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- Wire Wisdom - Solid vs. Foam Insulation
- Ultrasonic Metal Welding - New Solutions for Wire Harness Assembly
- Surplus and Used Machinery, Parts, and Employment Opportunities



Remembering Some Trade Show Basics

By Joe Tito

When I work with companies planning marketing strategy, I often let it slip that I enjoy all aspects of trade shows. Within two seconds, I'll have Exhibitor Manuals, show schedules, and the keys to the booth storage in my lap. But it's OK! Maybe I'm deranged, but I really love it. I think what frustrates most folks is the feeling they are not getting the most from their trade show dollar. With this understanding, I have assembled some guidelines and tips to help you avoid cost overruns and maximize your

ROI. Some of this may be basic to you veterans, but I see some basic mistakes being made out there. It's my hope that these suggestions will help you enjoy being a featured star, and not just an average performer, at your next show.

Pre Show Planning

Let's start with your booth. If you have an existing booth, ALWAYS set it up a couple of months prior to shipping. During tear down or shipping from the last show; graphics get torn, connectors go missing...stuff happens. Better to deal with this early and avoid costly last

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Loose Piece Contact Crimping

Martin Furer,
Director of Engineering,
Schleuniger Solutions AG
Rob Boyd,
Crimping Product Manager,
Schleuniger Inc.

Why Loose Piece Contacts?

There are two basic types of electrical terminals - reeled terminals and loose piece terminals, commonly known as loose piece contacts (LPC). Both types are crimped onto the ends of stripped wires to form a mechanical and electrical connection, but that is where the similarity ends. There are significant differences regarding how the crimping and quality processes are automated.

Reeled terminals come on a reel and are connected to a carrier strip with each terminal having the same distance, or pitch, between them. This makes reeled terminals easier to automate than LPC because the applicator tooling incorporates a feeding system that feeds each terminal a fixed distance equal to the

terminal pitch. They are available in open or closed barrel configurations.

LPC are packaged in single pieces and shipped in bulk. They are also known as "turned contacts" or "screw-machined contacts", referring to the manufacturing method used to produce them. They are machined from solid rod and are always the "closed barrel" type, meaning that the area where the wire will be inserted forms an unbroken, 360 degree cylinder. LPC come in various shapes and sizes and are primarily used where quality requirements are very high, such as in the military, aerospace and medical markets.

Advantages of Loose Piece Contacts

Because of their broad contact area, LPC have lower electrical resistance than stamped and formed terminals. With comparable wire cross sections and electrical currents, the heat generated in a LPC is substantially less than with other types of terminals. The voltage

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Marlin Shelley Retires as President of Cirris Systems

By Fred Noer

When Marlin Shelley founded Cirris Systems Corp. in 1984 he envisioned a company where he and others would enjoy working. In fact, its human resources manual states that Cirris should be a fun place to work.

"The best part of my career is to have created this company," Shelley said. "I very much enjoyed the experience of creating it. It is a place where I wanted to work and where others have wanted to work."

Cirris designs and manufactures a broad array of machines and accessories for automatically testing all types of cable assemblies and wiring harnesses produced at companies worldwide. Since its inception Cirris has been located in Salt Lake City, Utah. Sales offices are in England, Germany and China.

Shelley, 62, stepped down June 1 as company president and was replaced by Kevin Denning. Besides continuing as board chairman, Shelley is working 32 hours a week until he turns 65. He assists with product development and fine-tunes spreadsheets.

When Shelley is not working, he runs marathons, goes ultralight backpacking, reads, engages in humanitarian activities through the Church of Jesus Christ of Latter-day Saints, travels with his wife



Marlin Shelley

Kathi and spends time with their grown children RaeAnn, Lyn, David and Rob.

Another major change at Cirris is its sale by Shelley to staff members through an employee stock ownership plan (ESOP). Payments to Shelley will be made from the company's retained earnings, a process expected to take 10 years.

All of the company's approximately 50 employees belong to the plan and receive shares of the firm. The plan is similar to a company matching employees' 401(k) contributions and has tax-

Continued on page 25

Wire Harness Assembly

More Challenges but New Solution With Ultrasonic Metal Welding

By Saeed Mogadam
President, SonicSolution Systems

One look at the automotive marketplace will tell you that things are changing and quickly. The first real production electric vehicles are on the horizon. Hybrid vehicles dot the landscape in various forms from the small hyper-efficient high mileage cars to very large passenger trucks. Every major automotive manufacturer offers some kind of hybrid vehicle. It was only a few years ago that the term "hybrid" began when the futuristic promise of zero emissions vehicles was just a dream. The future is fast approaching and wire harness manufacturers face unique new challenges.

Ultrasonic Metal Welding (UMW) has

long been thought of as a young technology. UMW technology has faced continuous challenges while expanding its capabilities. Right now UMW faces its largest challenges yet, to provide welding solutions for current developments in renewable energy. For example; Hybrid vehicles and solar energy require larger splices and connections previously outside the capability of UMW.

The wire harness manufacturing industry has traditionally been the single largest user of UMW since the 1980's and will therefore be the focal point of this article. This industry now needs to develop products and processes at an accelerated rate to meet the challenges in the development of high voltage connections in harnesses. In the process,

Continued on page 10

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Remembering Some Trade Show Basics

Joe Tito has assembled some guidelines and tips to help you avoid cost overruns and maximize your ROI.

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Marlin Shelley Retires as President of Cirris Systems

Marlin Shelley founded Cirris Systems Corp. in 1984. When Marlin envisioned his company he wanted it to be a place where he and others would enjoy working. Marlin celebrated his retirement with the Cirris team on May 25th.

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Loose Piece Contact Crimping

There are two basic types of electrical terminals - reeled terminals and loose piece terminals, commonly known as loose piece contacts (LPC). Martin Furer and Rob Boyd of Schleuniger present some steps necessary to ensure reliable crimping of LPCs.

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Wire Harness Assembly

Ultrasonic Metal Welding (UMW) has faced continuous challenges while expanding its capabilities. UMW faces its largest challenge yet, to provide welding solutions for current developments in renewable energy.

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Wire Wisdom

Solid vs. Foam Insulation. Communication cables employ a variety of insulation materials to achieve precise electrical characteristics. One of the key considerations for communication cable designers is the insulation's dielectric constant.

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Manufacturers & Suppliers Invited to Exhibit at Electrical Wire Processing Expo

Manufacturers and suppliers of electrical wire processing machinery and services are invited to exhibit at the nation's largest dedicated electrical wire processing event, the upcoming 11th Annual Electrical Wire Processing Technology Expo. The show is scheduled for Wednesday, May 18 and Thursday, May 19, 2011 at the Frontier Airlines Center.

Businesses that exhibit will have the opportunity to meet buyers including presidents, CEOs, purchasing managers, manufacturing engineers, design engineers, plastic engineers, mold makers, plant foremen, job shops & other indus-

try professionals in the business who will be looking to the products/services for solutions to their problems. Industry specific seminars on timely topics are held both days of the Expo to packed rooms. More than 1,400 attendees representing 45 states and 15 countries attended the 2010 show.

For detailed information on exhibiting at the show or additional information on the show itself, visit the 11th annual National Electrical Wire Processing Technology Expo's website at www.ElectricalWireShow.com or call 800-367-5520.

2010 Production Schedule

Issue	Reservations Due Date	Materials Due Date
September/October 2010	August 6, 2010	August 13, 2010
November/December 2010	October 1, 2010	October 8, 2010
January/February 2011	December 3, 2010	December 10, 2010

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Over 10,000 copies of *Wiring Harness News* (ISSN 1097-0789) are distributed bi-monthly to wiring harness & cable assembly shops, cord set manufacturers, companies that process electric wire & cable (including fiber optic) for use in their own products, their suppliers and other interested parties.
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Wiring Harness News
P.O. Box 527,
Richmond, IL 60071 USA
<http://www.wiringharnessnews.com>
Office Hours:
7:00 a.m. - 3:30 p.m. CST - (Monday-Thursday)
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Marketing: the missing ingredient

By Paul Hogendoorn

What's the magic ingredient often missing in a manufacturer's pursuit of success?

Most manufacturers will not like my answer, but I think the missing link is marketing.

Marketing is not just glossy brochures and a high-tech website. It is knowing what your main differentiating value is, and then conveying that message to your marketplace. A simple test to assess the health or effectiveness of your company's marketing efforts is to ask yourself the following two questions:

- What do we believe are our company's key value differentiating features; and
- How would our target customers (existing and desired customers) answer that question?

If the answers to both questions are close, then your company has an effective marketing strategy. If they are not similar, then marketing is likely the biggest impediment to your company's growth, and perhaps even survival.

Many manufacturers will cringe at the thought that their future depends on their



Paul Hogendoorn,
President OES, Inc.

marketing effectiveness. They are builders, designers and doers. Marketers are considered talkers, dreamers and perhaps even artsy types; but they are really communicators.

A company's long-term success depends on two things more than anything else: its vision and its values. Marketing is key to making sure that the compa-

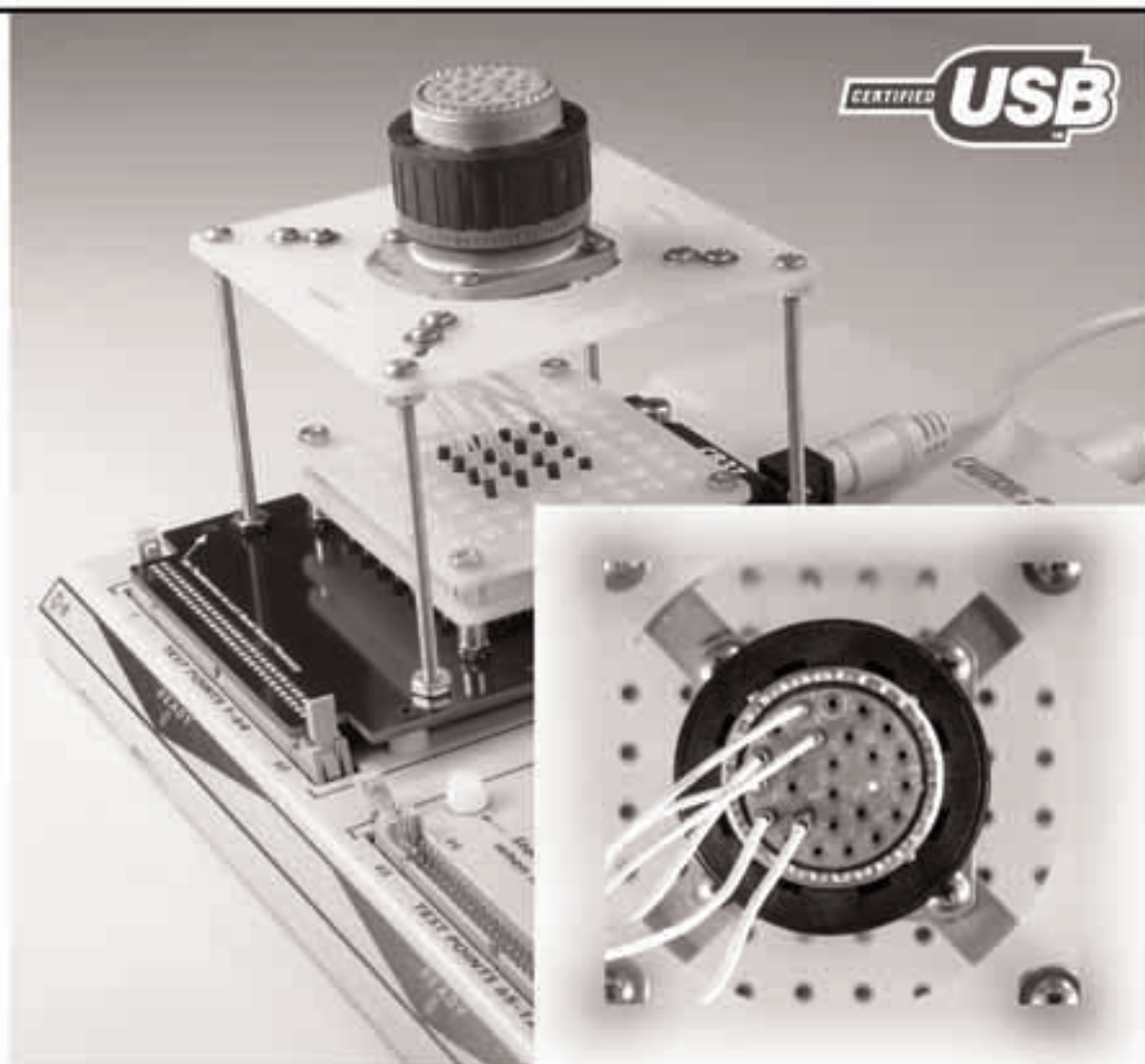
Continued on page 6

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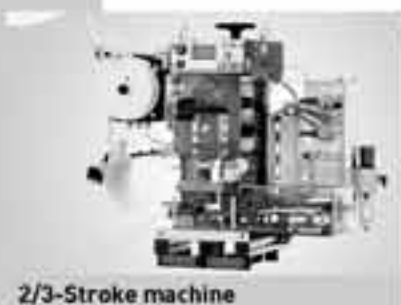
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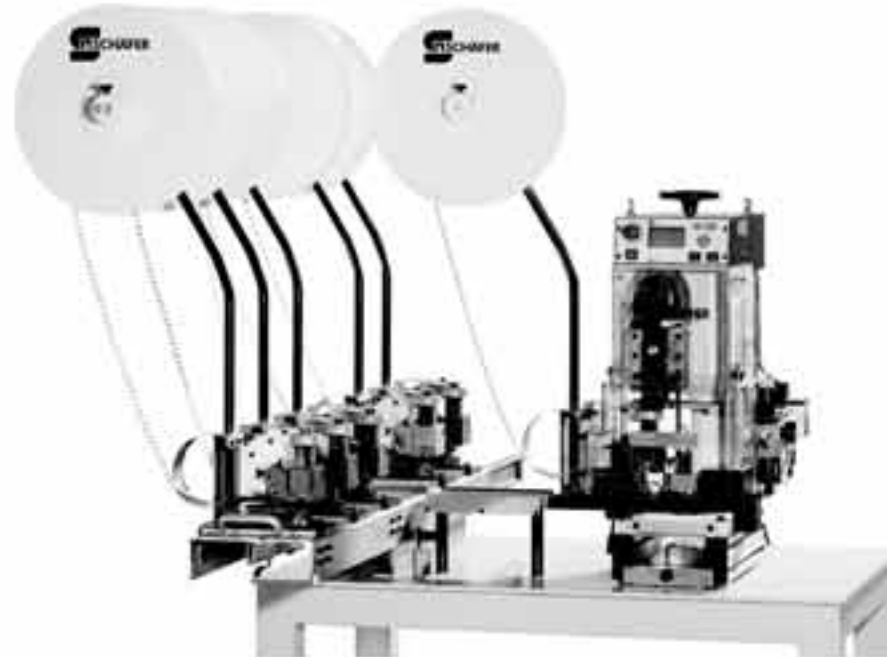
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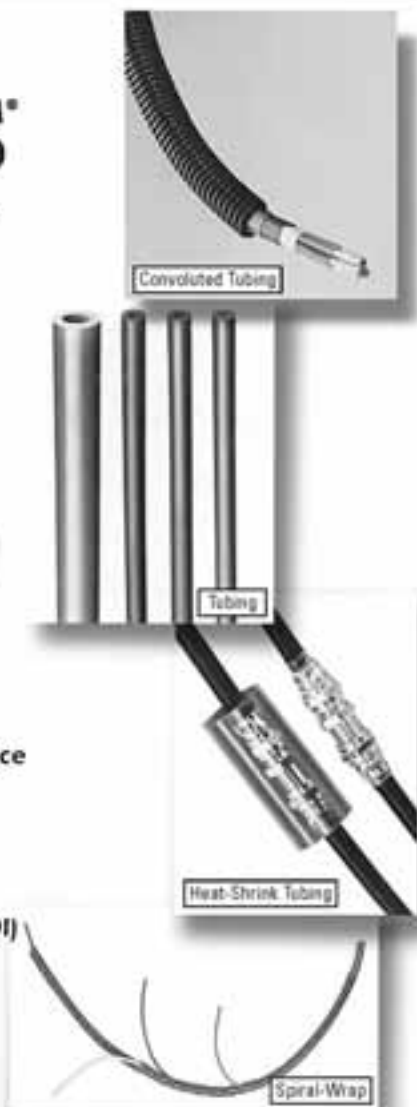
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Marketing: the missing ingredient

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ny's purported vision and values line up with the marketplace's perception of its vision and values. In this case, perception is reality.

If a company says that "customer satisfaction is our number one concern," but the consensus in the marketplace is that they are just bottom line focused, their marketing is fatally flawed. What is wrong in this case is not that they don't have the right message, it's that they don't live the right message.

Those manufacturers have big budgets with great glossy brochures and state-of-the-art websites designed to attract traffic and encourage viewer engagement. To them, marketing is intended to create a perception of the company or its products that is not true. This is a huge mistake, but it's not the most common one I see among manufacturers today.

The mistake made by most manufacturers is that they do very little to create or promote the awareness of their company's actual vision and values in their target marketplace, and it's their vision and values that separate them from their competition. Every purchasing decision by every customer or consumer comes down to one of, or a combination of,

three things: brand, relationship and price. Brand takes into account reputation, which includes factors like quality and features. Relationship takes into account the personal contact, distribution, after-sale service and support — anything that involves personal connection with the customer. Although price is also related to marketing, the first two are completely associated with marketing. If a company has a good brand, and if it has good relationships, it doesn't have to win business on price. However, if a company does not have a good brand and its relationships are weak, it has no choice but to win on price, and only one company can win on price — the lowest bidder.

My company has a scoreboard division that was successful selling to pro venues across North America, but wasn't successful in the main marketplace — elementary and secondary schools in the U.S. Although our products were good enough for the pro venues, we had no "brand" in the main market and didn't have any relationships with the target customers. The missing ingredient to success was marketing: we believed we were "the choice of the pros," but the marketplace didn't know that, and that's the only opinion that mattered. By persistently conveying this message to the market-

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place through tradeshows, in our brochures and on our website, we were able to convince distributors — the people who own the relationships — that our company and our product was sufficiently different, and that difference would be enough to separate us from our competitors.

Conventional logic suggests that expansion into a contracting market, with a more expensive product that competes against a half dozen established competitors, is not a recipe for success. But it was for us, thanks to marketing. We had a vision and values that were advantageously different from the rest, and accurately conveyed that message to the marketplace.

Does your company have a vision and values that separate you from your competition, and is that what your cus-

tomers and target customers think? If not, you need to zero in and define that message, and then get that message out to your marketplace effectively. If this is true for your company, it doesn't need more Lean, or cost reduction, or quality improvement, or even more new product development or innovation. It needs better marketing, pure and simple. It's often a tough pill to swallow for many engineering and technically minded people who have started and run most of our industrial companies; but it's true. Sorry to break the bad news.

Paul Hogendoorn is president of OES, Inc. of London, Ont., and OES-A, Inc. of El Paso TX. He is past chair of the London Region Manufacturing Council and can be reached at phogendoorn@oes-inc.com

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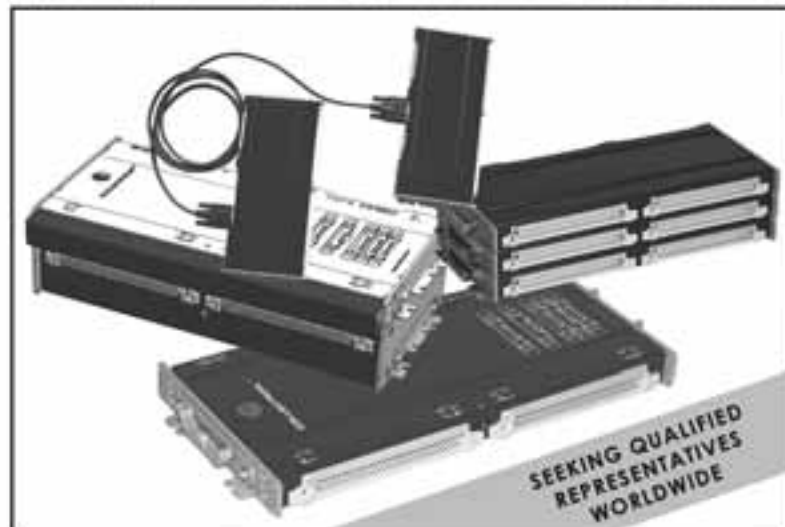
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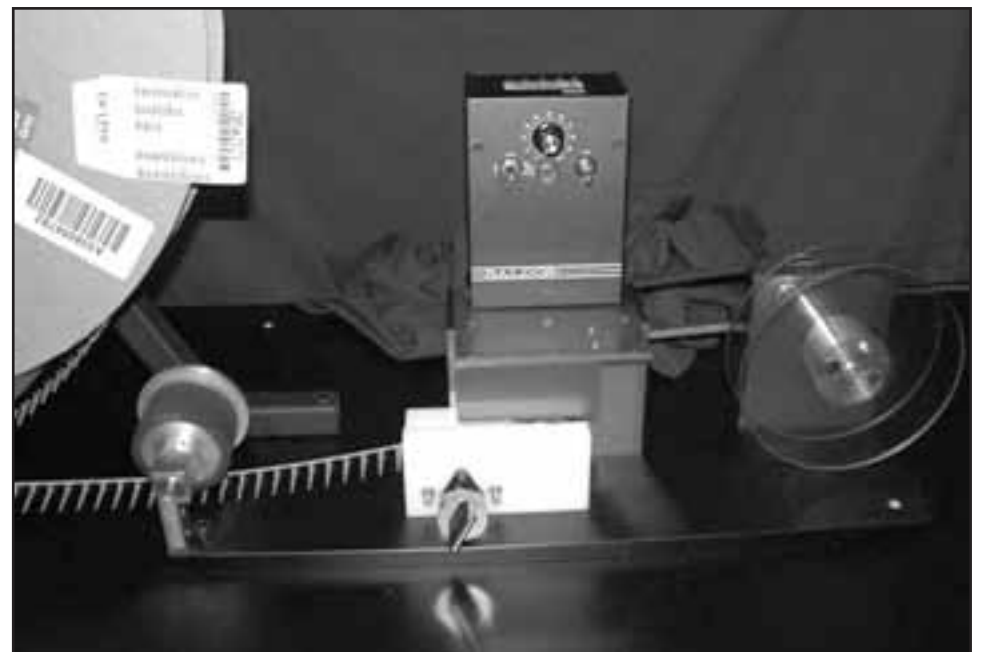
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Vehicle Harness Systems

Making Loose Piece Terminals Cost Effective



The Vehicle Harness Systems' hand operated pin cutting machine can cut a reel in 3 minutes, and the motorized machine (above) can cut the same reel in 30 seconds.

Vehicle Harness Systems, is a small company near Pismo Beach, Ca that specializes in the automotive connector industry.

The Problem:

To make the loose piece terminals cost effective, Vehicle Harness Systems cut 5 million off the reel per year by hand, resulting in hand, wrist, and shoulder pain.

Sending the reels to a cutting service was costly in freight and lost time.

Buying them already cut was even more costly than sending them out.

The Search:

Since a low-cost pin-cutting machine didn't exist, Vehicle Harness Systems developed their own prototypes.

It was a four-year process because of the great accuracy required in the cutting mechanism: to .0002 inches (thinner than a strand of hair).

As Vehicle Harness Systems experimented and cut 10 million parts, the hardened and ground stainless steel cutters lost no effectiveness, and could cut at faster and faster speeds.

quality

WITHOUT QUESTION

Prevent rather than react to quality problems.

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Capabilities:

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- ✓ Wire Position
- ✓ Conductor Diameter
- ✓ Partial Strip
- ✓ Pulled Strand
- ✓ Wire Strand
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The Solution:

Vehicle Harness Systems has developed three models of pin-cutting machines made of precision machined parts.

These machines will cut 90% of the terminals in existence with no tool changes necessary. They will not cut terminals attached to the strip at multiple points.

The hand operated machine can cut a reel in 3 minutes, and the motorized machine can cut the same reel in 30 seconds.

Vehicle Harness Systems depends on these machines daily now, and they have paid for themselves many times over in cost savings and fast turn-around time.

The pin cutting machines are produced in the Vehicle Harness Systems' machine shop and are available in three models.

The ZZ-500 Hand Operated Machine can cut 500 to 1,000 pieces per minute.

The ZZ-1000 Motorized Unit can cut 3000 to 5000 pieces per minute.

The ZZ-2000 Highest Speed Unit can cut 10,000 pieces per minute.

To see these machines in action, please go to www.youtube.com then type in ZZYXCO1. For more information, please call 1-610-916-4545

NEWS PLUGS

Blind Rivets from Micro Plastics, Inc.

Micro Plastics, Inc. has introduced a new product line of Blind Rivets. These specialized Blind Rivets are the newest in Micros' extensive inventory of panel fasteners.

The Blind Rivet is a precision molded all plastic rivet used to fasten plastic to plastic, plastics to metal and plastic to fiberglass. Rivets are non-conductive and non-corrosive. The body of the rivet is molded in Black Impact Modified Nylon 6/6 and the Pin is molded in Black Acetal. The three-leg design securely locks the panels in place and prevents pullout. The rivet inserts from either side of the assembly using standard rivet setting tools. As the pin is pulled through the body it draws

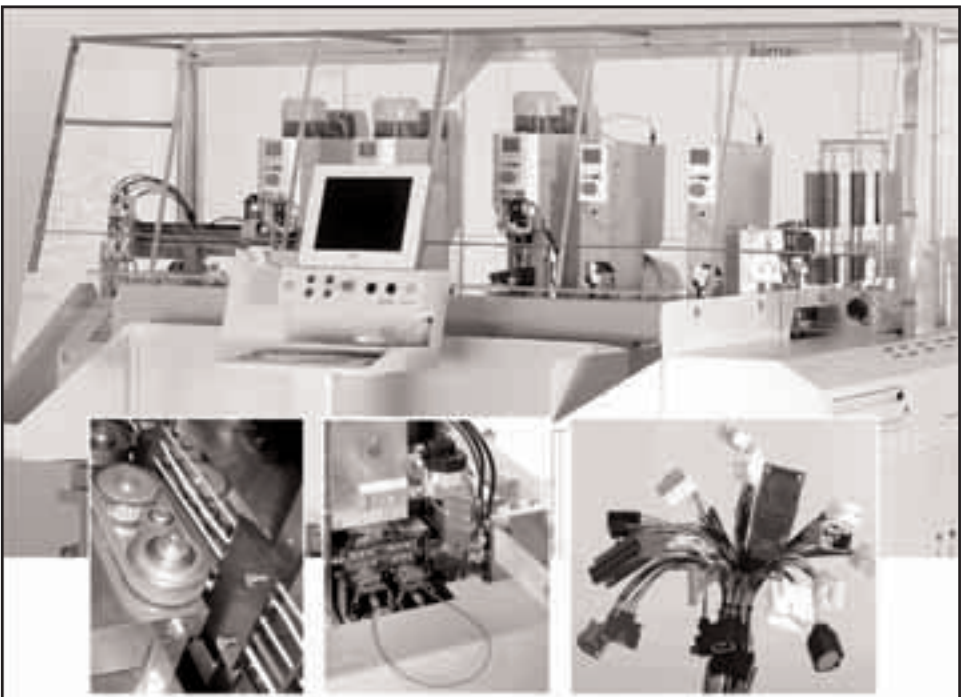
the panels together. When set, the pin breaks off even with the head leaving an attractive finished look.

Blind Rivets are available to fit hole sizes ranging from .156" to .260" and a range of metric hole sizes of 4mm to 6.6mm. The 14 Rivets available in this new product line will handle grip ranges of .028" to .413" and metric grip ranges from 7mm to 10.5mm.



Micro Plastics' Blind Rivets

For further information contact Micro Plastics' Inc., P.O. Box 149, Hwy 178 North, Flippin, Arkansas 72634. Visit www.microplastics.com



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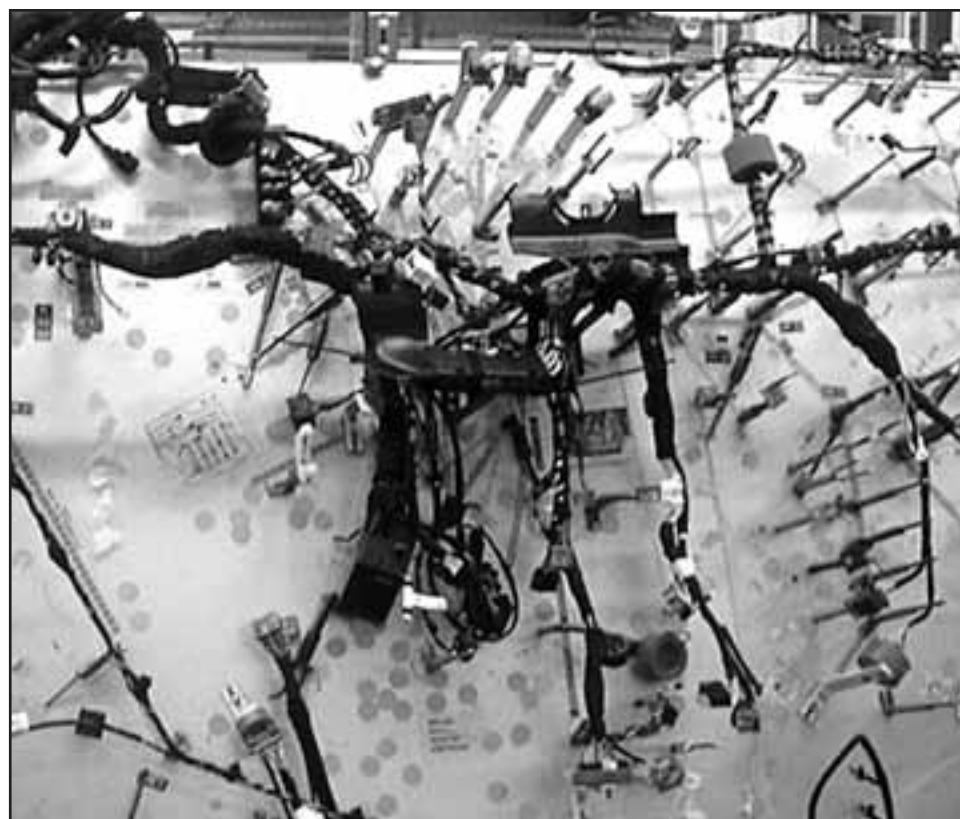




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Wire Harness Assembly

Continued from page 1



Wire Harness on Assembly Board

Ultrasonic metal welding capabilities and limits need to be redefined. This article defines the welding spectrum for UMW in relation to the latest applications development. In order to understand and appreciate the new challenges in UMW, we should define the technology and its application as accepted by the wire harness industry today.

Automotive wire harnesses contain more than 100 splices and grow with each model year. They are adding more features to cars and electronic features require more splices. The splices and wire terminations together make up a long and complex heavy harness that controls the entire electrical system throughout the vehicle.

Wire splicing has always been a major focus in the manufacturing of wire harnesses due to its labor intensity. Mechanical connection (crimping) was the first method introduced for wire splicing and it still has applications

today. In some cases, the joints were dipped in solder. In the early 1970's some companies started to utilize Resistance Welding to join wires together. This process involves fusion (melting) of the material created by resistance to current through electrodes.

In the late 70's German Wire Harness manufacturers started to investigate the feasibility of using ultrasonic metal welding for splicing stranded wires. Soon after, American manufacturers adopted this largely unknown technology. Companies like Delphi Packard, United Technologies and Siemens spearheaded efforts to perfect this process because of the advantages it offered.

- Low temperature process does not affect material properties.

- Pure metallurgical bond for many non-ferrous materials.

Continued on page 40



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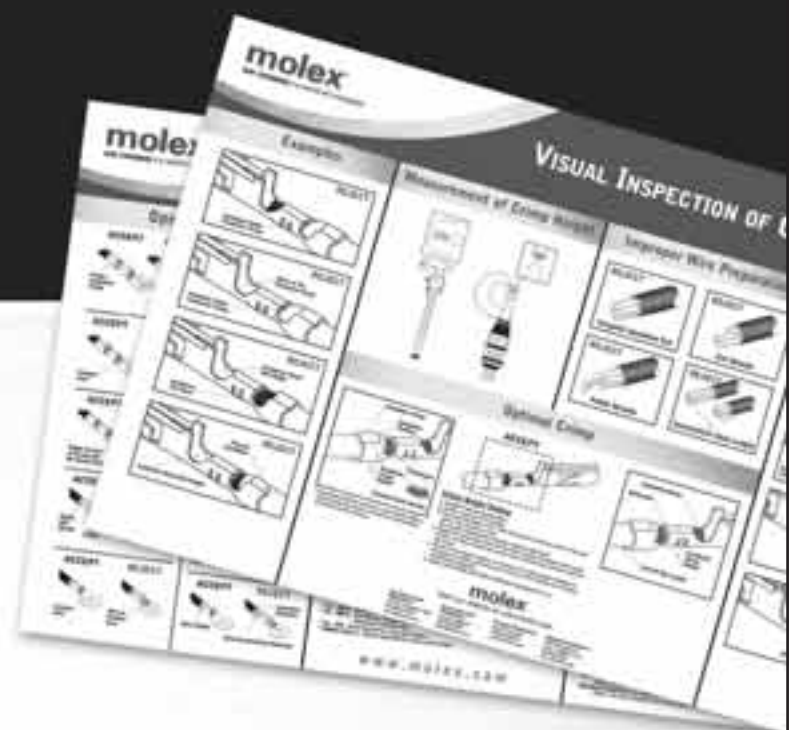


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Demand Molex crimping tools whenever you're assembling Molex products. It's a minimal investment compared to the cost of a failed or compromised termination. Think ahead. Think Molex, start to finish.



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Remembering Some Trade Show Basics

Continued from page 1 _____

minute, or at-show repairs. If you are ordering new graphics, this is an absolute imperative. You don't want to get to the show and find out your graphics fit like your brother's Bar Mitzvah suit.

As for the graphics, unless you are a household name like Google, have a short, powerful tag line or impactful graphic that speaks to your core competency. People only look at your booth for three to five seconds, and generally center their focus at the top of your backdrop before moving down. Keep this in mind. And for goodness sake, don't use a wordy, nebulous quip like

"Innovative Solutions for Supply Chain Enhancement". Just tell me what you do!

Shipping

Always use an experienced Trade Show Shipper. If you are at a loss, check the Exhibitor Manual for a list of preferred carriers. Many of the familiar shipping companies have Trade Show Divisions that understand the nuances of shipping to and from shows. Most shows have a specified time for you to move in. Arrivals outside this time can lead to extra fees charged to you from the shipper or the venue, so go with the pros. If it's a decent size show, a good shipper

can rattle off your move-in date and time quicker than you can look it up in the Exhibitor Manual.

Since we are discussing shipping, let's discuss minimizing the amount of literature you are sending to the show. I constantly refer to a statistic stating 70% of printed literature handed out at shows gets tossed before the attendee leaves the host city. If you don't believe me, look in the lobby trash cans. Have some on hand, but offer to "lighten their load" by having literature mailed. This will reduce costs while building your contact list. Also, consider using a newsletter as your de facto printed hand-out. Make it show specific, (The DEF-

CON 2011 Issue) and have content that will interest likely attendees. Newsletters have a sort of 3rd party feel, and I find people are more likely to read and keep them. I always have a "Notes" area on the back with a shaded grid where you can sketch any drawings, formulas, or other notes during conversations. Attendees are very likely to hang on to these.

Finally, if you have some last minute smaller items, ship them to your hotel. This will help you avoid extra drayage fees.

Forms, Forms, Forms!

I admit, even I hate this part. But you must do it in a timely fashion. I consult with many companies and find they have been submitting them late, foregoing significant discounts. Make this a bold entry on your checklist.

At union regulated shows, the union typically dictates what you are allowed to do at set-up and dismantle. As a general rule, if two people can erect the booth in about an hour, with minimal use of hand tools, you are OK. You are almost always allowed to handle your own products. If you are unsure about your needs, it's always wise to buy an hour of labor when ordering show services. You will be locked into the discounted rate if you need more labor hours. Some venues are more finicky than others so when in real doubt, ask the exhibition company.

Contact the show management and find out what color the isle carpet will

_____Continued on page 16

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ANIXTER

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

Solid vs. Foam Insulation

Communication cables employ a variety of insulation materials to achieve precise electrical characteristics. Without this precise control, the successful transmission of communication signals would be impossible, rendering modern communication equipment useless.

What is insulation?

Cable insulation can be identified as the part of a cable that is typically applied directly to conductors. Cable insulation works because it has a high resistance to the flow of electrons. The resistance provides electrical *insulation* from other cable components. Insulation acts like the pipe that keeps the flowing electrons contained inside the conductor.

One of the key considerations for communication cable designers is the insulation's dielectric constant. Generally speaking, a lower dielectric constant is desirable in a cable because it results in less capacitance and less stored charge on the cable. This allows the

majority of the charge, or signal, to get to its desired destination.

Solid insulation doesn't mean it's rigid

Solid insulation is the most common kind of insulation used in the wire and cable industry. It is a layer of solid polymer that covers the conductor. It should not have voids or bubbles in it. Solid insulation provides durable mechanical and electrical protection for the conductor and is generally lower in cost and complexity to manufacture than foam insulation. Made of a plastic or rubber polymer, solid insulation remains flexible while sacrificing very little crush and impact resistance.

Continued on page 14



Figure 1: Solid insulation from RG 59 style coaxial cable

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Solid vs. Foam Insulation

Continued from page 13 _____

Simple and low cost with excellent mechanical and electrical performance, solid insulation is used for control, power, instrumentation and flexible wire and cable applications. Some solid insulation materials have a dielectric constant sufficiently low enough that they can be used to make excellent performing communication cables. A low and stable dielectric constant is the electrical characteristic needed to achieve high levels of performance in the most demanding communication cables. As you might expect, the polymers that provide low dielectric constants tend to be fairly expensive.

High performance from reduced material

Foam insulation usually has a lower dielectric constant than solid insulation and is therefore used almost exclusively for high-performance communication cables. It is comprised of a layer of extruded polymer with bubbles of air or nitrogen throughout. These gas bubbles give the foam insulation its low dielectric constant. Because the gas itself has a low dielectric constant, the gas and polymer blend reduces

the dielectric constant relative to the solid version of a given polymer. In fact, foam insulations can achieve very high levels of electrical performance, which is often necessary for communication cables. The nature of foam allows the insulation to be thinner than a solid insulation that has comparable electrical characteristics. Obviously, the reduced thickness is useful in applications where space is limited.

One drawback associated with the cellular structure of foam insulation is that the bubble size, shape and dispersion throughout the foam are sometimes difficult to control. Precise control can provide outstanding performance, but that performance comes at a cost. Variations in foam density, bubble size and location can drastically reduce the performance of a communication cable. It is important to understand that the added difficulty may increase the cost enough to offset the reduction in cost that comes from the reduced polymer volume.

Handle with care

Foam insulation is not as physically robust as solid insulation. Modern materials can have a

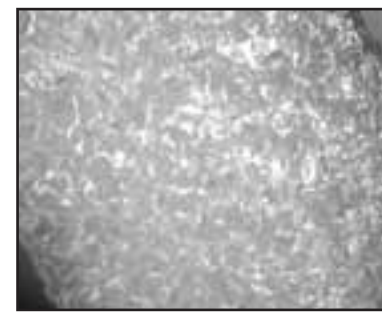


Figure 2: Foam insulation from RG 11 style coaxial cable

foam expansion rate as high as 80 percent, which means there is more gas than polymer in the cable insulation. Having such high levels of gas reduces the density and mechanical durability of the insulation and may result in a kink in the insulation around tight bends or greater chance of being crushed. Kinked and crushed insulation can cause a significant variation in the electrical characteristics, often greatly reducing the performance of the cable.

Modern manufacturing techniques have allowed for extremely high-performance products with outstanding quality. Understanding the role of the insulation and its special handling requirements should make your next application of foamed insulation more successful.

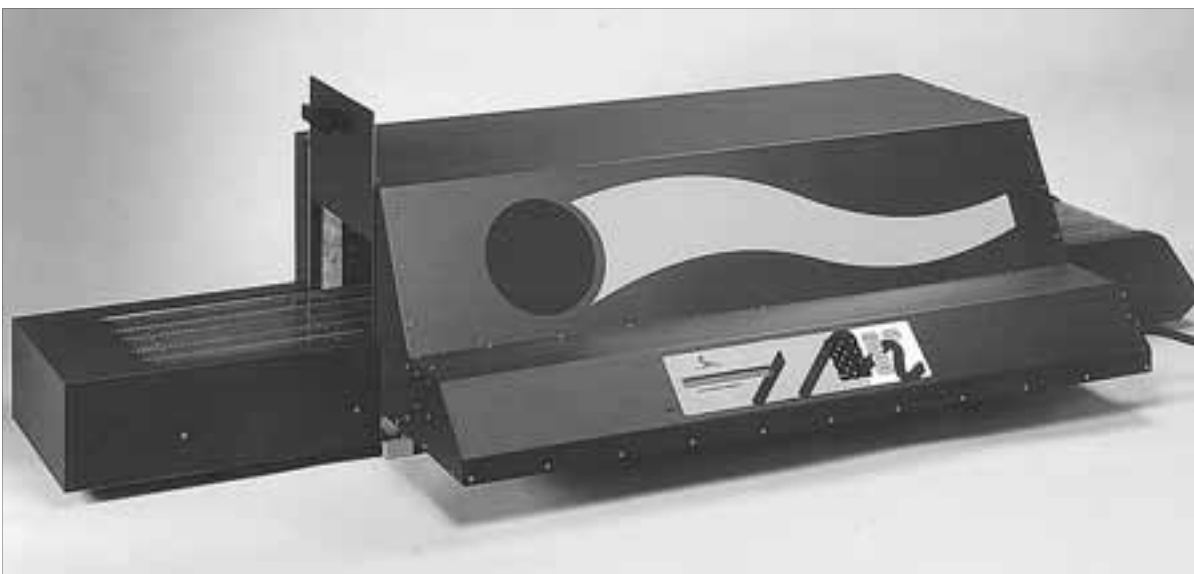
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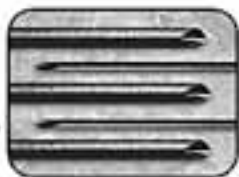


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Remembering Some Trade Show Basics

Continued from page 12

be. Unless the color you choose for your carpet is absolutely germane to the overall theme of your booth, consider a color that is not too contrasting to the isle carpet. A stark difference tends to create a psychological barrier that may make your booth less approachable. In my 20 year experience doing shows, I have identified two basic types of attendees: swimmers and waders. Swimmers will get into your booth even if you put an electric fence around it. Waders, the larger group in my estimation, are much more tentative. Be sure to use this and many of the other suggestions I am offering to make your booth more inviting to the waders. Remove all impediments.

Take a photo of your fully pre-erected booth and attach it to the utilities forms so they have a better idea where to run lines (*in case your drawing skills are like mine.*)

Pre-Show Marketing

It is my sincere hope that you grasp the importance of pre-show promotions. Reed Exhibition's research indicates that booth traffic can be increased by 33% through effective pre-show marketing. No atom splitting here - just a few suggestions:

- Most shows have VIP passes available to you. Take advantage of these and

all free promotional opportunities coming your way. (You are really going to have to break down and read that Exhibitor Manual.)

- Send press releases. Many shows have daily newsletters and are clamoring for articles on products being featured at a show. Also, make submissions to any industry publications likely to have special show issues. Schedule a press conference at the show if you have an earth shattering development to announce.

- Make sure every communication you make in the weeks leading up to the show includes a "See us at" tag. These can be stickers on invoices and catalogs, or electronic signatures on all company emails. Always include show information on your website, but (pet peeve warning) please take this stuff off after the show! If you can make all of these communications conform to the overall graphic theme of the booth, you are way ahead of the power curve.

- Most major shows have staff devoted to helping attendees with marketing, press releases, and other promotional avenues. You will find contact names in the Exhibitor Manual. These are the folks to ask about product displays, proper press release formats, and many of your trade show uncertainties. I'm a veteran, but I make it a point to speak to

Continued on page 18

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Remembering Some Trade Show Basics

Continued from page 16

these folks when I plan for any show. They never let me down. I learn something from every one of these conversations that I add to my trade show marketing arsenal.

- Sponsorships can be effective marketing tools. But make sure you are getting a good bang for your buck, and not lost in the shuffle. I often see banners or program inserts with a plethora of company monikers scattered at the bottom. I call it “Logo Soup.” Stay out of that pot.

Staffing

This is where a lot of companies drop the ball. There are many formulas in determining the appropriate staff level at a show. You can take the total number of projected attendees, divide by the number of show hours, say two Hail Mary’s and come up with some number. Just keep some simple things in mind. Your booth and display gobble at least 1/3 of your space. Stand up, point your arms out to form a “T” and spin around. This is about 50 square feet. If you put more than two or three people in a 10 ft.

booth, it begins to resemble the glee club ready to burst into harmony. It’s uninviting and nobody will be able to see those cool graphics. If you think the show will be busy, consider a larger space. I’ve even used 10 foot booths in a 20 foot space with an extra banner stand. It works great and it really allows free and unfettered access to your space and staff without investment in a new booth.

Have a written schedule and make sure to have enough staff to accommodate breaks every two hours or so. Make sure that there is always someone in the booth knows how to contact show management, labor, or other providers of show services.


At The Show

I’ve heard the term “Boothmanship” used and you need to learn it, live it and love it. It’s basically how you conduct yourselves at the show. Remember, you are showcasing your company’s image and integrity. First, everyone in the booth should be well conversant in sizes, flavors, delivery terms, lead times, and other product specific questions that are likely to arise. Engineers are usually better salespeople than most salespeople. But make sure everyone is on message, and prepared to take the prospect to the next level towards the final sale.

Avoid closed ended trivial questions like “How are you” or “Enjoying the show?” Use thoughtful open minded questions like “How familiar are you with our new technology?” Come up with a list of questions likely to get the ball rolling. Share and rehearse them with staff before going to the show. I know it’s always corny to do role playing, but it really works.

This is where I get the moans and groans. It’s never a good idea be seated in the booth, so no space eating chairs. People are less likely to engage if you are seated. Unless you have a huge booth with a conference table setting, please stand. If you have listened to me and staffed your booth properly allowing for breaks, this should be no

Continued on page 20



Tri-Tech KODERA

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Ultimate Miniaturization & Downsizing of Wire Processors

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C301	16-40 AWG
C370	10-32 AWG
C371	8-28 AWG
C373	4-28 AWG
C375	7-28 AWG
C377	3/0-16 AWG

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(Applicable wire range 12-32 AWG dependent on wire)

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- C550 SZTS Single End Crimp x Twisting and Tinning
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- C555 Seal Insertion & Crimp x Crimp
- C556 Single End Seal Insertion with Crimp x Twisting and Tinning
- C558 Double End Crimp x Double End Seal Insertion

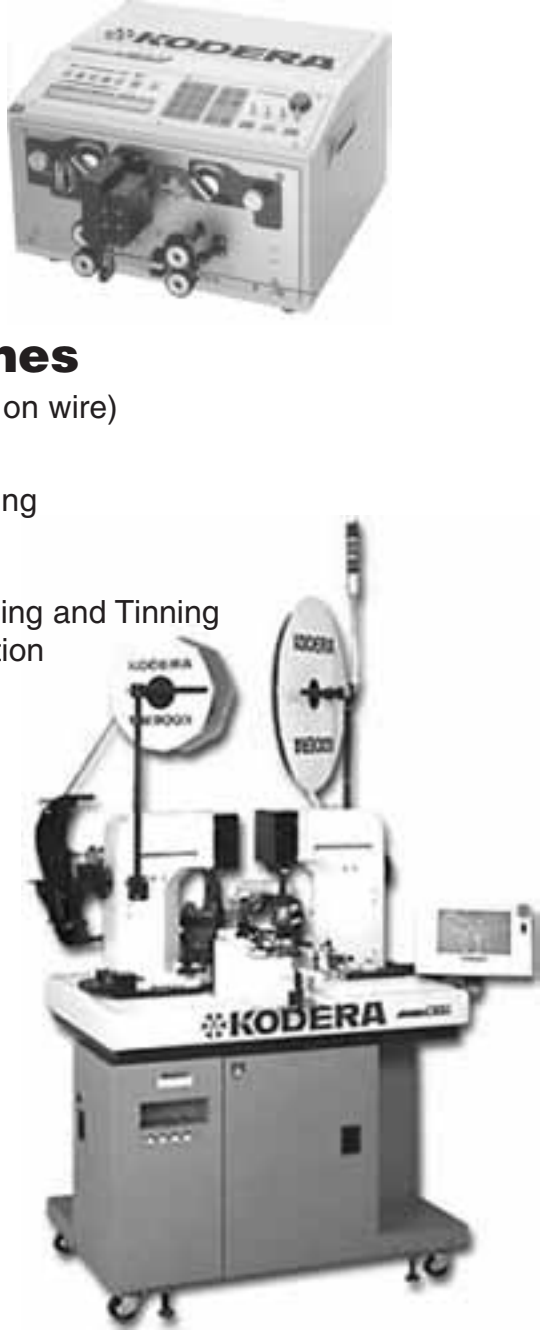
Ultimate Down Sizing and Miniaturizing

C511HXIA-2 DOUBLE END CRIMP
12-32 AWG

PRODUCTION 9,000 PER HOUR

C551HX DOUBLE END CRIMP
18-32 AWG

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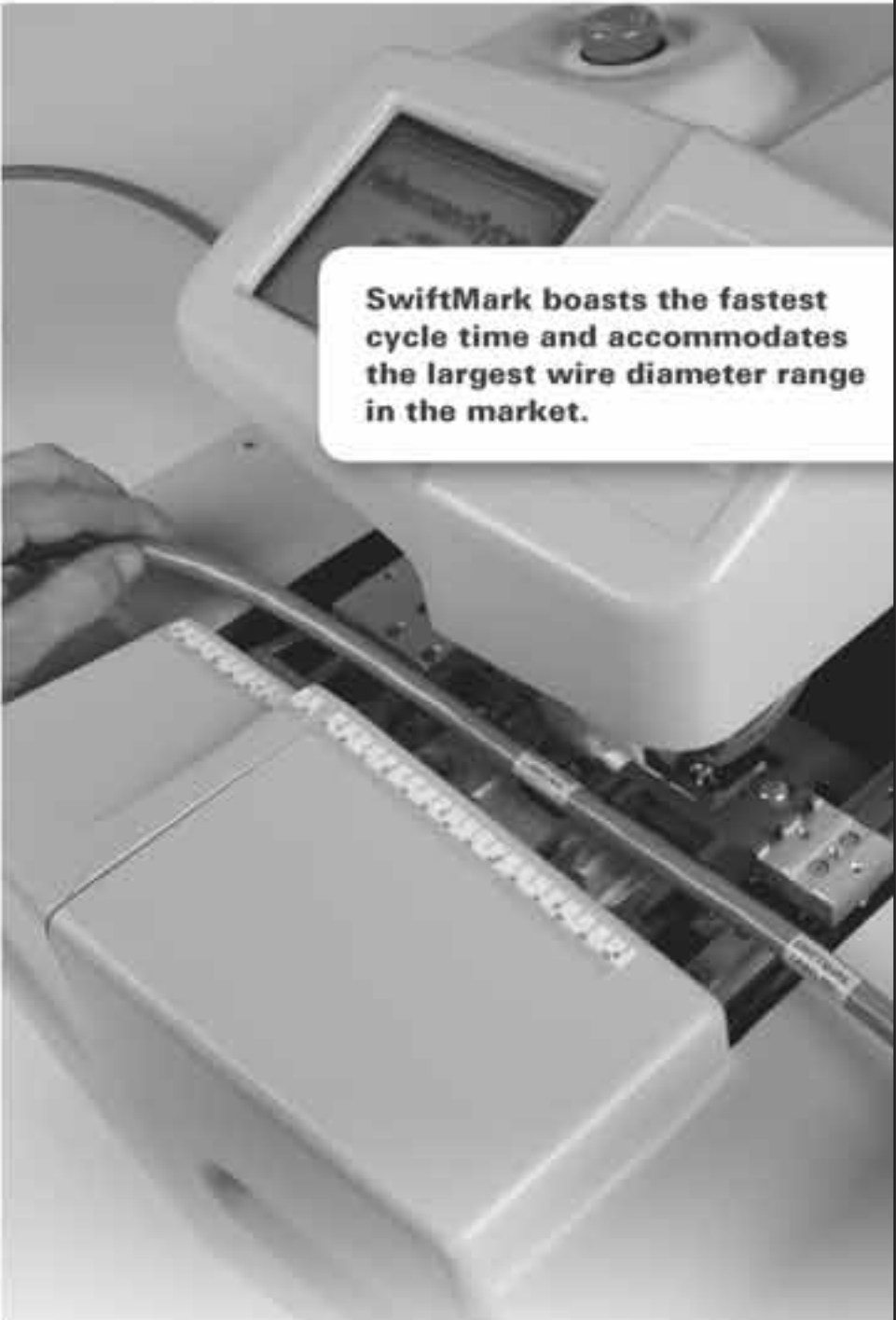
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Remembering Some Trade Show Basics

Continued from page 18

problem...right? I'm a bit of a cheapskate, but I always order the extra carpet padding. It helps.

Keep the booth tidy and free of drink cups, water bottles, extraneous laptops, briefcases, purses and other mish-mosh. Always have a bottle of all-purpose cleaner, some paper towels, and invest in a Dustbuster. I hear more moaning, but it only takes a few minutes to clean a 20 ft. booth this way. Even if you decide to pay extra and have your booth cleaned, it never hurts to do a lit-

tle maintenance throughout the day. Walk away from the booth occasionally and glance back to see how things look from the attendee's perspective.

Have a trade show Survival Kit consisting of small tools, two-sided tape, duck tape, and wire ties to make any MacGyver-type repairs. Always pack an extra power strip and extension cord. If you are erecting the booth yourself and are not over six feet tall, buy a folding stool and pack that as well. The show management and labor folks generally have an issue with you teetering

on stacks of crates, chairs, or God forbid a ladder.

I'm sure those nice folks from the accounting department let you know exactly how much the last trade show cost. The space, the meals, the travel, the laptop you left in a cab...it adds up. Get the most from the show and be on stage until the bitter end. Don't break down early - you never know who you might meet in the waning hours of the show. Plus, it is unprofessional in my opinion.

And finally, please, please, please, no eating in the booth!

The last thing I want to see when I'm walking the show is you shoveling down a nacho grande with great dispatch. It's a big time turn off. Don't do it.

After The Show


Whew, the show is finally over. This is the point where I have seen some of the costliest blunders take place. Make sure whoever is packing the booth has done it before...preferably blind-folded. Well intentioned "helping hulksters" can damage expensive graphics and booth components by tearing hastily into the display and packing things improperly. Let them go have a brewski. If I am working a show with a 10 ft. booth, I actually prefer to throw on a pair of jeans, wait for the crates, and tackle it myself. More is not better here. And, if you want to ensure yours are the LAST crates out, go whine to the event labor crew that you have a flight out in two hours. Be patient. If you are using labor for dismantle, be there when everything is being packed. Your booth represents a huge investment so take great care at this stage. Plan to take a later flight and stay an extra night if it ensures proper dismantling and shipping of your booth.

Here's a tip. Go fish around your shipping department for a 3/4 used roll of shrink wrap and throw it in one of the crates ahead of time. You will save money and help ensure your shipment will not be split and possibly lost or damaged in shipping.

Continued on page 22

Crimp Inspection System

PC based system with bar code scanner, micrometer, caliper, pull tester, microscope and USB camera



First the operator scans the circuit number, his worker number and the machine number. The target crimp specs and master image are recovered from the hard drive and displayed. Using current production samples the operator measures the conductor and insulation crimp heights and widths. The operator measures the pull force. The operator captures an image, either cross section or terminal image. When finished the data is stored in Excel.

Set Up Assistant ver 1.07


Circuit # WXYZ Release Report Chart Report Data Master Maintenance Quit

Dimension	Target	Target +/-	Actual	Measure
Cond. CH	0.033	0.002	0.034	Measure
Cond. CW	0.070	0.002	0.071	Measure
Ins. CH	0.080	0.005	0.080	Measure
Ins. CW	0.088	0.005	0.088	Measure
Pull	20.00	---	31.18	Measure


Master Image Sample Image Shutter




Save Into Excel




Scan the circuit number, operator number and machine number




Measure conductor and insulation crimp heights



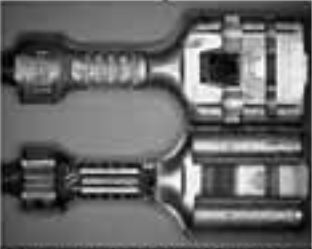
Measure conductor and insulation crimp widths



Measure pull force



Capture cross section image or terminal image



cross section images or terminal images can be captured

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



Model 1700



Model 2000

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

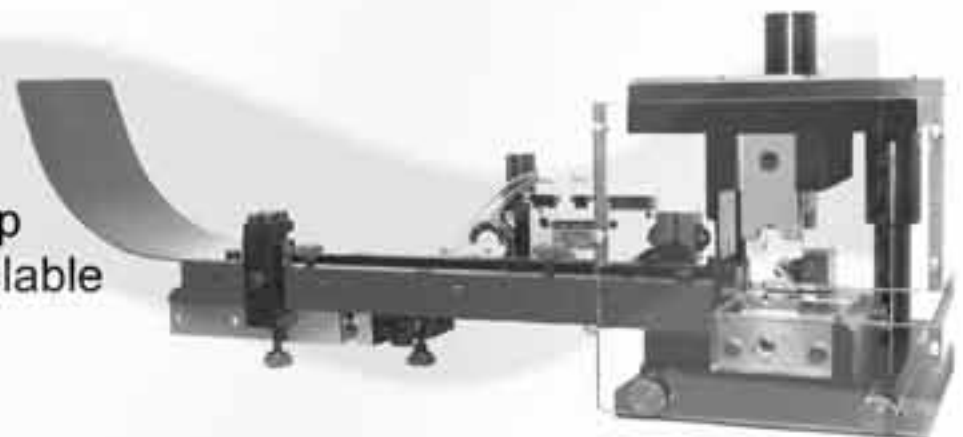


Model 1500



Model 2100

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



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Remembering Some Trade Show Basics

Continued from page 20

Etch this next sentence in granite. **When all of your materials are packed, skidded, wrapped, labeled, and ready to ship, take the completed bill of lading to the show service**

desk and contact your shipper to let them know. If this gets mixed up because you relied on someone else to do this, your stuff could be shipped via the show's preferred carrier; from Orlando to North Carolina by way of Ogden, Utah; all at your expense. Even worse,

things can get lost altogether. To save time, have pre-printed return shipping labels with you at the show.

Leads, Leads, Leads

This is really the meat of trade show marketing, and it transcends all stages of the show experience. You need to do the best possible job of qualifying the folks you meet at the show, and planning is key. This is one of those situations where quality absolutely trumps quantity. Ask your reps and salespeople to rate the quality of your show leads in the past. If they have been lacking in quality, you need to communicate that you are going to correct the situation...then actually correct the situation. This would be a good time to determine the type of customer you want to target, and integrate that into your overall message (pre show promo, booth graphics and newsletters.) Ask your sales team what types of qualifying questions should be asked of the prospect. This will help you develop some of those open-ended questions. Do your best to separate them by some sort of A,B,C priority. (I feel compelled to mention this because I saw it done, but please don't do this in the prospect's presence.) You never want to hand your sales team a mixed bag of unqualified leads. After the first few bombs, they will set those expensive leads aside never to be seen again.

Qualify and prioritize.

As for the actual lead retrieval at the show, save the fish bowls for the guppies. I recently worked with a company in the information technology field, and the fishbowl was their system for gathering leads. Please...it looks like you're giving away a trip to Vegas or something. You will invariably end up with a bunch of cards with illegible scribbling on the back. Junk leads. I know the lead retrieval systems are pricey, but they offer great flexibility and integrate well with database systems back home. You can customize fields to prompt the questions you need answered. If you're not a techno-geek, ask the system vendor to help you through it.

I have also used business card scanners successfully. These scanners work great at table top events, and you can build customized fields with them as well. Low tech lead cards are fine but if all you come home with is a fat wad of business cards, you're not optimizing your trade show dollar.

Here's another tip. People retain the first and last message they see. I know all of you savvy marketers want to be the first, so transfer the lead information back home at the end of each day. They can mail merge them into a letter or an

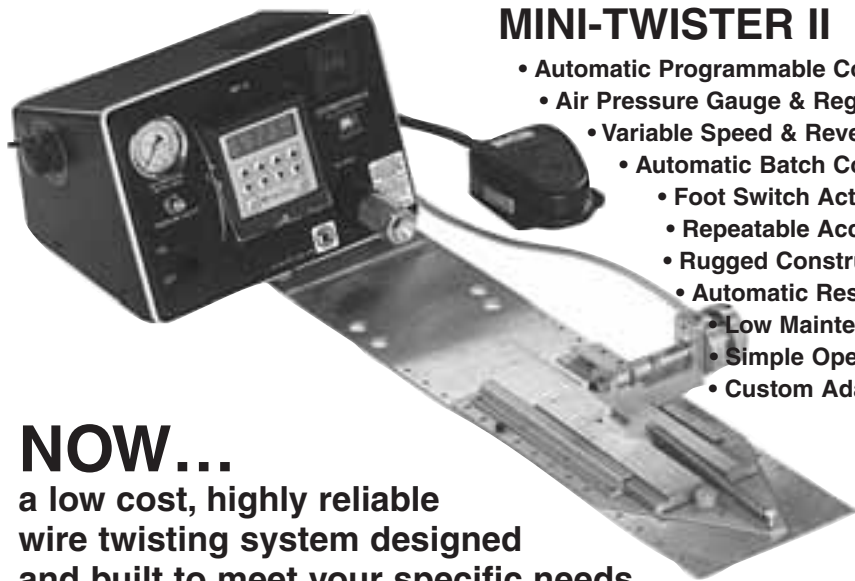
Continued on page 49

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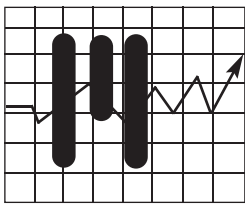
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Both twisting / tinning and crimping can be changeable with quick change (TR201SS). Lead-free and regular tinning can be handled with the tinning unit.



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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.

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NEWS PLUGS continued

T.S.R., Inc Appoints New National Sales Manager

T.S.R., Inc. announced that Mr. Ruedin has joined the company to oversee the North American sales team focused on Wire-Harness equipment and Consumable products. In his role as national sales manager, Mr. Ruedin will primarily assist in the development of strategy for growing the CYG USA heat-shrink business and expanding the current customer base across all product lines.

Mr. Ruedin brings more than 25 years of sales, sales management, and marketing, experience to T.S.R, Inc. He also has a successful track record in E-commerce development and project management for multi-billion dollar corporations across multiple industries.

"More than ever, our customers are seeking out solutions that meet the objectives and challenges specific to their customers," said Tim Paczesny, President, T.S.R., Inc. "By leveraging his deep understanding of sales strategy and multiple markets, as National Sales & Marketing Manager Mr. Ruedin will be able to guide our sales teams in helping customers and prospects select T.S.R. to not only meet their individual needs, but to exceed their expectations."

CYG produces a comprehensive range of heat shrinkable tubing in various kinds of colors and shrink ratio. They meet CSA certification, UL224/ MIL approvals and all products are backed by their TS16949 Quality Systems and ISO9001:1996 environment systems. As Sony and Samsung Green Partners, CYG products not only can meet Sony environment substance requirements, but also EU ROHS compliance. These strict quality certifications have helped CYG become a major player in the Heat-Shrink Industry, with an annual throughput of over 12 billion meters of tube, and growing.

CYG's product offerings include: heat-shrink single wall tubing, Dual wall tubing(with adhesive), Special designed tubing including Kynar and polyolefin-insulated crimp splices. CYG also offers extremely competitive pricing on popular pre-cut and bulk HS identi-

fication Sleeving. Applications include Automotive/truck wiring, repair and maintenance, automotive accessories installation, OEM automotive/ truck/RV, wire harness fabrication, and wire to wire splicing.

For more information on CYG or T.S.R, Inc., please contact: TSR, 5185 North US Hwy 31, Eastport, MI, 49627. Phone: 231-599-9956, Fax: 231-599-2965, Email: contact@tsr-mi.com, website: www.tsr-mi.com | www.youtube.com/timtsr

Breyden Products, Announces Asset Purchase of Gudebrod, Inc. Electronics Division

Breyden Products, Inc. is pleased to announce an asset purchase of the Gudebrod Inc. Electronics Division.

The purchase was complete on

Monday, August 16, 2010. The acquisition includes all manufacturing equipment, trade names, trademarks, inventory, and open purchase orders relating to Gudebrod's Electronics Division.

The asset purchase of Gudebrod Inc. Electronics Division enhances Breyden's position as one of the largest suppliers in the world of lacing tapes, cords and braided yarns used in the Wire Harnessing Industry. The Gudebrod product line will be incorporated into the Breyden facility in Columbia City, Indiana.

For questions related to the acquisition, please contact Breyden Products Inc. 260-244-2995 or email mzu-ber@breydenproducts.com

Breyden Products website: www.breydenproducts.com



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All applicators include:
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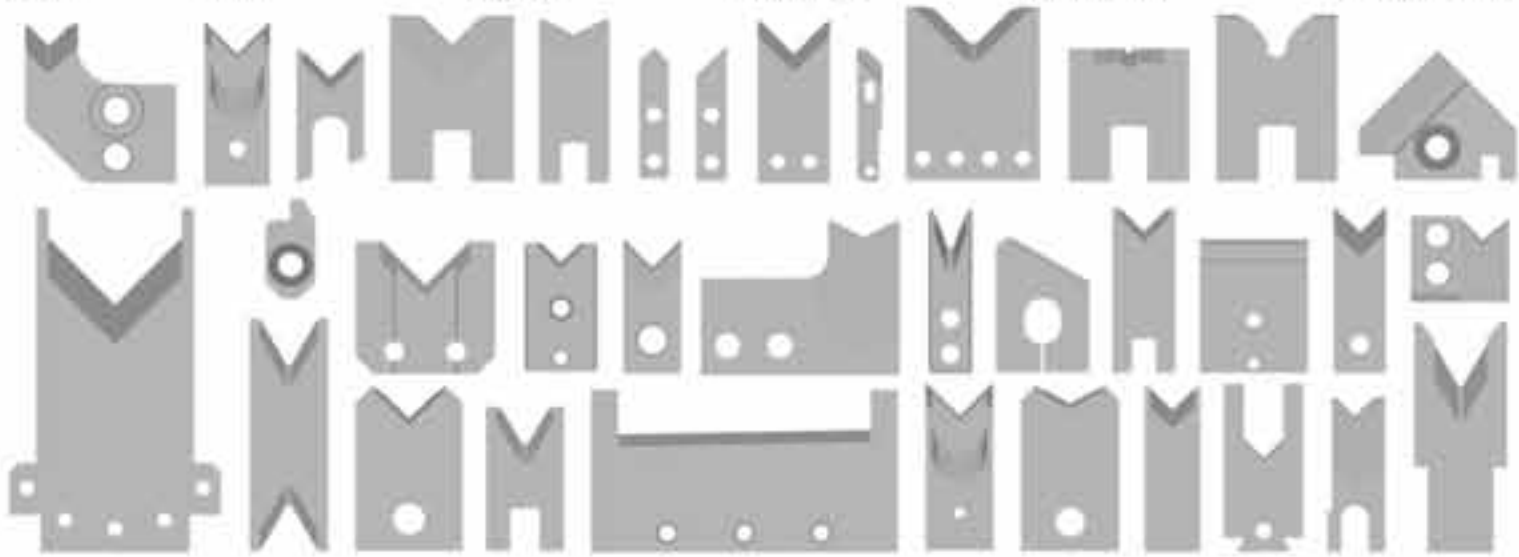
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 - and many others...



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 - Terminal Paper Winding Machines
 - Terminal Applicators & Crimping Presses



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Marlin Shelley Retires as President of Cirris Systems

Continued from page 1

reduction advantages. According to Shelley, several companies in the cable and harness industry have ESOPs, most notably Industrial Wire & Cable Corp. in Lake Zurich, Ill.

“The ESOP maintains the culture we have created,” said Denning, who has been at Cirris 21 years. “We get to keep the best parts of Cirris in the future. It is also a way to give back to the employees for what they have contributed for many years.”

The origins of Cirris can be traced when Shelley became fascinated with electronics while in fifth grade. His mother took him to used electronics store to buy pieces of equipment he disassembled and re-assembled to learn how they worked.

Shelley has degrees in electrical engineering, engineering administration and business administration from the University of Utah. His career began in 1972 at Sperry Univac in Salt Lake City. Five

Continued on page 26



Brent Stringham presents Marlin Shelley with a scrapbook of the past 26 years.

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Marlin Shelley Retires as President of Cirris Systems

Continued from page 25

years later he started Micro Peripherals Inc. (MPI) with other Sperry Univac engineers. The firm built dot-matrix printers and prospered until being decimated by large Japanese competitors.

While operating MPI Shelley learned that printer malfunctions could be traced to defective cables and realized an effective cable tester was needed. He started Cirris by developing the software for his first machines at his dining-room table.

Because Shelley often worked 70 hours a week at MPI, he did not want to repeat that with Cirris. "I came to realize that I worked too much," he said. "Life is too short. It made more sense to work hard for a reasonable amount of time



The Cirris team gathered for a group photo at Marlin's retirement celebration.

and then enjoy life the rest of the time to provide balance."

An active company presence in the

community also was important to Shelley. Cirris employees deliver Meals on Wheels, donate items and provide tutor-

ing at a school and contribute to United Way, homeless shelters and food banks.

To keep employee satisfaction high, numerous company-related parties and activities are held. "Marlin figured if people are happy as employees, they will make better products and treat customers better," Denning said, noting the average employee longevity is 14 years.

The first major order for Cirris was a tester for checking Amp flat-ribbon cables inside IBM computers. Intermittent pulses were not being detected adequately by a competitor's tester, and the Cirris tester did the job more quickly and accurately.

Similar instances led Shelley to comment that "we had lots of lucky breaks," but he and his staff constantly were innovating and producing larger and more sophisticated machines, particularly with the Signature line of testers. "We have gone from obscurity to one of the largest companies in our field," Shelley said.

Company growth surged with the addition of high-voltage testers years ago. The highest revenue was in 2008, and this year will be similar. Adequate profit levels have enabled Cirris to self-fund its growth.

Lean is practiced rigorously throughout Cirris, and vertically integrated manufacturing is advantageous. "Most of our competitors have to outsource certain operations, but not us," Shelley said. Cirris also follows A-620 standards, which he helped to develop.

Keeping pace with technology is important to Shelley, especially since

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Advantages:

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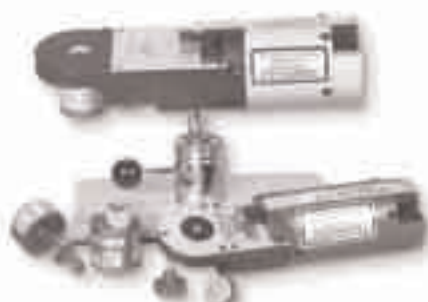
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Continued on page 28

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Marlin Shelley Retires as President of Cirris Systems

Continued from page 26

some Cirris tester software requires one million lines of code. “The amount of horsepower of computers is changing so radically,” he said. “We have to figure out how to leverage technology in the general marketplace and put it into Cirris.”

Responsibility for meeting that imperative and others at Cirris falls on

Denning and the other managers: Brent Stringham, sales and marketing; Scott Meredith, product development and engineering; Val Griffith, manufacturing and purchasing; Erin Petersen, administration; John Ahlstrom, international sales; and Gene Vought, quality.

Denning, 50, has been the product development manager, engineering manager, trainer for Crucial Conversations (which focuses on communica-

tion and problem-solving) and vice president. He serves on the board of directors with Shelley and two people outside the company.

“My great strength is to get people to work synergistically,” Denning said. “I have strong people skills, and I want people here to be capable and confident. The people here and our customers are our best assets. We are part of the quality that is at the core of

the products that people all over the world use.”

Denning foresees Cirris staff members sharing their expertise and experience in lean manufacturing with customers in a consulting role to relieve some of their struggles and use Cirris equipment better. Providing data and statistics through networking will continue to grow in importance, he stated.

“With all the systems that have been developed here, I have been put in a position that is so easy,” Denning said. “I do not have to fix anything or make any changes. We just have to keep moving forward.”

Denning is forever grateful to Shelley. “I have an indescribable respect for him,” Denning said. “I am very appreciative that he laid the foundation of what we have today. He is a brilliant individual, and he has developed me into where I am today by constantly encouraging me to learn and do better. He is someone to measure up to.”


Stringham, who has directed all aspects of sales and marketing since mid-1984, also has had a tight mentor relationship and friendship with Shelley due to their open and honest communication with each other. Stringham, 52, admires Shelley’s intelligence, focus on community betterment, belief in individual potential and dedication to customer service.

“What I appreciate about Marlin is that he recognizes and appreciates the need to give people the tools to get the job done right,” Stringham said. “He gives you a lot of room to do it your way as long as you get results. Everybody loves Marlin. His delivery is not always polished, but his intent is almost exclusively unchallengeable. He is almost above reproach. When you do business with Marlin and Cirris, integrity will be the watchword.”

Due to his position, of particular importance to Stringham is serving customers. “When you buy a tester from Cirris, you join the family. You are not just a customer but almost a member of the team,” he said. “We absolutely kill you with customer service. We have an excruciatingly intense focus on the customer.

“We make quality connections happen,” Stringham said. “That is our motto that applies to our equipment and our relationships with our customers.”


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One of the many benefits of the SSM is it will work with seal kits that you may already own. The seal size range for the standard track in the Schäfer unit is the widest in the industry. Its narrow construction saves space on your machine table, allowing for a wider variety of other modules. The SSM is designed to achieve maximum process speeds while minimizing space requirements.

Wide range is standard

The new SSM unit can handle seals in a wider range of sizes and shapes. It is user friendly and will process seals with diameters up to 10 mm and 9 mm in length in its standard configuration. This includes many hard shell seal applications. Optional settings are available for large seals with diameters up to 17 mm and 16 mm lengths. The SSM has many other cost savings options available as well.

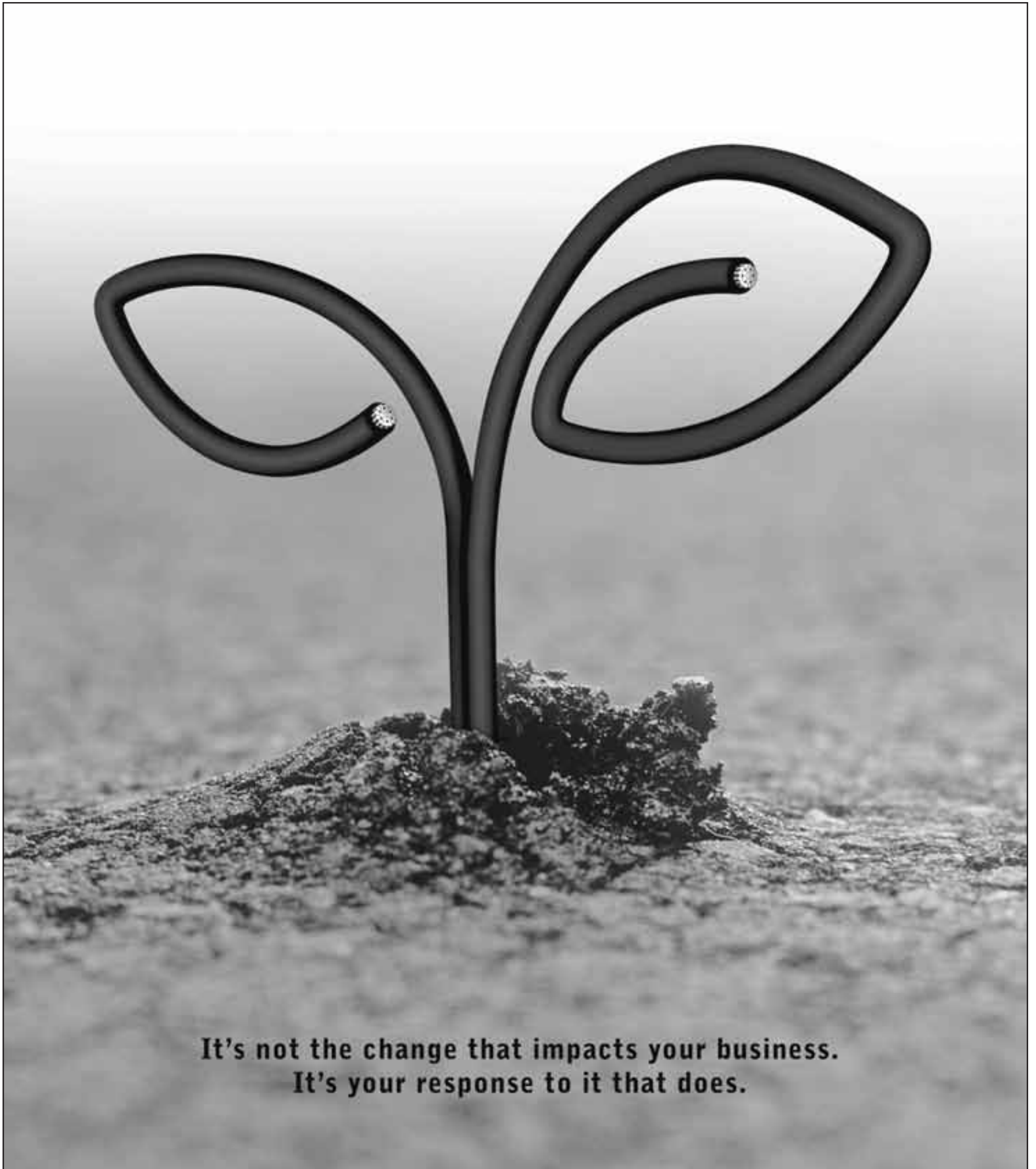


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Loose Piece Contact Crimping

Continued from page 1

drop between the conductor and contact is also lower. Because of this, smaller LPC contacts can be used compared to stamped and formed terminals, saving valuable weight and space in many different products.



Figure 1: Crimped loose piece terminals (MIL spec).

Another advantage of LPC is their precision cylindrical geometry. Male and female connectors mate together perfectly, forming a very reliable gas-tight and spark-free connection. This precision fit makes LPC resistant to intermittent connections caused by vibration as well. Standard pull-force tests almost always show that the wire strands break before they are pulled out of the crimped connection. The type of crimp that is typically used to terminate a LPC is known as a 4-indent crimp, where 4 indents are made at 90 degrees to each

other. The specifications and quality requirements for such a 4-indent crimp can be found in the SAE standard (aka “Mil-spec”) – which is mainly used in the military and aerospace industry.

Process automation

LPC are significantly more difficult to automate than reeled terminals. Accurate and reliable processing of LPC requires that they be automatically sorted and oriented into the proper position before being crimped onto the wire. Inserting a stripped wire into a closed barrel LPC requires an additional axis of movement and a guide system to ensure that all of the individual wire strands are safely inside of the contact before crimping,

Both semi- and fully-automatic systems require a number of automated process steps for reliable crimping of LPC:

- Sorting and orienting
- Feeding and positioning into the crimp tooling
- Stripping the wire end and inserting it into the contact which has already been positioned inside of the crimp tooling.
- Crimping (4-indent crimp), including quality assurance
- Extracting the completed wire and LPC assembly from the machine without damaging it.

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Figure 2: Typical Stripper Crimper for loose piece contacts.

Each step above requires a technical solution which differs greatly from those used when crimping reeled terminals. High-precision benchtop machines such as the one shown in figure 2 combine all processes, including quality

assurance, into one machine. The machine sorts and feeds the contacts using a combined drum / track system. An integrated stripping unit with trigger sensor strips the wire end. An optional “re-cut function” can be used to trim the wire, ensuring that the strip length and wire end position are exact. Short cycle times combined with precision mechanics allow for efficient and precise processing – making an automatic Stripper Crimper the preferred choice for demanding customers, especially in the military and aerospace industries. Depending on production requirements, LPC can be processed on fully automatic systems as well.

Continued on page 32

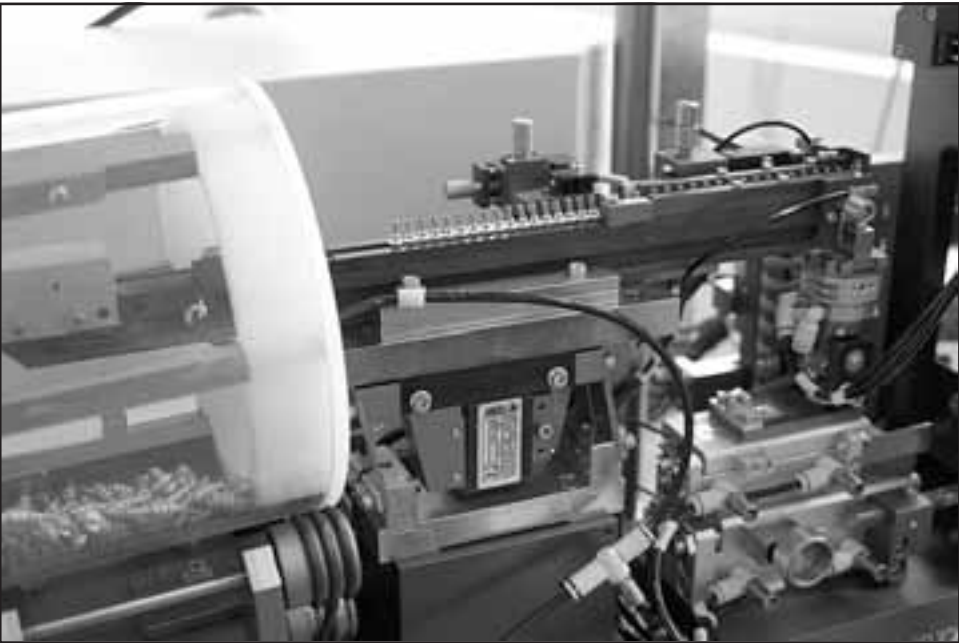


Figure 3: Drum with linear feeding track of a Stripper Crimper.

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Loose Piece Contact Crimping

Continued from page 31

Sorting

During sorting, LPC are brought into a defined position for further processing. A proven process is to use a rotating drum, which drops the contacts onto a vibrating feed track (see figure 3 page 31). The track is specifically designed for the shape of a given contact, so that they can only "fall" into the track in a defined way and are automatically lined up for further processing. A gripper then positions each terminal into the crimping applicator.

Contact type

The contact type determines how linear feeding and positioning are executed. There are 3 basic contact types, which are distinguished based on their center of gravity and shape. (see figure 4). Feeding is either done vertically (crimp zone up or down) or horizontally.

Many different types of contacts

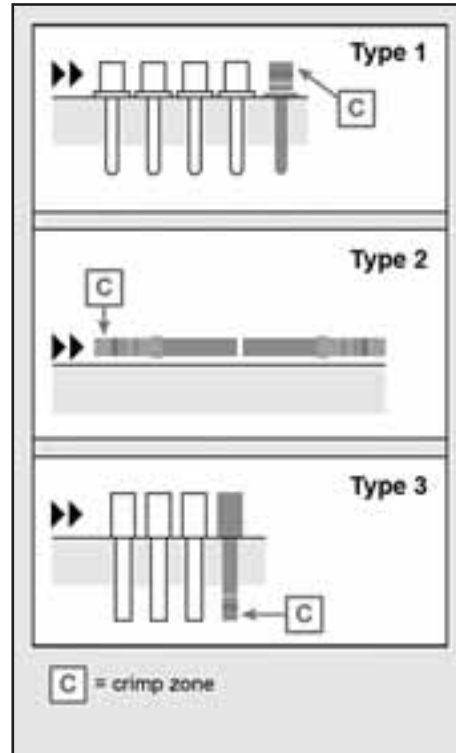


Figure 4: Terminal types.

can be processed. Quick-change tooling systems reduce changeover times to a minimum – for high productivity even when frequently changing applications.

The three most common contact types are:

- *Type 1: Vertical feeding with crimp zone up*

This contact type has a "collar" (or shoulder) between the connection area and crimp zone. Its center of gravity is below the "collar" in the connection area

- *Type 2: Horizontal feeding*

Type 2 contacts have no "collar" and their center of gravity is not clearly defined. Therefore vertical feeding is not possible, therefore the terminal must be fed horizontally.

- *Type 3: Vertical feeding with crimp zone down*

This contact type also has a "collar", but its center of gravity requires "upside-down" feeding, with the crimp zone down.

Continued on page 37

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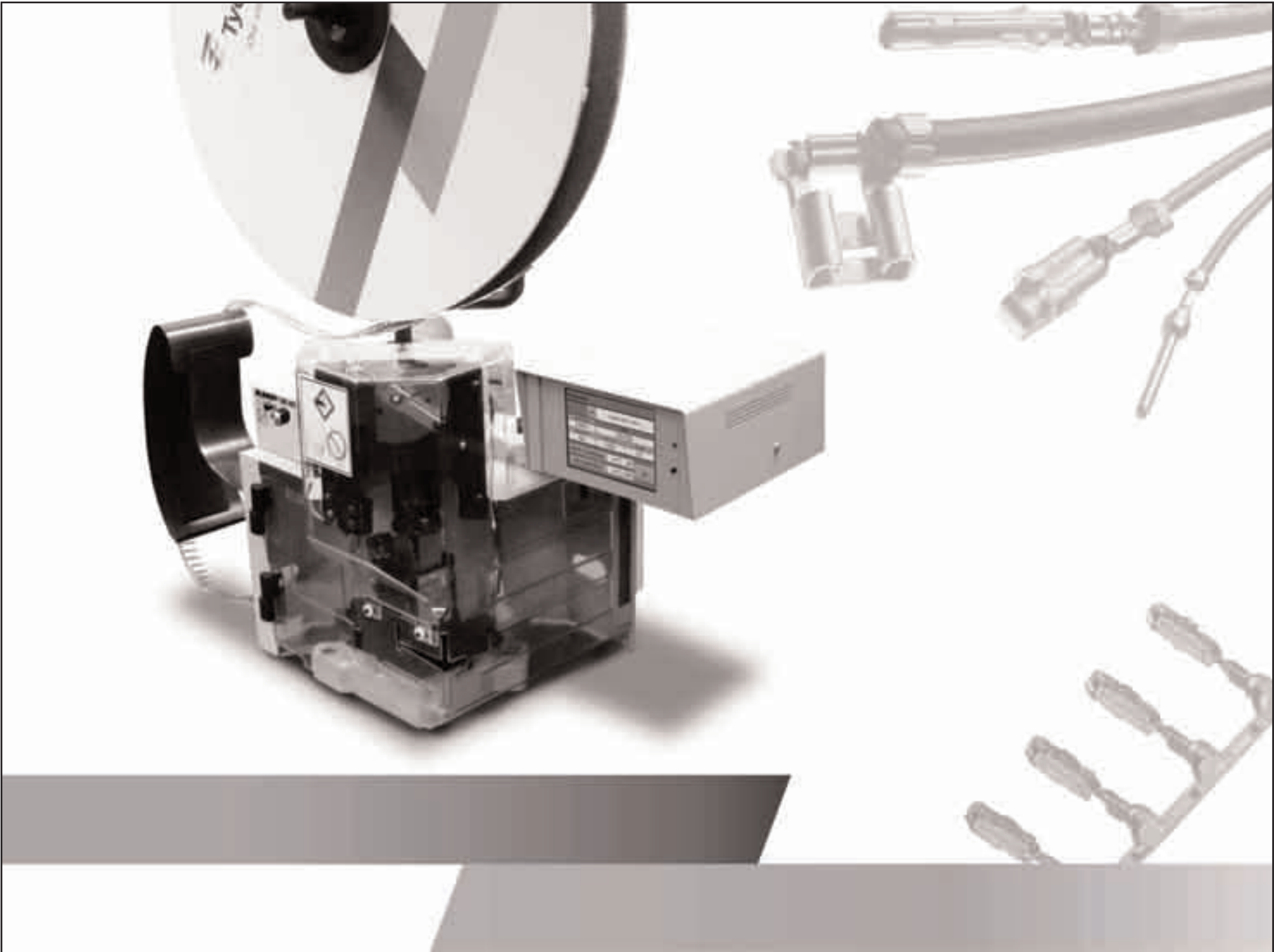
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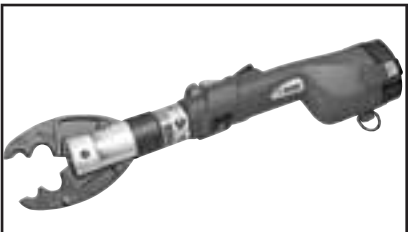
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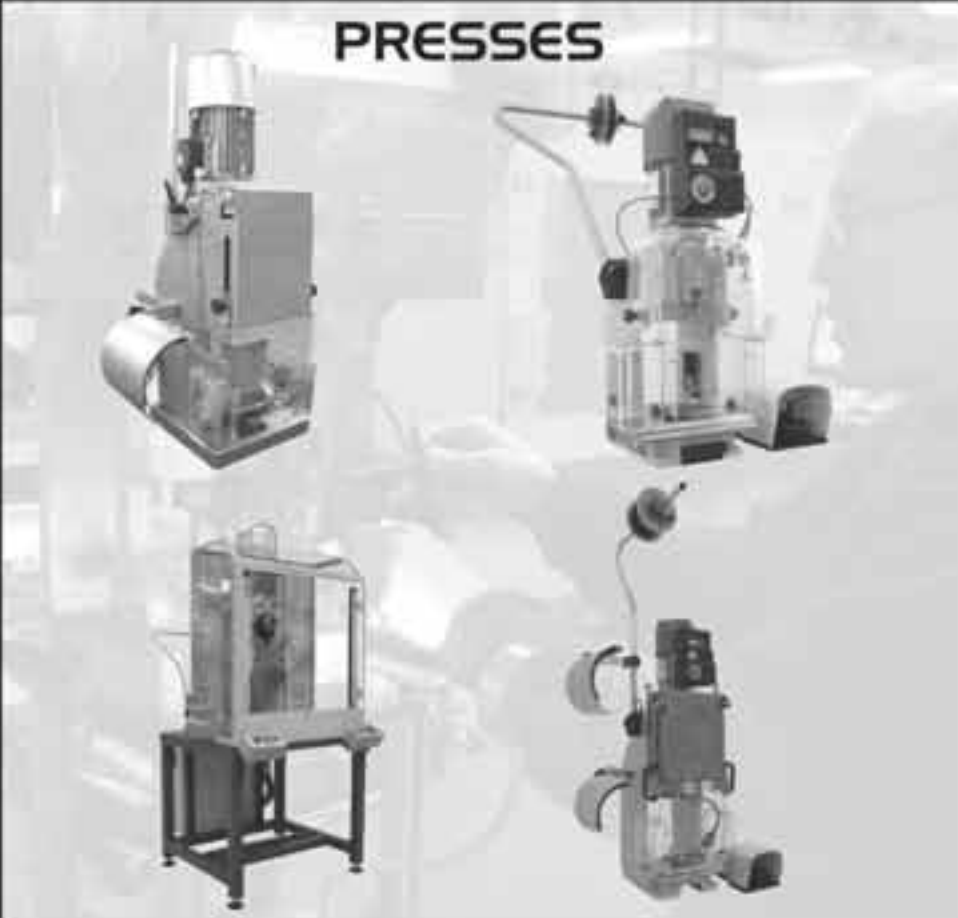
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Loose Piece Contact Crimping

Continued from page 32

Feeding and positioning: Contact

Contacts move along a vibrating feed track towards the positioning unit. The design of the positioning unit depends on the contact type being processed. The positioning unit consists of a combined tilting- / turning-module with gripper (*see figure 5*). The gripper unit picks up the contact after it is oriented properly and places it inside of the crimping head.

Type 2 contacts are the most complex to feed and orient since the crimp zone can be on the leading or trailing end as they move down the track. The machine must be able to accurately detect the position of the crimp zone and orient it into the correct position for further processing.

Continued on page 38

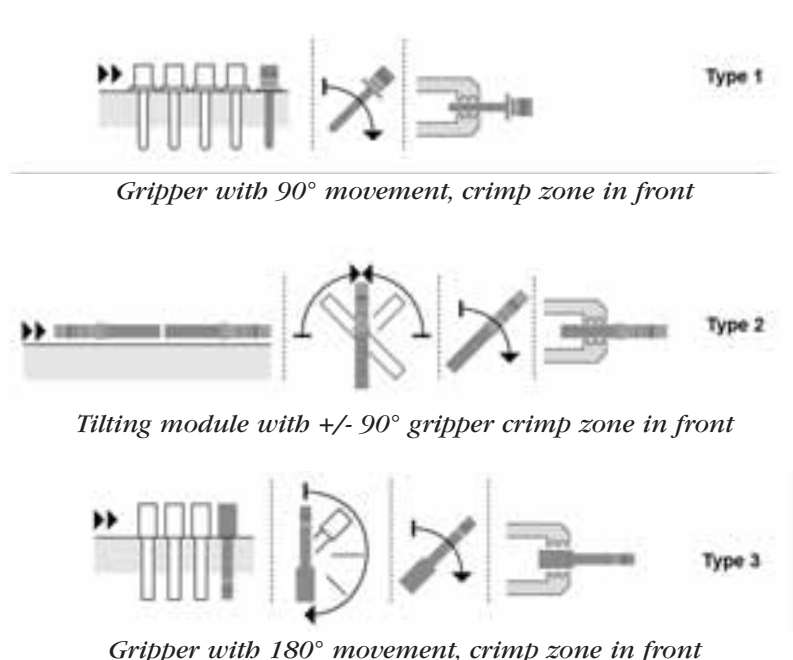


Figure 5: Required gripper movements to position the loose piece contact.

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Loose Piece Contact Crimping

Continued from page 37

Feeding and positioning: Wire

Once the contact is correctly positioned inside the crimp applicator, it can be crimped onto the stripped wire. The operator inserts the wire into the machine until the wire end touches the trigger sensor. A gripper automatically

closes and holds the wire during the entire processing cycle. The semi-automatic Stripper Crimper will guide the wire strands into the contact and ensure that the wire end is at the programmed insertion depth.

Crimping and quality assurance

To ensure the quality of every crimp,



Figure 6: Wire insertion area of a Stripper Crimper.

modern stripper-crimpers have an integrated crimp force monitoring (CFM) system. The CFM measures force vs. time while crimping a contact onto a wire. The operator teaches the CFM some “good” crimps and the reference curve is stored in the CFM memory. During each crimp cycle, the actual force vs. time curve is compared to the stored reference curve. Any crimps that do not match the reference curve within preset tolerances are flagged as bad and the

CFM stops the machine to allow the operator to investigate and correct the problem. The crimping head is very simple to adjust and calibrate, as only the crimping depth needs to be adjusted.

Additional quality assurance methods and test procedures known from “conventional” crimping, such as pull-force testing or visual analysis using cross sectional views known as micrographs, also apply to indent crimps. Quality criteria for gas-tight crimps with LPC’s include correct strip length, insertion depth and pull-force.

Conclusion

LPC are predominantly used in applications where high-quality connections are needed and very limited space is available. Automating the stripping and crimping processes using semi- or fully-automatic equipment reduces cycle times and increases quality, significantly lowering the cost per termination.

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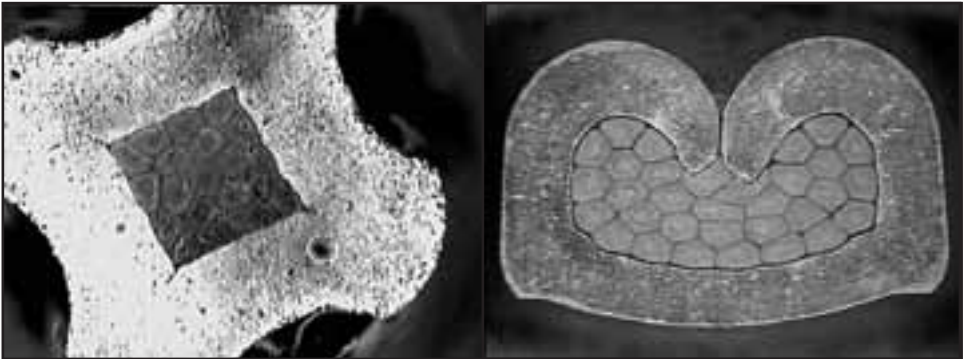
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Figure 7: Cross sectional views of different terminal types



Loose piece contact
(closed barrel)

Reeled terminal
(open barrel type)

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NEWS PLUGS *continued***BURNDY® Announces the Expanded Line of Narrow Tongue Connectors**

BURNDY®, a leading manufacturer and provider of connector solutions to the industrial, energy, construction, telecommunication, petrochemical, data center, and transportation industries, announces the expanded line of Narrow Tongue connector line of product. To meet increasing demand for smaller components in today's panels and switch gear, BURNDY® has expanded its line of narrow tongue product.

The narrow width tongue is perfect for connections in limited space applications. Made from high conductivity seamless copper tubing and electro-tin plated ensures a quality long lasting corrosion resistant connection. Marked with wire size, die index, and color coded bands to show correct number and location of crimps for proper installation. All BURNDY® narrow tongue terminals are UL Listed and CSA Certified when crimped with the approved tool and die combination, a part of the BURNDY® Engineered System. The connectors are RoHS compliant, per European Union directive, to help ensure a safer environment.

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

Schleuniger to Exhibit the New UniStrip 2300 at the 2010 ATExp

Innovation remains a clear part of Schleuniger's focus with the addition of the UniStrip 2300 Programmable Stripping Machine. It does not require any mechanical adjustments to process different wire sizes. Using the color touchscreen interface, the user selects the desired wire size from the pre-programmed library and all parameters (cutting diameter, clamping pressure, blade wayback, etc.) are automatically set.

The UniStrip 2300 is the only machine in its class that is fully programmable. The intuitive user interface makes it easy for the novice user to learn and operate the machine in minutes. All settings can be password

protected and different user levels make it possible to control who makes changes to program data and configuration settings.

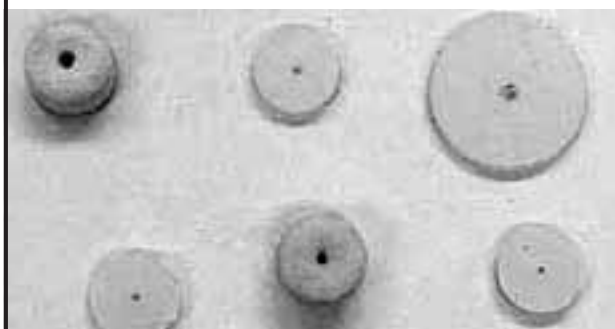
After calling up the desired wire size, the operator inserts the wire into the machine to initiate the stripping cycle. The sensitivity of the trigger sensor is automatically set according to the selected wire size, allowing very fine wires to be processed without requiring the optional foot pedal. The short cycle time of 0.35 sec makes the UniStrip 2300 suitable for high volume production while its programmability and instant changeover make it invaluable for low volume, high mix requirements.

The UniStrip 2300 offers precision mechanics, short cycle times and excellent accessibility for short

break-out lengths. High accuracy and repeatability of the programmed values make the UniStrip 2300 extremely reliable. Customer tests have shown that its user-friendly operation, mechanical precision and short cycle times have resulted in significantly improved productivity and higher process reliability.

Visit Schleuniger at booth #1007 where their wire & cable processing experts will be ready to demonstrate the UniStrip 2300 and other Schleuniger products and answer any questions you may have. Don't forget to bring your wire and cable samples!

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

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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.

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

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

- Provides 3.5 tons (31 kN) of crimp force for tape-mounted terminals up to 4 AWG.
- Accepts Molex FineAdjust™ and Mini-Mac™ applicators with side and rear feeds; accepts most industry-standard applicators.
- Can be used with Molex Tape Module (64016-2000).
- Meets OSHA safety and noise requirements and is CE approved.
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Wire Harness Assembly

Continued from page 10

- Ability to weld dissimilar materials.
- No consumable materials such as splice clips or solder.
- Environmentally friendly process.
- Consistent weld quality, mechanical and electrical properties.
- Fast cycle time.
- Operator safety with no fumes or chemicals such as lead.

Naturally, experts in ultrasonic metal welding became interested in developing reliable systems as high volume

equipment was in demand if the process proved to meet industry requirements. Some automotive wire harness manufacturers implemented these newly developed Ultrasonic Splicers. However, the process was still in its infancy, and major breakthroughs in equipment and process soon followed. A brief history of the UMW wire splicing evolution:

- Correlations were found between the dimensions of the weld nugget and the weld strength. The width and height of the weld are controlled by the machine. This remains one of the most important process controls today.

• Welding equipment became more compact and ergonomic. The machine became compact enough to be carried by hand.

• Universal tooling systems allowed many different splices to be made using the same equipment.

• The set up and tooling change-over was reduced to 15 minutes from over an hour.

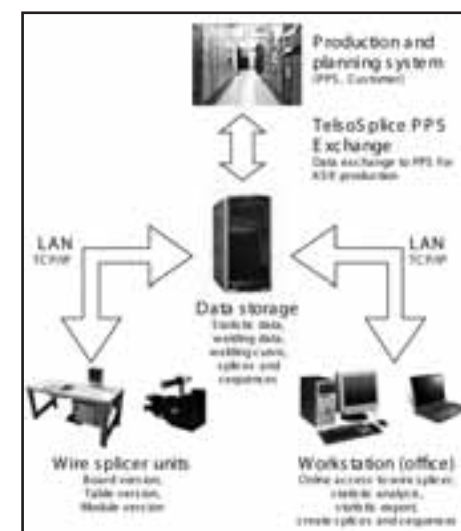
• Tooling adjustments for each splice were made automatic.

• Digital controllers provided methods for saving process parameters by name in files, instead of analog knobs and buttons. A bar code reader can be used to recall the process parameters for different splices in less than 5 seconds.

• Computer algorithms calculated process parameters based on wire size only.

• Ultrasonic energy generation development allowed more consistent process control regulating amplitude and frequency.

Car makers slowly but surely started to utilize advances in UMW technology. Splicing harnesses on an assembly board using portable ultrasonic welders has been standard practice for over a decade. Today wire harness production plants use a network control specific harness fabrication. Orders are sent to assembly carousels and every single splice is made according to customer requirements, including 100% weld quality monitoring.



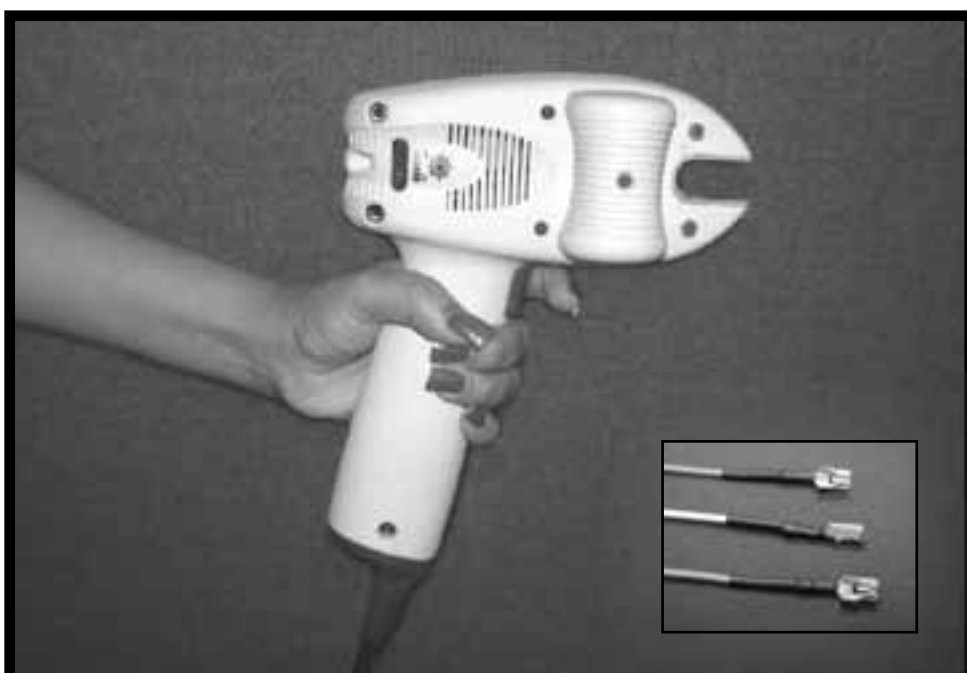
Networking Capability

Current applications utilized up to recent times

Until the early 1990's, only splices of up to 15mm² in total cross sectional area were allowed using ultrasonic welding by most carmakers. This was due to the power limitation of the ultrasonic generator, transducers, and welding modules. As the industry gained confidence in ultrasonic wire splicing, equipment manufacturers were faced with more challenges, including requirements for welding process control, better performing equipment and the capability to weld larger cross sections.

By the beginning of the 2000's Ultrasonic Metal Welding machines could weld larger splices, with precise control and proven quality. The wire harness industry was then ready to implement the technology further and apply it to wire terminations, welding FFC (Flexible Flat Cables), battery cable splices, and fuse elements. One popular application is the termination of multiple wires to eyelet terminals for ground connections. This was clearly for cost savings and quality improvements.

As application requirements changed and became more stringent, further



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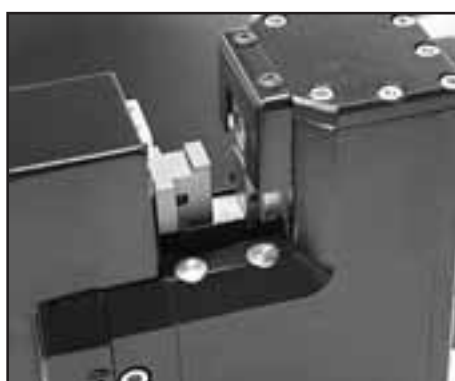
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Typical Copper Wire Splices

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Typical Wire Termination Examples

advances in digital electronics were being utilized by ultrasonic equipment manufacturers. Innovation didn't stop there. Ingenuity had to be applied to the mechanics of the welders which historically have the largest impact on the quality and consistency of the weld.

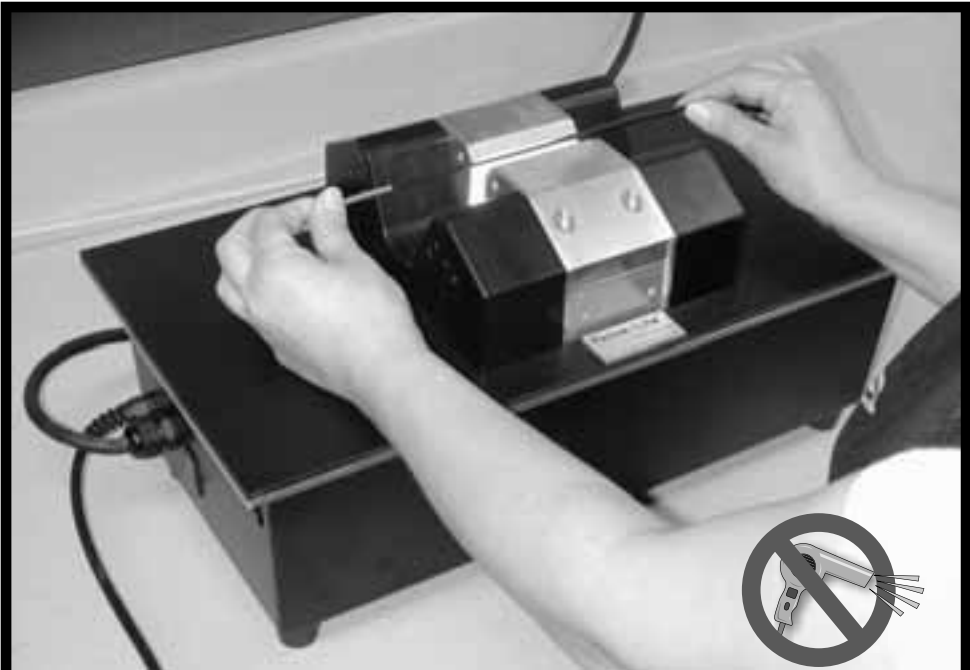
Besides passenger cars, almost all moving vehicles from motorcycles, light and heavy trucks to construction, agricultural, emergency, recreation and since the late 1990's some military vehicles have utilized ultrasonic splice welding. The main reason is the superior quality and technology advantages that ultrasonic metal welding companies have created to meet the ever increasing OEM quality standards. (See photo at left.)

The table below shows the UMW size spectrum for wire splicing and terminations, currently accepted and practiced in the wire harness manufacturing process.

Continued on page 42

APPLICATIONS COMMONLY UTILIZED UP TO RECENT TIMES			
Wire Welding	AWG Size	mm²	Ultrasonic Power Range Required
Splices			
Wire Size	22-6	0.35 - 13.00	
Weld size in Splice		1.05 - 50.00	3 KW - 5 KW, 20 KHz
Terminations			
Wire Size	22-6	0.35- 13.00	
Weld size		5.00- 35.00	3 KW - 5 KW, 20 KHz

1. 0.35 mm² is the smallest wire used in splices and terminations
2. Most applications for terminations involve either multi-wire to eyelet terminal or single and larger cable



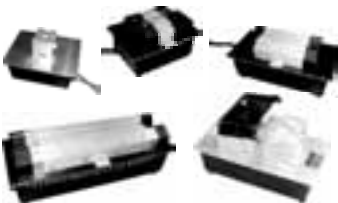
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Wire Harness Assembly

Continued from page 10



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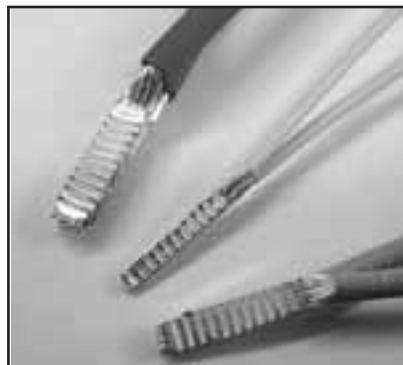
New applications for wire harnesses

Aluminum Wires in Automobile Harnesses

The Ultrasonic Metal Welding process has never been as popular as it is today, yet equipment manufacturers have never been challenged as they have in the last couple of years. Car companies have started to take interest in using Aluminum wires in place of traditional copper wires due to increased flexibility, lighter weight and lower cost. Now wire harness manufacturers need to evaluate aluminum wire splicing for their harnesses. It has taken some time to understand the application of aluminum wires

due to several factors. Aluminum wire requires more cross sectional area than a traditional copper wire of the same current carrying capacity. Life cycle testing including environment and corrosion tests also must be passed.

When evaluating Ultrasonic



Aluminum Wire Splices



Al and Cu Wire Splices

Metal Welding for aluminum wires there were two major challenges.

- The process parameters and weld dimensions had to be revisited.
- Tooling had to be developed to prevent strands from sticking of the working surface.

Those equipment manufacturers that invested time into the Al wire welding research have succeeded in delivering promising results. More aluminum wires will be slowly used in the harness of the future. However, the application of larger Aluminum cables for Hybrid electric cars is on the fast track with immediate demands for welding solutions. Due to the required cable size and flexibility, Aluminum cables are being considered more and more for high voltage connections.

Introduction of Hybrid and Electric Vehicles

The dynamic changes brought on by hybrid vehicles are not only limited to battery manufacturers. It has introduced requirements for high power electrical wiring harnesses, connectors, and hybrid electrical centers. The high voltage/high current cable assemblies include high voltage connection systems for motors, inverters, battery packs, service plugs, battery bus bars, high voltage cables with EMI shielding, and HV junction boxes for gasoline electric hybrid and other vehicles utilizing electric drive technology.

The evolution of high voltage/High current cable assembly connections for all aspects of Hybrid electrical cars has put terminal development on the fast track. Today every carmaker and their tier 1 suppliers for wiring harness assemblies have established their own hybrid

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Continued on page 44

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Wire Harness Assembly

Continued from page 42

/high voltage technical centers with ongoing development to meet the demands for electric cars. Ultrasonic metal welding is a crucial process for all aspects of these assemblies due to its ability to provide a bond with high cur-

rent carrying characteristics. Therefore, certain standards and specifications are being prepared by individual companies. USCAR in Southfield, Michigan recently released their SAE 38 for Ultrasonic Wire Termination that covers larger Copper cables. These new cable assembly designs require unique ultra-

ed spectrum of UMW equipment will drive the design and manufacturability of the harnesses for hybrid and electric cars.

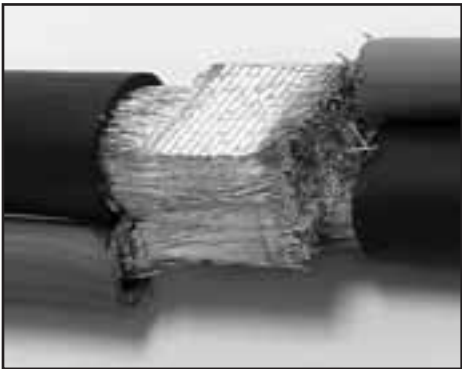
New Technologies in Ultrasonic Metal Welding

The table below shows the current UMW size requirements for wire splicing and terminations on high power electrical wiring harnesses.

The highest power generator and welder in the market today is 10KW. SonicSolution Systems with its collaborative team at Telsonic have equipments that allow welding in the size range in the table above. The equipment are categorized as Linear and Torsional welding.

Linear Ultrasonic Welding

This is the most common way of applying the oscillations to the work pieces. In this approach, the substrate is supported rigidly on an anvil, and the superstrate is vibrated longitudinally against it, under a static force delivered in a normal direction. A typical linear welder uses a single converter, an optional booster and a half wave sonotrode/horn as the main components in the transducer assembly. This type of set-up is widely used when power limitations and or mechanical




Large Splice - 172 mm²




120 mm² Aluminum Cable Welded to Bus Bar

sonic metal welding technologies with high power generators and robust machinery. The equipment necessary to accomplish these tasks must not only be capable of welding the much larger cross sections but also satisfy the new quality requirements specific to high voltage applications. The newly expand-

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CHALLENGING APPLICATIONS BY THE INDUSTRY		
Wire Welding	mm²	Ultrasonic Power Required
Splices		
Wire Size - Copper	0.13 - 35.00	
Weld size in Splice -Copper	0.39 - 120.00	3 KW - 10 KW, 20 KHz
Wire Size- Aluminum	0.50 - 2.50	
Weld Size in Splice- Aluminum	1.00 - 5.00	3 KW - 10 KW, 20 KHz
Terminations		
Wire Size - Copper	5.00- 103.00	
Weld size - Copper	16.00- 120.00	3 KW - 10 KW, 20 KHz
Wire Size - Aluminum	19.00 - 120.00	
Weld Size - Aluminum	19.00 - 120.00	3 KW - 10 KW, 20 KHz
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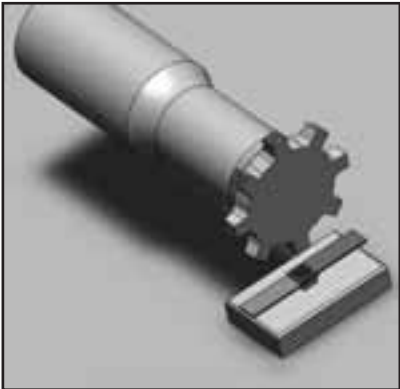
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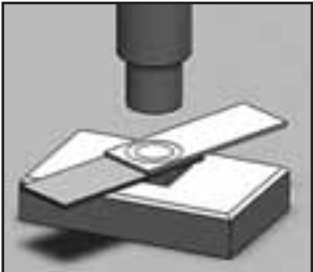
Linear Welding Concept

deflection are not a concern. The linear systems are easy to assemble and operate, and represent a low cost solution for a variety of joining applications. For larger welds (i.e. a wire splice with a cross section of 120mm²) the same linear approach is used, with the exception of two converters and a full wave sonotrode/horn. This type of transducer assembly utilizes two converters on the opposite sides of the horn. This allows for better amplitude distribution (mechanical displacement) to be applied to the work pieces. At the same time since the sonotrode/horn is supported on both sides while the static force is applied directly over the weld area, the deflection/bending of the transducer is practically eliminated. Welding with a full wave horn is more efficient, and only incrementally more complicated and costly. It is important to point out that this is still a more cost effective alternative to other joining techniques such as laser welding. Telsonic has developed special converters as well as ultrasonic generator with power output of 10kw+, which can drive a full wave length horn very efficiently with minimal energy loss under heavy loads.



Larger welds with AKG

Torsional Ultrasonic Welding



Torsional Welding Concept

The Ultrasonic Torsional welding approach was



AKG Telsonic with 10KW Power

originally conceived by Telsonic over 20 years ago for plastic welding applications. The main objective was to achieve a hermetic seal on round parts by applying the vibration in a horizontal plain (same as a linear welder) in combination with a twisting motion of the same frequency. The principal

is that a single the converter will apply the oscillations to the horn in a perpendicular fashion, resulting in a dynamic motion that is still longitudinal but with a twist.

In the last few years the Torsional welding technique which is still exclusively offered by Telsonic has found quite a few niches in the

Continued on page 46

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Wire Harness Assembly

Continued from page 45

metal welding market. The original applications focus was mainly on non-ferrous metals with round shapes such as cylindrical batteries, airbag and seat-belt sensors. But in the recent past this approach has been very successful on

conventional applications such as battery tab welding, wire splicing and terminations. By utilizing a high power generator and multiple converters, (i.e. "Power Wheel"), a new method of Torsional wire splicing and terminations has been developed for welds with cross sections as large as 200mm². Due to the

unique dynamics of the vibratory energy of a Torsional system, there is less stress on the material and depending on the geometry of the parts; the force and amplitude distribution is much more uniform across the weld area. Certain applications for high voltage connections that have historically utilized friction welding, can be done with the Torsional technique, using less power, and at lower temperatures. The resulting joint is much cleaner, not to mention better quality monitoring capabilities and a fraction of capital investment.

These new requirements and advances are truly a revolution in the wire harness industry. The exciting changes in the automotive industry seem like the science fiction of clean, quiet, electric vehicles that we read about as children. Yet, the biggest challenges lie ahead.



**Wire Termination by
TSP Power Wheel**

sales, and purely electric cars are just making their debut this model year. In time, as battery technology advances these will become more prominent.

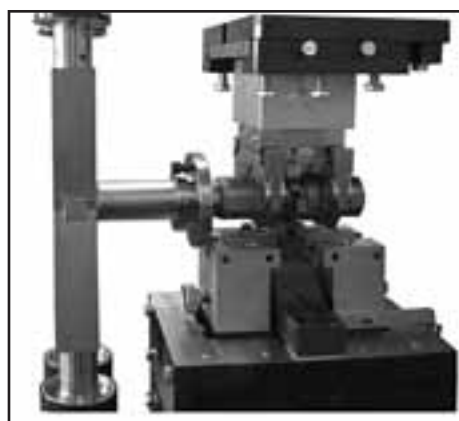
Let us not disregard other factors in wire harness design. Even the most common passenger vehicles now boast electronic gadgets once found only in top luxury vehicles. Steering wheels with a wide array of functions, displays for navigation and virtual gauges, heated seats, windows and mirrors, and an incredible array of dashboard options continue to expand the needs of vehicle wiring. The utilization of these instruments and devices often highlight the need for termination of ever smaller wire gauges. At the same time it challenges the terminal suppliers to produce connector solutions with a much wider range of capabilities while maintaining the flexibility of the design.

Ultrasonic welding has always been and will continue to be a critical part of the wire harness manufacturing. The ever expanding size of power cables and the increasing use of material such as Aluminum wires will require the development of new processes and techniques. There will be joining challenges and barriers to overcome, and it seems inevitable that the conventional approaches will need to give way to new promising technologies such as ultrasonic Torsional welding. Today's impossible will soon become tomorrow's normal procedure.

For further information contact SoniSolution Systems, 10 Ossipee Road, Suite 203, PO Box 38, Newton Upper Falls, MA 02464-0001. Visit www.ultrasonicsolution.com or email smogadam@ultrasonicsolution.com.



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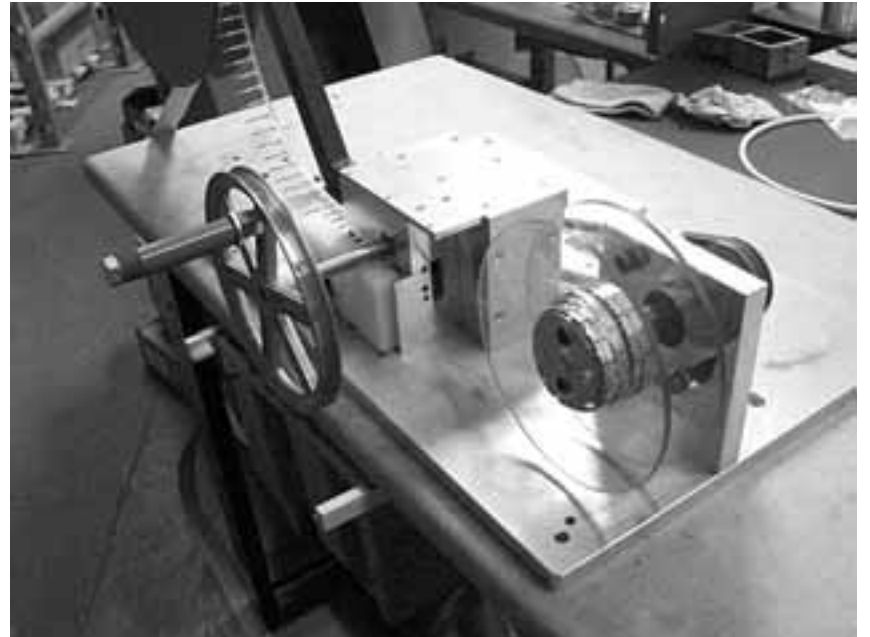
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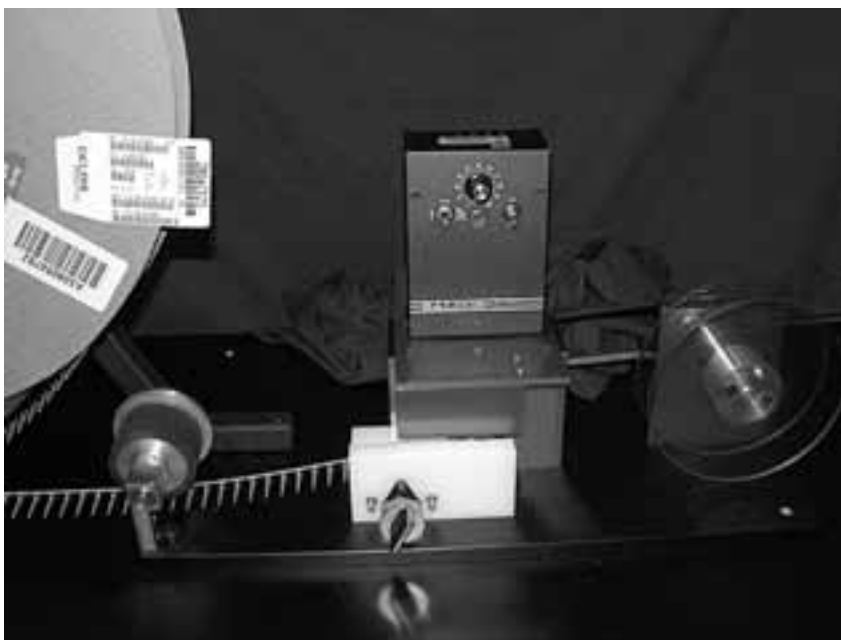
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Remembering Some Trade Show Basics

Continued from page 22

email thanking them for the visit with the requested info attached.

Make sure your lead response matches your customers buying cycle. If they won't be considering options for your product for several months, is it wise to give them the full-court press right now? Maybe a thank you with some company detail is more appropriate. And while we are on the subject, I think it's unwise to give new prospects a White House-style document dump in the beginning. Send them the information they requested. You can introduce them to other products once they understand your value as a trusted supplier.

Lastly; and you know what I'm going to say, but some of you still don't do it; follow up properly. If you don't have a fancy contact management or CRM program, those fine folks at Microsoft have seen to it that just about every computer has a copy of Outlook. Set it up to prompt you, or whomever you elect to do follow-up's. You paid good money for these leads. No brain surgery or magic

incarnations here. Just propel yourself to do the work and convert them into sales through effective and exhaustive follow up.

I hope this information has been useful. A lot of things were left out, but I tried to address many of the reoccurring problems I have seen in the last couple of years. Let me capstone everything with this thought. Think of the show as a four or five month marketing campaign with the show somewhere in the middle. Get all parties involved and plan as much as you can with checklists, scripts, and schedules. Make sure to meet in the weeks following the show and make an honest effort to evaluate the show's performance as well as your own. And please, force yourself to follow up on those leads. To the extent that you can do this effectively, you will greatly enhance the whole experience. I really enjoy this stuff, so if you have any questions about what I have written or want to enquire about something I left out; please feel free to contact me at JoeTito33@gmail.com. Now go be a star performer.

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Thermtrol MGI Global LLC is a TS16949 Certified manufacturer of custom wire harness & cable assemblies with notable competencies in insert/over molding. The company is currently serving that automotive, agricultural equipment and appliance industries among others. For high volume/high labor content manufacturing, the company features the services of its six-year old wholly owned sister company, Thermtrol (VSIP) Co. of HCMC, Vietnam. Thermtrol is genuinely interested to explore strategic opportunities with industry partners.

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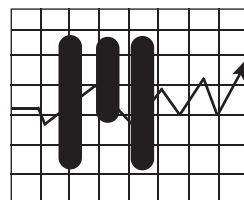
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**Mexitronica
October 19-21, 2010**

National Electronics Manufacturing Conference and Expo, Mexitronica, is Mexico's number one source for information on products, suppliers, service providers, and new technologies for the electronics and precision manufacturing industries. For details see www.mexitronica.com.

**Electronica
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With a constantly high number of exhibitors and visitors, electronica 2010 sends out some positive signals to the international electronics industry. The trade fair is about to attract around 2800 exhibitors and approximately 73,000 visitors. See www.electronica.de to register.

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SEPTEMBER/OCTOBER 2010

\$39⁰⁰

My company is involved in the industry as:
(Please check one)

☐ Wire and/or Fiber Optic Processor, Cable Assembly or Harness Mfg.

☐ Distributor Performing Value-Added Wire and/or Fiber Optic Processing

☐ Buyers of Wire and/or Fiber Optic Processing Services

☐ Suppliers to the Wire and/or Fiber Optic Processor
Supply what? _____

☐ Other (please explain) _____

☐ Send advertising rates and circulation information.

☐ Send Wiring Harness Manufacturers Association (WHMA) Information.

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