate the portability and the dramatically reduced rate of error in the functionality of the composite applicator."

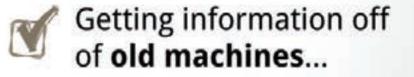
For more information visit http://edge.etco.com or contact an ETCO representative at 800-689-ETCO (3826).

Founded in 1947, ETCO is a privately owned company. The Company manufactures precision stampings and rubber and plastic molded products used principally by major automotive and appliance manufacturers. ETCO also has major customers in a variety of other industries in the USA and over 30 countries throughout the world.

For more information on ETCO, visit the Company website online at http://www.etco.com.



Problem #5: Trouble connecting your machines to your software?



Because you can't improve what you don't measure.



info@getfreepoint.com www.getfreepoint.com

Continued from page 37 _

Offered in a 2-way, 4-way or 6-way plug and receptacle in-line system, Tru-Loc is rated to 13 Amps continuous (with 16 gauge cable). It is designed to perform in demanding environments such as under valve covers on diesel engines to mate to fuel injectors. It can withstand vibrations up to 32 Grms, and the interfacial seal is molded out of a fluroelastomer material to withstand exposure to many chemicals.



Tru-Loc ideal for use in automotive, heavy equipment and rail applications

This cost-efficient Tru-Loc series has an operating temperature range of -40°C to +125°C, with higher temperatures rated to 150°C available upon request. Tru-Loc has an IP67 rating when mated. The connector's stamped and formed terminals are RoHS complaint and can crimp to wire gauges ranging from 0.8-1.3 mm².

Tru-Loc can be designed by Amphenol's engineering team to mate to a device, splitter, sensor, as well as become a pass through connector, or be tailored to customer specifications upon request. <u>Technical Specifications</u>

- Dielectric withstanding voltage 1,600 Vac RMS
- Withstand vibration to 32 Grms
- Operating temperature range of -40°C to +125°C
- Durability to 20 cycles
- Rated to 13 Amps continuous
- Pricing for the Tru-Loc starts at \$3.75 for the 2-way mated system.

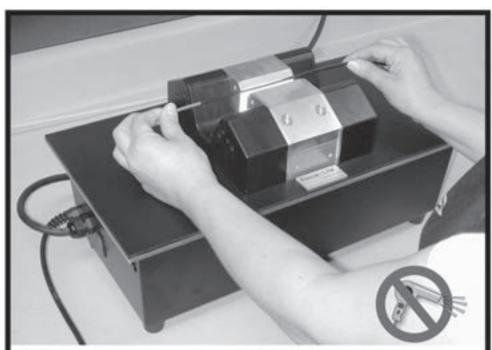
For more information, please visit http://www.amphenol-industrial.com or e-mail kcunningham@amphenol-aio.com

Udel[®] P-1703 NT is First PSU Foam for Wire and Cable

Solvay Specialty Polymers has launched Udel® P-1703 NT, a high-performance polysulfone (PSU) foam grade that provides low-halogen content and low-smoke performance for wire and cable applications. The new material passes the stringent NFPA 262 smoke and flame test for plenum (CMP) applications and is also the industry's first PSU foam for the wire and cable industry. Solvay made the announcement at the Wire 2014 exhibition April 7-11 in Düsseldorf.

"The industry is pushing for eco-friendly alternatives in wire and cable and Solvay has responded with a proprietary polymer solution that meets the low-halogen, lowsmoke requirements while providing exceptional performance in these demanding applications," said Michael Finelli, Senior Vice President-Head of Sulfone Polymers for Solvay Specialty Polymers.

__Continued on page 40



Save up to 80% of your labor cost on heat shrink operations

The Focus-Lite[™] by Judco Manufacturing, Inc., is the solution to all your heat-shrink operations. You can say goodbye to the high labor cost, excessive heat, and inefficiencies of other methods. The Focus-Lite[™] reduces the time necessary to shrink most types of heat shrink tubing. It also improves the process control and overall quality of your shrink operation. The The Focus-Lite[™] can be used for high volume bench top applications as well as low volume prototypes and laboratory applications.

Focus-Lite^{1*} technology uses radiant energy to shrink heat-shrink tubing in a fraction of the time of traditional methods.

Here's why it works: Dual Quartz Halogen bulbs are focused to direct all of the usable radiant energy to the cable/wire diameter covered by shrink tube. This allows for 10 times the average energy expended by the bulbs to be delivered to the target zone. What you will see is an amazing difference in shrink time!

The Focus-Lite[™] is equipped with an adjustable timer for repeatable shrinking, time after time. It also has a dimmer switch that controls the power for sensitive components. Visit our website at www.judco.net and see our full line of Focus-Lite[™] products.

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NEWS PLUGS continued

Continued from page 39 _

Udel® P-1703 NT PSU resin offers a significant cost advantage over competing resins such as fluorinated ethylene propylene (FEP) because of its lower specific gravity (1.24) and higher foam rate (50% to 60%). The material's high foam rate also imparts a low dielectric constant (1.8 to 2) to meet cable electrical requirements without the need for significant modifications to existing constructions.

Typically, Udel® P-1703 NT is chemically foamed using a FCB-8 foaming masterbatch, which is also supplied by Solvay Specialty Polymers. The material can also be foamed with physical foaming gases such as nitrogen. A ratio of 97%wt of P-1703 NT resin to 3%wt FCB-8 masterbatch is typically used to achieve 50% foaming. By controlling this ratio and other processing conditions, the foaming level can be dialed into the customary 20% to 70% closed-cell structure utilized in the industry.

Udel® P-1703 NT PSU with FCB-8 is currently being used for separators (tapes and cross-webs) in CMP Category 6 telecommunication cables. The technology can potentially be applied to other plenum applications including fiber optics (OFNP), jackets, and primary insulation in cables. Other potential plenum applications include plenum raceways and fire alarm cables.

Since the use of Udel® P-1703 NT is a contributing factor to cables passing the stringent NFPA 262 smoke and flame test, the material is expected to be suitable for use in telecommunication riser cables, which require compliance with the less-stringent UL 1666 flame test. Utilization of the Udel® PSU foaming technology in wire and cable is expected to lead to compliance with both FIPEC 1 (IEC 60332-3) and FIPEC 2 standards for the European telecommunications market, which is a leading user of low-halogen content/low-smoke materials.

Udel[®] P-1703 NT is also envisioned for use in wire and cable applications for transportation railway and shipboard, oil and gas platform, MIL SPEC, and other confined space uses. It is now commercially available in the U.S. and Europe.

Solvay is committed to the wire and cable industry with a broad-based material portfolio which also includes Hyflon® perfluoroalkoxy (PFA) and MFA perfluoropolymer, Halar[®] ethylene chlorotrifluoroethylene (ECTFE), Solef® polyvinylidene fluoride (PVDF), Cogegum® GFR cross-linkable HFFR compounds and AFR thermoplastic HFFR compounds, Polidiemme® XLPO, Radel® polyphenylsulfone (PPSU), KetaSpire® polyetheretherketone (PEEK), and AvaSpire® polyaryletherketone (PAEK). These materials deliver the performance and safety demanded by cable manufacturers, building owners, engineers, and equipment designers in a range of industries including telecommunications, oil and gas, automotive, aerospace





TR201 Series

sgcanusa.com

High Precision Crimping for Small and smart Wire Gauges 36-18 AWG Both twisting / tinning and crimping can be changeable with quick change (TR201SS). Lead-free and regular tinning can be handled with the tinning unit.

TR202 Series

High Precision Crimping For Medium and Large Wire Gauges 28-16 AWG

Stylish body with white and stainless steel color. Single end twisting/tinning and crimping can be changeable with quick change(TR202S). Lead-free tinning can be also processed.

ShinMaywa automatic wire terminating machine guarantees high quality not only in automotive industries but in household appliances. Halogen free wires can be processed by above all series.

ShinMaywa

ShinMaywa (America), Ltd.

10737 Gateway West. Suite 240 El Paso, Texas 79935, U.S.A TEL:+1-915-594-9862 FAX:+1-915-594-9866 E-mail: Info@shinmaywaamerica.com HP: http://www.shinmaywa.co.jp/english/index.htm and military, industrial, and consumer electronics.

Solvay Specialty Polymers manufactures over 1500 products across 35 brands of high-performance polymers – fluoropolymers, fluoroelastomers, fluorinated fluids, semi-aromatic polyamides, sulfone polymers, aromatic ultra polymers, high-barrier polymers and cross-linked high-performance compounds – for use in Aerospace, Alternative Energy, Automotive, Healthcare, Membranes, Oil and Gas, Packaging, Plumbing, Semiconductors, Wire and Cable, and other industries.

For further information visit www.solvay.com.

NEPTUNE Series of Connectors from Amphenol Now listed to UL 1682

Amphenol Industrial Global Operations, a global leader in interconnect systems, announces that its NEPTUNE connectors are now listed to UL1682. These

connectors, with ratings from 30 A to 400 A at 600 V, are offered in plugs, mount receptacles and inline receptacles.

Featuring Amphenol's Starline series contact system, which allows for more amperage and voltage through a smaller connector, the enhanced NEPTUNE line of connectors are half the size and weight of other connectors in its class and feature a reduced footprint option allowing for more flexibility during system design.

NEPTUNE is designed to perform in demanding environments including land and offshore oil exploration equipment, modular power generation equipment, portable diesel and turbine generator equipment, pumps, welders, compressors, cell base stations, shipping docks, ports power distribution and petrochemical applications.

NEPTUNE's contact inserts are reversible and interchangeable to accommodate each application's specific needs. Standard models are made from copper with silver plating, but are also available with optional gold plating. NEP-TUNE's aluminum hardware, which is precision machined from high-tensile strength bar stock and finished with a hard coating to 40 points on the Rockwell C scale, is both lightweight and rugged.



UL/TUV Approved Hercules II

rated IP-68-8 and have a dielectric strength of 1,800 V.

For more information, please visit http://www.amphenol-industrial.com

BURNDY[®] Announces the Release of GROUNDTAB

BURNDY a leading manufacturer and provider of connector solutions to the industrial, energy, construction, telecommunication, petrochemical, data center, and transportation industries. BURNDY is pleased to introduce the GROUNDTAB. The GROUNDTAB offers a convenient attachment point for terminations of ground wires to steel structures or steel supports. They are easily welded to steel with two options available, one with 1/2" stud holes, NEMA spaced and the other with 3/8" stud holes with 1" spacing. The tabs are made of 1/4" thick A36 steel and can be used to attach 1 or 2 hole terminals.

Common applications include large generators, mobile construction site modules, housing structures or any metal structure that requires a permanent or temporary ground.

Headquartered in Manchester, New Hampshire BURNDY has over 85 years of dedicated customer support in both service and product.



GROUNDTAB From BURNDY®

Contact BURNDY at 47 E. Industrial Park Drive, Manchester, New Hampshire, 03109, Phone 1-800-346-4175 Visit website www.BURNDY.com

TOUGH ON THE OUTSIDE. SMART ON THE INSIDE.

BMP® 21-PLUS LABEL PRINTER

The BMP21-PLUS portable label printer takes on the toughest labeling jobs in the field. Whether you're in a

server room, servicing a breaker box or organizing your workplace, you can count on the BMP21-PLUS labeler to get the job done. And it will get the job done quickly. With smart automatic formatting, all you need to do is drop a label cartridge in, type and print. Simple.

This printer also takes advantage of Brady's reliable material offering. Wire makers, cable flags, all-purpose vinyl, self-laminating labels, nylon cloth - you name it. Finding the right label to get the job done is easy.

- Automatic-label formatting for wire wraps, patch panels, terminal-blocks, cable flags and general banner labels
- Drop-lock-and-print materials
- Passed shock and vibration testing per MIL-STD-810G Method 5.16.6 S4.6.5
- Rechargeable Li-ION battery
- Tape widths 0.25" to 0.75"
- 70 total material parts
- · Label grabber holds label after cutting



Amphenol's NEPTUNE series of connectors provide safe interconnections to modular power equipment in all environments. These enhanced connectors are

- · 104 symbols for electric, smart home, safety and datacom
- 2-year warranty

Contact Heilind Electronics for your BMP®21-Plus Label printer - In Stock and ready to serve you.





866-887-2189 www.heilind.com/rpages/brady_bmp21_whn





Millions of Cable Designs Now Available on the Expanded Flat Cable Configurator!

icoil, a leading manufacturer of High Performance Flexx-Sil[™] Flat Cables and Assemblies, is pleased to announce its' Newly Expanded Online "Drag & Drop" Flat Cable Configurator. An entire section of the website is now dedicated to this New Web Application, which allows a user to easily design a custom cable in just minutes.

With a few simple clicks of a mouse, Configurator Cables, can be constructed of many elements (over 20 new additions), including power conductors, shielded signal pairs, video & coax wires, tubing for liquid and air, and design elements like Cicoil's patented Strip-Mount[™] fastening strip. To make the process even quicker, Cicoil has added Specialty Signal Modules (Cat 5e, Cat 6, Camera Link, FireWire, USB 2.0, USB 3.0) to the Configurator. Any of these elements can be combined in any position within the flat cable profile, which means that Millions of Flat Cable designs are available for immediate production and delivery.

As soon as the flat cable design is constructed, users receive a price quotation, custom part number and an engineering drawing delivered to their e-mail inbox within seconds. Once the cable is ordered,

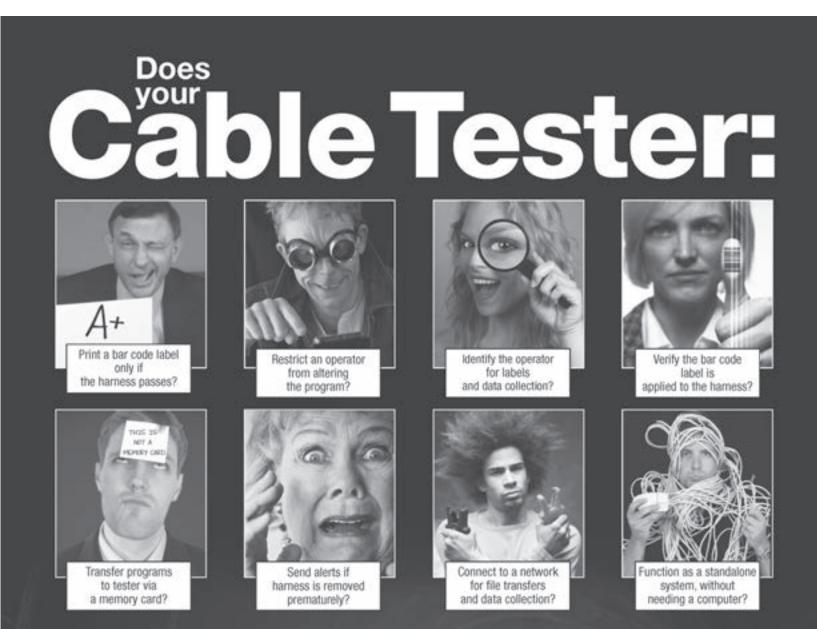
Cicoil guarantees a 1-2 week delivery on any cable designed using the Cable Configurator.

In addition to Configurator designs, Cicoil offers Standard Offthe-Shelf Motion Control, Video, Data, Power, Thermocouple and IDC Ribbon Cables and Assemblies. All cables are encapsulated with Cicoil's exclusive, crystal-clear Flexx-Sil[™] jacketing compound, which clearly shows the purity and cleanliness of the material, as well as the precise placement of each individual cable component.

All of Cicoil's Cable Configurator Cables are UL & CSA Recognized, CE Conforming, RoHS 2 & REACH

> Compliant, Class 1 Clean Room Rated and are cured continuously, with no debris or material contamination in an automated, climate controlled environment.

Cicoil has been a leader in designing and manufacturing high performance cable assemblies for over fifty years. The company's Patented Flexx-SilTM 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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Wiring Harness and Hipot Testers

Resistance: 1Ω-2MΩ Capacitance: 100pF-500µF High Voltage: 50-1500VDC Insulation Resistance: 5MQ- 1GQ Test Points: 64 to 32,768

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INDUSTRIAL INFO-TAINMENT

WIRE HARNESS ASSEMBLY STATIONS *Designed for the ergonomic assembly of wire harnesses*

Surfaces tilt and adjust up and down Holds boards from 24" x 24" up to 48" x 96". Two models to choose from — Electric or Manual adjust Adjustable front lip holds boards from .250" to .750".



NEWS PLUGS continued

New Utilities LED Panel Light

LEDtronics, Inc., adds a new Utilities LED Panel light to its PNL-1145 Series. These short thread body LED panel mount lamps only consume a half watt of power and replace incandescent high voltage panel indicators, such as GE ET5, ET6. They are designed to go in panels found in Transmission Station Control Panels, Control Rooms, Sub-Station control rooms of power plants and utilities.

These energy-efficient and longlived LED illuminators feature a fixed LED and removable transparent lens, a threaded metal shaft, and adjustable nuts and washers that enable the lamp to be front-mounted or rear-mounted in panels up to 1.10 inches thick with an Mtg Dia of 16mm (0.63"). Additionally, 13-inch, 22-gage wire leads are provided for screw or soldered connections.

The PNL-1145 series LED Panel Lights are designed with integrated series resistor to prevent short-circuiting; special fuses are unnecessary. They are also designed with a Bipolar Polarity circuitry to expedite



PNL-1145 series LED Panel Lights

integration into the electrical system. PNL-1145 LED lamps are available in 110~125 VAC or 120~140 VDC voltage ranges. LED light colors offered are 520nm Aqua Green (PNL-1145-013) and 637nm Super Red (PNL-1145-011). Utility monitors, industrial designers and maintenance departments will find these lights to be excellent solutions for maintenanceintensive and critical-process applications.

With an average life span of 100,000-plus hours (11 years), LEDs operate reliably year after year. Solidstate design renders LEDs impervious to electrical and mechanical shock, vibration, frequent on-and-off switching and environmental fluctuation. Integrated current-limited resistors prevent short-circuiting. LED lamps use only 10% - 20% of the energy consumed by equivalent

> incandescent lamps that, when combined with their maintenance-free operation, results in substantial cost savings.

> Prices for PNL-1145 Series LED Lamps are \$28.45 each, depending on quantity. Availability is stock to 4-6 weeks for special requirements.

> For additional information, contact LEDtronics toll free at 1-800-579-4875, telephone 310-534-1505, fax at 310-534-1424, email us at info@ledtronics.com or postal mail at LEDtronics, Inc., 23105 Kashiwa Court, Torrance, CA 90505; or visit our website at LEDtronics.com.

> For more information please contact LEDtronics, Inc, 23105 Kashiwa Ct, Torrance, CA 90505 - Phone (800) 579-4875/(310) 534-1505 or FAX: (310) 534-1424

Thermosleeve Offers CB-HFT 300 Thin-Wall Polyolefin Heat Shrink

CB-HFT(300) is a thinwall, flame-retardant polyolefin heat-shrinkable tubing that is typically used where rapid shrinking and



ONLINE PRICING, SPECIFICATIONS, AND REAL TIME INVENTORY CAN BE FOUND AT WWW.COMPAERO.COM

connector accessories.

CROSS REFERENCE TABLE

COMP P/N

S3175-2

600-052

S3175-2C

600-052-1

S3175-3C

600-057-1

S3175-3

600-057

M85049/128-1	
M85049/128-2	
M85049/128-3	
M85049/128-4	
M85049/128-5	
M85049/128-6	
M85049/128-7	
M85049/128-8	

BAND STYLE Standard, Welded, Flat Standard, Welded, Coiled Standard, Stamped, Flat Standard, Stamped, Coiled Mini, Welded, Flat Mini, Welded, Coiled Mini, Stamped, Flat Mini, Stamped, Coiled



Cancer of Canadiana Community, Name In: Watter Cancer Cancer (2019), Stationa (1981) Marcon Marcalana (2019)

> reduced space requirements are important. Features:

• Commonly used for insulating wire terminals and splices, mini switch etc.

• UL recognized at 125°C, 300V. All are F mark.125°C, 300V.

• Various colors available

Thermosleeve USA is the leading manufacturer of heat shrinkable products with over 20-plus years' experience in the industry. Since 1988 our factory has

Compaero, Inc. - 379 Timber Road - Mooresville, NC 28115 - USA www.compaero.com - sales@compaero.com - 877-COMPAERO (266-7237)

_Continued on page 46



microplastics.com

Continued from page 44 _

grown to produce 30% of all the world's heat shrink tubing products, and 40% of all PTFE Tubing-largely due to our use of state of the art technology. Thermosleeve USA manufactures and develops a very comprehensive range of heat shrinkable

tubing in various colors and shrink ratios. All products are manufactured under TS16949 Quality System and ISO 14001 Environment System certifications and are produced to meet or exceed UL224/MIL approval requirements. Thermosleeve USA products are widely used in the aerospace, automotive, communications, constructions, electrical, electronic, energy, military, oil and gas, and utility markets.

For further information, contact Thermosleeve USA, 12753 Moore St, Cerritos,







Accu-Drive:

A stepper motor terminal feeding system that is electronically programmable using a dockable and removable control module.

Accu-Drive processes metal strip, plastic strip and mylar tape terminals with ease.

> Accu-Drive fits in most presses, including the K and G from TE.

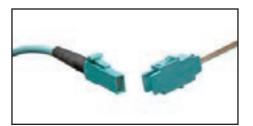


CA 90703. Phone 800-421-3536. Visit www.thermosleeve-usa.com.

Molex Technologies Support MXC™ Fiber Optic Interface

Molex Incorporated announced that its VersaBeam[™] expanded beam ferrule technology and single-mode silicon photonic active optical products will support the new MXC* fiber optic interface.

Molex joins a user community of diverse suppliers supporting the cuttingedge MXC interface targeted to meet projected demand in next-generation 'disaggregated' rack server and computing architectures. Supporting up to 64 optical fibers, the MXC plug and panel mount receptacle interface offers reduced component counts compared to industry standard MPO interfaces, as well as a 15 percent physical density improvement. Planned MXC products will include patch cords, MPO- and LC-to-MXC conversion cables, trunk cables and panel mount receptacles in single- and multi-mode fiber types.



Molex MXC Optical Interconnect

Molex high-speed silicon photonics optical products with MXC plug connectors will support transmission distances of up to 4km using single-mode fiber. Molex VersaBeam expanded beam MT ferrule technology provides users with ease of use by expanding the optical beam diameter and eliminating fiber-to-fiber contact within the connector. Additionally, VersaBeam ferrule technology greatly reduces fiber damage and cleaning requirements in the field, while improving dust and debris resistance compared to standard fiber interfaces.

For more information about the VersaBeam expanded beam ferrule technology and single-mode silicon photonic active optical products visit Molex at OFC 2014 or online at www.molex.com/link/ mxcoptical.html. Sign up to receive Molex e-nouncements at www.molex. com/link/register.

Providing more than connectors, Molex delivers complete interconnect solutions for a number of markets including: data communications, telecommunications, scientific, consumer electronics, industrial, automotive, commercial vehicle, aerospace and defense, medical, and lighting. Established in 1938, the company operates 45 manufacturing locations in 17 countries. The Molex website is www.molex.com. Follow us at www.twitter.com/molexconnectors, watch our videos at www.youtube.com/molexconnectors, connect with us at www.facebook.com/molexconnectors and read our blog at www.connector.com.

Cirris® Systems Provides "Plug in Anywhere" Test Setup with Smart-Lights™

Cirris Systems, a trailblazer in the cable and harness test equipment industry, makes test setup faster with their latest innovation: Smart-Lights. Smart-Lights are inexpensive devices that provide intelligence to fixtures and mating cables, enabling "plug in anywhere" functionality. Additionally, Smart-Lights utilize a bi-color LED, assisting users in guided assembly or identifying the location of errors.

By removing the process of mapping test points for each new test, as well as providing easy diagnostics, Smart-Lights make wire analysis faster and more efficient. This enables wire assembly shops to ship more products by spending less time on testing.

This year, Cirris celebrates its 30th anniversary as a leading manufacturer and supplier of cable and harness testers. Having a broad and diverse range of products, Cirris supplies their clients with highquality test equipment of all sizes and capabilities: from small benchtop analyzers to large rack-mounted systems.

information For more visit www.cirris.com.



Molex TM-3000 and Komax MCI-711.

Accu-Drive virtually eliminates false negatives when used with crimp force analysis.

Brilliant LED illuminates the crimping area.

Swappable tooling (called Crimp Packs) significantly reduces tooling costs.

Upper crimp

tooling

Crimp Pack



Terminal strip guide and lower tooling

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Now you can cost effectively mark terminal blocks, wire markers, push button plates, adhesive labels, and more in half the time.

- Print on both strip and tag style markers for terminal blocks, relays, etc.
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- All marking materials on continuous reel reduces reload for faster marking
- Mark up to 9,615 terminal blocks on a single reel

Watch us go from 0 to 100 in 10 seconds: www.smartprinter.us/video



Get a High Quality Connection

East Penn Manufacturing is recognized worldwide as a state-ofthe-art manufacturer of the finest wire and cable products. Our products meet rigid quality and performance standards, which include Underwriters Laboratories (UL), Canadian Standards Association (CSA), Society of Automotive Engineers (SAE), and are RoHS compliant.

East Penn's facility has been certified to ISO 9001:2008, ISO/TS 16949:2009, and ISO14001:2004 Management System Standards to assure custom a high quality connection with premium wire and cable products.

Primary Wire 80 C & 105 C SXL/GXL/SGX Cross-Linked Wire & Cable Starter Cable UL/CSA 1015 Machine Tool Wire Jacketed Auto-Plex Wire **UL Listed 1426 Tinned Boat Cable Bonded Parallel Wire** Trailer Lighting Cable Welding Cable **Dual Booster Cable**



Lyon Station, PA 19536 Order dept. Hotline: 610-682-4231 www.eastpenn-deka.com



- 2 -NEB 48-Carrier #2 Harness Braiders, 2BX Wire Carriers w/Cop Holders, 24" Capstan Wheels, Center Braid Tubes, Motors, Long Legs, Steel Base Plates
- NEB 32-Carrier #2 Harness Braider, Capstan Wheel, Spring Carriers, Center Braid Tube, Head Guard, Motor, Long Legs, Steel Base Plate
- 1 -NEB 32-Carrier #2 Harness Braider, 24" Capstan Wheel, 2BX Wire Carriers, Double Thick Track Plate, Center Braid Tube, Carrier Guard, Motor, Speed Control, Foot Pedal, Long Legs, Steel Base Plate
- 1 SCHLEUNIGER CC12 Crimp Center, Dual Crimp Station plus Crimp Force Monitor, Manuals, spare parts, full range of Adapters, new 2000
- 1 SCHLEUNIGER CS9100 Cut/Strip Machine with a PF2000 Prefeed SCHLEUNIGER CS9100 Cut/Strip Machine with a CA9170 Rotary
- Stripping attachment, 1995
- SCHLEUNIGER CS9050 Cut/Strip Machine 1 -
- 1 SCHLEUNIGER ES9300 EcoStrip Cut/Strip, 2007
- SCHLEUNIGER EC3200 EcoCut, #34-2007 1 -
- SCHLEUNIGER UC3750 Cutter, for wire, tubing, round and flat cables
- 1 SCHLEUNIGER US2100 Stripper
- SCHLEUNIGER US2015 Stripper, for wire sizes 32-14ga; strip length .04" .78" 1 -
- SCHLEUNIGER FO7045 Fiber Optic Cable Stripping Machine
- SCHLEUNIGER PF2200 Prefeed
- SCHLEUNIGER PF2000 Prefeeder
- SCHLEUNIGER PF1100 PreFeeder 1 -
- SCHLEUNIGER PF1000 PreFeeder (repairs required) 1 -
- 2 -SCHLEUNIGER CP1500 Heavy Duty Coilers
- SCHLEUNIGER Uni-A Applicator

Four Most Common Medical Cable Jackets

Continued from page 1

et because of its excellent mechanical properties, durability, and resistance against oils and chemicals. Due to the great mechanical properties it's a great choice for cables that are likely to be handled roughly. It also does not contain plasticizers so it is an environmentally friendly replacement to PVC without sourcing flexibility. A con for using this jacket is that it cannot handle high heat and certain cleaning agents for sterilization, which means this cable will usually be used in a non-sterile environment.

TPE/TPR - Thermoplastic Elastomer or Thermoplastic Rubber

Also, commonly known as Santoprene, a product of Exxon Mobil. This is a very common material with excellent chemical resistance and is easy to sterilize. This jacket can be sterilized by autoclave, ETO, Gamma, and other heat sterilization methods, and by chemicals. There are different formulations of Santoprene which can change the resistance to heat and other factors. Since this cable jacket can be easily sterilized a common place for these cable in the medical industry are in operating rooms, isolated area, and intensive care areas.

PVC-Polyvinyl Chloride

PVC medical cables are readily available, many of the major cable manufacturers and their distributors have thousands of feet on their shelves. PVC cable compounds can be formulated to meet many attributes in medical cables, such as specialized plasticizers, antioxidants, stabilizers, and lubricants. Some manufactures formulate PVC medical cables to withstand autoclave, chemical wipe, and other sterilization. Other pros of PVC cable are that it can easily be molded on to and is flexible. Some hospitals and manufacturers are however making efforts to reduce their PVC cable use, and PVC use in general.

Silicone

Silicone is considered the cable for medical assemblies. It's able to withstand extreme temperatures (high or low), chemical resistant, autoclave-able, light weight, and very flexible. It is also a great choice for high voltage cable assemblies. Unless a protective jacket is put over the silicone cable, it is prone to tearing and cutting, and tends to be more expensive than other cable jackets.

Still not sure what cable to use for your medical cable assembly? Contact one of DG Interconnect's sales engi-_Continued on page 50



- 2 SCHLEUNIGER CT32, CT42 Crimp Presses
- 1 SCHLEUNIGER HS4500 Hot Stamper
- 1 SCHLEUNIGER PT25 Pull Force Tester
- KOMAX Kappa 235 Cut & Strip Machine w/MECHTRIX MPF-33-LCS Prefeed, '08
 KOMAX Kappa 235 Cut & Strip Machines w/Prefeeds and Conveyors, Mexico
- 1 KOMAX Kappa 320 Cut & Strip Machine, 2009/10, absolutely Like New
- 1 KOMAX/WEIDENBACH Model IMS 291 InkJet Printer
- 1 EUBANKS 8000-01 Cut and Strip Machine w/Prefeed, Model 6880-05
- 1 EUBANKS 4000-04 Tandem Cut and Strip Machine, #890-151
- 1 EUBANKS Wire Processor, Model 9800-01
- 1 EUBANKS Wire Processor, Model 4900-01
- 2 EUBANKS Model 2600 Cut & Strip Machines
- 1 EUBANKS Model 02700 Cut & Strip Machine w/6215 Prefeed
- 1 EUBANKS Model 67200-02 Wire & Tube Marking Machine
- 1 ARTOS CS326 Cut/Strip Machine (2010) with a PF-6 Prefeed (2011)
- 1 ARTOS Model AM.STRIP.50 Pneumatic Cable Stripper, 2008
- PLUS: IDEAL Model STP Stripper, Part #45-930; RENNSTEIG Model CM-25-1 Pneumatic Crimper, 2006; CARPENTER Model 70B Strippers (3); MEGOMAT Model ASM3001-U Cut, Strip, Crimp Machine w/Crimp Force Monitor, 1996; METRONIC Alpha Jet C Inkjet Printer, 2006/07; MULTITECH 55T Injection Molding Machines, used 1 year; ARBURG 35T Injection Molding Machine, new



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WAGO Corporation's 222 Series LEVER-NUTS® lever-actuated splices reduce wiring time by up to 50 percent. A versatile, labor-saving alternative to twist-style splices, LEVER-NUTS® orange lever eliminates twisting, taping and crimping. Simply lift the lever, insert a stripped conductor and lower it. This also provides reusability, giving LEVER-NUTS® a unique, cost-effective edge over traditional splices.

UL Listed, touch-proof LEVER-NUTS® carry ratings up to 600V, 20 A max current capacity and 105°C insulating material temperature. CAGE CLAMP® spring pressure connection technology ensures maintenance-free, vibration-resistant connections.

Every model (2-, 3- and 5conductors) accommodates solid and stranded conductors AWG 12–28 (one conductor/port) in one unit.

Intuitive, tool-free operation have made LEVER-NUTS® a staple among electricians, OEMs and DIYers. Unique applications include:

• Controls — PLC wiring for everything from lighting to water purification systems.

• Vehicular — Interconnect lighting/communication devices aboard military vehicles.

• Machinery — Splice power leads for fans, pumps, motors, etc.

• Appliances — Internal wiring, e.g., commercial laundry, food service and HVAC.

Further Facts:

• 5,000 miles. If all LEVER-NUTS[®] sold were lined frontto-back, they'd stretch from Brookings, Ore. (Westernmost contiguous US city), to Eastport, Maine (Easternmost contiguous US city), and return to WAGO's Germantown, Wis.



WAGO 222 Series Lever-Nuts®

maintenance-free connections. For additional information, visit www.wago.us. Contact WAGO at 1-800-DIN-RAIL or info.us@wago.com.

Telsonic Offers Robust Solution for Splicing Large Cables in Automotive Harnesses

Automakers with hybrid or electric vehicles now demand splicing of larger cables and the capability to splice greater total cross sectional areas. Telsonic is pleased to announce the introduction of its TelsoSplice TS6 for wire splices with total cross sections ranging from 2.5 mm² to 100mm².

Utilizing Telsonic's state of the art technology in high power ultrasonics and most of the features of the well accepted TS3 for splices up to 45mm²; TS6 is now the ideal solution for processing larger splices in the harness.

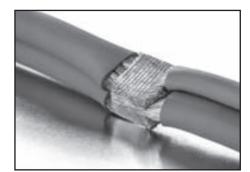
TelsoSplice TS6 offers an economical solution with unique advantages for today's challenging applications.

Some of the features include:

• Wide range of splices with the same tooling

• Suitable for copper and aluminum wires

- Built-in QC monitoring
- Intuitive software on touch screen
- User friendly and easy to operate
- Auto referencing
- Quick tooling changeover
- Reliable and safe process



95 mm² Splice

Continued on page 51

TE Connectivity Tooling Solutions for Aerospace, Defense & Marine

1.2 Premium CERTI-CRIMP & CERTI-CRIMP II Hand Tools

- Designed to exacting specifications
- Ratchet control provides complete crimping cycles
- · For most military, UL & CSA applications
- Manufactured using high quality materials
- Requires minimum skill
- Repairable
- Calibrated; recallibration recommended every 6 months or 5,000 cycles
- Produced under a quality management system

Other features include insulation crimp adjustment on most tools for different insulation thicknesses, a locator for properly positioning and supporting the terminal or contact in the tool, a wire stop, and color coding and/or wire size information on the head of the tool or on the handles.

All CERTI-CRIMP hand tools feature the reliable ratchet control. The ratchet will not release until the handles are fully closed and the dies bottomed. This helps eliminate partial crimps.

CERTI-CRIMP hand tools are well suited for low production runs, prototype work, and repairs - almost any application requiring consistent, highly-reliable terminations.

Produce Consistent High Quality Terminations

HQ.

• 480 A and 5 G. LEVER-NUTS® withstands 480 A Short-Circuit Currents (for one second), and vibration from 5Hz–2,000Hz, 5G.

• 5–2,500 pieces. LEVER-NUTS® packs for all projects from clamshells (select DIY stores), to JUGO-NUTS jars and bulk cartons (electrical distributors and OEMs).

WAGO is the leader in spring pressure connection technology that eliminates loose wires resulting from vibration and temperature cycling, while providing highly reliable, corrosion-resistant and

certified to ISO 9001

Premium CERTI-CRIMP and CERTI-CRIMP II hand tools are top-of-the-line, hand-operated tools for crimping a broad array of terminals, contacts and special wiring devices available from TE.

They are designed to exacting specifications to produce consistent, high-quality terminations. A potential service life of over 50,000 cycles is possible, depending on operator care. CERTI-CRIMP hand tools are designed to meet all feature requirements listed on applicable TE Application Specifications.

(Check appropriate product catalogs for qualification to military specifications, UL recognition and CSA certification.)

Contact us today! Call 866.887.2189 or visit www.heilind.com/rpages/te_tsadm_whn





CERTI-CRIMP, TE Connectivity, TE connectivity (logo) and TE (logo) are trademarks



Improve efficiency and profitability with a market-leading COBRA machine.

All our products use modern design and materials, and have an innovative control system. With speeds of up to 600 picks per minute, the ability to accept larger yarn and wire packages and the "jog forward and back" COBRA ensures higher productivity, reduced reworking and lower downtime.

For further details contact us on: office@cobrabraids.com

COBRA

BRAIDING MACHINERY

www.cobrabraids.com

Four Most Common Medical Cable Jackets

Continued from page 48

neers today for assistance of designing your next product. DGI is a designer, developer, and manufacturer (view all of our capabilities) of interconnect systems and cable assemblies for medical, scientific, and instrumentation applications. View all of our products here.

DGI is a designer, developer, and manufacturer of innovative, unique, and high quality cable assemblies. DGI has clients in the medical, scientific, and instrumentation markets. DGI is a spin off of Caton Connector Corp., focusing on high end high voltage and corona free cable assemblies for the military, semi -conductor, utility, and avionic markets. DGI was formed to address the medical, scientific, and other instrumentation markets that Caton was missing.

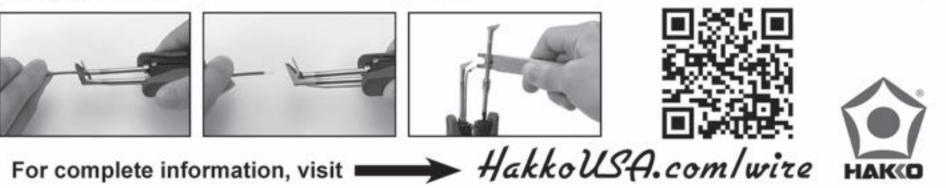
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Continued from page 49

Telsonic AG was founded in 1966 and has subsidiaries in Germany, England, South-East Europe, China and the USA, is part of a joint venture in India.

Ultrasonic technology is used for welding, cut-and-seal, cleaning, screening as well as chemical processes and packaging. Having introduced the Torsional Welding Power Wheel®, Telsonic has again achieved leadership in technology. The technology has spawned new solutions in many automotive engineering applications and has paved the way for numerous potential savings.

For further information contact TELSONIC Solutions, Inc., 10 Ossipee Road, Newton Upper Falls, MA 02464.

Phone (617) 244-0400. Email smogadam@telsonicmetal.com or visit www.telsonic.com.

Pasternack Releases New Line of 0.195" Diameter Low Loss Test Cables

Pasternack Enterprises, Inc., an industry leading manufacturer and global supplier of RF, microwave and millimeter wave products, introduces a new line of flexible 18 GHz low loss test cables. These new assemblies are terminated with durable stainless steel connectors and are well suited for test environments where a rugged, phase stable cable assembly is required.

Pasternack Enterprises' new low loss test cables utilize a 0.195 inch diameter coax with an expanded dielectric which results in 83% Velocity of Propagation (VoP) performance up to 18 GHz. These coaxial cable assemblies from Pasternack are made with PE-P142LL coax, which operates at higher power with improved phase stability. The double shielded flexible coax provides excellent effectiveness shielding greater than 95 dB and VSWR of less than 1.35:1. A heavy duty boot and FEP jacket improve strain relief and allow for a minimum bend radius of 1 inch which adds to the durability of these cable assemblies. Pasternack's new line of PE-P142LL test cables can be ordered with malestraight and right angle versions of Type N, SMA, and TNC connectors as well as female bulkhead versions for each connector series.



Low Loss Test Cables from Pasternack Enterprises, Inc.

The new LL test cables from Pasternack can be ordered in custom lengths and are also available in standard lengths from 12 to 60 inches. Metric lengths can be ordered in 50, 100, 150 and 200 centimeter (cm) lengths. Each assembly is 100% continuity, Hi-Pot and RF tested prior to shipment.

"The smaller 0.195" diameter of these test cables have a tighter bend radius while offering low loss and higher power when compared to solid dielectric cables," explains Steve Ellis, Interconnect Product Manager at Pasternack. "These cables offer our customers a high performance solution when choosing a low loss cable assembly."

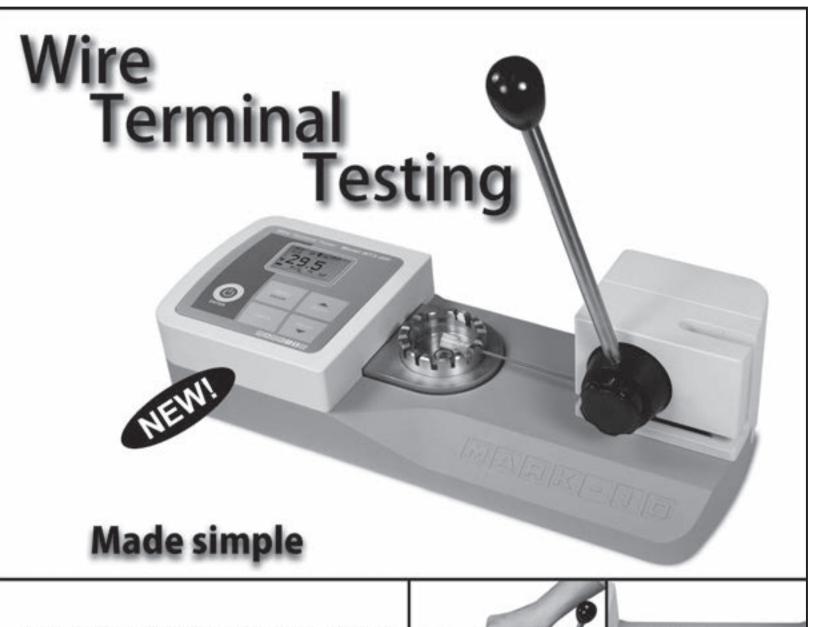
Contact Pasternack Enterprises, Inc., 17802 Fitch, Irvine, CA 92614. Phon (949) 261-1920. or visit http://www.pasternack.com/pages/Featured_Products/lowloss-expanded-diel ectric-pe-p142II-flexible-test-cables.htm.

New Underwater Connector from Amphenol Ideal for Deep Submersion Applications

Amphenol Industrial Global Operations, a global leader in interconnect systems, now offers a line of high performance, rugged and reliable underwater electrical connectors for deep submersion applications. The Submariner series of subsurface wet- and dry-mate connectors can be used in depths up to 6,000 meters (underwater pressure of up to 600 bar).

The connector is ideal for use by the military and government, diving equipment manufacturers, remotely operated vehicle (ROV) and autonomous underwater vehicle (AUV) manufacturers as well as deep submergence science and research projects.

Continued on page 53



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



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Cablescan's Series 90 TestRite programs run under the most popular Windows operating systems, and can import wire lists, net lists, and CAD data. TestRite's browser window allows you to provide setup and work instructions using HTML, image, and audio files. With a simple click, everything is displayed, stored, and can be printed in seconds. High voltage and high current models are also available. Put simply, you reduce test and assembly cost dramatically. Visit our website or call us at (909) 483-2436 for more details. Cablescan, Inc., 3022 Inland Empire Blvd., Ontario, CA 91764







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Continued from page 51 _



Submariner series of subsurface wet- and dry-mate connec-

torshe Submariner series is a full line of deep submersion connectors that include dry-mate connectors that are fully compatible with similar products in the industry. For example, these new connectors can

be interchanged with existing connections in an ROV, without having to replace all of the vehicle's connections.

Designed to meet the rapid growth and rising demand in the global ROV market, the new Submariner series uses Amphenol's molding and adhesion expertise to offer an optional molded-to-cable feature. This feature ensures that the seal between the cable and connector remains intact under water. All polymer-tometal bonding surfaces are sandblasted, carefully cleaned, primed and molded. The rugged metal shells and recessed pins assure reliable performance in the most demanding environments

Available in three different shell sizes and a variety of configurations, Amphenol's Submariner series features wire gauges from 10 AWG to 20 AWG, a maximum operating voltage of 600 V and operating temperatures ranging from -5°C to 65°C.

For longer life and prolonged mating cycles, each connector is designed with gold-plated contacts per MIL-G 45204 at 30 microns. Cable assemblies and pigtails are available.

applications, they may also be used as bushings, bearings, rollers, gliders and bumpers.

Micro Plastics' nylon round spacers are resistant to vibration, abrasion and corrosion. They are electrically insulating and have a high strengthto-weight ratio.

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Micro Plastics' manufactures millions upon millions of fasteners daily. They offer over 20,000 items and maintain an inventory of over 250 million parts.

See their full line catalog #39 for a complete list of nylon fasteners that are available. FREE samples are available upon request. Contents include:



Special Standard Round Spacers

standard and metric machine screws, cap screws, nuts, washers, spacers, insulators, grommets, bushings, rivets, hole plugs, clamps, printed circuit board accessories, suspended ceiling hooks, wire routing kits and many other hardware items.

For a copy of their new full line catalog #39 contact Micro Plastics', PO Box 149, Flippin, Arkansas 72634. Visit www.microplastics.com.

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For more information, visit http://www.amphenolindustrial.com.

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Micro Plastics' announces a new product line of "Special Standard Round Spacers". The new line of molded nylon round spacers include over 250 sizes, with diameters of 1/8" through 1 1/2" and lengths from 1/8" to 2^{3} . These tough resilient spacers can be used in a variety of assemblies. Useful in electronic and electrical

Many Thermosleeve USA products are produced to meet or exceed UL/224/MIL approval requirements.

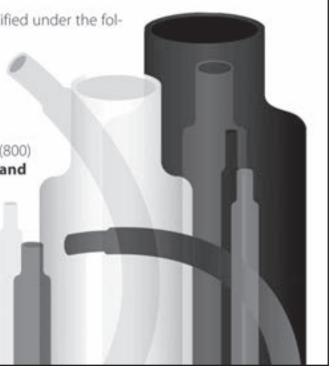
Thermosleeve USA products are also RoHS compliant and certified under the following agencies: UL, TUV, VDE, C-UL, F-Mark and our partners are registered "Green Partners" with Sony and Samsung. If you're manufacturing wire harnesses, rest assured Thermosleeve USA most likely offers a tubing to meet your requirements.

To view our complete line of products, visit us at www.thermosleeve-usa.com or to request a quote, contact us by calling (800) 421-3536 or via email at sales@thermosleeve-usa.com and expand your options.



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WELDING CABLE

WHAT IS WELDING CABLE?

The 2014 National Electric Code[®] (NEC) Article 630 Electric Welders defines welding cable as cable designed for use in secondary circuits of electric welders.1 Welding cable typically consists of a single, finely stranded conductor that ranges in size from 8 AWG to 500 kcmil and a single layer of EPDM or neoprene thermoset insulation with an operating temperature rating of 90° C or 105° C.Welding cable is thermoset (as opposed to thermoplastic) to better resist weld splatter. The cable is typically rated 600 volts but can also be rated 100 volts. Welding cable is known for its flexibility and durability, and many automatic and manual welding applications require the cable to hold up to repeated movement over rough surfaces.

WELDING APPLICATIONS

The two main types of electric welding, as defined in NEC 2014 Article 630, are resistance welding and arc welding. In both welding types, welding cable is used to power the electrode.

Resistance welding is the process where heat used for fusing two overlapping metals together is generated from the resistance of the materials. The metals are placed between two electrodes (also known as welding points) and lowvoltage, high-current electricity is passed from one point to the other. The metals resist the flow of the current and the resulting heat fuses the metals together.

Arc welding is the process of using a welding power supply to create an electric arc between the base material (also called the work piece) and the electrode. The electric arc melts the electrode and the remaining metal is used in the weld. The arc is sustained by blowing an inert gas such as argon between the electrode and the weld surface.

WELDING CABLE AMPACITY AND SIZING

Ampacity, also known as current-carrying capacity or current rating, is the maximum amount of current that a cable can safely carry without exceeding its operating temperature rating due to the heat generated from losses and ambient heat around the cable. Welding cable ampacity is a common source of confusion because it is calculated differently than other types of wire and therefore appears to have a higher ampacity than products such as building wire or tray cable , but these ampacities are for welding applications only. When done correctly, cable size selection for welding cable takes into account factors like welder output power, duty cycle and the circuit length.

The rated output of the welding power supply determines the maximum current the power supply will draw during operation. The cable must be sized to handle the maximum current.

Duty cycle is a capacity rating of a welding power source. The duty cycle is the percentage a power source can operate at a given output current level for a 10-minute span without exceeding its thermal limit.² If output levels decrease, duty cycle increases until it reaches 100 percent continuous output. The duty cycle rating can be found on the power source's nameplate or in the manufacturer's manual.

The welding circuit is the complete path electricity will travel in a welding application. The circuit typically consists of the welding power supply, the electrode, welding cable and the work cable. The total length of the welding cable and work cable is calculated to determine the circuit length. Ampacity ratings decrease as the length increases due to the additional resistance of longer cable.

The type of welding machinery can impact the duty cycle. The welder's intended use (light, medium or heavy), if it's single phase or three phase, and voltage rating will



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change the duty cycle rating. NEC 2014 Article 630 *Electric Welders* Part II *Arc Welders* and Part III *Resistance Welders* have different requirements for specifying duty cycles and ampacity.

Cable manufacturers or welding textbooks can provide recommended gauge sizes for welding applications. End-users select the welding power supply's rated output, duty cycle and the circuit length to determine the correct cable size. Table 1 is an example of a welding cable sizing chart.

APPLICATION RECOMMENDATIONS

Welding cable's flexibility and durability makes it attractive to use in nonwelding applications. However, most welding cable is not Listed by a Nationally Recognized Testing Laboratory (NRTL) like UL, meaning it does not meet NEC requirements for fixed wiring. Even UL Listed welding cable that meets UL 1276 *Welding Cables* is not approved for use as fixed wiring or general use portable cord unless it carries an additional Listing.³ Authorities having jurisdiction (AHJ) can approve the use of welding cable in applications where the installation is judged to be safe, but using welding cable as fixed wiring without discussion with the AHJ can lead to problems.

An alternate solution is to use diesel locomotive cable (DLO), Type W mining cable or another finely stranded Listed cable. Table 2 (page 58) lists typical insulation thicknesses and strand counts of these cable types.

DLO, which is 2 kV UL Listed RHH/RHW single conductor with flexible stranding and a CPE jacket extruded over the insulation, is commonly used where the installation or application requires flexibility. DLO is suitable for

Table 1 Welding Cable Sizing Chart ²						
Welding Machine Rating (Amperes)	Duty Cycle (%)	Lengths up to 50 ft. (AWG)	Lengths 50-100 ft. (AWG)	Lengths 100- 150 ft. (AWG)	Lengths 150 200 ft. (AWG)	
100	20	8	4	3	2	
180	20	5	4	3	2	
180	30	4	4	3	2	
200	50	3	3	2	1	
200	60	2	2	2	1	
225	20	4	3	2	1	
250	30	3	3	2	1	
300	60	1/0	1/0	1/0	2/0	
400	60	2/0	2/0	2/0	3/0	
500	60	2/0	2/0	2/0	3/0	
600	60	3/0	3/0	3/0	4/0	
650	60	3/0	3/0	4/0	-	

Please note that copper cable sizes are for combined lengths of electrode plus ground (work) cable.

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Type W mining cable is used in industrial and light-to-medium mining applications, heavy-duty service and as temporary power supply cables in accordance with NEC Article 400 *Flexible Cords and Cables*. The most common mining cable standard is ICEA S-75-3818. Type W can also be UL Listed to UL Subject 1650.⁴ Type W is rated 2,000 V and can be made in single or multiconductor jacketed constructions.

UL AWM Styles 1283 and 1284 are single-conductor thermoplastic wires that are dual listed MTW,TEW and THHW and are acceptable for flexible applications that are 600 V or less. These wires are commonly used in control cabinets, internal wiring of applications and machine tools where tight spaces require high flexibility and good durability.

——Continued on page 58

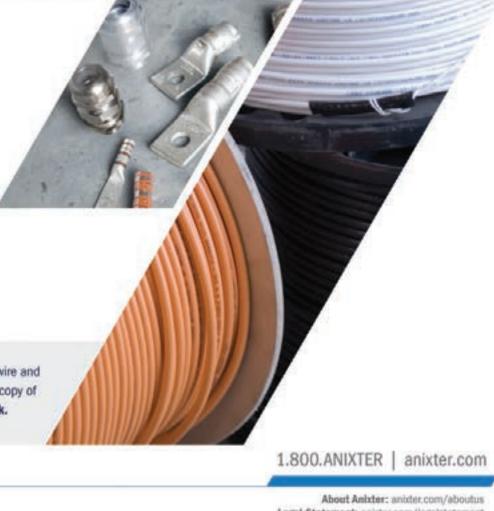


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Schleuniger Provides Automation and Quality for DräxImaier Group

The Dräxlmaier Group, founded in 1958 and headquartered in Germany, supplies renowned vehicle manufacturers with modern automotive electrical systems as well as exclusive interiors integrated with electrical and electronic components.

Prior to working with Schleuniger, Dräxlmaier's method for processing battery wire consisted of two stages: automatic cable cutting and stripping and manual crimping. To increase productivity, the company needed a solution that would allow them to perform both processes in one automated step. But, being a supplier to some of the most well-known and high-end brands in the automotive industry, Dräxlmaier knew they could not sacrifice quality for productivity. To improve the production process according to Dräxlmaier standards, they took advantage of Schleuniger's extensive experience in wire processing and worked with them to create a customized solution.

After extensive research and testing, Dräxlmaier chose the Schleuniger CrimpCenter 67 HD16.



Schleuniger CrimpCenter 67 HD16

With processing stations for automatic cutting, stripping and crimping combined with Schleuniger's ACO 05 crimp force monitor, which electronically monitors each crimp and compares the measured value to a known good reference crimp, Dräxlmaier automated their entire process while guaranteeing quality. Furthermore, Schleuniger customized the machine to specifically fit Dräxlmaier's need to



Schleuniger's ACO 05 Crimp Force Monitor

process wires up to 25 mm².

Ulises Benítez, Equipment Planning Manager, Dräxlmaier Components Automotive De México, says since they have implemented Schleuniger equipment, they have seen "significantly reduced process time, material handling and investments for semi-automatic crimping as well as increased valuable space on the production floor."

The CrimpCenter 67 HD16 is now a standard piece of equipment for any of Dräxlmaier's over 50 facilities world-wide that need to process this application.

For further information contact Schleuniger, Inc., 87 Colin Drive, Manchester, NH 03103. Phone (603) 668-8117 or Fax (603) 668-8119. Email: Sales@schleuniger.com or visit www.schleuniger-na.com





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Nelco Products, Inc. Expands Offering Of Heat Shrinkable Tubing

Nelco Products, Inc. a manufacturer and distributor of cable ties, wire ties, heat shrink tubing, wire connectors, cable tie mounts, HVAC supply products and related wiring worldwide, accessories has announced that the company has expanded its selection of heat shrinkable tubing with the launch of food grade heat shrinkable tubing. Specifically engineered to be used in applications involving contact with food, water, beverages and non-toxic materials, this unique form of shrinkable tubing is specifically for those building beer-brewing or sous-vide projects using Nelco Products' waterproof DS18B20+ digital temperature sensors.

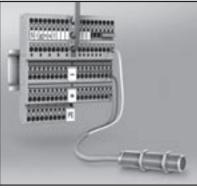
This heat shrinkable tubing is FDA compliant for contact with food and is flexible, non-toxic and resistant to ultraviolet light, moisture, fungus and a wide variety of chemicals and oils. Food grade heat shrinkable tubing is extremely environmentally friendly, as it breaks down to carbon dioxide and water when properly incinerated. Additionally, this tubing meets USP Class IV requirements.

For more information and to view Nelco Products' food grade heat shrinkable tubing, visit http://bit.ly/ 12GkX7P, or call toll-free at (800) 505-6352. Additionally, to view Nelco Products new product video, visit http://www.youtube.com/ watch?v =TOV_luveU7Q.

New additions to Push-In Terminal Block Line

Phoenix Contact has expanded its line of push-in technology (PT) terminal blocks to include a smaller version of the popular STIO 2.5 series. The PTIO 1.5/S series is only 3.5 mm wide with a new top-level location for the power wiring. The blocks offer the market's highest density power distribution for field sensors and actuators.

The compact double-level terminals are available in three-wire and



PTIO 1.5/S Terminal Bocks

percent faster termination than standard spring cage due to the short push button activation stroke. It is five times the IEC requirement for retention force and is the most compact solution available.

For more information about Phoenix Contact or its products, visit http://www. phoenixcontact.com, call technical service at 800-322-3225 or email info@ phoenixcon.com.

New DVD Helps Industry Understand Requirements of Conflict Minerals Regulation

As the first filing deadline approaches, electronics manufacturers and suppliers preparing for compliance with the U.S. SEC conflict minerals regulation have a new resource for answers and facts with IPC's 2013 Conflict Minerals Conference Proceedings. IPC's Proceedings DVD is a compilation of audio and slide presentations recorded during its popular summer conflict minerals conference and features top experts on the conflict minerals regulation.

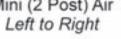
For companies seeking guidance on compliance with the new regulation, IPC's 2013 Conflict Minerals Conference Proceedings provides the facts on regulatory requirements, customer requirements and emerging industry practices. In addition to a brief history of the conflict minerals rule and an overview of regulatory requirements, topics covered



_Continued on page 59

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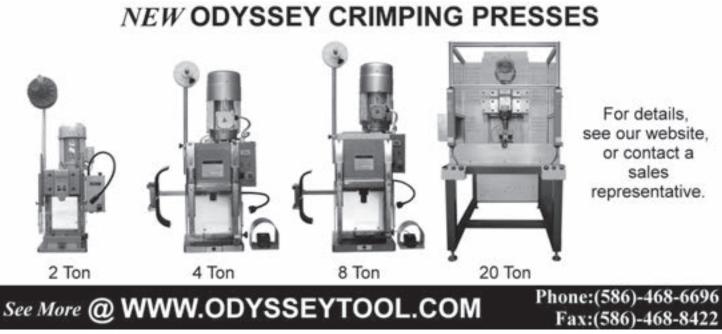


Med. Duty Slide Quick Change Tool Pack

four-wire versions. The upper level is for signal feed-through and is available with or without an LED. Continuous bridge shafts allow a quick and simple potential distribution of power using push-in bridges.

The PT terminal blocks allow easy and fast termination of ferruled wire by simply pushing the wire for a complete termination. Stranded wire is terminated by pushing the orange actuator, opening the spring for the insertion of the wire. All new versions are compatible with the Clipline Complete system of bridging, marking and test accessories.

The PT 1.5/S series features up to 50 percent reduction push-in force compared to other push-in type terminal blocks and allows for up to 35 Quick Change Tool Pack



ole 2: Insulation Thickness and Strand Count of Common Flexible Cable					WIREwisdom [®] Continued from page 55 —			
Gauge Size (AWG/kcmil)	Welding Cable (600 V)		UL Style 1283 (8–2 AWG) ⁵ UL Style <u>1284 (1 AWG-500 kcmil)</u> ⁶		<u>DLO (2,000 V)</u>		<u>Type W (2,000 V)</u>	
	Insulation <u>Thickness (in.)*</u>	Strand <u>Count*</u>	Insulation <u>Thickness (in.)</u>	Strand Count (multiple options)*	Insulation <u>Thickness (in.)</u> ⁷	Strand <u>Count*</u>	Insulation <u>Thickness (in.)</u> ⁸	Stran <u>Coun</u>
8	-	-	0.060	-	0.055 (0.085 w/ jacket)	37	0.060	133
6	0.070	259	0.060	19/133/266	0.055 (0.085 w/ jacket)	61	0.060	133
4	0.070	413	0.060	19/133/420	0.055 (0.085 w/ jacket)	105	0.060	259
2	0.070	651	0.060	19/133/665	0.055 (0.100 w/ jacket)	147	0.060	259
1	0.070	840	0.080	133/259/833	0.065 (0.110 w/ jacket)	224	0.080	259
1/0	0.090	1050	0.080	259/1064	0.065 (0.110 w/ jacket)	266	0.080	259
2/0	0.090	1323	0.080	259/1330	0.065 (0.110 w/ jacket)	323	0.080	259
3/0	0.011	1666	0.080	259/1330/1672	0.065 (0.110 w/ jacket)	418	0.080	259
4/0	0.011	2107	0.080	259/551/2109	0.065 (0.130 w/ jacket)	532	0.080	259
250 (DLO: 262.6)	0.125	2450	0.095	2451	0.075 (0.140 w/ jacket)	646	0.095	427
300 (DLO: 313.3)	0.125	-	0.095	3458	0.075 (0.140 w/ jacket)	777	0.095	427
350 (DLO: 373.3)	0.125	2350	0.095	-	0.075 (0.140 w/ jacket)	925	0.095	427
400	0.125	-	0.095	-	-	-	0.095	427
450 (DLO: 444.4)	0.125	-	0.095	-	0.075 (0.140 w/ jacket)	1110	0.095	427
500 (DLO: 535.2)	0.125	5054	0.095	-	0.075 (0.140 w/ jacket)	1332	0.095	427

* Common construction, subject to change per manufacturer

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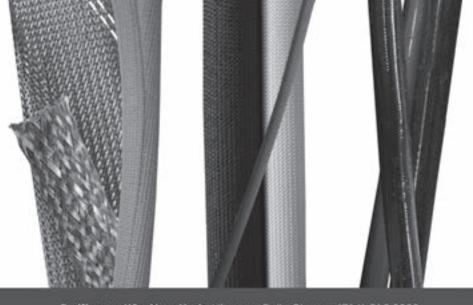
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Wider Protection with connectPower from Weidmuller

In efforts to strengthen an already extensive circuit protection product offering, Weidmuller introduces two new models to the connectPower line of DIN-rail mounted circuit breakers. Weidmuller's new BR Series circuit breakers are UL 489 Branch rated and the new SU Series circuit breakers are UL 1077 approved for Supplementary protection.

Weidmuller's lever-operated breakers use thermalmagnetic technology, having ratings up to 277/480V and 60A in 1, 2 and 3 pole formats, and are available immediately with C or D trip characteristics. The ranges are designed for industrial control applications, especially where the control equipment may be in an environment that needs to resist vibration and mechanical shock. A compact 17.5mm width on the rail is part of an attractive package for the connectPower circuit breakers. Weidmuller's BR Series and SU Series circuit breakers give users the option of using either wire-end ferrules or ring lug terminations for the supply and load, as well as UL-approved busbar accessories to simplify and reduce the installation time. To maximize security and safety, the operating lever can be locked, off or on, and even the IP20 connections can be supplied



Weidmuller's connectPower circuit breakers are designed to tackle industry's dirty jobs.

with optional touch protection caps.

Weidmuller supports customers and partners around the world with products, solutions and services in the industrial environment of power, signal and data. The company develops innovative, sus-

___Continued on page 61



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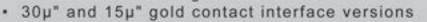
- · Available adhesive cover for discrete wire capability and secure termination
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- Available in 3M's unique "sword package," which helps to streamline the termination process, can reduce unnecessary process steps and can also improve

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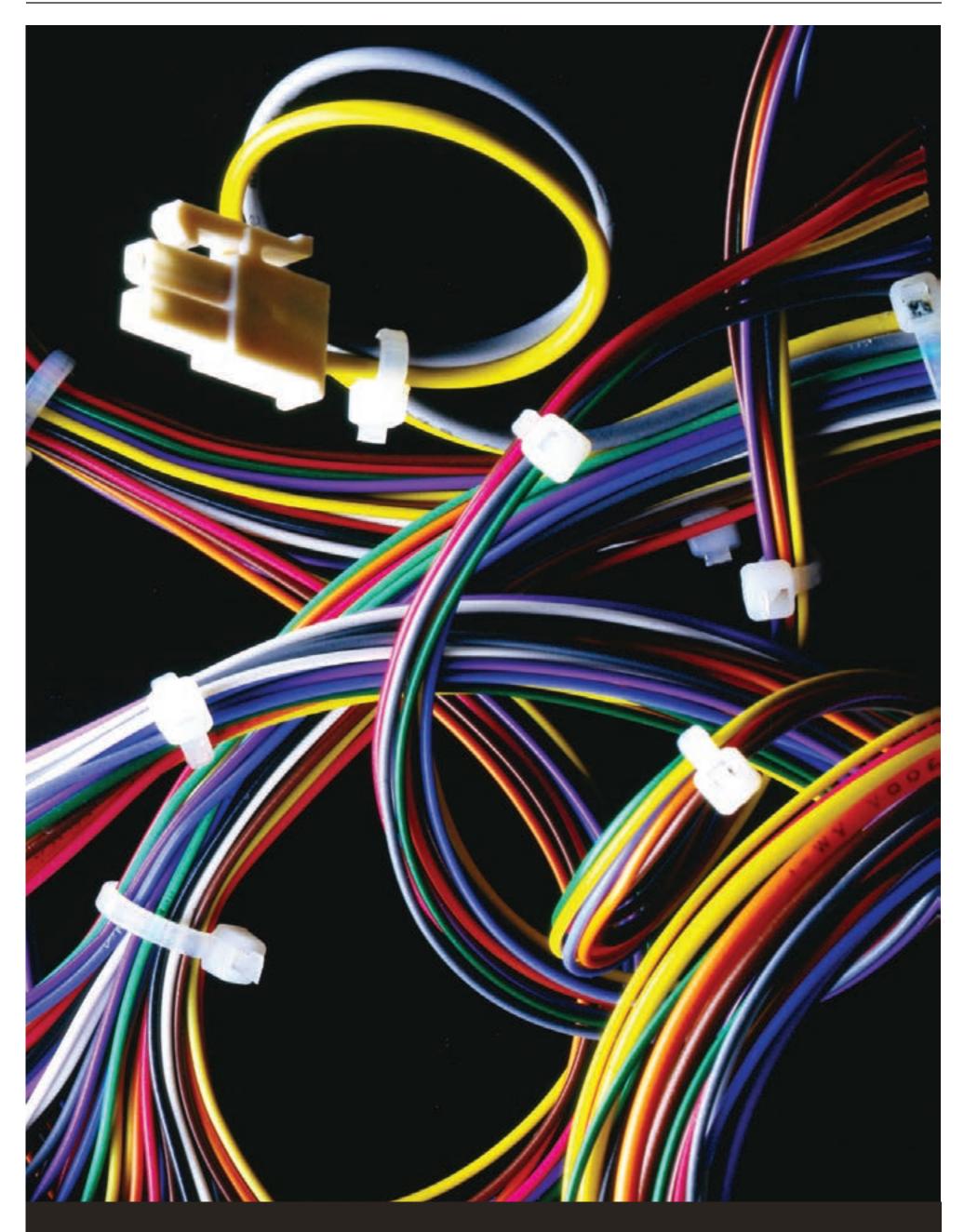




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Continued from page 59

tainable and useful solutions that set standards in Industrial Connectivity today and continually work toward providing solutions for the technology challenges of tomorrow

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For additional information, visit www.wago.us. Contact WAGO at 1-800-DIN-RAIL or info.us@wago. com

Burndy Announces Release of Hydent[™] OEM Uninsulated Lugs

BURNDY, a manufacturer and provider of connector solutions to the industrial, energy, construction, telecommunications, petrochemical, data center, OEM, and transportation industries, announces the addition of the HYDENT™ YAD uninsulated OEM lug. This lug is constructed of electrolytic copper. Designed with a brazed seam barrel, standard neck, Vgroove inner serrations and electro-tin plated for durable long-lasting corrosion resistance, two or more terminals can easily be stacked on a common stud. The HYDENT™ YAD is ideal for use with code or flex cable. In addition, the round ring tongue provides for a secure termination under the screw head that cannot be removed without the complete removal of the screw.

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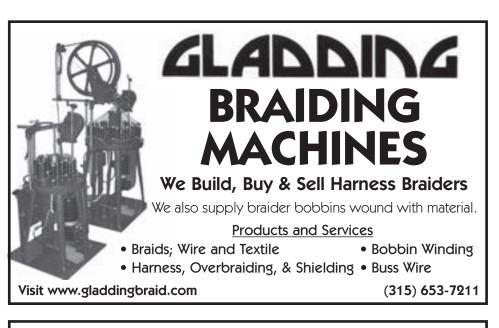
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