

This Issue Features:

- Methodology of Crimp Validation
- 20 Years in the Wire Harness Business
- Wire Wisdom - Capitalizing on PVC Scrap Recycling
- Growing your Business: Part 3 - Cultivating and Harvesting
- FreePoint Solutions Measures Harness Facilities "Black Holes"



Affiliated Products

By Fred Noer

In almost any aspect of contemporary American society the importance of leadership never can be overstated – particularly since the U.S. economy turned upside down a few years ago. Strong, effective leaders especially are needed in the business segment to provide a future of growth, prosperity and sustainability.

Three such people are leading Affiliated Products (AP) in Mayville, Wis., a community of approximately 5,200 peo-

ple 55 miles northwest of Milwaukee. The company produces contracted custom wiring harnesses, cable assemblies and electromechanical assemblies primarily for equipment used in the turf, off-road, construction, agriculture and other industries.

Steve Schlueter, 61, is the chairman and CEO, Chad Kruger, 48, is the president, and Sue Orlando, 58, is the executive vice president.

The strength and effectiveness of Schlueter, Kruger and Orlando lie primarily in their longevity with AP – 23, 25



Erika Aguilar and Christina Meza of Affiliated Products fully assemble and 100% electrically test a wiring harness.

and 16½ years, respectively. Schlueter and Kruger have owned the company since 1994, and Orlando became a minority shareholder in 2002.

"The three of us get along exceptionally well," Kruger said. "There's rarely any dissension. We have worked through big and small problems together. It's like a brotherly-sisterly relationship, and that has really made this work."

Kruger came to AP in 1988. He was hired by Richard Harpster, who became

the AP president, CEO and part owner in 1987.

The firm was started two years earlier in a garage in Waukesha County west of Milwaukee. Wiring harnesses and cable assemblies were produced for OEMs in the machine tool, construction equipment and software industries.

Harpster eventually acquired full ownership and relocated AP to the city

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The Methodology of Crimp Validation

By Keith Nicholas
TE Application Tooling
Electrical Controls Manager

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



Keith Nicholas

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

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FreePoint Solutions Measures Harness Facilities "Black Holes"

By Joe Tito
Wiring Harness News

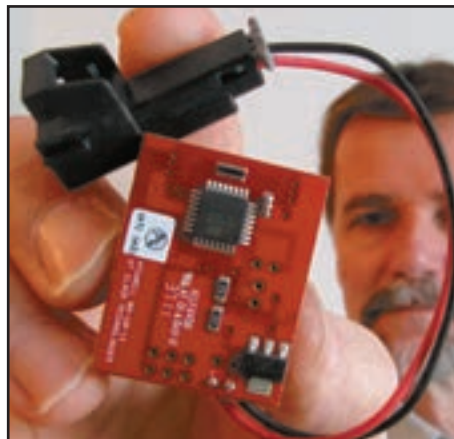
You can't improve what you can't measure. How many times have we heard that? Assuming the converse is true, it is difficult, if not impossible, to improve what you can't measure.

Automation has provided a great deal of real-time production management data for tier one manufacturers. This is not as true for the tier one harness manufacturer. Because of the level of manual and discrete processes in harness manufacture, OEE (overall equipment effectiveness) data is not available at all lev-

els. Manually operated equipment and smaller, typically less sophisticated machines, leave black holes in data capture in harness facilities. There are just too many areas of production that can't be monitored automatically.

Paul Hogendoorn, co-founder and former President of OES, Inc., had long been wrestling with this issue. "Automation has advanced continuously, reducing the number of man hours in every component of the vehicle with the exception of the wire harness," he advised. He noted that the lead preparation in harness manufacturing has advanced with measure, cut, strip, and crimp operations; but that the actual harness assembly remains largely a manual process.

St. Clair Technologies, a custom harness supplier, had been making head ways in using small wireless I/O devices in its cable analyzing process. In networking sessions with Randy Hess, a Director and Co-Owner at St. Clair, Paul became intrigued with their use of these I/O devices in a flexible and low cost ring out tester. Together they began to explore ways these wireless I/O devices



Paul Hogendoorn with with FreePoint Wireless I/O device

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APRIL
2013

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Affiliated Products produces contracted custom wiring harnesses, cable assemblies and electromechanical assemblies primarily for equipment used in the turf, off-road, construction, and agriculture industries.

1 The Methodology of Crimp Validation

How do you know you have a quality crimp?

1 FreePoint Solutions

FreePoint Solutions measures harness facilities "Black Holes".

6 Growing Your Business: Part 3

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Since none of us ever sees a mistake coming, it's the timing of the mistake that can cost you the ballgame in business. Loren Smith shares his experiences with readers.

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Capitalizing on PVC Scrap Recycling. There is one constant with industrial activity, it generates waste, and lots of it.

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2013 SEMINAR SCHEDULE

WEDNESDAY MAY 8

| | | |
|-------------------|---|---------------------|
| 8:30am – 9:30am | Worry-Free Automotive Aluminum Wire Don Price, USCAR Team | Ford Motor Company |
| 10:30am – 11:30am | Crimp Validation: "Get What You Expect by How You Inspect" Keith Nicholas, Manager Electrical Controls | TE Connectivity |
| 12:30pm – 1:30pm | Integration of Micrograph Laboratories in Wire Harness Production Processes Josef Liebl, CEO | SLE electronic GmbH |

THURSDAY MAY 9

| | | |
|-------------------|---|------------------------|
| 8:30am – 9:30am | New Revision-B to IPC/WHMA-A-620 Jack Crawford, Director Certification | IPC International Inc. |
| 10:30am – 11:30am | Crimp Force Monitoring: How to Detect Your Crimping Errors Gustavo Garcia-Cota, Crimping Product Manager | Schleuniger Inc. |
| 12:30pm – 1:30pm | Environmental Compliance in the Wire and Cable Industry John Crawford, Research Specialist | Anixter Inc. |

Visit with Kathy and Marilyn in the Business Center and Lounge

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MANAGING EDITOR
Marilyn Magowan
marilynmagowan@yahoo.com
Phone (262) 394-5558

ADVERTISING/CIRCULATION MANAGER
Kathy Freund
kfreund2000@yahoo.com
(815) 337-7885

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Electrical Wire Processing Technology Expo Seminars

Wednesday May 8
8:30 am – 9:30 am
"Worry-Free Automotive Aluminum Wire"

Presented by Don Price, Ph.D, Liaison from Ford Motor Co. to EWCAP of USCAR LLC. The USCAR, LLC.

Don's presentation will cover:

- Benefits of using aluminum wire for automotive applications
- Why processing aluminum wire for automotive can be worry-free
- What happens if precautions aren't taken to eliminate failure modes
- Examples of innovative wire-to-terminal bonding methods for automotive
- Progress on an industry-standard termination process for aluminum primary wire

10:30 am – 11:30 am
"Crimp Validation: 'Get What You Expect by How You Inspect'"

Presented by Keith Nicholas, Manager Electrical Controls, TE Connectivity.

Keith's Presentation will cover:

- What is a "quality" crimp
- Variables influencing the crimping process
- Crimp inspection standards
- Detailed look at various inspection methods:
- Non-destructive/Operator's visual inspection
- Physical crimp measurements
- Pull force measurement
- Terminal cross-sectioning

12:30 pm – 1:30 pm
"Integration of Micrograph Laboratories in Wire Harness Production Processes"

Presented by Josef Liebl, CEO, SLE electronic GmbH.

Josef's presentation will cover:

- Trends and visions in the European market
- Increasing demands on quality assessments and traceability
- Requirements for higher number of microsection evaluations
- Importance for reference data at the grinding lab
- Preparation of high volume, fast, continuous, & reliable micrographs to stay competitive




JWB Manufacturing LLC - Booth #1547
Strunk Connect Automated Solutions, Inc - Booth #1120

Thursday May 9
8:30 am – 9:30 am
"New Revision-B to IPC/WHMA-A-620"

Presented by John A. (Jack) Crawford, Director of Certification, IPC International Inc.


Jack's Presentation will cover:

- Revision-B changes to this internationally accepted workmanship standard
- Attendees will receive printed Redline Document showing technical changes from Revision A to B
- Information on space addendum and its implementation
- Practical information regarding the value manufacturers receive from certification to this standard
- "World Class" training resulting from use of A-620 in training and quality management systems
- Seminar Attendees will be entered into a drawing to win one of five free copies of IPC/WHMA-A-620B




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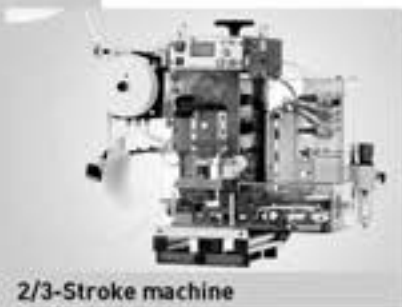
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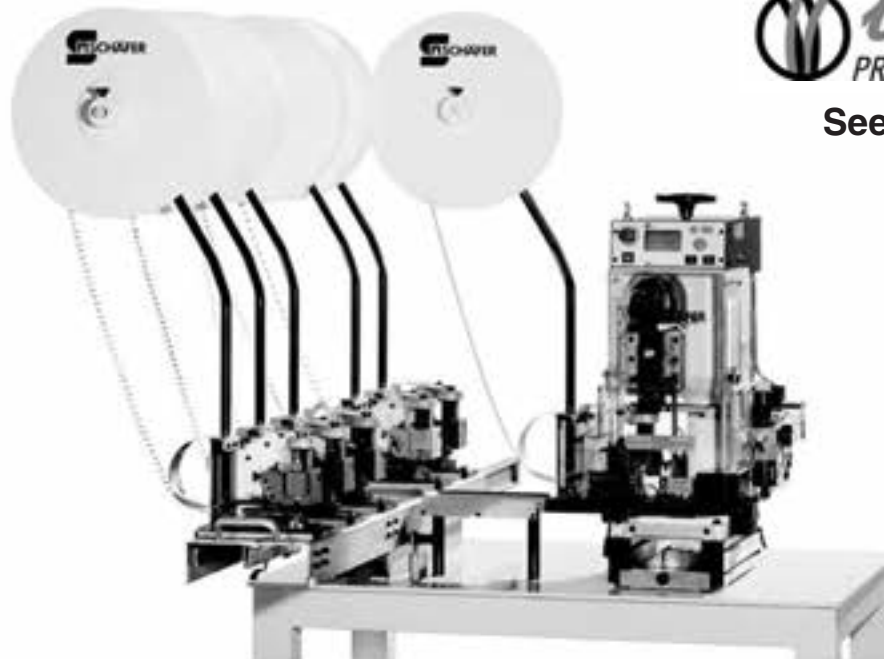
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Growing Your Business: Part 3 Cultivating and Harvesting

By Paul Hogendoorn

It's 10 AM on a Friday morning, and I'm moving a little slower than I normally do. I landed in Detroit at midnight last night, and from there it was a 2 ½ hour drive home. It was a long three day trip, just to visit two plants, and have dinner with one customer - but it was worth it.

My most recent column focused on the topic of "seeding", and the importance of seeding consistently and with intentionality. This column is about "cultivating" and "harvesting" the opportunities that result from the seeding efforts.

Most entrepreneurs that I know are natural cultivators; they cultivate products, or ideas, or customers, or relationships, or simply just opportunities. Whatever of these it is, it gets their full attention, without any need for an enforced discipline or routine, or any need to be encouraged. They are often so naturally oriented to cultivation activities that it sometimes is to their, and their companies', detriment; the importance of the seeding activities are overlooked, and harvesting opportunities are missed or mistimed.

When we are doing what we love doing, "work" is easy. Products, projects



Paul Hogendoorn

and specific business opportunities become our "babies" and we steadfastly cling to them, pouring in all our available time, energy and imagination. The completion of a project, the maturing of a product, or the closing of the big deal, brings the cultivation period to an end, and it's often not easy for the cultivator to let go. This is more true for technically oriented people than it is for relationship oriented people, but I have also

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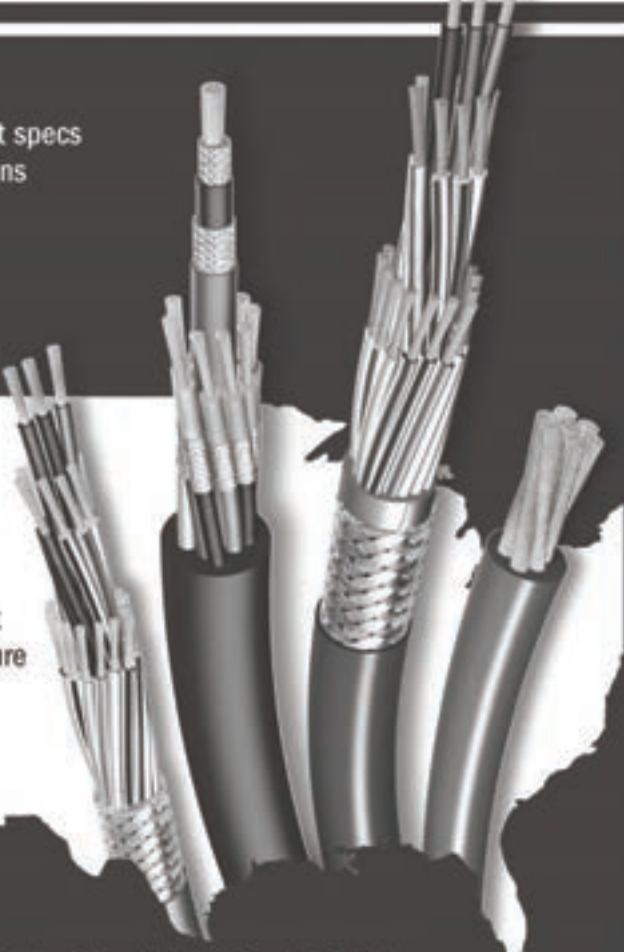
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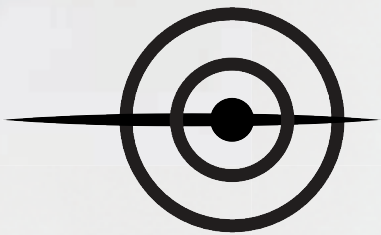
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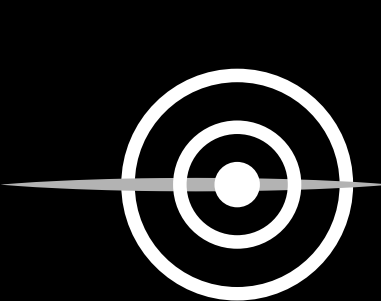
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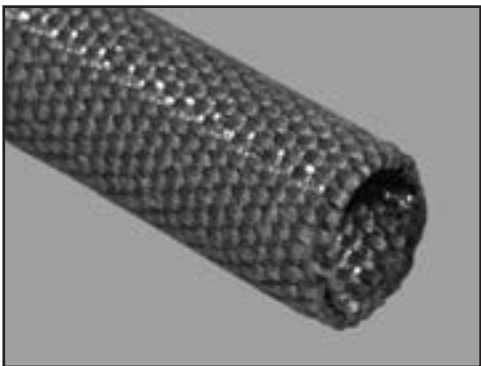
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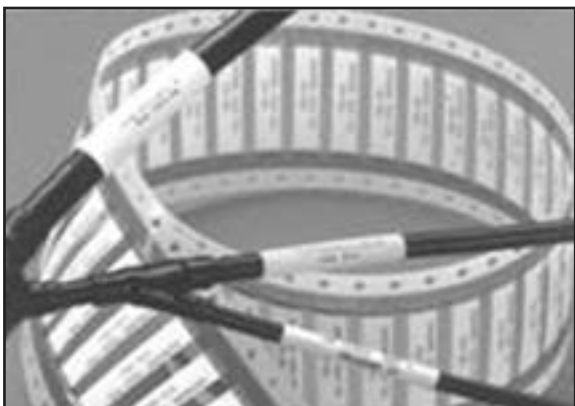
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Growing Your Business: Part 3

Continued from page 6

seen some sales and marketing focused people completely miss the “ask for the order” opportunity, or nearly as bad, to cling to their baby and try to retain control of it even after the deal is made.

Trying to close a deal too soon, before the opportunity or relationship has been properly cultivated, is another costly mistake. Good negotiations require a level of trust and respect, and these things are developed in the cultivation process. Negotiating without having established trust and respect reduces the process to simply having to win on price, which lowers your profit margin potential. It also increases the chance that the deal will be won by a competitor that cultivated the relationship or opportunity better than you did.

My own strategy for cultivation is simple: “escalate the connection”. Turn a webpage inquiry, or tradeshow lead (or any lead from your seeding activity) into a personal email reply as promptly as you can. Sign off with your first name and simple salutation. Elevate the email connection by following up with a phone call; leave a voice mail if there’s no answer. Elevate the phone call connection with an offer to meet them in person. If the opportunity warrants, establish a face to face meeting with them; make the effort to get to know them, and allow them to get to know you too. Elevate each connection as far

as you can effectively, and deepen the relationships that hold promise and opportunity. Face-to-face meetings may seem expensive and unnecessary, but if it’s the escalation step that your competitor won’t make, it can become your differentiating advantage.

Cultivation is key to closing more deals and making a better margin on each deal, and it’s a process that most entrepreneurs do naturally. The difference between success and failure though, is often a matter of knowing how, and when, to harvest the cultivated opportunities.


A few months ago, at a trade show, I made a connection that turned into an exchange of email messages, that set up a couple of telephone conversations, that in turn became a series of face-to-face meetings. The most recent meeting was 3000 miles and 2 time zones away. Today I’m preparing for yet another face-to-face meeting with them early next week, but this will be a simple meeting - to sign the deal. It’s harvest time!


And still it’s seeding time, because it’s always seeding time.

Paul Hogendoorn founded TPI Associates, an organization dedicated to helping entrepreneurs define and achieve their vision. For more ideas on these topics, please visit www.tpi-3.com or contact Paul directly at paul@tpi-3.com

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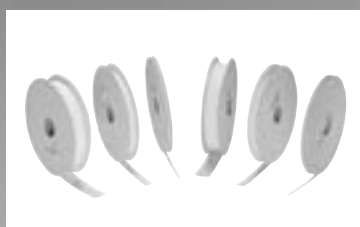


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The Methodology of Crimp Validation

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

The crimping process involves more than you may realize, so let's review the factors that can influence the crimp. The Wire: use the strip length set forth in the terminal manufacturer's specification, watch for nicked or cut strands, perform a clean, straight insulation cut, and practice proper handling of stripped wires if crimping is done by hand or a bench terminator. The Terminal: use lubrication when recommended by the manufacturer, take care in handling and storage of the terminal reels so as not to damage the cardboard sides or cause the terminal strips to become entangled, and be very careful when handling the product strip as it is being threaded through a machine and into the applicator. The Applicator: always use OEM tooling, inspect the surface condition of the crimper for any wear, make proper terminal feed adjustments to position the terminal over the anvil and confirm proper feed track adjustment for front-to-back terminal positioning on side feed applicators. Also, make sure you select the proper cam for bench or automatic processing. The Termination Machines (such as bench terminators and lead makers): check correct machine setup for the product that you are producing and, most importantly, have preventative maintenance processes. Preventative maintenance applies to your applicators and hand tools too. The Operator: train your operator in proper hand tool use, machine setup and operation, wire handling and positioning for crimping, and basic crimp theory. There are many factors at play and, if you slack off in any of these areas, your crimping process may suffer quality problems and other issues.

Once all aspects of your crimping process are understood and in control, then you need to be able to validate the crimps. There are quite a number of specifications that you can use or may be asked to use by your customer for validation. These include manufacturers' specifications, such as those provided by TE Connectivity, which can include terminal application specifications, applicator instruction sheets, and machinery customer manuals. Broader industry standards may be requested such as IPC/WHMA A-620, UL486A-486B, and SAE/USCAR-21. Finally, there are your customer's own specifications that likely have many similarities to the terminal manufacturer and industry specifications. Some of the common validation criteria that we will review include visual inspection, crimp height measurement, tensile strength or pull out force, and terminal cross section-

ing. In addition, applicable specifications may include electrical testing such as current cycling test, voltage drop test, and dry circuit terminations. Along with the electrical testing, the crimps may also be exposed to environmental elements such as sudden temperature change, known as thermal shock, and humidity change. The terminal manufacturer typically performs these electrical and environmental tests during product development to confirm the crimp meets its intended performance. It is rare for a harness manufacturer to be required to conduct such testing.

Visual inspection is one of the most important validation tests performed and is where you must trust your operators. Operators must be trained in basic crimp theory, as they are your first-line of defense in the validation of crimps. They may need eye-loops, microscopes, mag-

nifying glasses, and good lighting for this task. Visual inspections of crimps can include all of the following: conductor brush presence, conductor brush length, conductor strands cut, conductor strands not captured by the crimp legs, correct bell-mouth on the wire crimp, proper insulation placement, terminal roll, terminal twist, terminal damage including locking lances, crimp leg closure for both conductor and insulation crimps, and proper length cut-off tabs. Some of these features are subjective, so you should ensure that your operators are consistent in the way they visually inspect crimps. Terminal manufacturers may offer basic crimp theory training and visual aids. For example, you can obtain a visual aid poster from TE Connectivity by going to www.te.com and searching for part number 65780-4 or 'Crimp Quality Guidelines'.

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20 Years in the Wire Harness Business

Successfully Surviving My Own Mistakes Was My Greatest Achievement

Loren M. Smith, CEO
Blue Valley Capital

Because business success is almost always equated with financial gains, I have had what would be considered a successful career in wire harness manufacture. My own measure of success is slightly different, however. In twenty years of taking a harness business from under \$1 million in volume to \$85 million in volume at final sale, I view my greatest success to be surviving my own mistakes.

Mistakes are always dumb in hindsight. Ask any NFL quarterbacks how he feels about that last pass interception. Since none of us ever see a mistake coming, it's the timing of the mistake that can cost you the ballgame in business.

The stories I'll be sharing about my own mistakes are the ones which, coupled with timing, can kill any business the way they nearly did mine.

1. Emotional Agendas

When I made my way from the executive suite of a large multi-national cor-



Loren M. Smith, CEO
Blue Valley Capital

poration on the East Coast to a tiny wire harness company in the middle of a cornfield in Iowa, it was a very emotional decision.

My wife and I wanted to bring up our children in the Midwest and felt they were at the perfect age to make the move. I had no capital, so the sweat equity price tag was perfect. We jumped from Boston to rural Iowa in under thirty days with three pre-teenagers, buying the only house in a town for sale.

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My overwhelming passion to own my own business had driven me to make a basic mistake. Within three days of starting work, I learned the book inventory I was buying with my sweat equity purchase did not exist.

By failing to do an independent inventory prior to purchase, I had contracted to buy a business with a negative net worth as well as cash flow problems. The only real assets in the business I was to own were customers who loved the quality of the product and the quality of the workforce who produced it.

Based solely on those two facts, my wife and I gave ourselves two years to turn the numbers around and refinance for growth. It would be my first experience in relying solely on my gut instinct that the basics of a business were solid enough to warrant my total commitment. It was a valuable lesson in self-confidence, which would see me through my subsequent mistakes as well. In my opinion, any entrepreneur's gut instinct is his best friend.

2. Workforce Loyalty and Respect

I would like to think that the next mistake I made was not really my fault, but it clearly was my own doing which triggered a UAW union drive which could have buried my little business early on. The business had grown rapidly after that first nose-dive, and customer satisfaction was high.

We were adding line workers and shifts under the close supervision of employees who had been with me from day one. Hiring, firing, and promotions were handled in a largely collaborative, informal style. I prided myself on a management style without memos and an always-open door. And then I violated my own rule of loyalty and respect up and down the chain of command.

I frequently left the office to drive ten miles down the road for lunch. The older couple who owned the cafe asked if I could find a place for their 17 year old grandson who was getting into trouble out in California after his dad walked out on him and their daughter, the boy's mother.

I quickly acquiesced and put him on the night shift with a start date, informing the shift supervisor after the fact. She wasn't thrilled, but needed

people so went along. Within a week of his start date, I was hearing nothing but complaints from all sides; he showed up late, left early, and flatly refused to do his own rework when he screwed up. My people were mad at him and mad at me for the hire

He had received his third formal warning and was on his way out when I got the call at home from my night supervisor.

Turns out dad was a union organizer and the kid was passing out cards with promises for signatures. I was pretty upset. I believed that without direct communication with the workforce and the resultant customer-driven culture, my labor-intensive business could not survive, let alone prosper.

I quickly consulted one of the most famous labor lawyers in the

country who came in to advise me on what to do. In the end, I wrote him an enormous check but rather than follow his direction I did what my people in leadership on the factory floor had been urging all along. Once again I put my trust in my gut, did what my people and I agreed was the right thing, and avoided a killer hurdle in the road.

3. Always Promote the Home Team First

This mistake is almost a variation on #2. As my business continued to grow, I saw the need to beef up my management team so that I could be less hands-on. I brought in a quick succession of highly degreed and experienced mid-level managers and left them to it. Like

Continued on page 16

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20 Years in the Wire Harness Business

Continued from page 13

most entrepreneurs, I have a real distaste for meetings. They had a whole lot of meetings I missed for about a year.

It was just enough time to really wreck the bottom line. My non-degreed homegrown talent had been muttering for a while, and the year-end inventory showed the extent of the damage. Had I promoted first from within and added outside talent singly on a strictly as-needed basis with my close supervision, the loss would have been avoided. Bringing in any outsider is always higher risk than bringing along the talent you know.

The root cause of my misstep was the fact that I had stepped away from the day-to-day management, and turned my company over to a new team far too quickly. My new controller had instituted accounting changes which masked what was really happening and I was too removed to see it. I had to fire my con-

troller and all the corporate guys, and gave an entry level accountant who seemed to me to be loaded with common sense and smarts the chance to run the day to day as my GM while I focused solely on the customers.

We turned the company around in a matter of months. Even as we were digging out of the disaster we kept gaining market share and growing.

4. No One Shares Your Agenda

Never assume your customers, your suppliers, or your banker share your goals for your business. They may use the words to make you think you are working toward the same end, but the truth is they all have their own agendas, not yours.

For several years, I kept a cartoon

Continued on page 18



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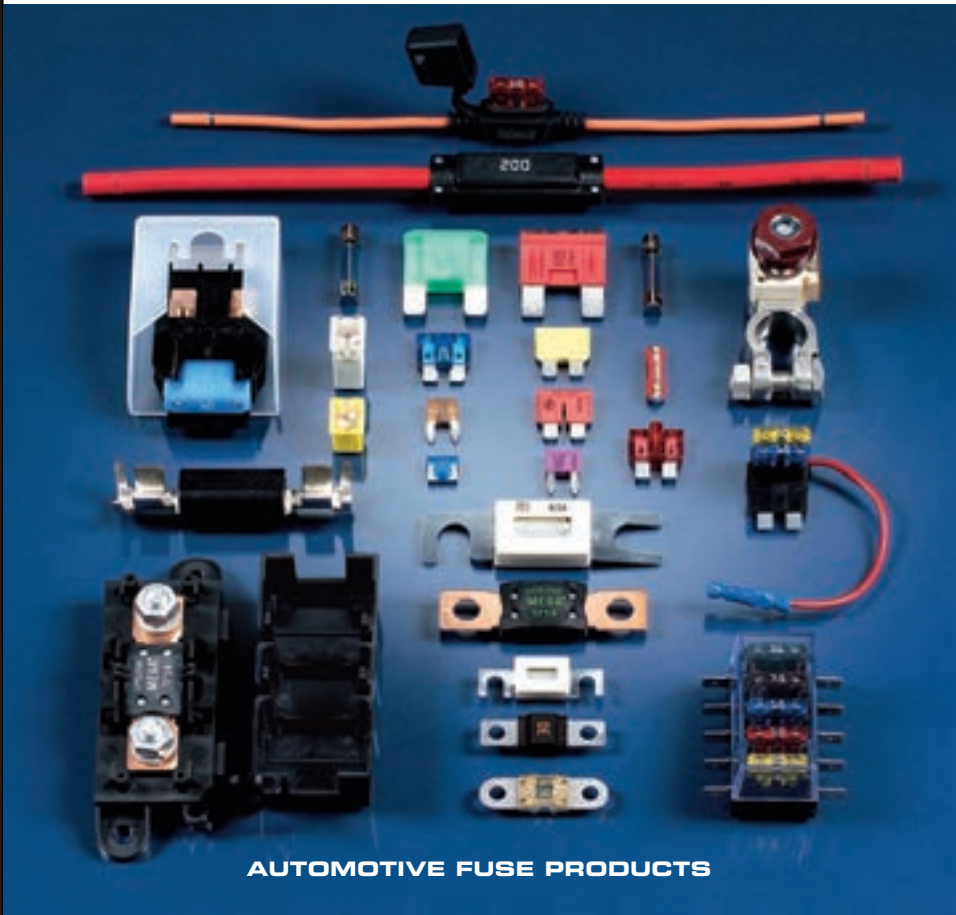
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20 Years in the Wire Harness Business

Continued from page 16

in my office which showed an entrepreneur going up a mountain with his banker on his back. The banker is smiling; the entrepreneur is sweating. The cartoon reads: "it's hard enough to get to the top without carrying a banker on your back."

All through my growing pains with the business, I had enjoyed a good relationship with the large Eastern bank which financed my expansions and contractions. Interest rates were astronomically high the entire time, and I never missed a payment. I didn't like it, but that was the deal. So imagine my surprise when I got a call from my friendly banker on a Good Friday holiday.

"The bank has been sold and the acquiring bank has decided to de-acquisition your loan; your company does not fit their lending criteria. You'll have ten days to replace your financing." Several covenant violations gave him the legal standing to "call" my loan. His bank could liquidate my company if I did not comply with his request. During this period of bank consolidation this was not unusual.

Five working days in the middle of nowhere to persuade a banker you've yet to meet to loan millions on a business with a complex mix of current financing that has just been yanked after a long relationship. Anyone who has ever had a home loan knows loan committees usually only meet once a week. It literally would not be possible in this time frame.

But then I got lucky. A friend who owned a small farm bank down the road offered to tide me over until I could replace financing with a large commercial bank. I took down my cartoon. A really good banker will throw you a rope when you need it. The lesson here? Always have a Plan B in the drawer.

5. Uncontrolled Growth Can Kill

The next lesson I learned (perhaps relearned) the hard way was that prior to taking on new business be sure to understand exactly how the new business will effect each component of your manufacturing process. Understanding how many new hires and what their

Continued on page 18



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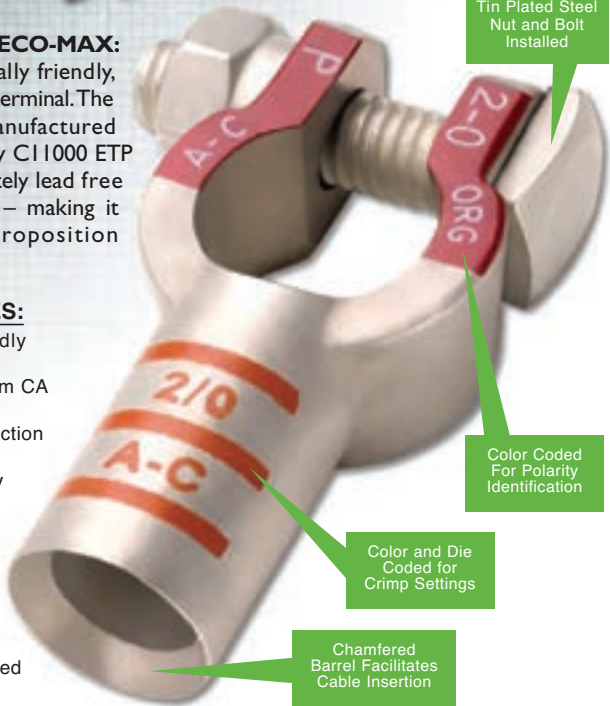
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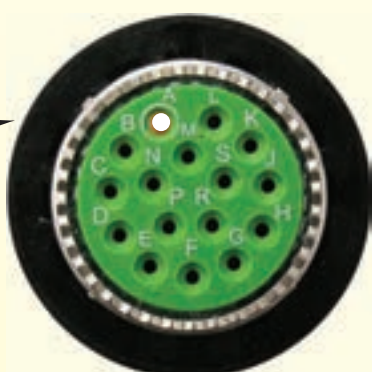
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3

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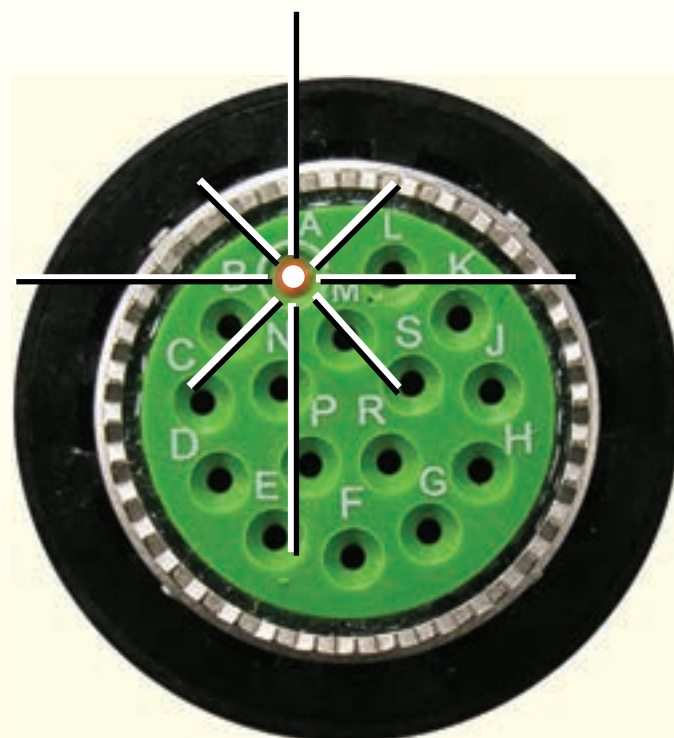
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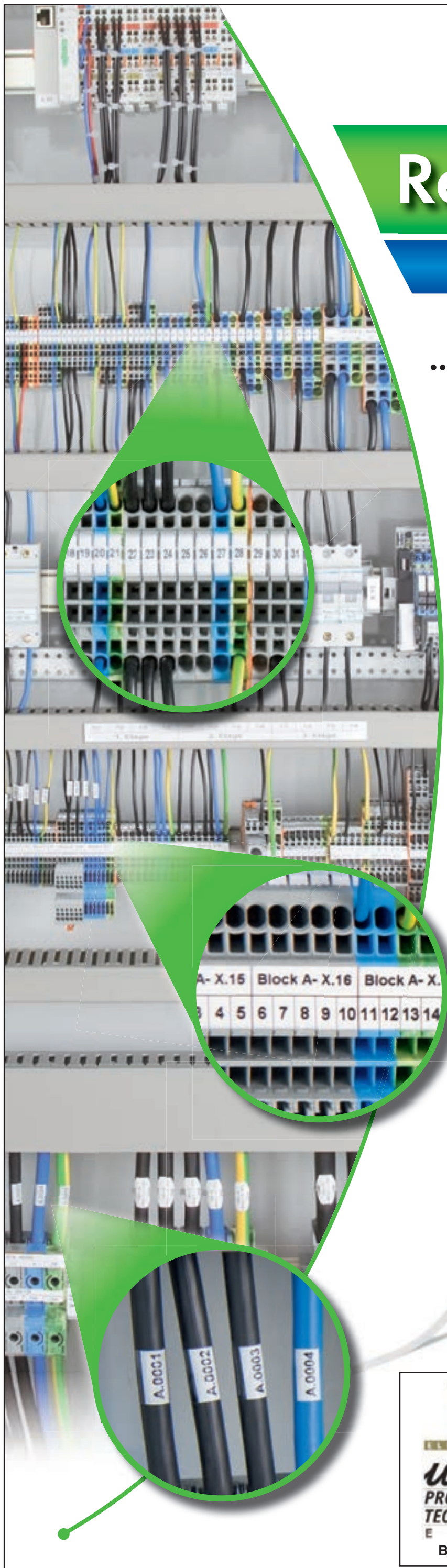
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Continued from page 18

learning curve will be to handle the new work is key in harness manufacturing. Re-learning this basic fundamental was very costly for me.

As our large construction equipment customers grew into their supplier reduction programs, they moved ever more aggressively to reduce the number of their wire harness suppliers, and dramatically drove up our rate of growth. Our lack of adequate understanding of the rate at which we could successfully add folks in the plant, along with the fact we had no tracking and forecasting system for work flow began to tell. Labor efficiencies plummeted and deliveries fell behind, creating serious delinquencies. This happened very quickly.

One morning in January, I pulled into the parking lot next to my controller. The temperature was below zero and the wind was blowing. He got out of his pickup and said, "Loren, I closed the books last night and we had a horrendous loss last month. Something is really wrong."

The magnitude our loss and delivery delinquency made past missteps look like a cakewalk. It was clear we had to take immediate aggressive action to stop the losses and get current, or we'd be dead. Over the course of a week-end I decided what we had to do. My back of the envelope analysis told me we could handle this growth rate with our core customers, but only if we eliminated most of our other customers. This had to happen immediately. We couldn't sustain a loss of this magnitude for another month. Continued delivery delinquency would not be tolerated by our customers.

In the space of the next few days, I had conversations with all the customers we could no longer support. These were some of the most difficult conversations I have ever had. When a company places their confidence in you and you have to tell them they have to move their business, it's a tough conversation. I knew I had no choice. In most cases, I was able to refer them to a competitor who was glad to have the business. I still

count that week as the most difficult of my entire career.

By taking this drastic action we were able to stop the losses, but it took time to get current. We committed to a delivery plan, part number by part number, for our remaining customers. We never missed a commitment. To this day I am grateful to my customers and my employees for getting the business through that terrible time. Once again, I had learned a tough lesson. Strong growth, particularly in the

wire harness business where a trained work force is your largest single component for success, must be meticulously planned or it will put you under faster than anything.

By limiting our focus on our core customers, we were able to reduce our growth trajectory to a manageable level, and most importantly we were able to keep out-performing our competitors to gain share with these customers.

Continued from page 22



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20 Years in the Wire Harness Business

Continued from page 21

As customers constantly reduced their harness suppliers based on strict performance criteria, we consistently earned their number one ranking, despite the challenges of my missteps. We had survived our own growth successfully.

Today when you say your company is “market-oriented” or “customer-driven” it sounds like an overworked buzzword. Seminars, books, and consulting practices teaching how to create a customer driven culture or a passion for the customer are now commonplace. But like weight loss, if it were easy, there would be no market for those who supposedly provide answers.

That said, if I had to name one thing that enabled me to survive my missteps and to earn a market leadership position, it was our customer driven culture. In an era when price was constantly the prime market mover, we successfully coupled it with quality and service.

As management, we made sure we were constantly communicating to every employee with frequent plant meetings and a newsletter. I always tried to make sure everyone understood we all worked directly for the customer.

In my view as a former owner of a wire harness manufacturer with now additionally over a decade of experience consulting

primarily with M&A in our industry, the basic elements for success in this challenging manufacturing business have not changed significantly.

Let’s face it; a wire harness will always be a relatively small part of the end product from the buyer’s viewpoint. What we, as manufacturers know, is that without our high quality product that expensive piece of equipment does not work. Yes, we are in a labor-intensive business so margin pressure from customers will always be constant. As long as we never compromise quality and, clearly value the people who produce that high quality, we’ll all survive our own mistakes.

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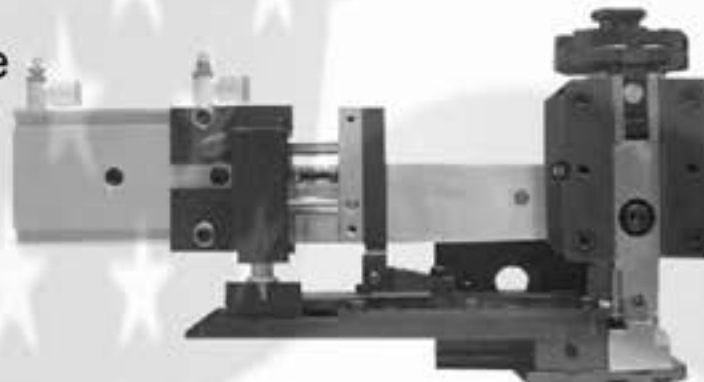


Model 1700



Model 2000

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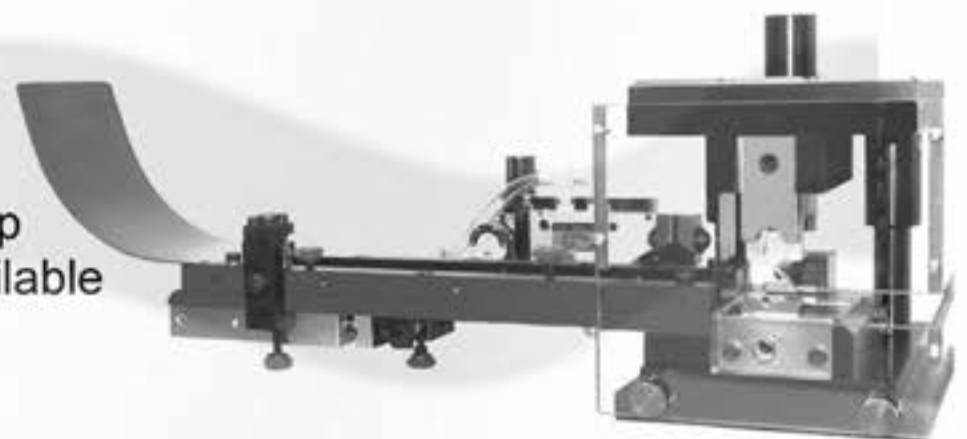


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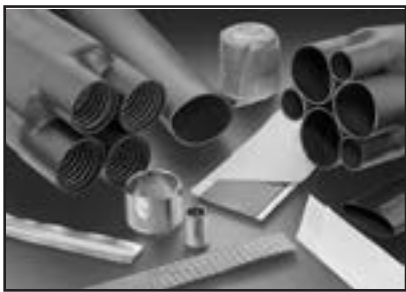
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NEWS PLUGS

TE Connectivity's Marine High-Voltage Termination and Splice Kits Help Ensure Maintenance-Free Long Life

TE Connectivity (TE) debuts new marine high-voltage termination and splice kit products that provide a safe, simple and secure way to terminate both water and non-water blocked cables rated up to 15 kV. These new kits have been designed to be watertight and feature non-tracking insulation with a revolutionary new electrical stress control system. In addition, the kits assist in ensuring maintenance-free long life, even in highly contaminated areas.

"We offer both heat-applied and cold-applied products to help withstand in a variety of hostile environments," said Terry Huston, Field



**Marine High-Voltage
Termination and Splice Kits**

Application Engineer, TE Connectivity, Global Aerospace, Defense & Marine. "The heat-applied products offer excellent abrasion protection as well as sealing that meets and exceeds the leakage requirements of Mil 24640. The cold-applied products offer flexibility and ease of installation inside cabinets and close-quarter environments."

The installation procedure for the marine kits is streamlined, making them ideal for a broad range of applications, including commercial and military marine high-voltage cables. The marine high-voltage kits offer mechanical strength, watertight sealing and the ability to withstand extreme environments.

A wide variety of marine high-voltage kits are available, including:

MHHT: Heat-Shrinkable Terminations with Built-In Stress Control, seals equivalent to MIL-STD 24640

MHHS: Heat Shrink In-Line Splices for Shielded Cable (0-15 kV)

MHCS: In-Line Cold-Applied Splice for Marine Cables (0-15 kV)

MHCT: Cold-Applied Terminations for Shielded and Non-Shielded Marine Power Cables (0-15 kV)

These kits contain all the components required to terminate or splice marine cables. They have been designed and tested to IEEE-48 and IEEE-404 standards. They provide excellent environmental sealing, excellent electrical stress control and easy-to-follow installation instructions.

For more information on TE's marine high voltage kits, visit www.te.com/offshore or contact the Product Information Center at 1-800-522-6752.

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BURNDY Expands Offering with the PATHCC10 (battery) and RHCC10 (remote) C-Head Cutter Series

The unique C-Head tool allows users to simply scoop and cut without the need to open and close a latch, making cutting easier in a variety of applications.

The PATHCC10 and RHCC10 Series of cutters are available with four (4) individually designed blades enabling users to optimize the cutting of the intended cable type with ease and effectiveness. A variety of options are offered including order-



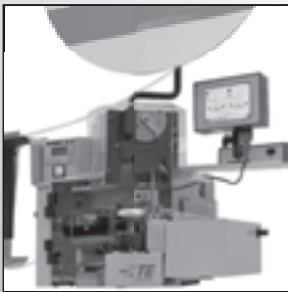
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ing the tools with all blades or specific blades only.

The PATHCC10 is a self-contained battery operated cutting tool (18 Volt Ni-MH) and the RHCC10 is a remote power operated hydraulic cutter (10,000 psi). Both platforms also have covered head versions available.

The PATHCC10 and RHCC10 cutting tools have blade alignment technology ensuring a clean cut and maximum blade life. The interchangeable blade feature allows you to customize either style to best suit your specific cutting needs.

For further information contact Burndy, 47 E. Industrial Park Dr, Manchester, NH, 03109 Phone Customer Service at (800) 346-4175, or visit website www.BURNDY.com

Zeus Announces Website Now Available in Japanese

Zeus, a global leader in material science and high-performance polymer extrusions, announced today that its website is now available in Japanese, adding to its availability in English and German. In addition to having its entire site available in three languages, Zeus offers general company information in French, Chinese, Spanish and Italian. The company also has a catalog available in several languages, international facilities and offices, bilingual representatives and modified customer support hours to better accommodate partners outside of the U.S. “Zeus has always been committed to making our exceptional products available to customers world-wide,” said Alan Andrews, Senior Vice President of Global Sales and Marketing. “Having our entire website available in Japanese will help us better reach the growing Asian market and continue to meet the needs of our customers there.” Equipped with all the same enhancements as the English version, the new translated website is available by clicking the Japanese Flag icon at the top right corner of the company’s home-page. The website continues to be a resource for comprehensive information on Zeus products as well as its analytical, research and development services.

Headquartered in Orangeburg, S.C., Zeus is a world leader in material science and the production of high-performance polymer tubing used in demanding applications; operating multiple facilities in North America and internationally. Zeus products and services are preferred by companies

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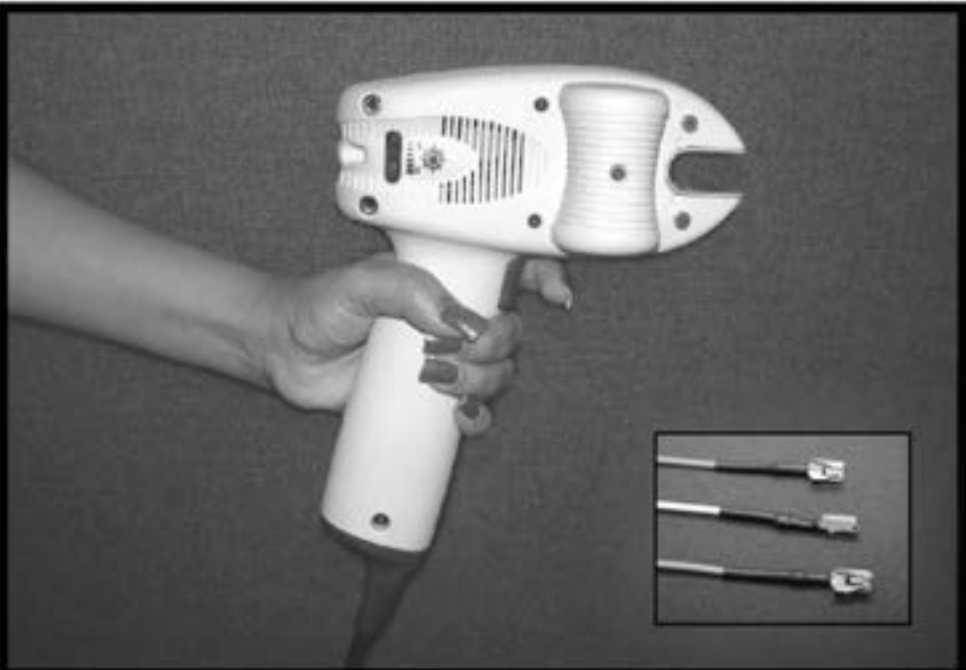


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In every issue of Wiring Harness News Anixter will bring you informative articles about wire and cable technology.

Capitalizing on PVC Scrap Recycling

There is one constant with industrial activity: it generates waste, and lots of it. This is especially true when manufacturing high-volume cable assemblies. Although the metals used in cable assemblies are easy to dispose via recycling and are in high demand, what happens with the leftover insulation or jacket materials, such as PVC?

Scraping the Scrap

Currently, the majority of PVC waste ends up in a landfill. However, these landfills do not solve the PVC disposal dilemma. PVC scrap can damage infrastructure, pollute the local environment (such as contamination of groundwater or aquifers), or create bothersome problems such as dust, odor, or noise pollution. Many users of cable assemblies feel that landfills are an undesirable way of discarding scrap.

Why Recycle?

PVC is recyclable and provides an outstanding long-term solution for waste management. In fact, PVC is the second

most commonly used plastic after polyethylene. Recycling PVC can reduce the amount of virgin PVC manufactured, which reduces its environmental footprint. Furthermore, the recycling process uses only half the primary energy (54 percent) to process the original PVC and emits only 39 percent of the greenhouse gases. Hence, it results in a significantly lower global warming potential. Starting a recycling program is not only helpful for the environment, but also for businesses. Many companies will buy PVC scrap or exchange materials, which reduces cost. In the United States, free disposal services to recycle PVC are available and about 25 states offer tax credits for recycling market development. Finally, recognition of recycling is a huge benefit for companies both small and large as there has been a surge in consumers buying more “green” products. By going green, improved public image, new markets and improved employee morale are all possible.

Where To Start

To recycle, contact your local public works department to determine if it



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PVC is recyclable and provides an outstanding long-term solution for waste management.

accepts PVC plastics for recycling. If so, you'll need to know whether the PVC can be collected curbside or whether it has to be dropped off at the recycling center. This information may also be available on your town's website.

In addition to the public works department, recycling facilities across North America accept both post-consumer and post-industrial PVC scrap. A database of PVC vinyl recyclers and companies manufacturing products from recycled vinyl is available at vinylinfo.org/recycling/directory/.

Case Study

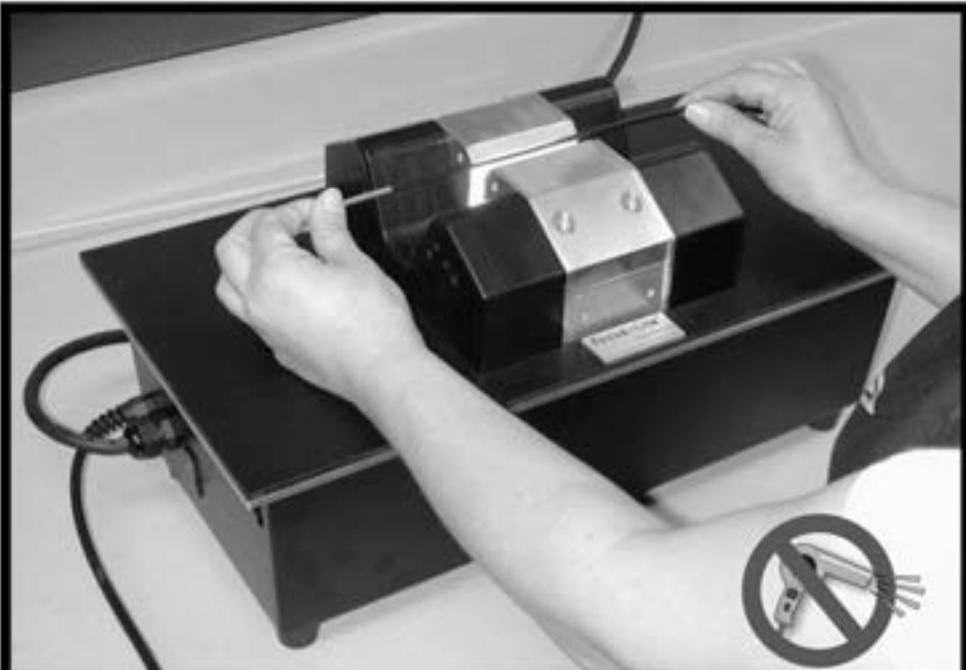
In one example of a successful PVC recycling program, a plastic recycling

company helped a manufacturer process its PVC cutoffs. These cutoffs have very little market value, and disposal costs were estimated at \$0.03-\$0.05/lb. The recycling company was able to recover 95 percent of the PVC metal-free, so the manufacturer could sell it at \$0.30/lb.

The manufacturer also reprocessed the recycled PVC and even further reduced costs instead of purchasing new virgin material.¹

For more information, contact your local Anixter sales representative at 1.800.ANIXTER.

¹ "Window Profiles & Lineals: Metal Is Not An Issue." Web. 7 Jan 2013.



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FreePoint Solutions

Continued from page 1 _____ could be used to measure manually operated equipment, such as stand alone crimping stations, ultra sonic weld stations, heat shrink operations, taping operations, etc. It was through experimentation at St. Clair that Paul and Randy formed a new company called FreePoint Technologies, Inc. They recently spoke with *Wiring Harness News* about their new venture in detail.

FreePoint is marketing low cost, modular, wireless communication systems that it calls FreePoint I/O Solutions. At the base level, these wireless I/O devices can be fitted to actuators on discrete, manually operated equipment. The devices can be set up to capture cycle times and other relevant production metrics that could never be tracked before. “What we’ve been able to do,” Randy explained, “is provide an inexpensive,



Fig. 1 - A BRAVA module retrofitted to the base of a typical holder.

wireless data gathering I/O, and a nice way to put the data in a collection network.” With FreePoint connection, Randy noted, managers no longer have to wait until the end of day or shift to know what happened in a specific process.

Of major importance to Paul and Randy is that, with the FreePoint system, information can be collected in an open format. “When Randy first showed me a demonstration of their innovative ring out test systems,” Paul explained, “what

immediately caught my attention was that it was an open architecture design based on proven industry standard protocols.” This means that the data can be placed in simple spreadsheets, or can be easily collated exported to existing ERP or other data management software.

Continued on page 30

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MEASURE/CUT/STRIP >> CRIMPING >> HOOK-UP WIRE STRIPPING >> MATERIAL CUTTING



Industry Problem

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

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

Industry Solution

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

The technology allows the components to benefit in being:

- | | |
|-----------------------------------|-----------------------------------|
| 100% Sealed Throughout the Part | No Cosmetic Change |
| No Dimensional Change | Temperature Resistant Up To 232°C |
| Hydrocarbon Fuel Resistant | Solvent Resistant |
| Component Flexibility Is Retained | Solderable |
| No Effects On Conductivity | Elimination of Potting Compounds |



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FreePoint Solutions

Continued from page 28

FreePoint BRAVA

Without doubt, the biggest nugget of information in a harness facility is in the assembly areas. This was the area St. Clair first sought to streamline with wireless I/O devices. It is where the new compa-

ny took FreePoint to the next level they call BRAVA (Build, Report, Adapt and Verify Aid.) With BRAVA, the I/O devices were installed on the holders of the test fixtures (shown in Fig 1, page 28) and the board is tilted forward. A custom software (BRAVA) was written as an assembly aid for manufacturing as well as well as for quality assurance and productivity improvement. In keeping with their insistence on an open architecture platform, Paul and Randy insisted BRAVA port seamlessly to industry standard PCs or tablets.

“The result,” Paul noted, “is a very simple fixture, free of all the extraneous wiring and connection boxes, but now equipped with a friendly and intuitive user interface, and a powerful visual assem-



Mike Foster inspecting a harness assembly fixture equipped with BRAVA.

Continued on page 32

ShinMaywa (America) Ltd - Booth #1407
HellermannTyton - Booth #1303

Creating Solution Advantages "Gentle to the wire and Operators"

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New Generation Wire Terminating Machine with Great Variety of Advanced Functions (24-14 AWG)
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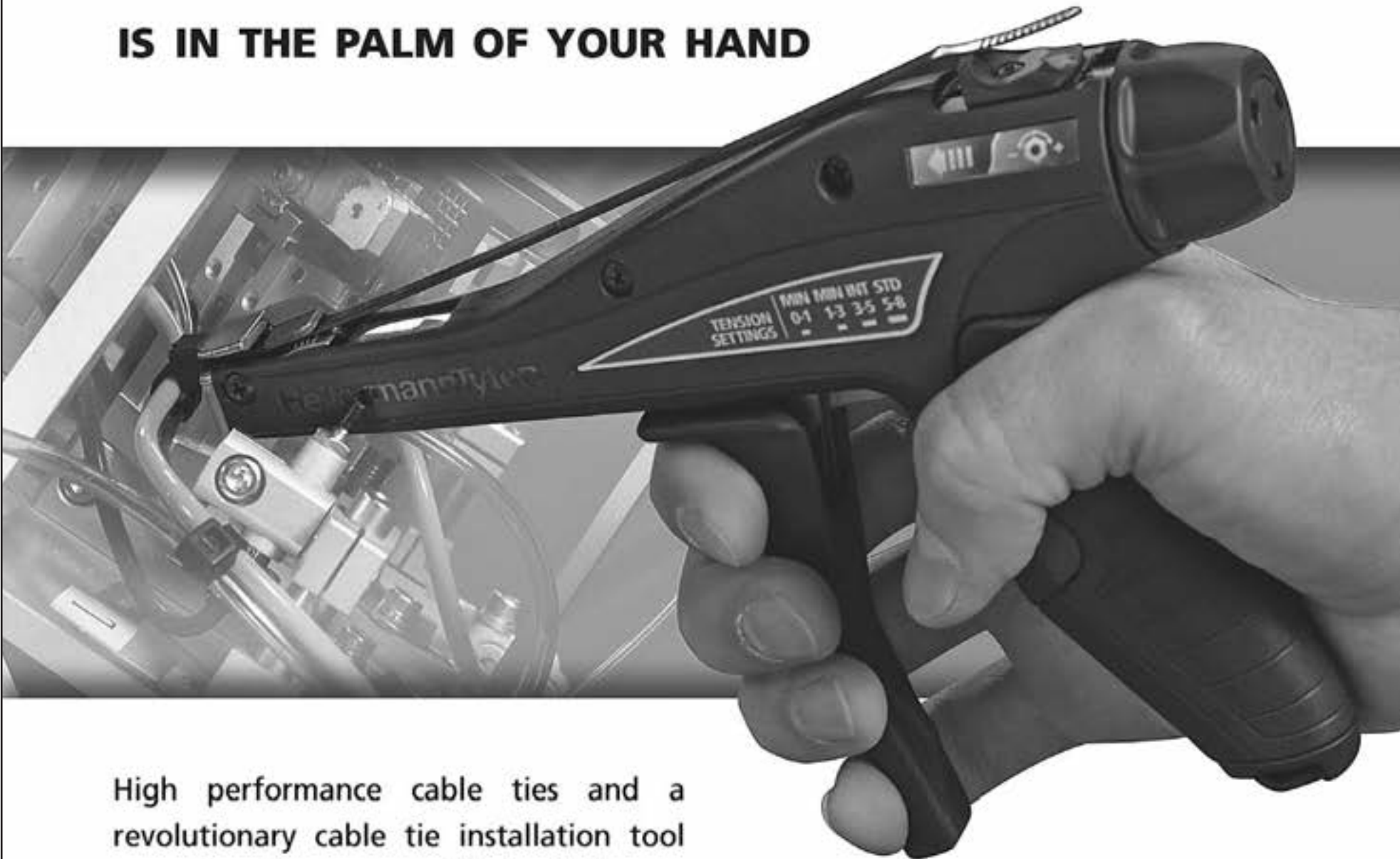
TR201 Series
High Precision Crimping for Small and smart Wire Gauges 36-18 AWG
Both twisting / tinning and crimping can be changeable with quick change (TR201SS). Lead-free and regular tinning can be handled with the tinning unit.

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.

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EVO7

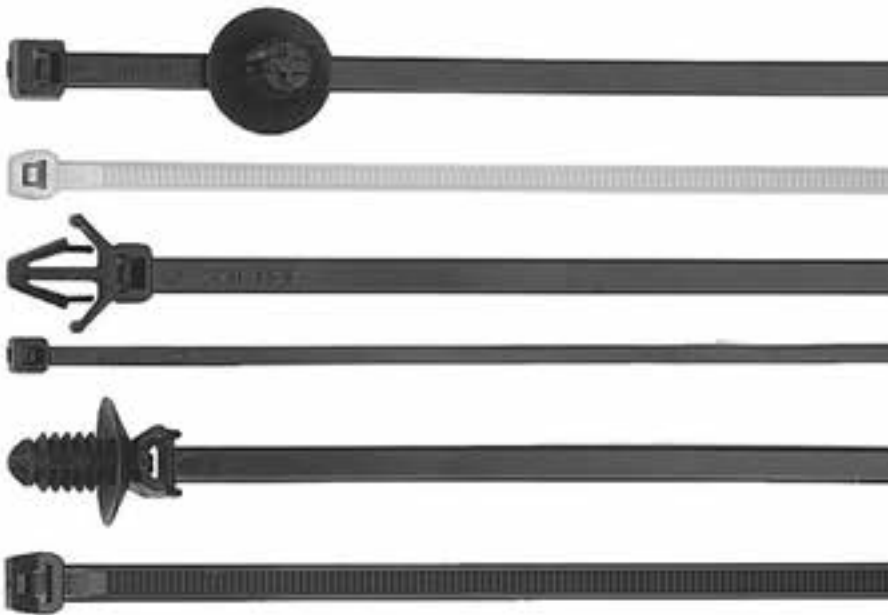
ERGONOMICS

HellermannTyton's EVO 7 offers the most ergonomic cable tie installation tool in the market. Period. Comfort and operability are combined in one revolutionary tool.

PERFORMANCE

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TENSION • LOCK • CUT



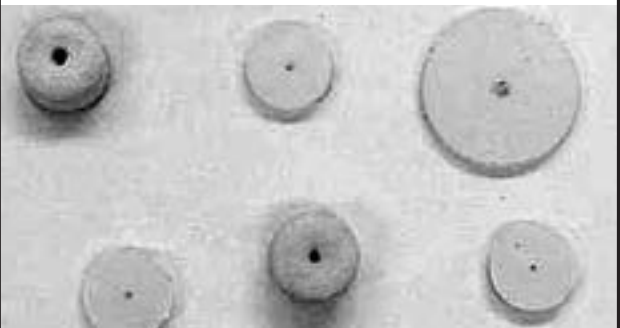
HellermannTyton is globally recognized for manufacturing a full line of high quality cable ties and fastening systems. Manufactured in the USA, the EVO 7 cable tie tool and HellermannTyton's cable ties together produce bundling and fastening systems of unparalleled quality. Learn more about HellermannTyton at:

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FreePoint Solutions

Continued from page 30

bly aid." But the biggest advantage, Randy noted, was BRAVA's flexibility. "Design changes to the wire harness, or even completely new designs, can be accommodated very easily—almost automatically." This seamless connection from the design to the assembly and test station assures the end customer that every harness produced is built and tested according their design criteria.

Irrevocable Corrective Actions

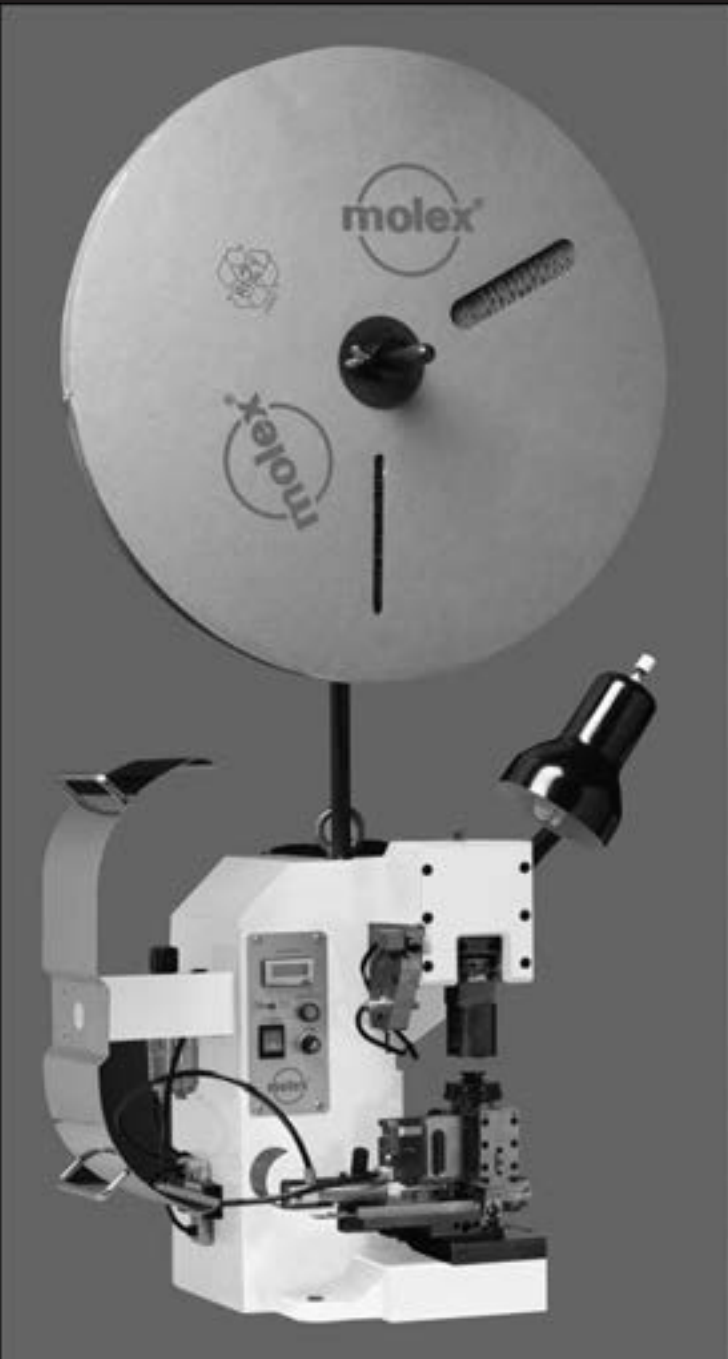
Shortly after starting the new company, Randy and Paul sought the advice and input from respected people throughout the industry. One of the first people they contacted was Jim Miller, recently retired from a long and successful career. Jim saw additional opportunities for the FreePoint products, and explains that "when a customer experiences a quality problem, they are naturally unhappy and want to be assured that the issue has been

irreversibly fixed. Often the only corrective action that the supplier can offer is to increase inspection, add identifying marks, or re-enforce training. All of these actions are costly and only marginally effective solutions. What I saw in FreePoint and BRAVA changes that paradigm".

Mike Foster was another seasoned veteran of the wire harness industry that Randy and Paul contacted. For many years, Randy had counted on his skill and experience and his "outside-of-the-box" thinking. "What I really liked about the product" Mike explains, "is that it can connect to a wide variety of standard sensors, and would be very easy to add to pretty much every machine, including manual machines, regardless of the age or sophistication of the machine."



Heilind Electronics - Booth #1707



The **TM-4000™ Universal Crimp Press** is an industry-standard, bench-top press that terminates large lug products on Mylar tape up to 4 AWG insulated and some 2 AWG uninsulated, resulting in lower overall applied costs. The TM-4000™ has electrical requirements of 240 AC 50/60Hz.

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Features and Benefits of the TM-4000™ Universal Crimp Press Include:

- Provides 3.5 tons (31 kN) of crimp force
- Accepts any Molex applicator and most industry-standard applicators
- Can be used with Molex Tape Module (64016-2000)
- Meets OSHA safety and noise requirements and is CE approved
- Two safety interlock switches attached to the guard prevent press from cycling if guard is open during operation

The **Tape-Terminal Crimp Module** efficiently crimps terminals to wires from 4 to 30 AWG with minimal setup adjustments and achieves optimal cycle rates for mid-to-high volume, semi-automatic operations.

Features and Benefits of the Tape Terminal Crimp Module Include:

- Quick-change modular tooling accepts all existing ATP-201 and ATP-301 die sets
- Used in Molex TM-3000™ and TM-4000™ presses, which accept Molex applicators and most industry standard applicators
- Independent adjustment of insulation crimp height provides flexibility for various wire insulation thicknesses
- Quick tool changeover from die set to die set for increased productivity



one company > a world of innovation

The 30,000 Ft. level

Even with the greatly enhanced amount of information now available to the harness manufacturer, Paul and Randy saw a need to capstone this newfound information, along with all manufacturing data, in a more cohesive manner. The duo entered into a strategic relationship with "10in6", a London based company founded by Dennis Cocco that develops production reporting and management software. "What really excited me about the FreePoint I/O Solutions," Dennis presented, "was that it was now possible to collect this type of information from all the manual processes and small machines as well, not just from the expensive automated machines." Dennis has seen information black holes in every facility he has visited and views FreePoint as the conduit to monitoring those areas.

FreePoint I/O Solutions, coupled with "10in 6" software (or other available production management software), advised Paul, can drill down to look at individual processes; or determine how the whole plant is doing against scheduled production. "The goal," Paul stated, "was to gather previously unavailable information at the FreePoint I/O level, combine that with critical assemblies information at the BRAVA level, and then provide all of that information up through the corporation in one cohesive open architecture, open protocol platform." Both Paul and Randy

were emphatic towards developing a system specific to the wire harness industry with open protocols so manufacturers can "plug into it where and when they need to, from the individual operator up to the executive dashboard." If the customer wants to develop their own production measurement or analysis utilities, that's fine too.

Paul and Randy see FreePoint I/O Solutions, BRAVA Solutions, and software such as 10in6, as products and solutions designed to make the manufacturers more competitive by giving manufacturers in the wire harness industry better information tools; better harness build information and validation, and better productivity measurement and reporting at top levels. Paul summed up the benefits with this quote:

"Productivity is improved on the plant floor and scrap is reduced. Plant capacity and efficiency is measured in real-time and constraints are easily identified so they can be corrected immediately. Set-up times are reduced, fixture storage space is eliminated, and engineering changes are easily accommodated. Plant and corporate managers can now determine their OEE, including all of those black holes, to determine how a facility performs relative to designed capacity."

Measurement Tools

The key to continuous improvement is measurement. Without having measurements in hand, plant managers have no real way of knowing where the most effective areas for improvements are. And without having continuous measurement in "real-time", they have to rely on old information to know whether or not a production or improvement objective was met, and by that time it's too late; the shift is over and the production time is lost. "This is what I think makes FreePoint so valuable", Jim states, "not only is manually recorded data 'old news', most of the time it's completely inaccurate. You can't make informed decisions with manual data."

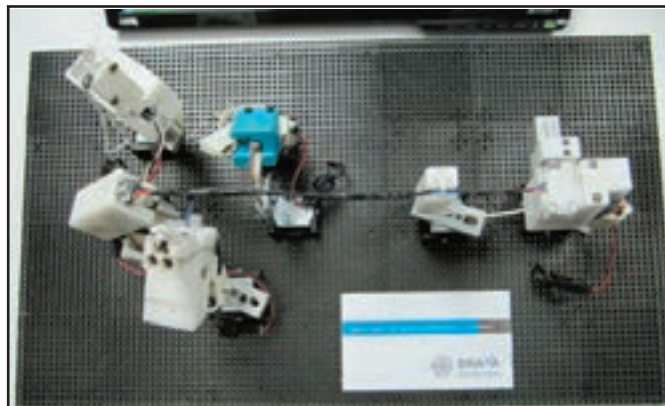
Industry has long recognized that measurement is critical to success. "What we are doing different" Randy explains, "is that with FreePoint and BRAVA, we are allowing for granular measurement, to be collected automatically, in real-time." Granular meas-

urement means not just measuring the output of the entire process, but measuring all the critical steps and processes within it.

Every manufacturing facility is a unique facility, with unique challenges and opportunities. Leveraging decades of industry experience, and the power and flexibility of new technology, FreePoint's I/O

Solutions have been designed to be practical and cost effective tools aimed at helping wire harness manufacturers remain competitive in a very competitive world.

FreePoint Technologies will be exhibiting at the Electrical Wire Processing Expo, in booth #1348. For further information visit www.freepointtech.co.



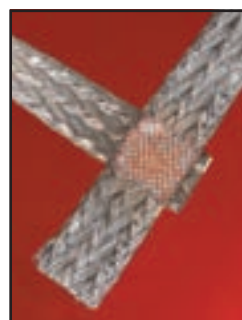
A harness build and test fixture equipped with BRAVA

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Sonobond ultrasonic welders can handle even your toughest wire welding challenges.

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Our ultrasonic welders are quality engineered to take on the most difficult metal welding applications. Consider these heavy-weight advantages that only Sonobond can offer...



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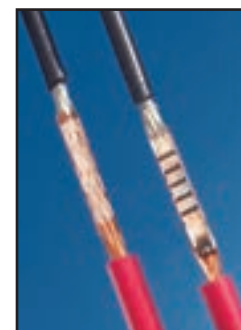
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We are so confident that our welders can deliver a quick one-two punch to your toughest application that we encourage you to put us to the test.

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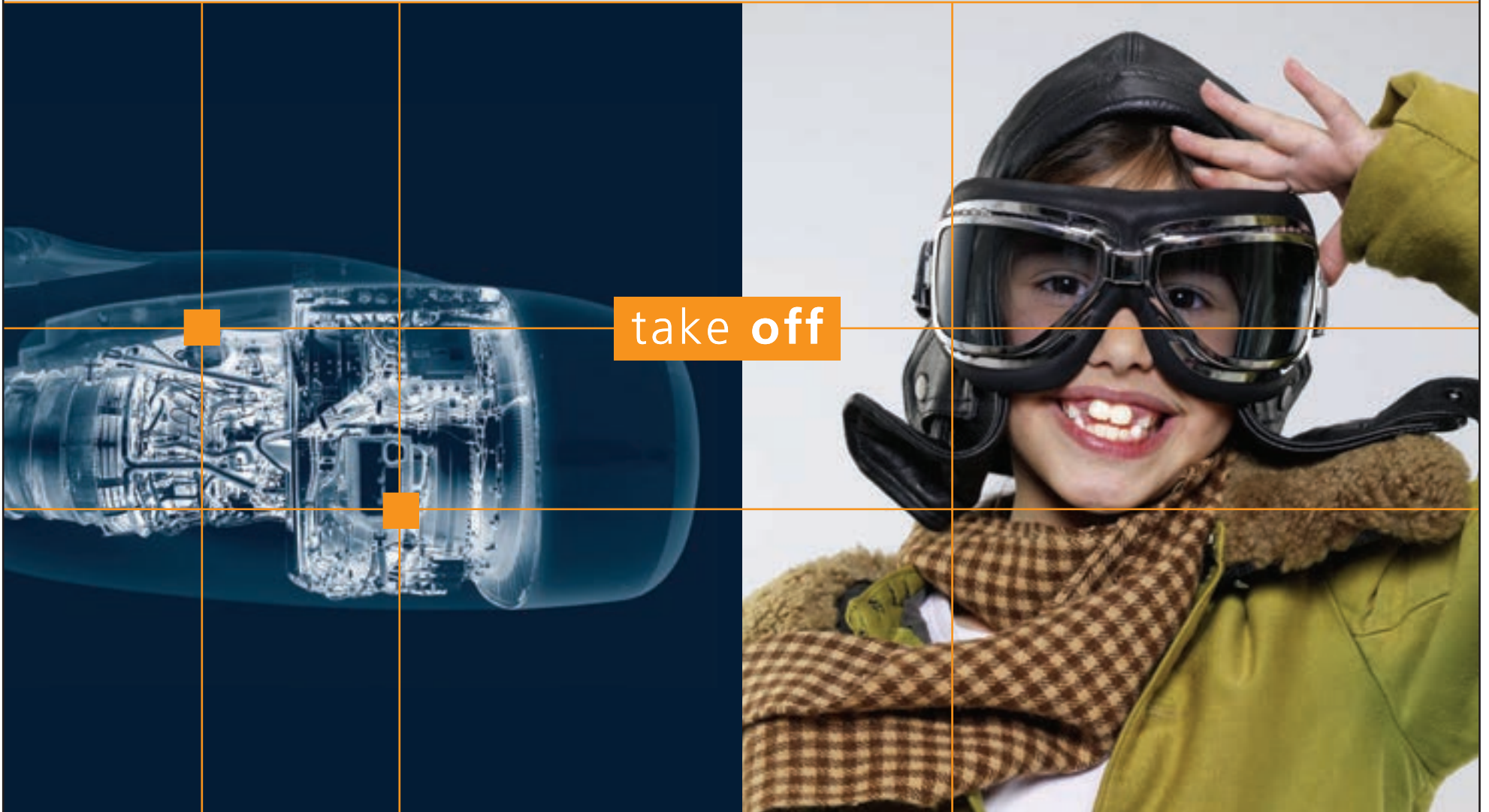
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The **PowerStrip 9550** modular cut and strip machine is available in four basic configurations and combines the utmost in precision and performance to cover a wide range of wire processing applications. Shielded cable and complex multi-conductor applications can be processed in one automated operation. All processing and functional modules can be retrofitted at a later date, making the **PowerStrip 9550** a future-proof investment.

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- Measures, cuts and strips up to 2/0 AWG and jacketed cables up to 0.63" in diameter
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Special Features

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Professional Force Gauges Series 7

Mark-10 introduces their all new Series 7 digital force gauges, designed with a number of sophisticated features for the most demanding tension and compression measurement applications up to 500 lbf (2,500 N). The gauges feature $\pm 0.1\%$ accuracy and a blazingly fast, industry-leading sampling rate of 14,000 Hz, pro-

ducing reliable results for extremely quick-action tests. A range of capacities from 0.12 to 500 lbf (0.5 to 2500 N) is available to address numerous applications in virtually every industry, including medical device, pharmaceutical, packaging, consumer products, automotive, aerospace, and others.

Series 7 gauges feature high speed continuous data capture and storage, with memory for up to 5,000 readings, at an acquisition rate of up to 14,000 Hz – eliminating the need for data acquisition hardware and software.

The gauges also feature a uniquely programmable footswitch command string, break detection, and 1st / 2nd peak detection. For productivity enhancement, the gauges can automatically output data, store data, zero the display, and stop a Mark-10 motorized test stand upon the completion of several event types. A coefficient of friction unit of measurement is provided, as well as a user-defined unit of measurement for special applications.

Series 7 gauges are supplied in a cushioned carrying case with AC adapter, rechargeable battery, set of common attachments, USB cable, resource CD, certificate of calibration, and user's guide. The gauges are compatible with Mark-10 test stands, grips, and software.

For further information contact Mark-10 Corp., 11 Dixon Ave, Copiague, NY 11726. Phone (631) 842-9200 or Fax (631) 842-9201. Visit www.mark-10.com or email info@mark-10.com



Series 7 Force Gauge

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Pin-Sight is a revolutionary tool for building quality into cable and harness assemblies. Pin-Sight guides the assembler in real-time on the monitor, to insert the correct wires into the correct cavity. Field tests show throughput increases of 10-15% for skilled operators and up to 50% for new operators. Pin-Sight helps you deliver better quality cables and harnesses in less time by eliminating the need to troubleshoot and re-work cables that fail final electrical tests. The best thing of all is Pin-Sight requires no mating connectors or fixtures.

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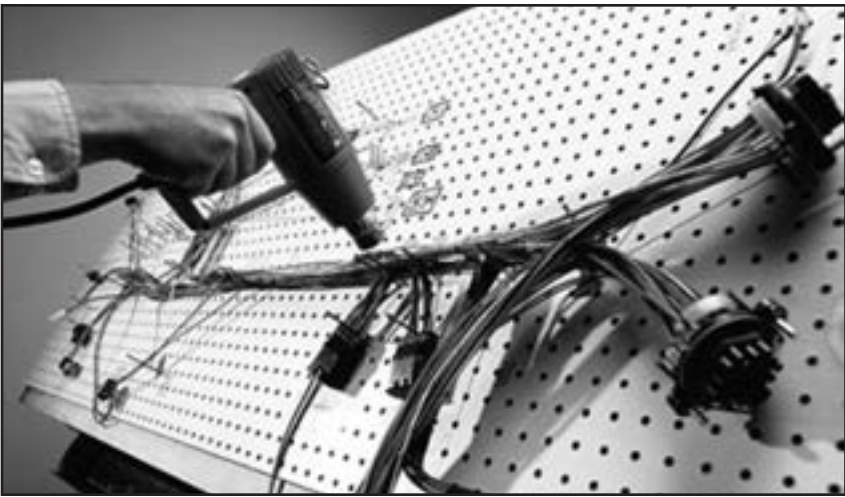


Pro-Line - Booth #1835
Heilind Electronics - Booth #1707

Insure Your Wire Harness with Heat Shrink Tubing

It's amazing how often heat shrink tubing is used as a last resort in wire harnesses for repair of unexpected issues. What's even more amazing is that the same issues keep coming up. If you have found yourself in this situation in the past and scrambling to find heat shrink to fit your unique requirements, maybe it's time to start specifying heat shrink tubing into your design upfront. This will give you greater control over choosing the product that best fits the application - which will save you time, money, and ultimately improve the overall quality and workmanship of your harness.

The automotive industry has readily adopted front-end design of heat shrink into harnesses for many



years. As a result, the automotive harness operations processes are incredibly efficient and produce a very high quality product. DSG-Canusa has been supplying heat shrink tubing and heating appliances to the automotive harness

industry for many years, and sees opportunity for other wire harness designers and fabricators to benefit from a similar approach.

Within every wire harness there are several critical areas in terms of the construction and design of the wire harness. Consider adding heat shrink tubing to your design in these identified, critical areas.

Cable-Connector Interfaces

Whether it's a connector termination with a single wire or 30 wires, DSG-Canusa's heat shrink tubing is a cost effective insurance policy to ensure that your cables stay properly seated within the connector assembly.

One of the most common applications for heat shrink tubing is strain relief. In most applications, wires are subject to regular flexing. By adding heat shrink tubing, you are distributing the forces over a larger surface area, resulting in less direct force on the wires. Heavier wall thicknesses of heat shrink tubing can also increase the rigidity of the cable, which can have desirable benefits depending on your application.

DSG-Canusa heat shrink tubing can be supplied in thin wall or thick (heavy) wall options. As you increase the wall thickness of your heat shrink, you also increase the rigidity. Single wall tubing (without adhesive or glue) can provide excellent strain relief and abrasion resistance to protect your cable/connector interfaces. Dual wall tubing (with adhesive or glue) provides additional protection for complete moisture or dust protection to your cable/connector configuration.



The "quick take-up" terminal retention feature



The Ram Retract Safety Button



BT 3500 Battery-Hydraulic Hand Tool

More Than a Ton of Portable Power in a 1.4 Pound Hand Tool

The BT 3500 Battery-Hydraulic Hand Tool is designed to provide the ultimate in flexibility, modularity, and powered efficiency in a lightweight, ergonomic, powerful crimp unit. It's compatible with SDE dies, CERTI-CRIMP II, Double Action, Large Die C and Heavy Heads, using the appropriate adapters.

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

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

We are now accepting orders for the BT 3500 Battery-Hydraulic Hand Tool.

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Easy portability and use with the harness, strap and belt accessories.



BT 3500 Port with multiple storage pockets.

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TE connectivity
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In addition to standard heat shrink products, which can be supplied in a variety of colors and with shrink ratios up to 6:1, DSG-Canusa is committed to working with customers on innovative solutions. A great example of this is our new dBShrink product line that is designed to provide EMI/RFI absorption and strain relief for your critical communication systems. With up to 13dB of attenuation, you are able to cut the power level of unwanted interference signals by up to 90%. The heat shrinkable tube combines excellent physical protection and a space saving design with electromagnetic properties to neatly seal junctions and connector interfaces.

Protect Cable Jackets from Damage
The most common repair application for heat shrink tubing is cable insulation breaks or tears. Heat shrink is applied to provide abrasion protection and electrical insulation to the damaged cable. The difficulty with these repair operations is that you typically need a high shrink ratio product to fit over extra rigid connectors. As a designer or installer, it would be worthwhile to consider designing in thin wall heat shrink up front to avoid potential issues from abrasion cuts during normal handling of the product. You do not need to cover the whole length; you can simply choose the section that is most vulnerable to extra physical contact.

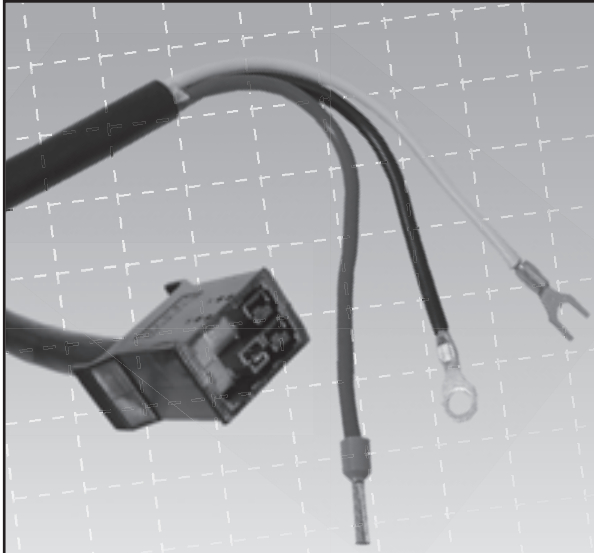


Exposure to Extreme Temperatures
Some applications require wire harnesses to come in close contact with very hot or cold temperature sources. Whether it's just a short section of exposure, or the entire length of cable, heat shrink tubing is an excellent product to protect your wire harness from harsh conditions. Our high temperature non-polyolefin products can provide excellent flexible protection from heat sources up to constant operating temperatures of 220 degrees Celsius.
If your application requires contact with low temperatures or harmful chemicals, consider using our CNP200 product, which has excellent cold bend

flexibility (up to -70 °C) and resistance to harsh chemicals.
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Affiliated Products

Continued from page 1

of Waukesha. It also was the first location of Capital Electric Wire & Cable, a distribution company he founded in 1978 and operated until his retirement in 1994. The firm eventually moved to its present location in Pewaukee.

"When I was first hired I didn't even know what a wiring harness was," Kruger said. "The company only had six employees then, so I did a lot of every-

thing, from buying parts to hiring people."

In the mid-1990s Kruger began focusing on sales, which he still does. He handles all the key accounts, manages the two manufacturers rep firms used by AP, attends trade shows and does estimating. "I enjoy selling, and I'm a good people person," he said. "By using my sales skill it's nice to watch the company grow because it is sales-driven."

Continued on page 42



Lisa Loehrke operates one of the wire processing machines at Affiliated Products.



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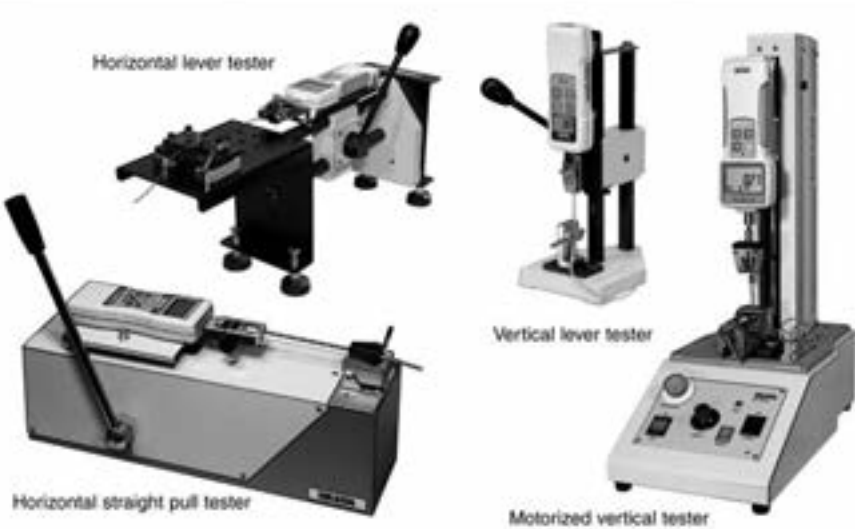
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Affiliated Products

Continued from page 40

Schlueter was hired by Harpster in 1990 as general manager. The previous 17 years Schlueter was in purchasing, and he used his business experience and expertise to upgrade AP systems for computerization, a quality program and part numbering.

Five years ago Schlueter moved to Bradenton, Fla., and entered semiretirement, so day-to-day operations are man-

aged by Kruger and Orlando. "He is very hands on even though he is 1,500 miles away," Kruger said. "We are on line with him every day so he is not left out of the loop."

In addition to preparing monthly and annual budgets, Schlueter travels to Mayville four times a year to meet with Kruger and Orlando. They talk about sales, finances, equipment needs and other aspects of the company.

Orlando was the administrative VP prior to being named executive VP five years ago. She handles accounting, human resources and purchasing; oversees customer service; and meets regularly with managers and departments.

"I really have my fingers in everything except sales," Orlando said. "I'm very involved with customer service and customer accounts and work with the plant manager on scheduling."

Before AP, Orlando held several office positions. First was eight years with a distributor of laundry and dry-cleaning products, second was another eight years with a tool-and-die shop, and third



Brenda Vis, Affiliated Products QA Manager.

Continued on page 44



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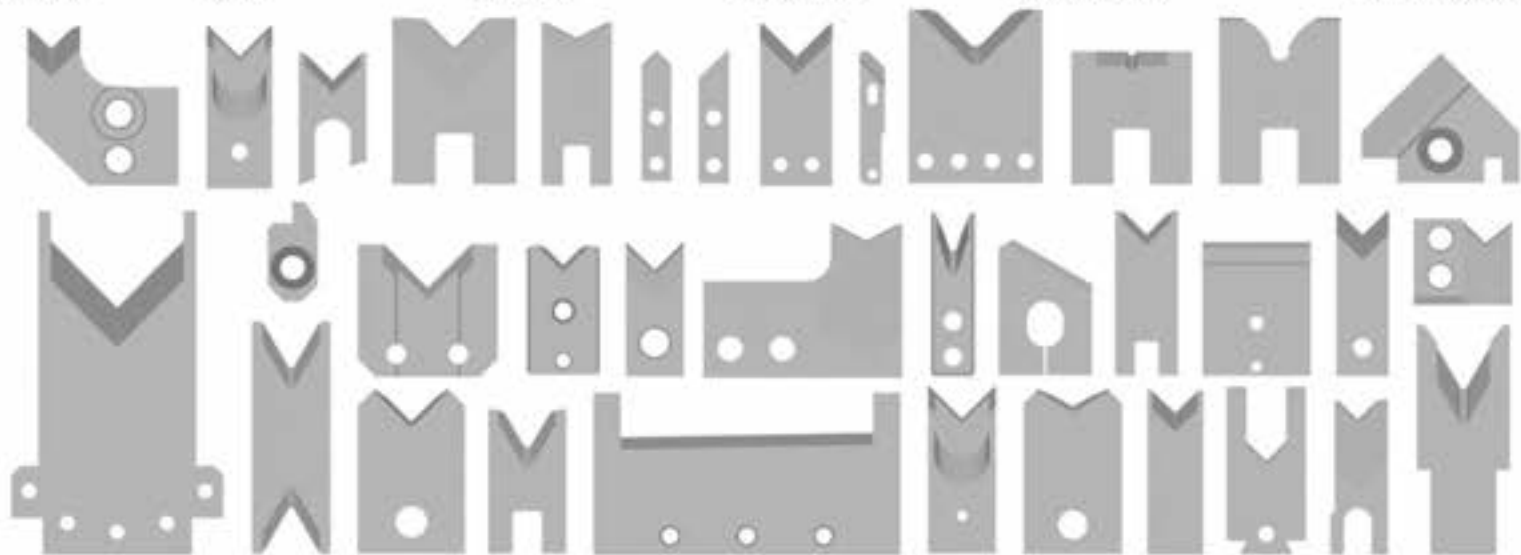
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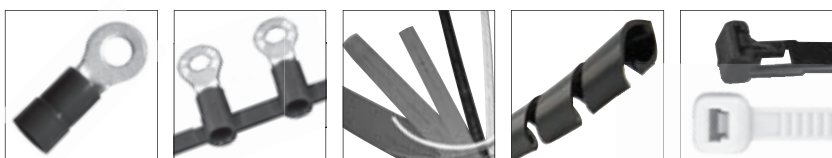
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Affiliated Products

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was almost five years with a chemical manufacturer.

Further proof of company solidity is the second leadership level. It consists of: Brenda Vis, quality manager, 11 years; Daniel Arca, production manager, 16 years; Connie Sitas, customer service rep, 14 years; Jami Guenther, accounting assistant, 13 years; Becky Tyler, buyer, 15 years; Carrie Greeves, estimator, 12 years; Dan Bartsch, estimator, 10 years; and Levi Arndt, production technician, six years.

"Except for Jami, all of them started at the bottom in other jobs and moved up," Orlando said. They average 11½ years, so all have the same mindset about the company.

The AP staff totals 53, all working on one shift. Fifteen are in management and administration and the balance of 38 in production. The total has increased 30 percent the last three years. More employees will be added this year as AP grows.

Kruger estimated sales growth at 10 percent in 2013, improving to approximately \$6.5 million. He said AP grew 35 percent in 2010-12. "Ten percent a year

is a manageable number for us," he said. "We continue to strive for incremental, steady and sustainable growth. We're optimistic about this year based on the information from our customers and the projected revenue.

"We don't chase most large OEMs," Kruger said. "We go for the mid-tier business, the smaller OEMs. They provide a better opportunity for us, and there are more of them."

AP, which gained ISO 9001:2008 certification in 2006, did not escape the ravages of the Great Recession, according to Kruger. "2009 was a real eye-opener when we had a short-term but severe slowdown," he said. "We became a different company – smarter, leaner and more efficient."

One major aspect of that transformation is conversion to cell manufacturing, part of an ongoing continuous-improvement program. The changeover began last August and is nearing completion.

"We needed a more efficient work flow, so there are three production cells now instead of different departments and 45 work centers," Orlando said. "We have had excellent results. Shop efficiency has not been under 100 percent for seven consecutive months."



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Changing the plant layout was recommended by production workers because “they are the ones doing it every day,” Kruger said. “Sue and I have a very open-door policy. We meet with everyone once a quarter and share all the numbers – financials, payables, receivables, downtime, rework and overall shop efficiency. They have opportunities to ask questions and make suggestions then and through leads and supervisors at meetings.” Employees are updated weekly by white-board postings of numbers of parts shipped and invoiced.

Employees are compensated with current-market wages and conventional benefits, including health, dental and life insurance. Assemblers participate in a bonus program in which they receive additional hourly wages of 50 cents for exceeding attendance, quality and individual efficiency standards by 110 percent. For 120 percent the bonus is \$1 per hour.

Tickets with employee check are put into a quarterly drawing that awards a day off work with pay. Drawings at Christmas reward winners with \$1,000, \$500 and trips to Jamaica and Florida.

Lay-offs occurred in 2009. The remaining workers have elevated production levels. “We keep throwing more at them, and they surprise us by doing a lot more,” Kruger said. “The same number of people are getting it done. Everybody knows their job well and stays focused on the task at hand.”

The current staff is a contrast from the early 2000s when approximately 85 worked on two shifts. “We had one customer that was 35 percent of our business and was high volume but low profit,” Kruger said. “That was very difficult, and we eventually got out of it.”

“We know what type of work fits into our facility, and not everything is a fit,” Kruger said. “We learned lessons along the way. We could secure \$1 million in a new harness customer, but if it has low margins, a demanding purchasing department and a difficult shipping schedule, it’s not good.”

Production consists of 60 percent harnesses, 30 percent cable assemblies and 10 percent electro-mechanical assemblies (EMAs). Runs are from one to 3,000, with 100-250 average.

A harness can have between two and 600 wires, be up to 30-plus feet long and cost between a few cents and \$5,000. Cables with 4-50 conductors can be up to 200-plus

feet long. EMAs range from a simple toggle-switch assembly to multiport control panels with 20 knobs.

The work is done in a 22,000-square-foot building constructed new in 1998. The previous AP locations were 12,000 square feet and 6,000 square feet, respectively, in Waukesha following the garage start-up. The move to Mayville put AP closer to its customers and a better labor pool.

AP has nearly 100 customers located primarily within 50 miles of Mayville and throughout the Midwest. Others are in California, Connecticut, Florida and on both coasts.

Customers produce commercial lawnmowers, transmission systems for oil and natural gas fracking rigs, railway maintenance equipment, agricultural equipment, heavy trucks, fire trucks, security systems, laboratory equipment and analytical instruments.

Seven of AP’s top 10 customers have been with the company more than 15 years. The top two started 24 and 22 years ago. All customers receive products built according to applicable A-620, CSA and UL guidelines. Included in production processes are pieces of equipment from Amphenol, Artos, Cannon, Carpenter, Cirris, Deutsch, Kingsley, Koder, Komax, Kut-Rite, Molex, New England Butt, Packard, Panduit, Schleuniger, Thomas & Betts and Tyco.

Quality has improved from 11,701 defective parts per million in 2005 to 1,051 ppm in 2012, and on-time delivery went from 83 percent in 2005 to 94 percent in 2012. Electrical testing is done at 100 percent in the cells and then sent to quality control for final testing.

Most AP suppliers are local. They total 80, with 11 receiving the most AP orders. “We have reduced our number of suppliers by half over the years,” Orlan-

do said. “We’re very pleased overall with them. We have met quarterly over the last two years with our key suppliers to talk about quality, price and on-time delivery. They’re glad we show them our ratings.”

As 2013 unfolds, Schlueter, Kruger and Orlando will keep both the short-term and long-term futures of AP in mind. The three executives will maintain a broad customer mix to buffer against market changes.

“Business is cyclical, so another 2009 is coming,” Kruger said. “We hope we are as prepared as we were in 2009 when the storm hits so we can come out of painful times smarter. I advise everyone to get good at what you do and stick to it.”

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All Bets on Central Mexico for Manufacturing

By Doug Donahue
VP Business Development
The Entrada Group

There's no doubting that wire harness manufacturing is an incredibly cost competitive industry. Low barriers to entry have encouraged a host of new market competitors coming from all corners of the globe. With margins tight and a significant amount of physical labor necessary in order to produce, wire harness manufacturers are sharply focused on keeping costs down in order to realize profits.

Unsurprisingly then, many have established operations in low-cost labor markets such as Honduras, Asia and Mexico. Mexico in particular has been a location of choice thanks in great part to its proximity to North America. But whereas in the early years large wire harness manufacturers flocked to Mexico's Border States, midsize and smaller players are increasingly exploiting the higher cost benefits, less competitive labor environment, and lower turnover offered in the country's interior.

US-based Entrada Group has been supporting overseas firms looking to establish a footprint in Mexico for the past decade. As a shelter provider with a 60-acre manufacturing park in Fresnillo, Zacatecas, located in Central Mexico,

Entrada enables manufacturers - no matter their size - to set up shop without establishing a direct, in-country presence. What's more, they are able to help their clients do this in as little as 10 weeks.

Once up and running, Entrada's clients achieve lower year-over-year costs. Entrada offers key support services delivered through a shared services model, which allows manufacturers to further reduce and control indirect costs - both overhead and administrative - through economies of scale gained because they are all located in the same industrial park. This is good news for smaller operations; even if their Mexico operation only requires a dedicated workforce of 50-100, they can still enjoy the leverage of a 1,500 person operation.

"When small and midsize firms commit to establishing an operation in Mexico, they're looking to secure mid- and long-term cost advantages. They want to be competitive today and in ten years' time. That's why Zacatecas is so attractive," explains Doug Donahue, Principal and Vice-President Business Development. "In our experience, an efficient, well-managed wire harness operation that is leveraging Entrada Group's service structure can achieve total Mexican operating costs as low as \$4.50-\$6.50 per hour."

Continued on page 50

HOT from **HAKKO** **FT-801** THERMAL WIRE STRIPPER

Cuts insulation like a hot knife through butter!

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- Strips fine wire gauge easily
- Digital power display
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- Part Number: FT801-02



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NEWS PLUGS continued

TE Connectivity's Dr. Stefanie Harvey
Awarded Bes Paper at IWCS

TE Connectivity's (TE) Dr. Stefanie Harvey was recently awarded with the 2012 Best Paper Award from the International Wire and Cable and Connectivity Symposium (IWCS). The IWCS is one of the world's leading technical conferences for communications cabling and connectivity products.

Held in November 2012, the 61st IWCS received more than 100 unpublished papers on research and development for wire and cable materials and connector/interconnect technologies, designs, components, fabrication, performance, testing and applications. Dr. Harvey's paper, "Carbon as Conductor: A Pragmatic View," was selected as the 2012 Best Paper. "This paper reflects TE's commitment to developing new technologies for wire and cable that will help our customers meet their SWaP (Size Weight and Power) goals," said Dr. Harvey, principal scientist, TE Connectivity, Global Aerospace, Defense & Marine.

"It is fantastic that Dr. Harvey's work was recognized by the IWCS Committee for the most outstanding paper at the conference this year," said Dale Reeves, manager, Global eBusiness & Marketing, TE Connectivity, Global Aerospace, Defense & Marine. "This award reflects TE's and our employees' dedication to innovation and advancements in the newest technologies. You can connect with Dr. Harvey and a number of our dedicated experts on our new industry resource site, www.DesignSmarterFaster.com. This site was specifically created for design engineers and serves as a 'one-stop shop' for the electrical design and connectivity community."

Dr. Harvey's paper discussed carbon nanotubes (CNTs), which have been touted as a game-changing material for medicine, microelectronics, and renewable energy. CNT efforts at TE have focused on electromagnetic interference shielding and data transmission cables using commercially available CNT materials. With a tape format, TE has achieved greater than 50dB shielding effectiveness in GHz range; current CNT materials do not provide adequate shielding below 100 MHz. The paper discusses how data transmission cables made using

a yarn format perform comparably to MIL-STD 1553 and how termination is possible using standard techniques (e.g. crimping, soldering) without contact resistance issues due to the relatively high resistivity of the CNT formats.

For more information on TE's carbon nano technology, connect with Dr. Stefanie Harvey at www.DesignSmarterFaster.com and download her paper from <http://bit.ly/ZcWIRt>.

A New Family of Ultra
High-Density Fiber Optic Cables

Optical Cable Corporation (OCC) has introduced a new family of ultra high-density fiber optic cables. The new HC-Series cables feature unique tight-buffered 12-fiber units, combining the ruggedness of OCC's tight-buffer technology with high-fiber density. With the HC-Series, OCC now offers cables that have an outer diameter much smaller than conventional



OCC's HC-Series high-density cables offer up to a twenty percent reduction in diameter and weight relative to conventional loose-tube cables, allowing for a greater fiber density and cable packing within ducts.

cables using loose tube construction. OCC's HC-Series high-density cables offer up to a twenty percent reduction in diameter and weight relative to conventional loose-tube cables, allowing for greater fiber density and cable packing within ducts. Suitable for direct pulling with wire mesh grips, the HC-series cables can help reduce costs by eliminating the need to splice outdoor cable to indoor cable at building entrance. "No other cable matches the mechanical and environmental performance of our HC-series cables while maintaining such a small diameter and high-duct efficiency," said Ted Leonard, Vice President of Tech-

Continued on page 52



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Let Entrada help you leverage the best place on the continent to build wire harnesses and secure your economic future.

Why Zacatecas in central Mexico?

- Home to more than a dozen operations employing over 7,000 workers building wire harnesses
- Total Mexican operating costs as low as \$4.50-\$6.50 per hour – the most competitive in North America
- It’s the ideal spot – whether you have 50 employees or 2,000.

But location alone isn’t enough

- Shelter provider Entrada’s shared services model, with co-location at a single park in Fresnillo (Zacatecas), divides costs among clients and maximizes savings
- Flexible, scalable and risk free
- Startup in as little as 10 weeks.

Contact Doug Donahue
Ph: 210-828-8300

ddonahue@entradagroup.com
www.entradagroup.com

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All Bets on Central Mexico for Manufacturing

Continued from page 48

With such favorable conditions, the footprint of Entrada’s clients at its facility continues to grow dramatically – despite a challenging global environment.

“In 2009 our 11 clients employed 1200 workers. At the start of 2013, they



An Entrada Group client’s production line in Fresnillo, Mexico.

more than doubled their workforce. Furthermore, three of these clients are in the process of making investments of more than \$1 million each to expand their production capabilities,” explains Doug. “Again the flexibility and scalability of the model and infrastructure we offer enables manufacturers to grow their presence at a pace well aligned with their mounting ambitions.”

In sum, Mexico’s proximity to the US and Canada, highly competitive cost structure, and transparency make it a winning location for low-cost manufacturing for North American markets. Scouting further, wire harness manufacturers find that in the center of Mexico, total operating costs are hands down the most competitive in North America. Finally by relying on the Entrada Group model, manufacturers can secure even greater cost savings, whilst enjoying the opportunity to focus management attention where it truly belongs: running their core business.

In an industry where the difference between staying ahead and falling behind is a matter of a few dollars per hour... wire harness manufacturers are doubling down on Central Mexico.



Entrada Group - Booth #1250

Cirris Systems - Booth #1729

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Mission Critical Problem Solved by New Laser Development

What defines “Mission Critical” in wire harness construction in the aerospace and military environment, the answer is a nicked wire or braid. The mission critical can appear in two areas, either impedance changes or at least potentials and loose wire strands or braid fragments waiting to fall into some other critical area. Add to this the idea of a weakened joint at a connection point due to a deeply nicked wire and you have mission critical problems.

Not only does this propagate to the functionality of the end product, a missile hitting the wrong target, but if discovered by the customer, even in a non-critical area, results in automatic rejects, future reputation, and possible recalls. Even if it is found at the manufacturers’ site in many cases the cost to replace a wire or cable at a final stage can be a serious dollar value.

So what are the challenges to overcome this dilemma? First there is the problem of finding a technology that eliminates this possibility in the first place. Second is to make the solution also fit the current methods of production which include the workers, the manufacturing floor, and the space available. Third is it must be robust, fool proof, and have a cost that is reasonable to the issues it solves.

Let’s take these one at a time, first it is well known that laser technology and the physics of wavelengths and materials have been the leader in providing manufacturing solutions in all industries for years. This case is no different, the fact that different wavelength lasers are absorbed by some materials and reflected by others solves issue number one. Just as a laser is utilized to make the backlit buttons on a car radio, heater, window, and door by this principle whereby the button is first painted with a white paint and then with a layer of black paint. The laser is then programmed to lase off the black paint with the appropriate picture, number, or word and because it is absorbed by the black paint and reflected by the white the white layer remains perfectly intact. You put a LED light behind it and you have your impressive radio display at night.

That is exactly what happens with a laser wire stripper, you select a wavelength that is absorbed by

plastics, Teflon and their combinations but is reflected by all metals and again you have a process that removes or cuts insulation but CANNOT do anything to the metal wire or shield of a multiple wire cable.

The added dividend of the laser is that unlike a mechanical blade it doesn’t care about the shape, a twisted cable or a perfectly round wire react the same, even a difference in diameter within the depth of focus range of the laser cause no problems, you get the same great results.

To accomplish problem number two and three this technology must be presented in a very small and portable package with industrial reliability and features that are flexible enough to handle the myriad of wire types that aerospace

and military manufacturers require.

Control Laser has been in the business of providing laser based solutions in all major manufacturing arenas for over 45 years and is the leader in laser based wire processing and is also inventor of many patented solutions that are the defacto standards in several industries.

This solution is no different, working with some of the major worldwide aerospace and military end users Control Laser has developed and recently released its No-Nic hand held wire stripper specifically designed for use in the manufacture of “Mission Critical” harnesses. The worry and liability of mechanical methods for wire stripping have been eliminated in a compact, portable and robust laser wire stripper. While the ROI for removing such a

threatening problem would justify just about any price this product is meant to be in line with many other tools in the industry.

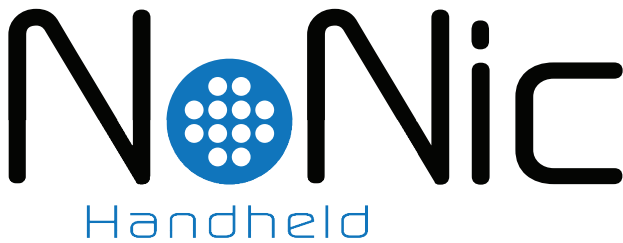
Control Laser offers a complete line of wire stripping and marking products for industry professionals looking to process many different types of wire from larger to smaller. For more information on the **No-Nic** hand held wire stripper or any of our other laser products, please contact Control Laser Corporation at (407) 926-3500 or visit our website www.controllaser.com.

Also, we will be exhibiting at the EWPT 2013 tradeshow in Milwaukee, WI with our distributing partner Ideal Industries. We will be performing LIVE demonstrations of the No-Nic hand held wire stripper in Booth #1858.



You Asked...We Delivered

The greatest development in laser wire stripping just got better. Introducing Control Laser’s latest innovation, the No-Nic hand held laser wire stripper. Industry manufacturers can now strip their most sensitive wires directly at the wire harness with a guaranteed solution to deliver absolutely clean no-nick wire processing. Another mission critical problem solved by the leaders in laser technology solutions, Control Laser.



For more information about our Products and Services, please contact: Control Laser Corporation
2419 Lake Orange Drive, Orlando, FL 32837 | ph. 407.926.3500 | www.controllaser.com



NEWS PLUGS continued

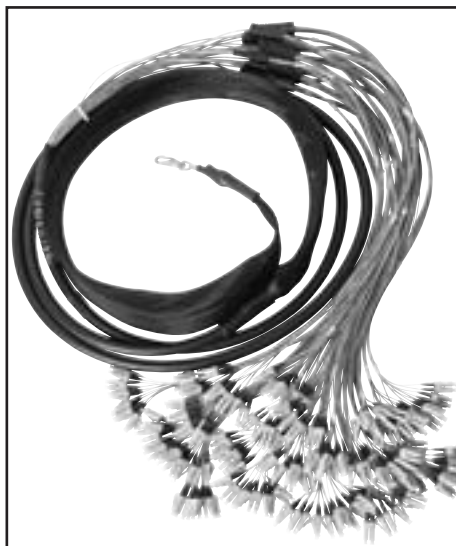


Continued from page 49

nology and Engineering for OCC. "These HC-Series cables are the ideal solution for campus networks and indoor-outdoor installations."



**Lapp Tannehill -
Booth #1716**



HC-Series cables from OCC feature unique tight-buffered 12-fiber units, combining the ruggedness of OCC's tight-buffered technology with high-fiber density.

The HC-Series cable couples the density of a ribbon style fiber optic cable with the ruggedness typically associated with

OCC's fiber optic cables. "This new series of cable draws on our heritage as a leader in tight-buffer fiber optic cables, and is another example of OCC's commitment to providing stellar end-to-end solutions," concludes Leonard.

OCC's HC-Series cables are currently available in fiber counts from 24 fibers to 288 fibers.

For more information on the HC-Series cable contact: Optical Cable Corp. at (800) 622-7711, or visit www.occfiber.com.

SEA Wire & Cable, Inc. Receives Silver Boeing Performance Excellence Award

SEA Wire and Cable, Inc. announced that it has received a 2012 Boeing Performance Excellence Award. The Boeing Company issues the award annually to recognize suppliers who have achieved superior performance. SEA Wire and Cable, Inc. maintained a Silver composite perform-

ance rating for each month of the 12-month performance period, from October 1, 2011, to September 30, 2012.

This year, Boeing recognized 594 suppliers who achieved either a Gold or Silver level Boeing Performance Excellence Award. SEA Wire and Cable, Inc. is one of only 441 suppliers to receive the Silver level of recognition.

"We are pleased that we have been honored with this award," stated Marty Clark President of SEA Wire and Cable, Inc. "More importantly, it demonstrates our commitment to the critical mission of our war fighters," Clark said.

SEA Wire And Cable founded in 1970, is a woman owned small business dedicated to providing its clients with consistent, reliable quality, accurate technical support and exceptional customer service at a competitive price. For more than 41 years, SEA Wire and Cable, Inc. has been a full stocking supplier of military/aero-

space wire, cable and related harnessing products. SEA is a world class provider of vendor managed inventory programs, logistical management, and value added services. SEA is also an ISO 9001:2000 and AS9100 Rev C certified company and registered with ITAR.

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

An Increase in Floor Productivity

Located in Mississauga, Ontario Canada lies Kelvin Technologies with over 100 years of combined experience in electrical heating, controlling and sensing. Specializing in electrical heaters, microprocessor controls, temperature sensors, custom built harnesses and custom designs, Kelvin Technologies has a product to fit each of their customer's needs.

While working with a specialized thermocouple cable, Kelvin Technologies had been operating by using hand tools; employees were manually cutting, stripping and hand crimping the cable. To increase their productivity and efficiency, Kelvin requested a visit from Schleuniger, Inc. for an overview of possible products and a demonstration. Proficient in cable processing, Schleuniger recommended three machines



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that would increase their productivity: EcoStrip9300, UniStrip 2600 and the UniCrimp 200.

“With the purchase of Schleuniger equipment, our rejection rate dropped as these machines eliminated all the possible errors in wire preparation, thus error proofing the process,” Kelvin Technologies’ Manufacturing Analyst, Manmohan Flora stated.

In purchasing the ES 9300, the UC 200, and the US 2600, Kelvin saved production time and increased quality as they no



EcoStrip9300



UniStrip 2600



UniCrimp 200

longer have to measure, cut, strip and crimp the wires manually. With its ability to perform several steps in one ergonomic program, they gained flexibility for multi-conductor sensor cables with the US 2600. Not only does the machine process their specialized thermocouple cable, but the user may program the machine for different operations that make repeating production a cinch.

With these machines, Kelvin has a faster and more accurate production while remaining a simple operation for the employee.

For further information contact Schleuniger, Inc. 87 Colin Drive, Manchester, NH 03103. Phone (603) 668-8117 or Fax (603) 668-8119. For Toll Free Technical Support phone: (877) 902-1470 or email Sales@schleuniger.com. Visit www.schleuniger-na.com

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Industrial Wire and Cable Corp. has been manufacturing wire and cable products for over 40 years. We only produce the highest quality products at competitive prices. Our manufacturing process begins with 5/16 copper rod so we can control all tolerances to the highest standards in our state-of-the-art facility, located in Lake Zurich, IL.

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NEWS PLUGS continued

Stable and Electrically Isolated Power Supply with New ConnectPower DC/DC Converter

Weidmuller introduces a new DC/DC Converter to the PRO-M Power Supplies product line optimized for machinery and offering a host of advantages. This new electrically isolated DC/DC Converter avoids critical earth loops; from an unregulated or distorted input voltage, it generates a stable, low-distortion output voltage. With class III protection the compact converter is ideal for use in earth-free power systems, such as the battery back-up systems found in marine technology, as well as in oil and gas, machinery, and factory automation applications.

Weidmuller's DC/DC Converter is a versatile solution for all 24 VDC power supply applications. It features industry leading power specifications, excellent resistance to shock and vibration, an extremely thin profile, over 91% efficiency, and a status signal for remote monitoring.

Weidmuller's thin design, with a width of only 60mm, and the capability to be mounted side-by-side without clearance requirements saves space in the cabinet. The metal clip-on foot provides increased stability on the DIN-rail as well as high vibration and shock resistance.

Integrated features such as an alarm output, which monitors the status of the 24V output voltage, and an LED that indicates DC OK status for the output voltage, the integrated transistor outputs, and the on/off status of the relay contact, provide clearly visible visual aids making trouble shooting quick and easy thus optimizing

machine up-time.

Weidmuller's DC/DC Converter is extensively protected with an internal fuse on the input side and on the output side with short-circuit and overload protection as well as a power boost at 24VDC of 12A for one minute.

As with all Weidmuller PRO-M Power Supplies the DC/DC Converter is designed



Power Supply with New ConnectPower DC/DC Converter

for extreme environments with an operating temperature range of -25° C to +70° C and approvals ranging from CE, TUV and GL to cULus and cURus for applications worldwide. The 3-year warranty for all PRO-M Power Supply products gives the customer ease of mind.

For further information contact Weidmuller Interconnections, 821 Southlake Blvd., Richmond, VA 23236. Phone (800) 849-9343 or Fax (804) 379-2593. Visit www.weidmuller.com

BURNDY Provides Customers Exciting Cable Cutting Options

BURNDY® welcomes a new scissor-style cutting tool to its family of cutters. The PATMDCUT series of cutters will begin shipping in March 2013. These cutting tools are built on the reliable IN-LINE® platform and allows for both cutting and crimping using the appropriate attachment. Crimp jaw and cutter jaw assemblies as well as replacement blade sets are available separately.

This tool employs a scissor cutting action shearing the conductor as the blades are designed to cut an array of conductor materials including copper, aluminum, ACSR, and even EHS guy strand. This cutter features a retractable blade guide (pictured below) ensuring an efficient cut with true one-handed operation.



The PATMDCUT cutting tools are available utilizing either the Li-Ion or Ni-MH battery power source. BURNDY is one of the only major manufacturers committed to supplying and servicing both battery types offering a choice of power source to better suit individual customers' needs.

For further information contact Burndy, 47 E. Industrial Park Drive, Manchester, NH 03109. Phone Customer Service at 1-800-346-4175 or visit website www.BURNDY.com



TE OCEAN APPLICATOR SERIES



NEW APPLICATOR FEATURES DEVELOPED TO PROVIDE IMPROVED PRECISION AND REDUCED SETUP TIMES

Crimping standards continue to rise to higher levels of quality and repeatability. Taking customer input and market demands into consideration, TE Connectivity (TE) has created the new Ocean Applicator series to meet those higher demands and to take terminal crimping to a new level.

By consolidating our past applicator offering, TE was able to provide design consistency and tooling standardization to the market. One of the resulting benefits to customers of this consolidation is flexibility in the choice of feeding options: new and improved mechanical and pneumatic feeds along with the innovative and precise servo feed option. The new Ocean Applicator series design also allows customers to perform field upgrades to system III and Smart Applicator technology. It provides an upgrade path for terminal intelligence that allows the machine to obtain set-up features as the applicator is upgraded.

- One applicator platform – modular family design
- Two ram interface styles
- Three interchangeable feed options (mechanical, pneumatic or servo)
- Smart Applicator Integration

For all your application tooling needs, contact Heilind Electronics or visit heilind.com/rpages/te_oceanapp.





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Kindorf® Fast Cable Link From Thomas & Betts Requires No Tools for Installation

The new Kindorf® Fast Cable Link from Thomas & Betts provides a quick, easy and economical way to suspend cable, conduit and ductwork, among other things, from industrial ceilings. Consisting of a length of steel wire rope and a self-locking



Kindorf® Fast Cable Link

cable-grip fastener, the Kindorf® Fast Cable Link requires no tools for installation. The Kindorf® Fast Cable Link comes with either a hook or loop end for beam attachment.

“The Kindorf® Fast Cable Link features a cable-grip design that uses positive-grip locking rollers,” said Chad Smith, director, product management at Thomas & Betts. “The locking rollers are serrated for an extra non-slip grip, while matching serrations on the locking roller track engage the rollers and prevent them from slipping.”

Other features include a release pin that eases adjustment after inserting the wire rope into the fastener and stainless steel springs that keep the locking roller in constant contact with the wire rope. The fastener is constructed with riveted connections for strength and durability. The fastener body is made of zinc alloy and the wire rope is made of zinc-plated steel for corrosion protection.

For more information about Thomas & Betts new Kindorf® Fast Cable Links, visit www.tnb.com and look for Kindorf® on the "Brands" tab, or call (800) 238-5000.

Douglas Winther celebrates 50 years with Technical Devices Company

On March 12, 1963; Douglas Winther began working at Technical Devices Company as a shop helper. Mrs. Margaret Winther gave her 18 year old son some advice that day as he headed off to his first job, “When you are at work – work hard. Get there before your boss does and leave after your boss leaves.”

Doug applied that advice and earned promo-

tion after promotion. He worked his way up from shop helper to assembler to buyer to plant manager to sales manager to president. In 1985, Doug became the owner of Technical Devices Company.

During his tenure at Technical Devices Company, Doug has made significant contributions to the PCB assembly field. He helped develop the Nu/Clean family of batch and inline aqueous cleaners as well as the Nu/Era line of wave soldering machines. He holds patents in both wave soldering and inline cleaning. He has been honored many times with awards for his business contributions as well as philanthropic contributions.

Doug’s true talents are his ability to lead a company through good economies and bad ones. During the difficult years following 9/11 and the shift of manufacturing to overseas markets, Technical Devices Company did not lay off a single employ-

ee. This was largely due to Doug’s tenacity to find new business and expand the company while most others were closing their doors.

Doug sees where the industry is heading and works hard to get out in front of the changing times. He inspires employee loyalty by treating each employee like family. Many Technical Devices’ employees have over 20 years with the company. Many of Technical Devices’ customers are long time partners and can share many great stories of Doug selling them their first machine decades ago and how his company still supports those machines.

Doug enjoys being involved in the daily operations of Technical Devices Company and the interactions he has with his employees and customers. From his twice a week racquetball matches with his Buying Manager (who is half his age) to his many trips to visit longtime customers and

to cultivate new relationships with some of the biggest companies in the world, Doug is not slowing down at all. He has put together a great team of professionals at Technical Devices Company and is looking forward to many more successful years at the helm.

Technical Devices Company has been committed to providing superior products, including both batch and inline aqueous cleaning systems, and unmatched customer service and support for the manufacturing industry since 1952. For more information, please visit www.TechnicalDev.com.



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NEWS PLUGS continued

Rely on Cicoil Flat Cable Solutions for Complex Guided Missile Applications

Cicoil's highly durable flat cables are designed for guided missile and fire control systems, where unparalleled performance is critical and cable failure is not an option. Our compact, silicone encased flat cable solutions are engineered to provide consistent electrical characteristics, space & weight savings, optimum cable flexibility and are well suited to meet the stringent demands of mission-critical applications.

Unlike other types of cables, such as Teflon or Polyurethane, Cicoil utilizes an exclusive process of encapsulating individual components in a shock absorbing silicone jacket that renders them unaffected

by repeated exposure to severe vibration, compressive force, flames, ice, fog, ozone, steam, humidity, extreme temperatures (-65°C to +260°C), harsh weather, operational stress, chemicals and the rigors of turbulent flight. This combination of features makes Cicoil cables the ideal alternative to formed flat cables, wire harnesses and bulky round cables in missile applications.

Each Cicoil flat silicone cable can incorporate a variety of components including power conductors, controlled impedance pairs, shielded control wires, video conductors and Cicoil's patented StripMount™ fastening strip, all combined in a single condensed cable design, precisely controlling the inner component spacing, jacket thickness and the overall cable shape. Cables are available in continuous lengths, break-outs, custom shapes for very tight spaces, cut to order, or as assemblies, complete with



Cicoil's highly durable flat cables are designed for guided missile and fire control systems, where unparalleled performance is critical and cable failure is not an option.

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or conduit for protection, is tear-resistant and will not deform or wear during a lifetime of more than 10 million cycles, even under tight bending radius and high speed flexing conditions.

Cicoil's highly durable silicone is "self-healing" from small punctures and cable jacket damage can easily be repaired in the field. For applications that require resistance to friction and adhesion, Cicoil offers coating options by request.

Cicoil's Cables are UL Recognized, CE Conforming, RoHS & REACH Compliant and are manufactured in an automated, climate controlled environment. In addition, these environment-friendly cables are 100% contaminant-free and exceed the outgassing requirements of ASTM E-595.

Cicoil has been a leader in designing and manufacturing high performance cable assemblies for over fifty years.

The company's unique silicon coated flat cables provide 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 cable and cable assemblies in an automated facility in Valencia, California. Cicoil's quality assurance system is certified to the ISO 9001 (AS9100) standard.

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

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

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

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

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NEWS PLUGS continued

IPC Reases PCB Industry Results for January 2013

IPC — Association Connecting Electronics Industries® announced the January findings from its monthly North American Printed Circuit Board (PCB) Statistical Program.

PCB Industry Growth Rates and Book-to-Bill Ratio Announced

Total North American PCB shipments were down 1.1 percent in January 2013 from January 2012, and bookings decreased 4.0 percent year over year. Month-to-month growth rates are not available in January due to the change in IPC's survey sample as of the first of the year. The book-to-bill ratio for the North American PCB industry crossed into positive territory in January and stands at 1.01.

"The book-to-bill ratio for the North American PCB industry strengthened for the second consecutive month, turning the corner in December after an eight-month downturn," according to Sharon Starr, IPC director of market research. "Sales and orders, however, remained sluggish in January."

The book-to-bill ratios are calculated by dividing the value of orders booked over the past three months by the value of sales billed during the same period from companies in IPC's survey sample. A ratio of more than 1.00 suggests that current demand is ahead of supply, which is a positive indicator for sales growth over the next two to three months.

The Role of Domestic Production

IPC's monthly survey of the North American PCB industry tracks bookings and shipments from U.S. and Canadian facilities, which provide indicators of regional demand. These numbers do not measure U.S. and Canadian PCB production. To track regional production trends, IPC asks survey participants for the percent of their reported shipments that were produced domestically (i.e., in the USA or Canada). In January 2013, 85 percent of total PCB shipments reported by survey participants were domestically produced. These numbers are significantly affected by the mix of companies in IPC's survey sample, which change slightly in January, but are kept constant through the remainder of the year.

Interpreting the Data

Year-on-year and year-to-date growth rates provide the most meaningful view of industry growth. Month-to-month comparisons should be made with caution as they may reflect cyclical effects and short-term volatility. Because bookings tend to be more volatile than shipments, changes in the book-to-bill ratios from month to month may not be significant unless a trend of more than three consecutive months is apparent. It is also important to consider changes in bookings and shipments to understand what is driving changes in the book-to-bill ratio.

The information in IPC's monthly PCB industry statistics is based on data provided by a representative sample of both rigid and flexible PCB manufacturers in the USA and Canada. IPC publishes the PCB Book-to-Bill Ratio and the PCB Statistical Program Report each month. Statistics for the previous month are not available until

the last week of the following month.

More detailed monthly findings on rigid PCB and flexible circuit sales and orders, including military and medical market growth, total market size and forecasts, will be published in IPC's North

American PCB Market Report. The first report in this new monthly subscription series will be published later this week. More information about this report can be found at www.ipc.org/market-research-subscriptions.



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Pro Football Champ Hines Ward Named Keynote Speaker at WAI’s Interwire 2013



The Wire Association International (WAI), Inc. reports that Hines Ward, former starting wide receiver for the Pittsburgh Steelers, will give the keynote address at Interwire 2013 and WAI’s 83rd Annual Convention at the Georgia World Congress Center (GWCC), Atlanta, Georgia, USA.

Ward’s presentation entitled “The W.A.R.D. Rule,” which is an acronym for “Will Always Rise above Difficulty,” will include lessons he learned from his legendary rise to the top of the National Football League.

The luncheon and keynote address, scheduled from noon to 1:30 p.m., on Tuesday, April 23, 2013, is open to full conference registrants. This conference event is sponsored by Gem Gravure Co. Inc., a leader in wire and cable marking technology. Gem Gravure is also one of more than 400 companies exhibiting in Hall A of the GWCC, April 23-25.

Visit www.wirenet.org for full conference and exhibit details and to register online.

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Interwire is held biennially and is the largest trade show of its kind in the Americas for the wire and cable manufacturing industry. Initiated in 1981, Interwire offers an anticipated and timely meeting point for suppliers, manufac-

turers, buyers, researchers, and industry luminaries from around the globe. It is a forum for global industry experts to share insights on the latest trends and developments in wire and cable, including those related to fiber optic, electrical, fastener, ferrous, and nonferrous disciplines.

The Wire Association International, Inc., founded in 1930, is a worldwide technical society for wire and cable industry professionals. WAI is dedicated

to the promotion, collection, and dissemination of technical, manufacturing, and general business information and trends in the industry. It organizes events such as the Interwire and Wire Expo trade shows, technical workshops, and annual International Technical Conferences. Its publications and technical products include Wire Journal International (WJI) and the annual WJI Reference Guide as well as handbooks, reports, and DVDs.

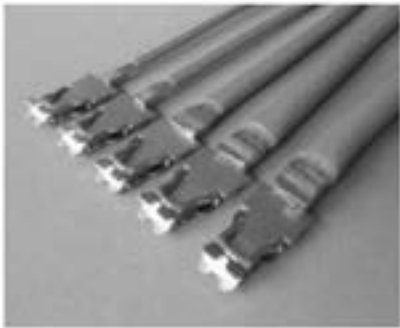


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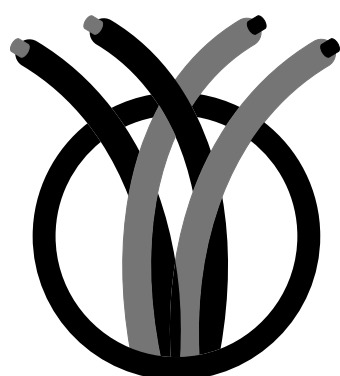
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