

## This Issue Features:

- Developing Nimble Techniques in the Wire Harness Manufacturing Process
- Inline Wire and Cable Identification
- Roots and Routes: The evolution of leaders
- Wire Wisdom - Electronic Cable Capacitance
- Surplus and Used Machinery, Parts, and Employment Opportunities



The production area has long troughs for taping and corrugating.

# Ag Leader Technology

## Boosting the Efficiency and Profitability of Crop Production

By Fred Noer

People at Ag Leader Technology are thinking big these days. How big? The company in Ames, Iowa, has a goal of cutting cable harness production time from five days to three days, a 40-percent improvement. Another daunting number is a reduction in defects from one percent

to a half percent, a 50-percent gain.

Ag Leader Technology (ALT) designs, engineers and manufactures software, equipment, and components that enable farmers to extract maximum production potential from a field. They factor in such field characteristics as soil condition, tillage method, seed variety and water drainage.

By knowing exact field parameters, farmers use ALT products in four distinct

ways: planning; planting; applying fertilizers, herbicides, fungicides and pesticides; and harvesting.

The overall concept is known as precision agriculture. It is focused on boosting the efficiency and profitability of crop production by relying heavily on electronic technology.

Among ALT products are harvest yield monitors, planting controllers, crop sensors and applicators of liquid and granular chemicals for fertilizing and/or preventing insects, weeds and fungi. Devices for mapping fields, automatically steering tractors and com-

bines, using global positioning systems and collecting details about crop scouting and soil sampling also are made by ALT.

Much of the equipment is mounted on tractors, harvesters and applicators. However, gathering and analyzing the information is possible on desktop and laptop computers as well as mobile devices.

The company makes all its own wiring harnesses and cable assemblies, more than 1,600 different types. In turn,

Continued on page 38

# Developing Nimble Techniques in the Wire Harness Manufacturing Process

In the early 2000's, millennial fears subsided, and manufacturers were no longer required to include Y2K compliancy certificates. The focus turned back to process improvement and Lean Manufacturing. Elimination of waste was paramount through all facets of production; and the concept of pulling, rather than pushing product through the production process; became the key. Fast forward to today and Lean Manufacturing is the starting point. It seems the new competitive challenge, especially for the small to mid-level harness manufacturer, is speed and agility. Price and quality are no longer the goal; they are the price of admission. Savvy manufacturers must cleverly adapt their entire organizations to accommodate quick changeover through the production process. Careful attention must be made to maintain Lean theory while minimizing the complexity of production in order to accommodate a wider breadth of products. Flexibility is now the key. This article offers a brief history of manufacturing theory, reviews Lean theory, and explores the essentials of speed and

agility for the wire harness manufacturer. It will then outline ways one equipment manufacturer has enhanced the capabilities of their equipment to facilitate this theory. Finally, the efforts of a small harness manufacturer successfully implementing nimble manufacturing techniques will be reviewed.

Frederick Taylor is considered the father of Scientific Management and efficiency studies. Using time and motion studies, Taylor applied the scientific method to the manufacturing process with the goal of optimizing tasks and simplifying jobs. Inspired by Taylor, Henry Ford studied various industries and identified four principles to increase efficiency for mass production. By using interchangeable parts, continuous flow, division of labor, and reducing wasteful efforts, Ford initiated the first assembly line in 1913.

In the Early 1920's Deming and Shewart introduced Statistical Process Control. Previously, quality was achieved through post-manufacturing inspection. With SPC, statistical tools were used to

Continued on page 27

# Call for Technical Seminar Speakers at 11th Annual Electrical Wire Processing Technology Expo

Presenters and technical seminars are being sought for the 11th Annual Electrical Wire Processing Technology Expo held in May 2011. Expo Productions Inc. (EPI), the producer of the Expo, is looking for speakers with technical expertise in the fields of wire harnessing, wire & cable processing and related industries

The 11th annual Electrical Wire Processing Technology Expo will be held Wednesday, May 18 & Thursday, May 19 at the Frontier Airlines Center in Milwaukee, WI. The show features a dedicated seminar area for the presentations. Seminars are free with paid admission to the show. To ensure seminar attendees receive superior information, the conference advisory board is petitioning a number of key presentations from industry leaders as well.

The annual post-show survey of attendees shows that more than two-thirds of Expo attendees rate the technical semi-

nars as important to their trade show experience. The attendees come to trade shows to be educated and updated on new trends and technologies within the market.

Prospective seminar speakers should send an abstract of their topic and an outline to Cheryl Luck, seminar coordinator of the Electrical Wire Processing Technology Expo.

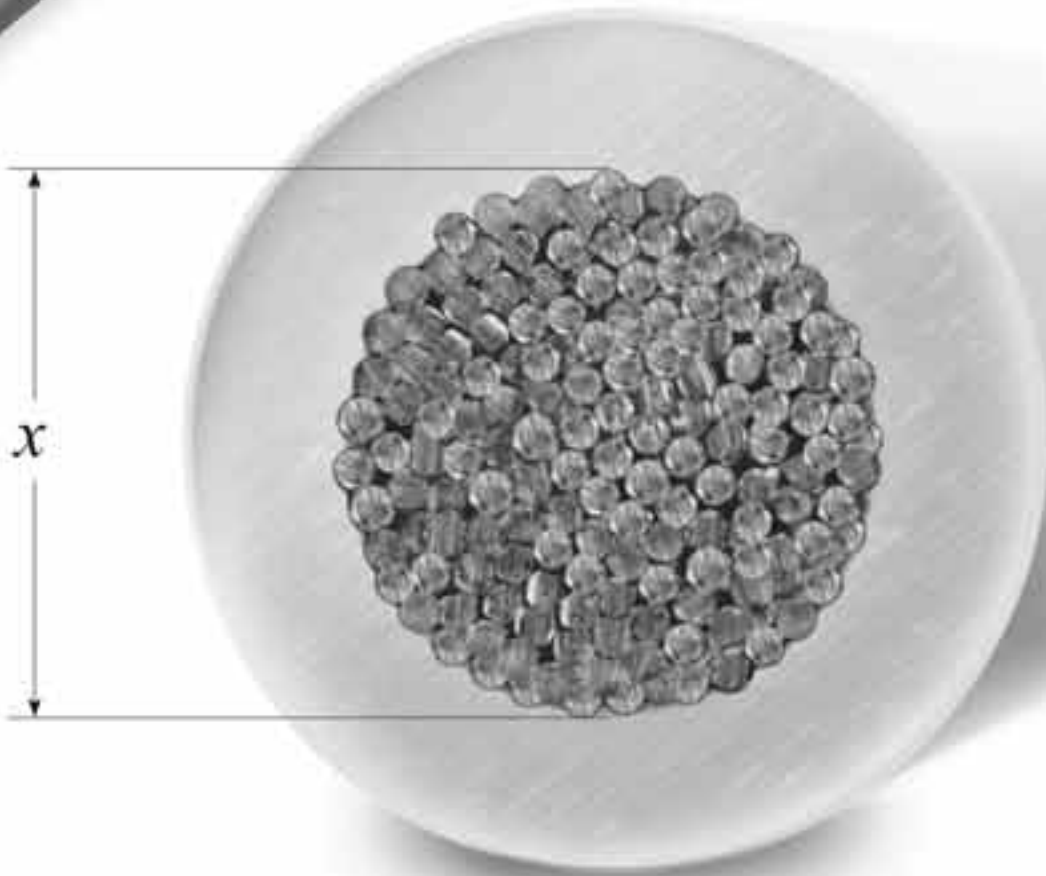
Submissions must be submitted by December 31 to Expo Productions, Inc., 510 Hartbrook Dr., Hartland, WI 53029, faxed to 262-367-9956 or emailed to cheryl@epishow.com. (The presentation content must be technical rather than commercial in nature. General company information and advertising is not acceptable.)

For further information on seminars or the show itself, visit the 11th annual National Electrical Wire Processing Technology Expo's website at [www.ElectricalWireShow.com](http://www.ElectricalWireShow.com) or call 800-367-5520.

The first name in wire processing  
**ARTOS**  
 ENGINEERING COMPANY

**NEW**  
 FROM ARTOS

visit our website: [artosnet.com](http://artosnet.com)



**FIND THE VALUE OF  $\chi$  THE FIRST TIME.  
 EVERY TIME.**

**When it comes to ease of setup, Artos' new SenCor technology passes the test.**



Introducing the innovation that takes "trial and error" out of wire changeover once and for all. It's smart, it's fast and it's ready to go when you are. Our proprietary SenCor Intelligent Setup uses patent-pending sensor technology to accurately detect wire conductor thickness and then automatically program the cutting and stripping blade, guaranteeing error-proof setup.

Originally developed for the CS-326, SenCor technology is now available on the CR-11, making it the only fully automatic wire processing machine with this technology. Our engineers are also in the process of making SenCor available on many of our most popular models. In the meantime, your existing machine can be retrofitted with this time-saving feature.

**To learn how SenCor Intelligent Setup Technology** can increase efficiency of your operation, contact your Artos sales representative at **262.252.4545** or visit us at [artosnet.com](http://artosnet.com).



**WE PROCESS  
 THE WIDEST  
 RANGE  
 OF WIRE  
 BAR NONE**



**INSIDE**

SEPTEMBER/OCTOBER  
2010

**1 Ag Leader Technology**

Since June of 1992 Ag Leader Technology has been boosting the efficiency and Profitability for crop producers around the country.

**1 Developing Nimble Techniques in the Wire Harness Manufacturing Process**

Savvy manufacturers must cleverly adapt their entire organizations to accommodate quick changeover through the production process

**1 Call for Technical Seminar Speakers**

Presenters and technical seminars are being sought for the 11th Annual Electrical Wire Processing Technology Expo held in May 2011.

**4 Roots and Routes**

All leaders have roots, and the same is true with company leaders.

**7 News Plugs**

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

**9 Inline Wire and Cable Identification**

Pete Doyon of Schleuniger, Inc., discusses inline wire and cable identification, describing what type of information is typically identified on wire and cables, concepts for improved productivity, what types of systems are available and the pros and cons of each.

**23 Wire Wisdom**

Electronic Cable Capacitance - designers and users need to understand how a cable's capacitance can impact its performance and what manufacturers do to control it.

**48 Supplier Directory**

**Classified**

- 55 - 56 ..... Machinery, Job Line & Misc.
- 57 .....Calendar of Events
- 58 ..... Advertisers Index
- 58 .....Subscription Order Form

*This is the time of year to give thanks and we do thank everyone for their continued support.*

*Wishing everyone a wonderful holiday season and a great New Year!*

**Marilyn & Kathy**




| <i>2010 Production Schedule</i> |                              |                           |
|---------------------------------|------------------------------|---------------------------|
| <i>Issue</i>                    | <i>Reservations Due Date</i> | <i>Materials Due Date</i> |
| <i>January/February 2011</i>    | <i>December 3, 2010</i>      | <i>December 10, 2010</i>  |
| <i>March/April 2011</i>         | <i>February 4, 2011</i>      | <i>February 11, 2011</i>  |
| <i>May/June 2011</i>            | <i>April 1, 2011</i>         | <i>April 8, 2011</i>      |
| <i>July/August 2011</i>         | <i>June 3, 2011</i>          | <i>June 10, 2011</i>      |
| <i>September/October 2011</i>   | <i>August 5, 2011</i>        | <i>August 12, 2011</i>    |
| <i>November/December 2011</i>   | <i>October 7, 2011</i>       | <i>October 14, 2011</i>   |
| <i>January/February 2012</i>    | <i>December 2, 2011</i>      | <i>December 9, 2011</i>   |

*Wiring Harness Contact Information:*

*Marilyn Magowan - Managing Editor*  
*Phone 262-394-5558 • Fax 877-275-5916*  
*marilynmagowan@yahoo.com*

*Kathy Freund - Advertising/Circulation Manager*  
*Phone 815-337-7885 • Fax 888-709-8179*  
*kfreund2000@yahoo.com*

*International Harness Resources, Inc., dba Wiring Harness News, reserves the right to reject advertisements which in its sole judgment it considers, in whole or in part, inappropriate or unprofessional.*



**Credit Card Only**  
 Please use the subscription order form located inside back cover.  
 Back issues, bulk subscriptions, special subscriptions, call Circulation Department.

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.

Copyright 2010  
 International Harness Resources Inc., (IHR Inc.)  
*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)  
 Printed in the USA.

**MANAGING EDITOR**  
 Marilyn Magowan  
[marilynmagowan@yahoo.com](mailto:marilynmagowan@yahoo.com)

**ADVERTISING/CIRCULATION MANAGER**  
 Kathy Freund  
[kfreund2000@yahoo.com](mailto:kfreund2000@yahoo.com)

**INTERNET**  
<http://www.wiringharnessnews.com>

Subscription Rate:  
 1 Year, U.S. & Territories \$39.00  
 Canada & Mexico \$44.00 U.S. Funds  
 All other countries \$54.00

# BRAIDERS - NEW & REBUILT

**Specializing in New England Butt:**

- #2 Harness Braiders
- CB1 Cable Braiders
- Specialty Application Braiders

We Purchase Good Used Braiders

SHORTEST POSSIBLE DELIVERY!!!

**ASK ABOUT OUR NEW DESIGN DRIVE SYSTEM**

**Contact: Jack Dennehy**

**COMPOSITE & WIRE MACHINERY, INC.**

490 Old Baptist Road,  
 North Kingstown, RI 02852  
 Phone: (401) 884-4760 • FAX: (401) 885-2499  
 Visit: [www.compositewire.com](http://www.compositewire.com)  
 Email: [compositewire@aol.com](mailto:compositewire@aol.com)



## Tyco Electronics

Authorized Distributor

### Largest Raychem Product Inventory in The West

- Heat Shrinkable Tubing
- Medical-Grade Tubing
- Heat Shrinkable Molded Parts
- Adhesives
- Adaptors
- High Voltage Splice Kits
- Electrical Interconnects, MTC Connectors
- Solder and Crimp Wire Termination Devices
- Application Equipment for heating, crimping, shrinking & dispensing
- Wire & Cable
- Identification, Wire & Cable ID Solutions
  - Software, Printers, Labels & Ribbons



- Competitive Pricing
- Experienced Technical Sales Staff
- Bar Coding
- Custom Kitting
- Custom Cut & Mark Tubing and Sleeving Services
- Dock to Stock
- Electronic Data Interchange (EDI)
- Kanban

For Raychem Product Solutions Contact:

**insco**

insulation supply company

Since 1952



(888) 883-6810  
(310) 533-0783 Fax

www.inscoinc.com



# Roots and Routes: The evolution of leaders

All leaders have roots, and the same is true with company leaders. They came from somewhere and advanced through the organization before they were eventually given the opportunity to lead. Their roots, and the route they took, have a big impact on their leadership style.

From my observation, most company leaders started in one of three areas in the company: engineering, accounting or marketing. These are their "roots." Often, though, they start in one area and migrate to another before ascending to the top spot. This is their "route."

In my own career as a company leader, I have closely followed the career path of many role models, trying to learn good leadership habits and hoping to avoid bad ones. As I have written before, I believe the essential role of the leader pertains to two fundamental things: the vision and the values of the company. Recently, however, I have noted a certain pattern — an alignment so to speak — in the leaders I have considered as my "good" role models and in the types of companies they lead. Their roots, and their routes, line up well with their company types.

The leaders in growth-focused companies tend to come through marketing; leaders of startup or technology compa-



Paul Hogendoorn,  
President OES, Inc.

nies come from engineering; and leaders of bottom line focused companies usually come from accounting. This is not always the case, but it is the prevailing one in the successful companies that I have followed as models over my career.

Startup companies are usually founded by someone who believes they have a better idea about a product, or how to make a product. That company's first leader is usually the person with the ini-

Continued on page 6

## Wire Crimp Pull Testers



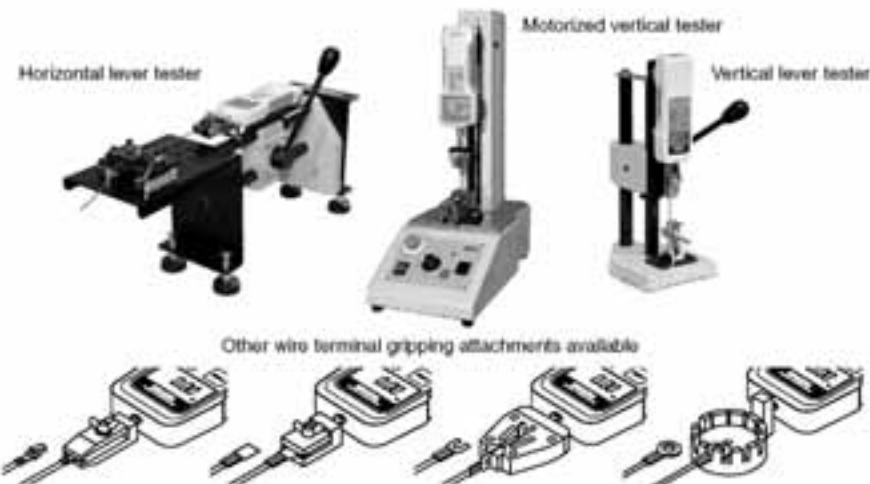
Choose from manual or motorized testers, either vertical or horizontal, and a wide variety of gripping attachments including spring-loaded and auto wire-gripping fixtures.

Application specialists are available to assist you.

**BEST VALUE**

- Capacities up to 220 lbf (higher capacities available)
- Modular systems allow quick recalibration
- ISO 9001 registered and ISO/IEC 17025 accredited
- Free NIST Certification with new systems!

Visit [www.imada.com/wire\\_terminal\\_crimp\\_test.htm](http://www.imada.com/wire_terminal_crimp_test.htm)



**IMADA**

IMADA, Incorporated

3100 Dundee Rd., Suite 707, Northbrook, IL 60062  
Tel: 847-562-0834 Fax: 847-562-0839  
www.imada.com E-mail: wire@imada.com

ISO 9001 Registered & ISO/IEC 17025 Accredited

## COMPAERO

A Woman Owned Small Business since 1989.  
An ISO 9001 Company since 2006.  
[www.compaero.com](http://www.compaero.com)

# adapt to any environment.

### INTRODUCING COMPAERO'S NEW LINE OF SPRING ADAPTERS

- Tool-less, easy installation
- Re-usability without tools
- Pull testing exceeds 150 lbs (250 lbs with shrink boot installed)
- Temp. range from -65 Deg to +150 Deg C
- Accommodates individual shields as well as overall shields
- Available in straight, 90 Deg, 45 Deg, and Low Profile 90 Deg configurations



1-877-COMPAERO  
sales@compaero.com

Manufactured and Distributed by Compaero



ISO 9001:2008



## Your One Source Wire Processing Equipment Partner

INNOVATIONS IN WIRE PROCESSING



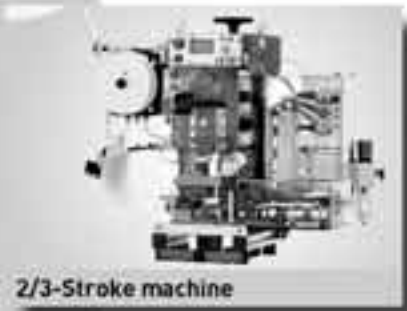
Standard applicator



Stripper Crimper



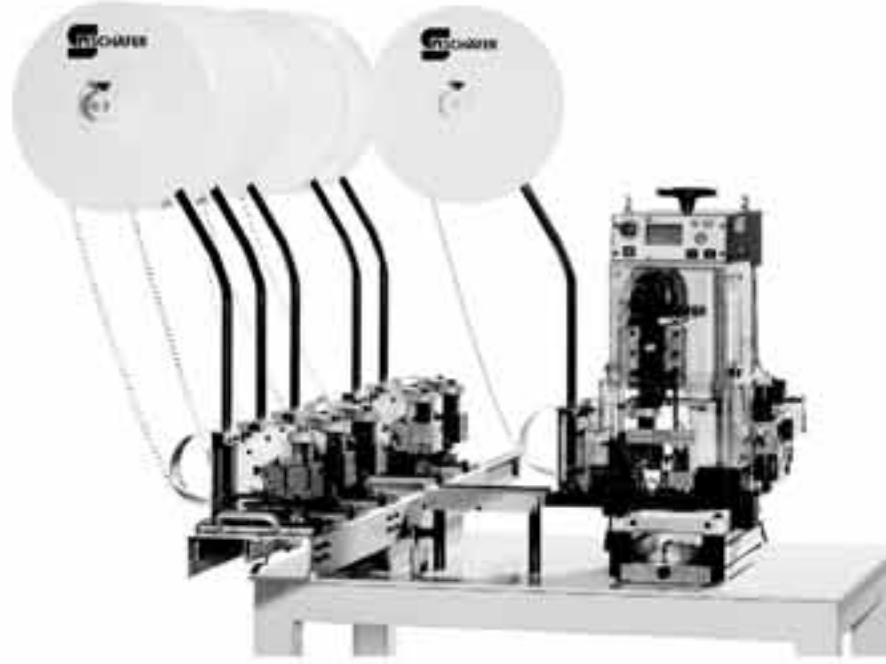
Cross-section lab



2/3-Stroke machine



Automatic crimp machines



### Crimping Machine with Quick Change System

#### Our Innovation

The customized crimp work table consist of a sliding table which is mounted perpendicular and next to the crimping press EPS 2003. The sliding table can be equipped with multiple combinations of applicators and the appropriate terminal reels. The user can now simply select the preset applicator and slide it into the crimping press. A total of five side feed and one rear feed applicator can be installed on the sliding table. The identification of the tooling is provided by the RFID technology.

#### Your Advantage

- integrated RFID tooling identification system
- reduction of the set up time
- considerable reduction of down time
- reduction of setup mistakes
- pre-setup at an external station

visit [www.schaefer.biz](http://www.schaefer.biz)  
for more information

#### Schaefer Megomat USA, Inc.

W233 N2830 Roundy Circle W.  
Pewaukee, WI 53072  
USA  
Phone: +1 262 524-1100  
Fax: +1 262 524-1133  
Email: [pewaukee@schaefer.biz](mailto:pewaukee@schaefer.biz)  
Web: [www.schaefer.biz](http://www.schaefer.biz)

#### Schaefer Technologies, LLC

751 N. Raddant Road  
Batavia, IL 60510  
USA  
Phone: +1 630 406-9377  
Fax: +1 630 406-9381  
Email: [batavia@schaefer.biz](mailto:batavia@schaefer.biz)  
Web: [www.schaefer.biz](http://www.schaefer.biz)

#### Schaefer Megomat USA, Inc.

10767 Gateway Blvd. W - Ste. 510  
El Paso, TX 79935  
USA  
Phone: +1 915-598-3037  
Fax: +1 915-598-5374  
Email: [elpaso@schaefer.biz](mailto:elpaso@schaefer.biz)  
Web: [www.schaefer.biz](http://www.schaefer.biz)



# Roots and Routes: The evolution of leaders

Continued from page 4

tial idea, and their roots are usually in engineering or technology development. After the startup company experiences some initial successes validating its technology or product offering, it starts to aim at loftier company growth goals. When this happens, the leadership needs to transition from someone with a focus on engineering to someone with a focus on marketing. In many cases, the leader makes the transition to a marketing focus by delegating the engineering and technology development to someone else in the growing organization.

Bottom line focused companies - those operating in mature marketplaces, where top line growth is not as important as profitability and sustainability - are most often led by someone with accounting roots. When head office is looking for a responsible person to oversee their operations, they are usually looking for a person that sees things the way they see them and can report to them in their terms.

When a successful family owned business transitions from the founding generation to the next, its leadership often transitions from engineering roots to accounting roots at the same time. This is because the second generation is

frequently groomed to take over the business by getting a "better business education" than the founding generation believed they had (which was learning the basics the hard way). This can inadvertently change the focus from growth (marketing) or development (engineering) to simply maintaining or growing the bottom line.

Growth-focused companies need solid leadership and skills in the accounting and engineering departments, but they have to be deployed effectively and intentionally in the pursuit of the overall goal - growth. The accounting and engineering leadership can be delegated to capable people, but the person in the ultimate leadership position has to keep his or her focus on growth, and that requires marketing.

Marketing is more than brand or brochures, advertising or websites. It means knowing your current and future market opportunities, and your key differentiating advantages, and then building your company in that pursuit. It also means knowing how your company is perceived in the marketplace, and how you want to be perceived, and then working to close the gap. Every part of the company that touches either the product or the customer involves marketing. It is nearly impossible to grow a

## ZEUS

"Largest Zeus Inventory  
in The West"

### Quality Fluoropolymer Extrusions for Medical, Aircraft & Aerospace Applications:

Heat Shrink Tubing, Dual Shrink (PTFE Outside, FEP Inside) Tubing, Convulsed Tubing, Spiral-Wrap Tubing, Spagethin Tubing, Thin Wall Tubing, Lay-Flat Tubing, Industrial & Heavy Construction Tubing & Custom Constructions.

Fluoropolymer Resins Used  
ePTFE, PTFE, FEP, PFA, ETFE, PVDF,  
PAL, PE, PEEK, PBT, PEEK and More.

- Competitive Pricing
- Experienced Technical Sales Force
- Bar Coding
- Custom Cutting
- Custom Kitting
- Dock to Stock
- Electronic Data Interchange (EDI)
- JIT Delivery
- Kanban



For ZEUS Solutions to your most Challenging Projects contact:



(888) 883-6810  
(310) 533-0783 Fax

**insco**  
insulation supply company  
Since 1952

www.inscoinc.com



## ShinMaywa

Creating Solution Advantages "Gentle to the wire and Operators"



**NEW**

### TRD401 Series

New Generation Wire Terminating Machine with Great Variety of Advanced Functions (24-14 AWG)

Excellent precision and quality in wire measuring and crimping. Thanks to the combination of automatic wire changer and manual applicator changer, change over time has reduced to 1/8th!



### TRD301 Series

To meet Comprehensive Range of wire Processing Requirement (24-14 AWG)

High processing capability and more stable processing precision. Single end, both ends seal insertion can be processed by TRD301WPSA/ TRD301WPSB/TRD301WPA



### TR201 Series

High Precision Crimping for Small and smart Wire Gauges 36-18 AWG

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



### TR202 Series

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

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

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

## ShinMaywa

●ShinMaywa (America), Ltd.

10737 Gateway West, Suite 240 El Paso, Texas 79935, U.S.A  
TEL : +1-915-594-9882 FAX : +1-915-594-9886

E-mail: info@shinmaywaamerica.com

HP: http://www.shinmaywa.co.jp/english/index.htm

company without that innate understanding, which is why the leader's "route" to the top should have gone through marketing.

This is not to say that leaders don't evolve as they grow, or can't change their roles along the way. Two of my best role models were engineers when they started their businesses, but their passion for designing the business grew to eclipse their passion for designing the product, and they migrated into marketing, delegating the engineering to others. One of my role models started out as a successful accountant, but then after

discovering he had a true entrepreneur's heart, he purchased and built two successful businesses by focusing on the marketing, delegating the accounting to others.

When you look at a leader you admire, be sure to look at their "roots" and their "routes," too. There is much to be learned from where they started, and how they got there.

*Paul Hogendoorn is president of OES, Inc. (www.OESTechnologies.com) and can be reached at phogendoorn@oes-inc.com.*

## NEWS PLUGS

### Low Voltage Disconnect Protects Batteries from Excessive Drain

Waytek, Inc., an electrical distributor, adds a new low voltage disconnect to their expansive line of battery management products.



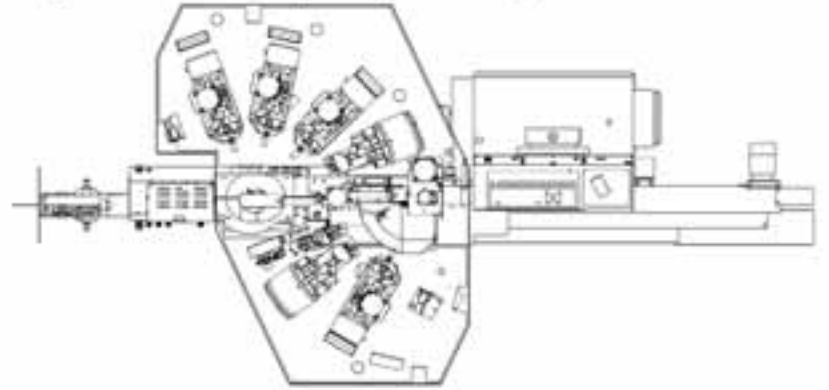
Low Voltage Disconnect Switch

Waytek's new Low Voltage Disconnect Switch (LVD) is a solid state electronic module that protects batteries from excessive draw, by limiting the drain due to auxiliary loads. The unit automatically disconnects loads that are powered when the ignition key is off, before the battery is discharged low enough to prevent a vehicle start. Ideal power management solution in off-highway equipment, military equipment, and the transportation industry.

Waytek's LVD switch is manufactured by Sure Power Industries, the inventor of the battery isolator, and a leader in battery management products for over forty-five years. Waytek is a Master Distributor for Sure Power Industries.

Visit [www.waytekwire.com](http://www.waytekwire.com) for an expansive selection of battery management products.

## Imagine what you could do with up to seven processing stations.



### Meet the Alpha 356.

You could handle virtually any combination of crimping, seal loading, fluxing/tinning, twisting, bulk loading, attaching insulating sleeves and end sleeves as well as many other standard and customer-specific processes. Plus, you can setup for the next job while the current one is running. Crimp-height and pull force measurements are all integrated into the process. A wealth of other options lets you tailor the Alpha 356 to be your winning combination.

# komax

Professionals in Advanced Automation

[www.komaxusa.com](http://www.komaxusa.com)

The most complete source  
of wire and cable  
in America.



## NationalWire.com

Custom & Stock  
Competitive. Reliable. Fast.

323-225-5611

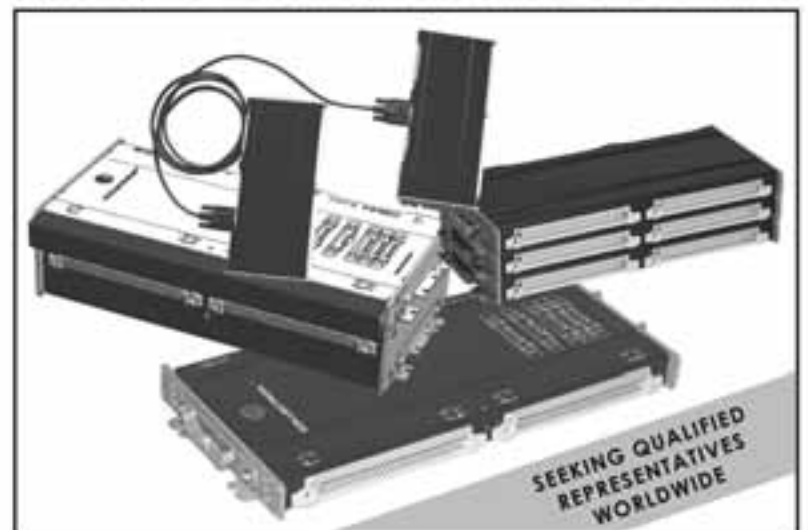


## COLLECTRON<sup>GmbH</sup>

a CK TECHNOLOGIES, INC. COMPANY

YOUR PARTNER FOR PRODUCTION ELECTRICAL TEST

Your wiring, cable and harness testing requirements have become more complex - is your present test system up to the task? **Collectron has the answer!**



SEEKING QUALIFIED  
REPRESENTATIVES  
WORLDWIDE

For the cost of a standard harness test system the Collectron solution provides far more:

- Low-voltage and high-voltage testing up to 1500VDC
- AC dielectric breakdown testing
- Unlimited expansion in 128 test point increments
- Component testing - resistors, diodes, relays, etc.
- Interactive lamp and switch testing
- LIN bus, CAN bus and 1553 bus functional testing
- Distributed testing
- Full featured Windows® based software

NORTH AMERICA:

CK Technologies, Inc  
TEL: +1-805-987-4801  
FAX: +1-805-987-4811  
E-mail: [collectron@ckf.com](mailto:collectron@ckf.com)

EUROPE:

Collectron GmbH  
TEL: +49-(0)9342-934680  
FAX: +49-(0)9342-9346820  
E-mail: [sales@collectron.de](mailto:sales@collectron.de)

WEBSITE: [WWW.COLLECTRON.DE](http://WWW.COLLECTRON.DE)





Brady has been a source of ideas and innovation in the identification business since 1914. Let Insulation Supply and Brady solve all of your identification problems

- Portable Printers
- Thermal Transfer Printers, Labels & Ribbons
- Software, Services & Data Collection
- Pre-Printed Wire Markers, Labels & Tags
- Health & Safety Signs, Security & Property Identification
- Visual Warning, Lockout/Tagout & Regulatory Markings
- Numbers & Letters



### Massive Brady Inventory

- Competitive Pricing
- Experienced Technical Sales Staff
- Value-Added Services: Bar coding & Custom Labels Unique Applications? Just Ask Us
- Dock to Stock



For Brady Solutions to your Identification Problems Contact:

**insco**

insulation supply company

Since 1952



(888) 883-6810  
(310) 533-0783 Fax

[www.inscoinc.com](http://www.inscoinc.com)



# Inline Wire and Cable Identification

By Pete Doyon,  
VP of Product Management  
Schleuniger Inc.

Many OEM's require that individual wires and cables used in their products be clearly identified with a mark or label. For some, such as in the military and aerospace markets, wire and cable identification (or "wire ID") is mandatory and the process is governed by stringent specifications, such as SAE AS50881 (formerly MIL5088L). For others, the decision to use wire ID is a voluntary one.

Wires and cables can be identified as part of an "inline" process while they are being cut to length and stripped on automatic equipment. Alternatively, wire ID can be applied using a secondary manual or semi-automatic process. The scope of this article is limited to inline wire ID. This article will describe what type of information is typically identified on wire and cables, concepts for improved productivity, what types of systems are available and the pros and cons of each.

#### Why Wire ID is Used

Wire ID is used to identify individual wires during the life of a product, from

initial product assembly and testing to servicing the product years down the road. Key identification requirements are legibility, permanence and abrasion resistance. In order to meet those requirements, the identification method used must be well suited for the environment where the product will be utilized.



#### Typical Wire ID Uses

##### Termination ID's

The most common type of wire ID is the Termination ID. The Termination ID clearly identifies where a wire or cable is terminated on a terminal strip, mating connector, etc. The Termination ID prevents any miswiring during wiring harness assembly, product assembly and testing as well as when the product is serviced.

*Continued on page 10*



## An Eye for Innovation

Bringing Precision, Flexibility and Experience to Wire Processing

### NEW JacketStrip 8310

- Unique floating blade system for processing round, out-of-round and twisted pair cables
- Cross sections from 0.10" – 1.0" with no blade change required
- Universal centering system, eliminates need for mechanical changes
- Intuitive programming via color touch screen
- Digital display of axial and radial blade depths
- Unlimited slitting lengths



[www.schleuniger-na.com/JS8310\\_wn](http://www.schleuniger-na.com/JS8310_wn)  
(603) 668-8117

**Schleuniger®**  
To Be Precise.





**Test Continuity,  
Display Work  
Instructions,  
Specify Test  
Parameters,  
Test High  
Voltage  
Isolation**

- **500 Points Per Second**
- **PC-Based Simplicity**
- **Test Wire Harnesses & Backplanes**
- **Audio/Visual Work Instructions**
- **Store Test Results**

**SERIES**  
**90**

More customers choose Cablescaan Series 90 Continuity Analyzers with our unique TestRite software than any other continuity test system of its kind. Series 90 circuit analyzers provide exceptional speed, versatility, and accuracy in the testing of wire harnesses, backplanes, and other interconnects. Results are 200 times faster than hand buzzing and shorts are tested in the process. The testers provide resistance and capacitance measurements, diode testing, and guided harness assembly. You can locate wires by touch and verify terminations.

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



**Cablescaan**  
A EUBANKS COMPANY

[www.cablescaan.com](http://www.cablescaan.com)

# Inline Wire and Cable Identification

Continued from page 8

may not be able to read the barcode. Samples should always be run to verify each application.

## Traceability

Many industries require traceability of product components and sub-assemblies. Company logos, serial numbers and date codes can be directly marked or labeled on each wire or cable to aid in traceability. This is especially common for more expensive assemblies which have undergone electrical performance or other testing. If there are any field failures or warranty claims, the unique code makes it possible to trace a particular assembly back to the original test report.



## Logos

Some companies like to differentiate their cable assemblies by marking or labeling their logo, brand name or other unique identifying mark on them. Most of the wire ID methods (except hot-stamp) offer this capability.

## Wire ID Concepts for Improved Productivity

## Lean Manufacturing of Wiring Harnesses

Wire ID can be very cost effective, especially in high mix, low volume applications, such as when building one wiring harness at a time. Fully integrated, PC controlled wire processing



## Bar Coding

Several of the wire ID methods allow barcodes to be printed directly on wire or cable or on labels that are applied to them. There is a practical limitation when using barcodes on wires or cables under 0.100", since the barcode scanner

Continued on page 13



**insco**  
Insulation supply company  
Established 1952

**We are constantly working to improve and add value to the products we distribute.**

**Wire and Cable Identification Markers:**

- Hot stamp printing of wire lists on heat shrink tubing & cable ties
- Thermal transfer printing on shrink tubing & self laminating wire markers
- Logos printed on shrink tubing & labels
- Software, printers, ribbons and wire I.D. markers

**Stock & Custom Labels and Nameplates:**

- Logos
- Warranty
- Tamper-proof
- High performance materials and adhesives
- Software, printers, ribbons and labels

**Design and Manufacture:**

- Aircraft test set cable assemblies manufactured to your specifications

**Tube and Sleeving Cutting Services:**

- Cut to length
- Slit

- Competitive Pricing •
- Just-In-Time Delivery •
- Special Packaging •
- Custom Kitting •
- Bonded Inventory •
- Kanban •




**Corporate Offices**  
1901 Harpers Way  
Torrance, CA 90501  
(310) 320-9400 • (800) 457-7715  
Faxes (310) 533-0783


**San Jose, CA**  
2021 O'Toole Avenue  
San Jose, CA 95131  
(408) 435-1244  
Fax (408) 435-5079


**San Diego, CA**  
5654 Mission Center Dr., Suite 204  
San Diego, CA 92108  
(619) 467-6890  
Fax (619) 467-6894


**Dallas, TX**  
13500 Midway Rd., Suite 500  
Dallas, TX 75244  
(972) 715-0055  
Fax (972) 715-0056

# Aerospace Harness Testing








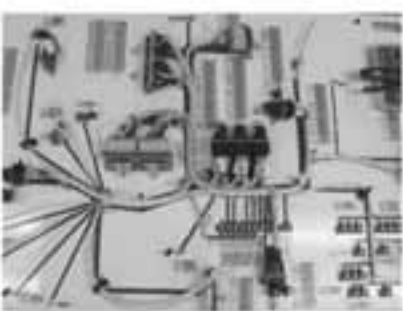


CH2 now with DWV to 1500VAC


**Beginning**



From insertion of the first pin



Through on-board guided assembly



To final electrical test

**End**

**Cirris offers complete solutions for military/aerospace harness manufacturers implementing Lean Manufacturing processes.**

- Up to 20,000 Test Points
- Energize Relays
- Component Testing

- 4-wire "Kelvin" from .001Ω
- SPC Data – Customized Test Reports
- External Meter Integration

More Info at: [CH2.cirris.com](http://CH2.cirris.com)

**CIRRIS**  
Cable/Harness Testing Made Easy™  
Phone 800-441-9910 • 801-973-4600



U.S. Associate



U.S. Associate



www.mecalbystarn.com

## WIRE HARNESS SOLUTIONS

### APPLICATORS



Everything from the standard side feed, to splice, to four point, all the way to extreme heavy duty two post for 2/0 crimping. There's a Mecal applicator for all your crimping needs.

### PRESSES



From the very popular 110 volt, 2 ton, TT Press, all the way to the stand alone 25 ton, Mecal has it all.

### TOOLING



Providing all of your replacement and tooling part requirements. Over 6000 terminals in Mecal's data base. Reverse engineering available.

#### Mecal



www.mecal.net

Italy

#### Mecal

Established in 1976 with the aim of supplying the wire harness industry with the best crimping equipment available, in less than 30 years Mecal has reached and kept a respected position at the top of its market. Their products are extensively used by the automotive, communication and IT industry, and wherever a high quality connection is called for. Situated in the middle of the most industrially developed part of Italy, Mecal operates out of its fully owned 54,000 sq. ft. plant, employing 100 skilled and motivated young people and has a very modern and rational production structure.

ISO 14001 Registered

ISO 9001 Registered

#### Starn Tool & Manufacturing



www.starn.com

USA

#### Starn

Established in 1945, Starn Tool soon became a leader in supplying the automotive industry with progressive stamping dies and spare parts along with the building and assembly of applicator bodies for one of the world's largest terminal manufacturers. It was this experience that Mecal was looking for to form a partnership in the United States. Through this partnership, Starn Tool and Mecal by Starn are providing world class applicators and spare tooling for the wire harness industry.

ISO 9001:2000 Registered

Mecal Srl - Italy  
Ph (39) 013-479-2792  
sales@mecal.net

Mecal de Mexico S. de R.L. de C.V. - Mexico  
Ph (52) 614-419-6542  
ventas@mecal.com.mx

Mecal Shanghai - RP China  
Ph (86) 216-316-4976  
mecal\_sh@jintonica.com

Mecal by Starn - USA  
Ph (1) 814-724-1057  
jbelovarac@starn.com

Mecal Bras Ltd - Brasil  
Ph (55) 313-712-3207  
mecalbras@mecalbras.com.br

Mecal Cebu - Philippines  
Ph (63) 919-306-2807  
excel.canque@mecal.net

Find you world wide dealer at [www.mecal.net](http://www.mecal.net)  
[www.mecal.net/eng/retevendita.php](http://www.mecal.net/eng/retevendita.php)  
[www.mecal.net](http://www.mecal.net) Mecal S.r.l. - Strada per Felizzano 18, ISO43 Fubine (AL) - Italy



Manufacturer and Distributor of All Mecal Products in the U.S &amp; Canada







**Stripping Blades, Applicators and Special Wire Processing Equipment**

**THB® Applicators by Mechtrix (Starting at \$1675)**

Mechtrix is proud to offer the full line of THB Mechanical and Air-feed Applicators. With more than 20 years of tooling experience utilizing our Mechtrix CrimpCADD® design and analysis software, Mechtrix can design and supply you with the perfect solution to even your most difficult wire terminating projects. Ask us about our special reduced pricing on spare tooling with your initial order.

Innovative wedge adjustment design provides positive, precise, tool-less crimp height adjustment with visual confirmation of settings

Insulation Crimp Height adjustment range of 2mm in 0.02mm increments

Conductor Crimp Height adjustment range of 2mm in 0.02mm increments

All replacement parts clearly laser engraved

Rubber shipping and storage collar prevents accidental tooling collision damage

All applicators include:  
 • Owner's Manual  
 • Complete BOM  
 • Terminal Cross-Section Analysis

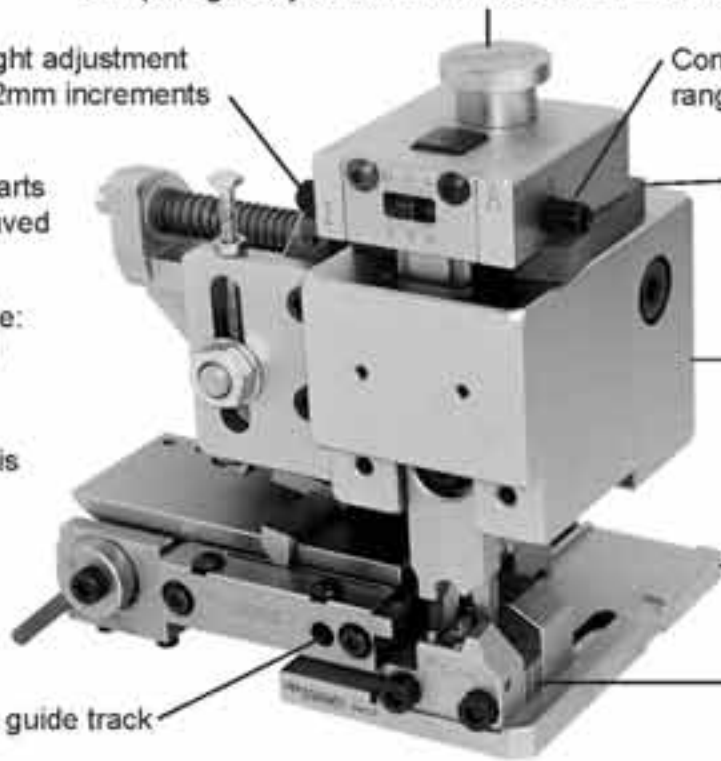
Rugged cast and fully machined body for rigidity and durability

Special corrosion resistant plating

3-point quick change base

Adjustable guide track

Split anvil design to reduce tooling costs



**Mechtrix Stripping Blades**

Mechtrix designs and manufactures standard replacement and custom stripping blades for:

- Amp/Tyco
- Ideal
- Kirsten
- Kut-Rite/Weix
- Schäfer/Megomat
- Tekuwa/Dorema
- Artos
- KM Digitech
- Kodera
- Makfil
- Schleuniger
- Toyojamco/JAM
- Eubanks
- KMI
- Komax
- Metzner
- ShinMaywa
- and many others...



**Mechtrix Equipment**

Mechtrix has designed a number of unique machines to solve specific wire processing problems. These machines range in complexity from our patented center stripping machines to terminal paper winding machines. These machines include:

- Wire Prefeeding Equipment
- Terminal Carrier Strip Cut-off Devices
- Heavy Duty Benchtop Wire Stripping Machine
- Terminal Paper Winding Machines
- Automatic & Manual Center Stripping Machines
- Terminal Applicators & Crimping Presses



Mechtrix Corporation  
 W147 N9461 Held Drive  
 Menomonee Falls, WI 53051  
 Tel (262) 255-6555  
 Fax (262) 255-2628  
 sales@mechtrix.com  
 www.mechtrix.com

# Inline Wire and Cable Identification

Continued from page 10

machines can produce all of the wires necessary to build one complete wiring harness. All of the wires are typically collected in a tray or wire stacker. Without wire ID, it would be difficult to identify the individual wires and where they go. By marking or labeling the termination ID's on each wire, an operator can quickly identify the "from" and "to" points when routing the wires on the harness board. If there are no identifying marks or labels, the operator must first determine which wire is which (by overall length, color, strip length, terminals, etc.) and then look at a schematic or other cross reference list to determine where each end goes. Having the termination ID's on each wire or cable end is like having routing instructions right at your fingertips.

## Single Wire Color vs. Many Different Colors

In high mix, low volume applications, the key to success is to reduce tooling changeover time to the absolute minimum. In wire processing applications, each wire color change can take from one to several minutes. By reducing the number of wire colors from 10 to 1, changeover frequency and therefore

labor can be reduced by 90%. If permitted, using labeled white wire instead of many different colors can yield exceptional savings. Some applications are governed by specifications and codes which specify that specific different wire colors must be used. One example is ground wiring in electrical equipment must be green or green with a yellow stripe. Many other applications and circuits allow any wire color to be used. If permitted by the product manufacturer and any applicable specs, there are many benefits that can be had by using one wire color wire to replace many.

### Some of the benefits include:

- Reduced changeover frequency saves labor costs
- Purchasing wire in bulk (larger reels or wire barrels) at a lower unit cost
- Reduced wire inventory cost
- All wires can be marked using one inkjet ink or hotstamp foil color
- Larger reels or barrels impart less "memory" on the wire, resulting in more consistent wire processing

If the wiring harness for a given product was originally designed with many

Continued on page 14

## Industrial Wire and Cable Corp.

Premier manufacturer of high quality copper wire and cable products

- Bare Copper Wire 8AWG – 40AWG soft and hard
- Building Wire 600V
- Fixture Wire 600V
- Machine Tool Wire 600V
- Power and Control Tray Cables 600V
- Appliance Wire & Cable
- Crossed Linked Polyethylene 150C\*
- Irrigation Cable
- Pet Wire
- Thermoset Insulated Wire
- Communication Cable
- Plenum Cables
- Our products meet or exceed RoHS requirements.



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

Request a complete catalog by phone, fax, or email today!

Phone: 847-726-8910  
800-878- WIRE  
Fax: 847-726-7544

Visit our website  
[www.industwire.com](http://www.industwire.com)



Industrial Wire and Cable Corp.  
66 N. Buesching Road  
Lake Zurich, IL 60047



## Over 40 Types of Tools

To Crimp, Strip, Grip, Press Fit and Punch.  
Cable Cutters and Nibblers to You Name It . . .

For more than 50 years our quality tools have been known for providing the ultimate in precision and functional efficiency

## Introducing CS VARIO Head Change System



### Professional LINEAR CRIMPING

Now with Three Power Choices

- Basic Hand Grip
- Battery Powered
- Benchtop Electric

### One Tool Head System

- Multiple Applications  
With a wide range of available tool heads for many different connectors including fiber optic processing.
- Fast Two-Click Head Change  
Snap a completely adjusted tool head in place. All crimping profiles and settings are ready to make perfect crimps.

### CS 150 Cordless Crimping Unit

- ✓ Fast, 2 Second Cycle Time
- ✓ Powerful & Consistent Force
- ✓ Includes 9.6V Battery & Recharger
- ✓ Balanced, Easy Handling Operation
- ✓ Head Adjusts 360 Degrees
- ✓ Adapters for CSV, CS30 Series Heads

Call for all your production and prototyping needs  
Toll Free (877) 953-8780

PATENTED  
USA & INT'L

Product Information [www.wezag.de](http://www.wezag.de)

## WEZAG TOOLS, Inc.

1490 Bernard Dr., Unit B, Addison, IL 60101-4337  
E-mail: [WezagTools@aol.com](mailto:WezagTools@aol.com)  
Fax: (630) 953-8781 Phone: (630) 953-8780

# Inline Wire and Cable Identification

Continued from page 13

**NOW UL APPROVED!**

**cRU<sup>®</sup> US**  
File #E326725

**Largest Selection of Ferrules in North America**

[www.ferrulesdirect.com](http://www.ferrulesdirect.com)

different colors, an alternative is to use white wire exclusively and print the name of the color it replaces on the wire. For example, the word "RED" could be printed every 3" along a white wire instead of using a red wire. In addition, the circuit number could be printed on the wire as well to distinguish it from other white wires that have the "RED" designation. Using a single wire color (or just a few) with an integrated inline wire ID system saves time and money, especially in high mix, low volume applications.

### End Marking vs. Continuous Marking

End marking is typically used for termination ID's, as mentioned earlier in this article. Continuous marking can be used in addition to end marking to provide more information at preset intervals along each wire or cable assembly. Typical nomenclature includes the wire part number or circuit number and it is repeated every 3 to 6 inches or more along the wire. This makes it possible to identify individual wires anywhere along their length when servicing them. If a particular mark is difficult to read, another mark is located just a few inches away.

### Marking on-the-fly

Like laser marking, inkjet marking is done on-the-fly, i.e.; while the wire is moving. The benefit is that the wire doesn't have to stop during the marking process, therefore the production rate of the wire processing machine is not

greatly reduced. Continuous marking is best suited for inkjet or other marking methods that can be done "on-the-fly". For labeling, hotstamp and direct thermal transfer marking, the wire must be stopped, therefore these methods are best limited to end marking applications only.

### Wire List Management Software

To realize the maximum benefits that inline wire ID has to offer, some type of Wire List Management Software (WLMS) is required to control the wire processing system and the inline Wire ID system. The WLMS is used to keep track of the processing parameters for every wire that will be produced. Typical parameters include wire type and size, overall wire length, strip lengths, marker text and marking positions. The WLMS synchronizes the functions of the wire processing machine and the wire marker, including automatic text changes (depending on the wire ID method used). All of the wires for a particular wiring harness may be produced in sequence without any operator intervention. Since all functions are synchronized, there is no waste wire when the system changes over from one wire to the next in the wire list. The wire list can be sorted by wire size/type/color. In this way, the only time the system has to stop processing is for the operator to change the wire size, type or color.

Continued on page 16

**quality**  
WITHOUT QUESTION

Prevent rather than react to quality problems.

**Capabilities:**

- ✓ Strip Length
- ✓ Wire Position
- ✓ Conductor Diameter
- ✓ Partial Strip
- ✓ Pulled Strand
- ✓ Wire Strand
- ✓ Wire Splay
- ✓ Seal Position
- ✓ Seal Presence
- ✓ Seal Orientation
- ✓ Pierced Seal

**WireWorx™ OFFERS WIRE HARNESS MANUFACTURERS THE MAXIMUM "ZERO DEFECT" QUALITY MONITORING POSSIBLE - ALL WITHOUT ADDING TIME TO THE PROCESS, OR COST TO THE PART PRODUCED.**

**OES Technologies**  
OES Technologies.com  
Milwaukee Wire Expo booth 1207





*Great  
Weekend!*

It's like  
having a  
best friend  
in the  
business.



WE MAKE IT HAPPEN.

ATS is like having a best friend in the business. It's the confidence of knowing that ATS will be there for you to assist and support in all your application tooling needs. When you need tooling and need answers, we're the one to call. ATS is committed to you. When you pick up that phone, you'll reach an application tooling expert, one with your needs in mind. We provide you with the one-on-one service to ensure that you get precisely what you need - the highest quality and greatest value - and you get the answers right away.

Call us at 1-877-671-2955 or

Fax to 1-717-810-2862

E-mail us at [custserv@applicationtooling.com](mailto:custserv@applicationtooling.com)

Mail to P.O. Box 6780, Harrisburg PA 17112

[www.applicationtooling.com](http://www.applicationtooling.com)

When you need an applicator, terminator, or wire processing equipment, just a phone call or an email to ATS gets you quick, effective response whether you need a quote, fast shipment, technical field supports, or just some friendly expert advice.





2288 Graffenburg Road  
Sauquoit, New York 13456  
(315) 794-0161

E-mail: wiresystems@verizon.net



- Designed to collect wires up to 12 feet in length
- Lightweight, portable, adapts to fit most wire cutting equipment
- Greatly reduces the labor involved in handling long wires
- Designed and built for millions of trouble-free cycles
- Can be run either (left to right) or (right to left) direction
- Wire Collectors can be put in tandem for longer length wires
- Swivel lock casters standard
- Stainless steel guard and tray
- Can be activated directly from the wire cutter or as a stand-alone unit
- Height adjustable from 24 to 42 inches
- Standard Collector lengths  
(WC 1000 TT - 10 FT.) (WC 500 TT - 5 FT.)

CONTACT US TO DISCUSS YOUR WIRE CUTTING NEEDS!

**(315) 794-0161**

**wiresystems@verizon.net**

## Inline Wire and Cable Identification

Continued from page 14

### Wire Identification Methods

#### Hotstamp

Hotstamp marking is one of the oldest wire identification methods. On the positive side, it's one of the lowest cost marking methods and the marks are quite legible and permanent. Other than laser marking, it's one of the few marking methods that can produce a permanent mark on Teflon insulations. It's also easy to change the color of the marking foil, making it possible to print on every insulation color.



On the negative side, the wire must be stationary while the hotstamp process takes place (approximately 1 sec cycle time), thus lowering the production throughput. Changing the marker text is a manual process on most systems, which means that hotstamp mark-

ing is not a good candidate for low volume, high mix production. Improper settings (temperature, pressure and dwell time) can cause damage to the wire insulation. Some specifications require that a spark tester be used after the hotstamp marker to verify the insulation integrity.

#### Labeling

New labeling machines offer print and apply technology, making it possible to use them with inline wire processing systems. They offer high resolution (300+ dpi) print resolution and multi-line text capability. Like hotstamp, the wire must be stationary during the labeling process (4 - 5 sec cycle time), which also lowers the production rate. In general, the cost for the labels is higher than for other wire identification methods. On the other hand, the ability to print logos, multiple lines of text, barcodes, etc. in a self laminating package may justify the higher applied cost. Applying labels as part of an inline wire processing operation is much less labor intensive than printing labels and then applying them manually in a secondary operation.

Continued on page 31

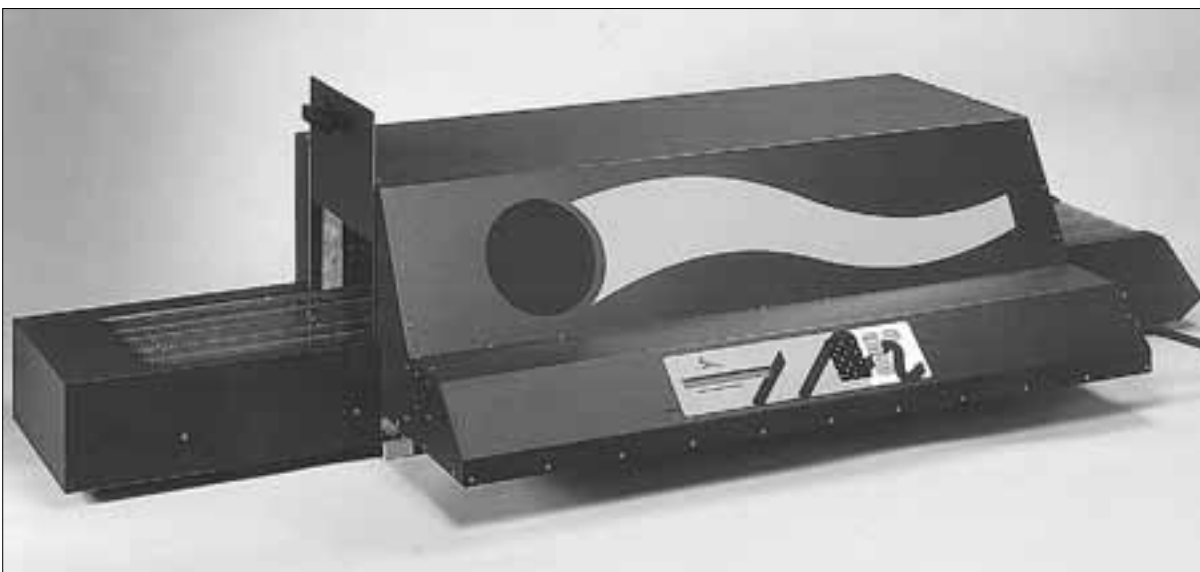
## SLICE® 141

## THE SHRINK OVEN



THE SLICE®141 will automatically cut HST, Convolution Tubing, Spiral Wrap, Hose, Wire Gasketing, Braided Bus, Multiconductor Cable and can pull from a Gaylord!

- Accuracy,  $\pm$  1.0 millimeters
- Adjustable Cutting Speed from 1" - 30" per second
- Up to 99 Stored Standard Programs and 30 Batch Programs.
- Safety Features, 2-Hand Operation and Emergency Stop Switch



This PROVEN conveyORIZED oven utilizes Hi-Voc Heated Air to quickly cure your Heat Shrink Tubing, increasing your production and reducing your labor cost. Whether you are processing small components, heavy wire cable or 20 ft long harness assemblies. The SHRINK features:

- 52" long oven chamber with 6" x 12" opening
- 92" long conveyor with speeds to 100"/minute
- Operating Temperature to 350 deg. F
- Easily moved to meet your production requirements

# AMTI

A DIVISION OF MAXANT

847•588•2280

thanlon@maxant.com

www.anti-products.com

## INCREASE PRODUCTION AND REDUCE LABOR

**NEWS PLUGS** continued**A.E. Petsche Co. Recognized by Cessna for Outstanding Performance**

A.E. Petsche Co., Inc. has received Cessna Aircraft Company's "STARS" Supplier Excellence Award for the sixth consecutive year. Each year, Cessna, a Textron company, recognizes suppliers for adherence to the STARS 2000 vendor performance criteria including quality, delivery and cost control. Less than 1 percent of Cessna's suppliers have received the STARS award more than three years in a row.

"We are once again honored to receive the Cessna STARS award. We are proud of our long-term relationship and look forward to supporting Cessna's needs in the years to come," said Glenn Davidson, president of A.E. Petsche Co.

A long time supplier to Cessna, A.E. Petsche Co. provides a wide range of interconnect products and services that allow Cessna to minimize on-hand inventory, and provide the assurance of on-time delivery of product. A.E. Petsche Company is a global supplier of high-performance military/aerospace interconnect products and services. For additional information on A.E. Petsche Co., visit [www.aepetsche.com](http://www.aepetsche.com).

**Sharpening Industry's Edge on Tin Whiskers**

The microscopic crystalline structures known as tin whiskers will be the focus of an IPC technical conference and workshops, December 6-7, 2010, in Schaumburg, Ill. IPC Tin Whiskers Conference: Practical Perspectives will convene industry experts from all market sectors to present the latest research and practical methodologies to mitigate the risk of tin whiskers. Presentations will provide real-world examples to illustrate causes of growth, risk mitigation, implications of material selection, methods for detection and failure analysis.

The technical conference will kick off on December 7 with a keynote presentation, "Practical Perspectives on Tin Whiskers," by Dave Hillman, principal materials and process engineer at Rockwell Collins. Other presentations will explore: controlling the copper substrate roughness and controlling the tin deposit crystal structure; long term investigation of conformal coating; susceptibility testing; evaluations of nanotechnology-based component surface finishes; pressure-induced growth in press-in connections of PCB

through-holes; reliability issues from a military perspective; and forensics, using automotive case studies.

Technical conference speakers include representatives from ACI Technologies; Benchmark Electronics; Boeing Satellite Systems; CALCE; Continental Automotive GmbH; Delphi Electronics and Safety; EMC Corporation; MacDermid; NASA Goddard Space Center; SAIC; Sundew Technologies; the University of Massachusetts Lowell; and Uyemura International Corporation.

Prior to the technical conference, two half-day workshops will take place on December 6. DfR Solutions CEO Craig Hillman, Ph.D., will provide an understanding of fundamental drivers of tin whisker growth in a morning workshop. He will discuss the roles that material diffusion, stress gradients, oxide formation and various plating elements play in tin whisker formation, and how ele-

ments of the environment, including temperature, humidity, vibration, mechanical shock, corrosion, pressure and bending impact the drivers. Dr. Hillman will also explain the risks and benefits of implementing existing tin whisker prediction algorithms into design decisions and reliability forecasts. The afternoon workshop, "Controlling Tin Whisker Risk: Implementation of Appropriate Mitigations," will be led by David Pinsky. A principal engineer at Raytheon Company, Pinsky will cover the practical aspects of managing tin whisker risks within the context of high-reliability systems. He will share proven techniques for integrating various approaches into a successful program of risk mitigation and discuss the trade-offs inherent in implementing these techniques.

For more information or to register, visit [www.ipc.org/tin-whiskers-conference](http://www.ipc.org/tin-whiskers-conference).

**Z TECH**  
Engineering LLC

James A. Zonka  
5140 Country Lane  
Saukville, WI 53080

New Product Design  
Connector Design  
Assembly Automation & Fixtures  
Test Equipment  
Production Engineering  
Custom Design Products  
Injection Molding Design  
CNC Capabilities

- \* Custom Harness Assembly/Test Boards
- \* Custom Test Blocks made for any type connector
- \* Standard Pin/Socket or Spring Contacts

Direct (262) 692-2712  
Fax (262) 692-3912

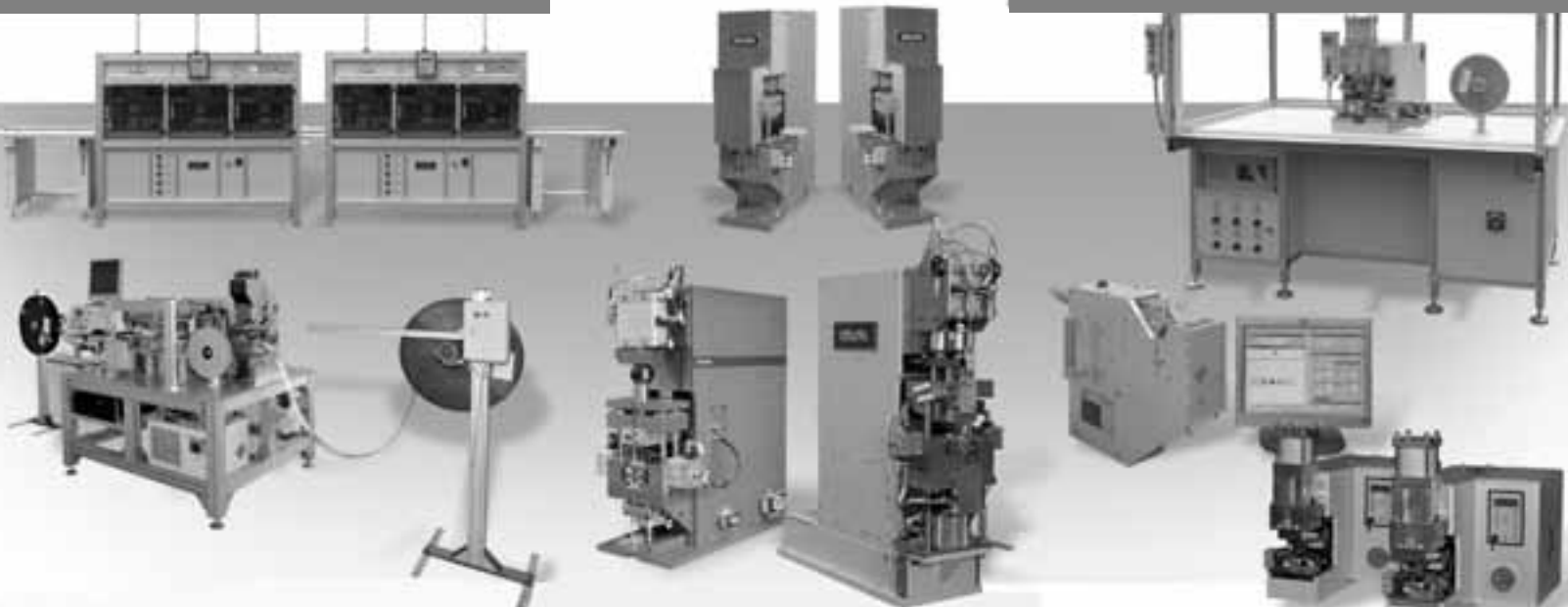
[jazonka@powercom.net](mailto:jazonka@powercom.net)

[www.z-techengineeringllc.com](http://www.z-techengineeringllc.com)

**STUNK**CONNECT automated solutions



- Micro-Spot Welding
- Compacting
- Splicing
- Contact Welding
- Resistance Brazing
- Terminal Welding
- Automation
- Resistance Welding
- Laser Welding
- Stamping/Bending
- Controllers
- Inverters

**AUTOMATION****MANUAL STATIONS****CUSTOMIZED MODULES**

**STUNK**CONNECT  
automated solutions, Inc.

39 Scenic View Drive • Deep River, CT 06517

Phone: 860-227-0638

Fax: 860-526-9296

Internet: [www.strunk.de](http://www.strunk.de)

Email: [heinz.bockard@automationhb.com](mailto:heinz.bockard@automationhb.com)  
[info@strunk.de](mailto:info@strunk.de)



**NEWS PLUGS** continued**L-com Solves Bend Sensitivity in Fiber Bulk Cable and Cable Assemblies**

L-com, Inc, a global leader in the manufacture of wired and wireless connectiv-

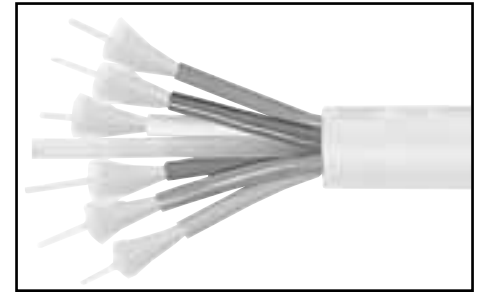
ity products, now carries Bend Insensitive (BI) bulk fiber optic cable and cable assemblies, a unique cable type that solves one of the biggest drawbacks of fiber-bend sensitivity.

Standard fiber cable does not perform well when it is bent at sharp angles or flexed frequently. L-com's BI fiber cable is ideal for data centers or any environment where cable is subjected to long-term

bending and flexing because it avoids performance issues.

"Fiber optic technology offers blinding speed and pure data durability," said Steve Smith, L-com's Product Manager in charge of fiber optics,

"but until now its physical limitations kept it from being used in high-flex applications. Now, customers can find a quality, professionally made and tested fiber



**Bend Insensitive (BI) Bulk Fiber Optic Cable**

cable that will last for bend after bend."

L-com's BI cables come off-the-shelf as singlemode simplex and duplex with LC connectors, and bulk cable as simplex, duplex, and 6- or 12-count breakout, but L-com can custom manufacture fiber cables quickly and in multiple formulations per customer requirements.

For further information visit <http://www.L-com.com>

**Laird Technologies Releases New Tflex™ XS400 Series Thermal Gap Filler**

Laird Technologies, Inc., a global leader in the design and supply of customized performance-critical components and systems for advanced electronics and wireless products, has announced the release of its new Tflex™ XS400 Series thermal gap filler.

The Tflex™ XS400 Series is the latest thermal pad in the Tflex™ thermal gap filler line, offering a compliant elastomer gap filler specifically designed to provide moderate thermal performance with a thermal conductivity of 2.0 W/mK. This soft interface pad conforms with minimal pressure, resulting in minimal thermal resistance even at low pressure with little or no stress on mating parts.

Available in thicknesses from 0.020 inch (0.50 mm) through 0.200 inch (5.0 mm) in 0.010 inch increments, the Tflex™ XS400 thermal material is naturally tacky for easy assembly and no adhesive coating is required. Due to its TG (Tgard™) liner on the other side, it is electrically insulating, stable from -40°C to 160°C, and is certified to UL 94V0 flammability rating; complying with the limits of RoHS Directive 2002/95/EC and its subsequent amendments.

"The Tflex™ XS400 gap filler is an easy-to-handle thermal pad that possesses low outgassing properties," said Jane Bell, Laird Technologies Thermal Interface



## Solutions for seal processing

**You do have choices**

When it comes to fully automatic seal applicators, you have a few to choose from. Your choices have just grown as Schaefer GmbH has introduced a new seal module or SSM for fully automatic wire process machines.



Schaefer Seal Kit SSK

**Your benefits**

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 Schaefer 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.



Schaefer Seal Module SSM with SSK

**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.

**Schaefer Megomat USA, Inc.**  
W233 N2830 Roundy Circle W.  
Pewaukee, WI 53072  
USA  
Phone: +1 262 524-1100  
Fax: +1 262 524-1133  
Email: [pewaukee@schaefer.biz](mailto:pewaukee@schaefer.biz)  
Web: [www.schaefer.biz](http://www.schaefer.biz)

**Schaefer Technologies, LLC**  
751 N. Raddant Road  
Batavia, IL 60510  
USA  
Phone: +1 630 406-9377  
Fax: +1 630 406-9381  
Email: [batavia@schaefer.biz](mailto:batavia@schaefer.biz)  
Web: [www.schaefer.biz](http://www.schaefer.biz)

**Schaefer Megomat USA, Inc.**  
10767 Gateway Blvd. W - Ste. 510  
El Paso, TX 79935  
USA  
Phone: +1 915-598-3037  
Fax: +1 915-598-5374  
Email: [elpaso@schaefer.biz](mailto:elpaso@schaefer.biz)  
Web: [www.schaefer.biz](http://www.schaefer.biz)

Continued on page 20

# Productivity<sup>2</sup>

Leading the Global Market in Bundling and Labeling Automation



The AT2000 has an average installation cycle of one second – up to 90% faster than manual installation.

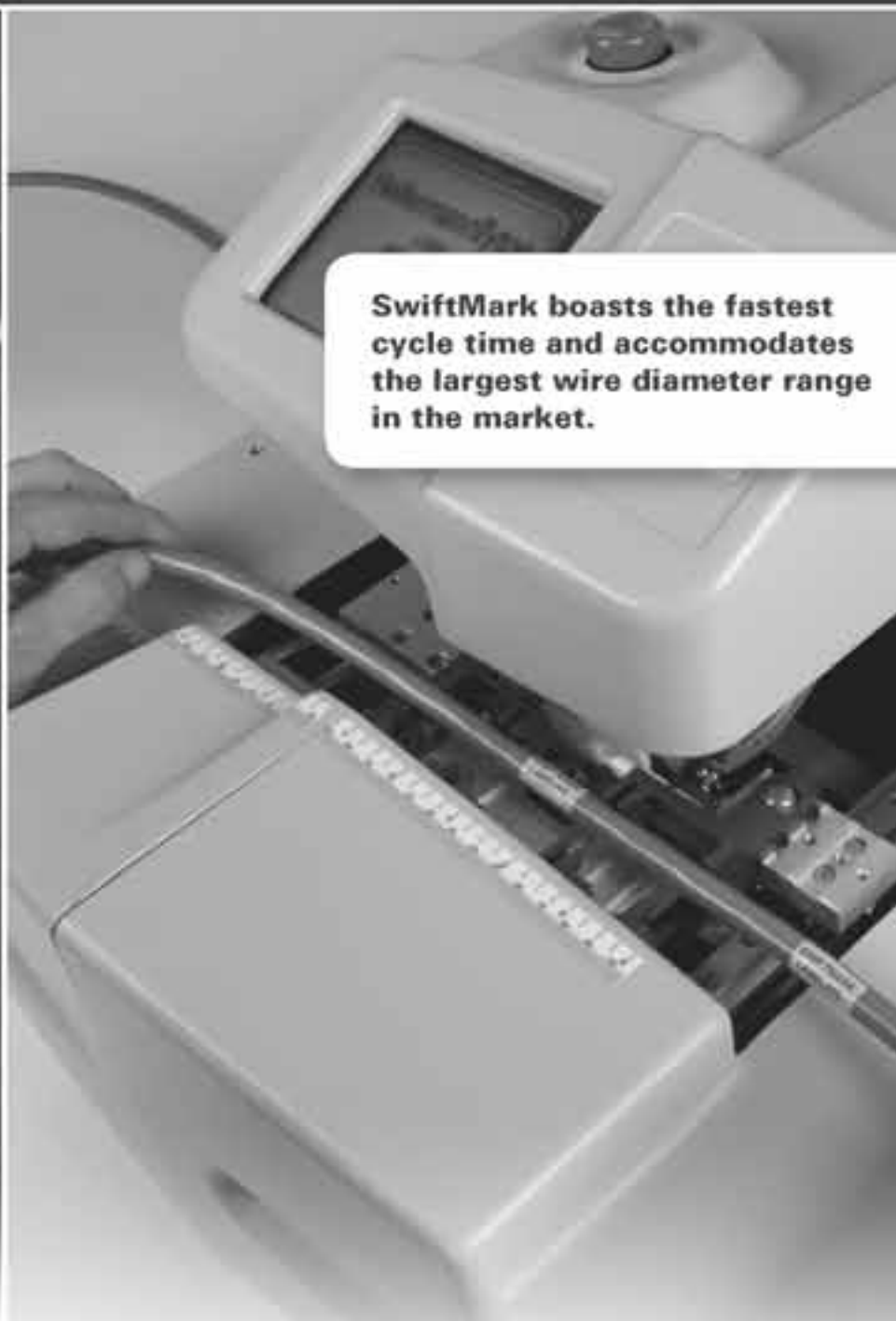
## AT2000, AT2060 and ATS3080 Automatic Cable Tie System

**Automatic application and consistent tensioning of cable ties for your harness or bundle.**

**Adaptable** – All systems are electric and can be easily converted to hand held, bench mount and overhead configurations to match your changing production schemes

**Versatile** – A variety of tools that can apply 18-, 30- and 50- pound cable ties for bundles up to 3"

**Efficient** – The AT2000, AT2060 and ATS3080 Automatic Cable Tie Systems are known for their speed, flexibility and ergonomics



SwiftMark boasts the fastest cycle time and accommodates the largest wire diameter range in the market.

## SwiftMark Label Printer and Applicator

**Automatically prints and applies labels to wire and cable.**

**Productivity** – Fast cycle time, up to 400% faster than manual application

**Quality** – Machine is durable and rugged. Labels are UL recognized for indoor and outdoor use

**Ease of Use** – View the label on the touch screen prior to and during the print process (WYSIWYG – What You See Is What You Get)

- ▶ For more information or to set up a demo, call us at (800) 822.4352 or visit [www.hellermann.tyton.com](http://www.hellermann.tyton.com) for complete product information.

## HellermannTyton

(800) 822.4352 | [www.hellermann.tyton.com](http://www.hellermann.tyton.com)  
email: [info@htamericas.com](mailto:info@htamericas.com)

**NEWS PLUGS** continued



Continued from page 18

Materials Product Manager. "It is an excellent choice for telecom, IT, consumer, automotive, LED, and power supply applications which require a gap pad between heat generating components and heatsinks, and provides electrical isolation with the ability to absorb high tolerance stack-up."

Laird Technologies provides the knowledge, innovation, and resources to ensure exceptional thermal performance and customer satisfaction for applications in the med-

ical, analytical, telecom, industrial, and consumer markets. For more information, please logon to [www.lairdtech.com](http://www.lairdtech.com).

**Alpha Wire Introduces Rugged Sleeving Line Extension**

Alpha Wire has announced a line extension of its FIT Sleeving product family. The new offering is comprised of rugged sleeving products that are designed for applications that demand superior abrasion resistance, high operating temperatures, and/or resistance to oils, solvents, and chemicals.

Available in a varied assortment of wrappable, expandable, and non-expandable configurations, the new FIT rugged sleeving is ideal for military, industrial, and other potentially hazardous applications.



**Rugged FIT Wire Management Sleeving**

"The new FIT rugged sleeving products allow us to expand and already considerable offering of wire management products," said Konstantin Khitrik, Product Manager at Alpha Wire. "With accessories ranging from heat-shrink, rigid, and flexible tubing to lacing cords and EMI shielding tape, Alpha Wire has an unparalleled range of wire management accessories."

The new FIT rugged sleeving products are available in the following configurations:

Flexible, Semirigid Wrapable Sleeving: 10-mil PET braid, more flexible than spiral wrap or split convoluted tubing, available with an installation tool for fast and easy wrap-around installation. Flame resistant and flame retardant constructions available.

Advanced Performance Expandable Sleeving: 20-mil nylon polyamide monofilament for extreme abrasion resistance without losing flexibility or durability. Expandable to 150% and resists fuels, solvents, salt water, chemicals, and UV rays.

Advanced Chemical Resistance Expandable Sleeving: 8-mil polyphenylene sulfide (PPS) monofilaments for advanced acid, base, solvent, and fuel resistance. Ultra-lightweight with high abrasion resistance, expandable to 150%, and flame resistant.

Maximum Performance Expandable Sleeving: Flat 20-mil nylon filaments for superior coverage and abrasion resistance. Resists fuels, solvents, chemicals, salt water, and UV rays; smooth inner wall prevents internal abrasion damage.

Extreme Performance Sleeving: 16-mil PTFE filaments resists virtually all chemicals and UV rays. Features a wide temperature range of -70°C to +280°C, thermally stable with low outgassing, and suitable for plenum use.

Abrasion-Resistant Non-Expandable Nylon Sleeving: 45-mil tightly woven thick nylon for excellent abrasion resistance. Deflects high-pressure hose ruptures and resists fuels, chemicals, UV rays, rot, and vermin.

For additional information visit the Company's website at [www.alphawire.com](http://www.alphawire.com).



**Wire Harness and Cable Design Services**

Our experienced design engineers will help you design all of your cables and wire harnesses. We'll also improve their manufacturability for you:

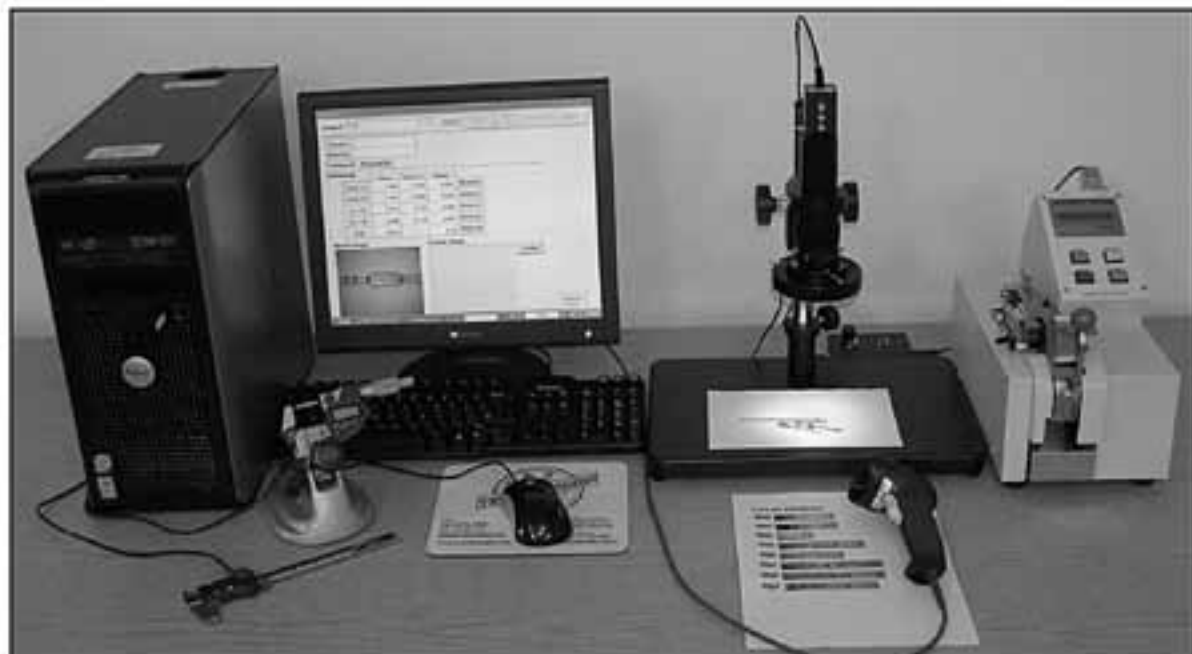
- Bill of Material Drawing
- Wire List Assembly Work Instructions

**RPC Manufacturing Solutions, LLC**  
303 417-1500

[Larry@RPCMfg.com](mailto:Larry@RPCMfg.com) [www.RPCMfg.com](http://www.RPCMfg.com)

# 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 Master ver 1.22

Circuit # WXYZ [Release] [Print Chart] [Report Status] [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 [Shutter] Sample Image

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

## C&S TECHNOLOGIES

573 Rt. 30  
Imperial, PA 15126

Tel: 724-695-2829  
Fax: 724-695-3134

Juarez, Mexico (52) 656-638-9502  
Chihuahua, Mexico (52) 656-626-6188

[www.cs-technologies.com](http://www.cs-technologies.com)

[sales@cs-technologies.com](mailto:sales@cs-technologies.com)





**Applitek**  
TECHNOLOGIES CORPORATION

## Crimping Applicators

Applitek and all of its employees are proud of the fact that we are one of the oldest independent applicator manufacturers in the United States. Our Company was founded on designing and manufacturing quality products using our in-house capabilities. To this day the tradition continues and we are prouder than ever to say "Still made in the USA"

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.

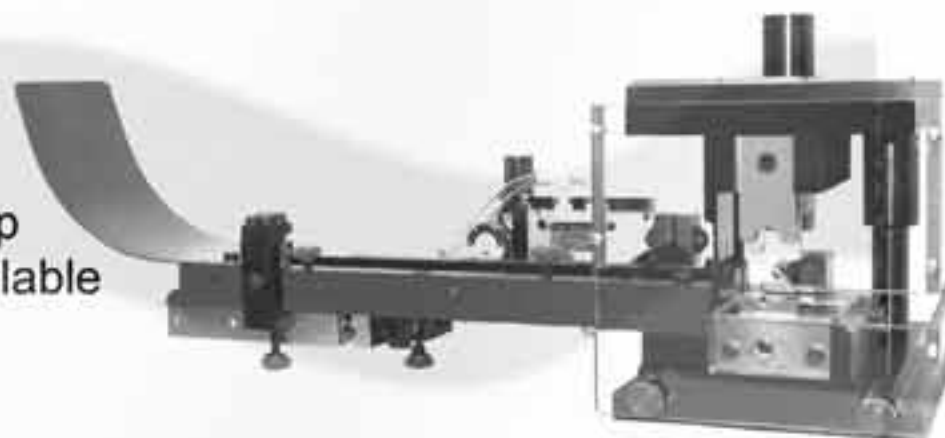


Model 1500



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.



DSA Series

Applitek has a solution for all your termination requirements. That's why many major wire harnessing companies and Original Equipment Manufacturers use and specify Applitek applicators. Our base applicator frame designs have proven themselves over the years with their reliability and have been able to accommodate over 3000 different types of terminals.

Give us a call at (401) 467-0007. Our business is applicators, not terminals, not wire, not connectors, etc., etc. It's our only business.

Visit our web site: [www.applitek-usa.com](http://www.applitek-usa.com)

Applitek Technologies Corporation, 174 Georgia Avenue, Providence, RI 02905 Tel: 401-467-0007 Fax: 401-467-5525

## MINI FUSE HOLDER CAP



Use with Delphi/Packard components to build a 280 Series Sealed Metri-Pack MINI Fuse Holder

Designed for harsh environments and engine compartment conditions

Phone: (440) 871-0800 • Fax (440) 871-0799  
E-mail: sales@whiteproducts.com



925 Bassett Road, Unit D, Westlake, OH 44145  
www.whiteproducts.com

## NEWS PLUGS continued



### Weidmuller Terminal Blocks Pass Insulation Testing for Photovoltaic Applications

Weidmuller has announced the completion of specialized insulation testing on their terminals blocks, geared specifically for solar photovoltaic (PV) applications. This testing ensures that Weidmuller terminals can withstand a continuous voltage of 1000 VDC under all climatic conditions.

Specialized insulation testing is required for PV applications because



Weidmuller's Terminal Blocks at work in a PV application.

standard insulation tests performed on terminals do not detect low-ener-

gy (partial) discharges, which are common in PV applications. Partial

discharges can slowly work through a terminal's insulation line, ultimately causing a defect. In addition, insulation lines react differently to partial discharge tests for DC voltage than to partial discharge tests for AC voltage. Since solar panels generate DC electricity, only terminal blocks that have passed a partial discharge test for DC voltage are suitable for safe use in photovoltaic systems.

To maximize the power generated by a PV system, solar panels that convert solar energy to DC electricity are connected in series or in parallel to create solar arrays. Arrays are connected to a DC to AC converter (Solar Inverter) via a combiner box. The combined voltage from the arrays within a combiner box may be as high as 1000 VDC in global applications, or 600 VDC for NAFTA applications requiring UL certification. It is critical that terminal blocks used within a combiner box are able to safely and reliably withstand these voltages.

"Weidmuller is well positioned to serve the global photovoltaic industry", says Jim Cahaly, Director of Custom Engineered Solutions for Weidmuller. "Our engineers have developed a complete offering of high quality and innovative connectivity solutions for the entire DC pathway of a solar energy system, including connections in and between the solar panels, combiner box, and inverter."

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

# Tri-Tech KODERA

Offers the Cutting Edge of Wire Processing  
**Ultimate Miniaturization & Downsizing of Wire Processors**

## Cut and Strip Machines

- 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



## Fully Automatic Machines

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

- C550 Single End Strip x Crimp
- C550 SZTS Single End Crimp x Twisting and Tinning
- C551 Crimp x Crimp
- 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

PRODUCTION 10,000 PER HOUR



# Tri-Tech KODERA

Offers the Cutting Edge of Wire Processing  
**Ultimate Miniaturization & Downsizing of Wire Processors**

16601 West Glendale Drive New Berlin, Wisconsin 53151  
Phone 262/782-4352 Fax 262/782/6237  
[www.tritechkoder.com](http://www.tritechkoder.com) [sales@tritechkoder.com](mailto:sales@tritechkoder.com)







# ANIXTER

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

## Electronic Cable Capacitance

A high-performance communication cable requires a precise capacitance to ensure it performs to its stated specifications. Even though there are many characteristics that determine the performance of an electronic cable, a lower capacitance value is often a goal many cable designers try to achieve. System designers and users need to understand how a cable's capacitance can impact its performance and what manufacturers do to control it.

### What is Capacitance?

Capacitance is a measure of a material's ability to store a charge between two conducting, current-carrying components. If a signal is transmitted along a twisted-pair or coaxial cable, the insulation becomes electrically charged. The charge is stored in the medium between the two conductors, which can be the insulation, air or other filler. All electronic cables (not wires) have two or more conductors and therefore have some capacitance. This is also true for a coaxi-

al cable that uses its shield as a conductor.

The materials that constitute the cable generally dictate the cable's capacitance. The materials often have a specific characteristic that is identified by the manufacturer as the dielectric constant. If all things are equal, the lower a material's dielectric constant, the lower the capacitance.

The geometric size and spacing of the conductors is also a major influence on a cable's capacitance. Spacing is affected by the thickness of the insulation and other components sometimes found between conductors. The smaller the conductor and the larger the distance between them, the lower the capacitance. Figure 1 (page 24) identifies some of an electric cable's common components and the capacitance that is present between the conductive surfaces.

### Impact of Capacitance on Cable Performance

Because cables are intended to carry electrical current from one point to another, low-capacitance is generally preferred. A low-capacitance cable is a

poor energy-storage device. If the cable is a poor energy-storage device, then more energy is delivered to the intended destination and less energy is used charging and discharging the cable.

If low capacitance means less energy is used in the cable, why aren't all cables designed with the lowest capacitance possible? There are several reasons to accept or even design for higher capacitance. One reason is cost: materials that have lower dielectric constants are gen-

erally more expensive. Also, cable designs that use greater conductor spacing to reduce capacitance can grow large quite quickly. Finally, some cables are designed with higher capacitance because it is only one factor that affects a cable's impedance. When communication systems are designed for a specific impedance, such as a 100-ohm Ethernet cable, they will maintain maximum sig-

Continued on page 24

## SOLDER FUME EXTRACTORS

portable, benchtop, wall-mounted, floor models.

### ESD-SAFE






**HEPA FILTRATION**  
[UP TO 99.97% EFFICIENT ON PARTICLES .3 MICRONS AND LARGER]

**LOW ENERGY CONSUMPTION**  
[.3 AMPS]

**MADE IN THE USA**



1.800.799.4609    WWW.SENTRYAIR.COM

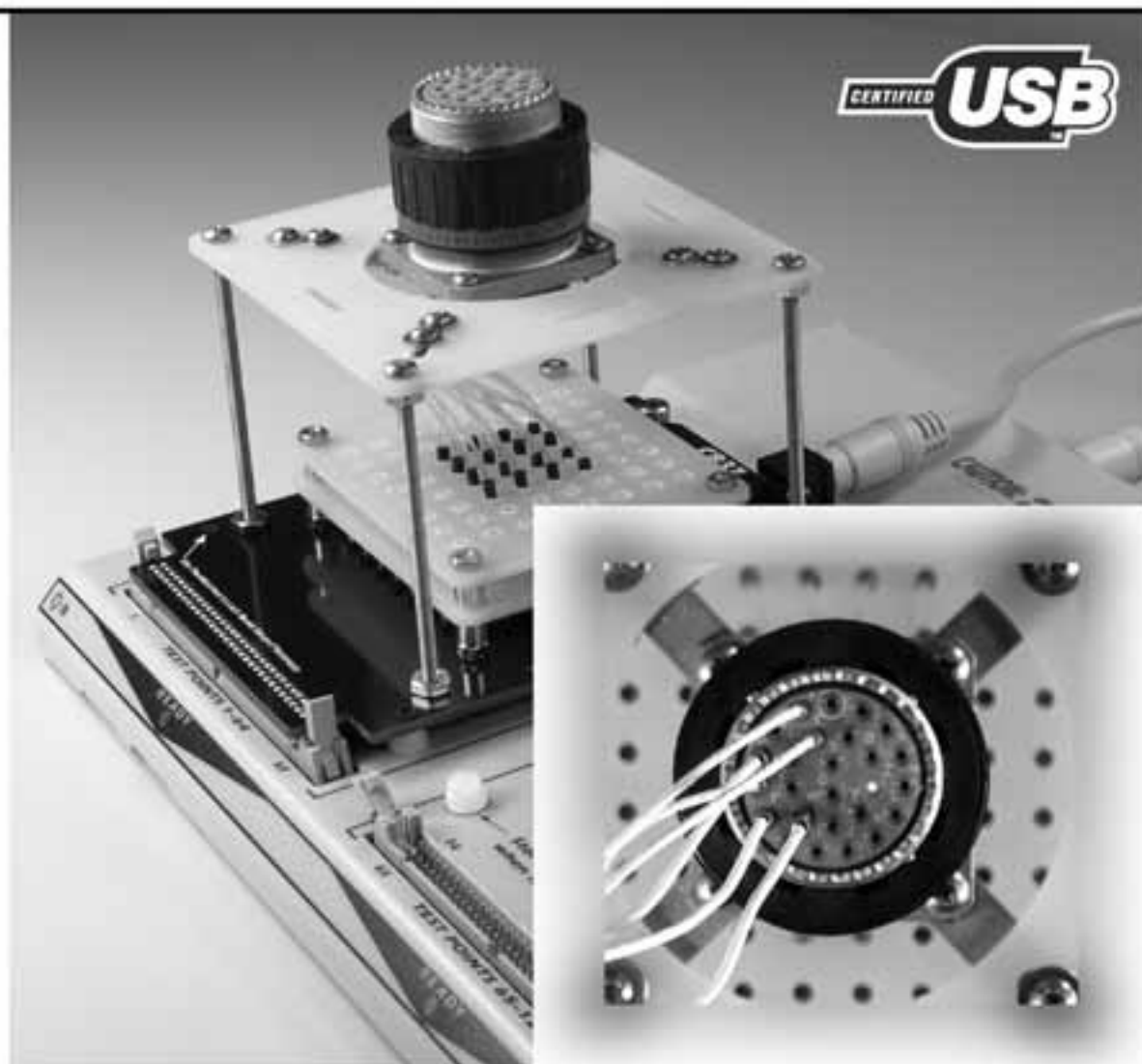
## SENTRY AIR SYSTEMS, INC.

## Light-Guided Connector Assembly

Use this new, patented system to **double** your productivity\* when assembling circular and rectangular connectors. The Light Director™ system uses light fibers driven by super-bright LED lamps to individually illuminate target cavities in the connector being assembled. When you enter the wire code printed on unconnected wires or touch a wire terminated at the other end, software turns on the appropriate fiber, thereby causing a bright, flashing light to project from inside the target cavity guiding you to the proper insertion point. Correct insertion is confirmed by the elimination of light from that location, whereas insertion into an incorrect cavity leaves the flashing light visible.

- Improved productivity quickly repays the cost of the test equipment and fixturing.
- Use with the CableEye Model M3U PC-based cable test system.
- Accepts connectors up to 128 pins.
- Includes English and Spanish screen labels and voice commands.
- Send us your mating connector and we will mount and program it at no charge.

[www.cableeye.com/LightDirector](http://www.cableeye.com/LightDirector)  
Tel: (800) 776-0414



1 - Scan wire code OR touch unconnected wire with probe or finger.

2 - Target cavity begins to flash. Computer also reads pin number in natural voice.

3 - Insert and lock pin in place. Light blocked to confirm insertion.

\*Field testing has shown a doubling of assembly speed while practically eliminating errors. Reduced worker fatigue using the Light Director permits more consistent production output throughout the work day.

**CAMI**   
**CAMI Research Inc.**  
530 Main Street, Acton, Massachusetts 01720  
Tel: 978-266-2655 Fax: 978-266-2658  
e-mail: sales@camiresearch.com





Continued from page 23

nal transfer if the impedance of the cable matches the rest of the system, even if the capacitance is higher than it might otherwise be.

**Measuring Capacitance**

In North America, capacitance is usually expressed by the unit pF/ft. (pico-Farads per foot). As the unit implies, capacitance of a cable run increases as

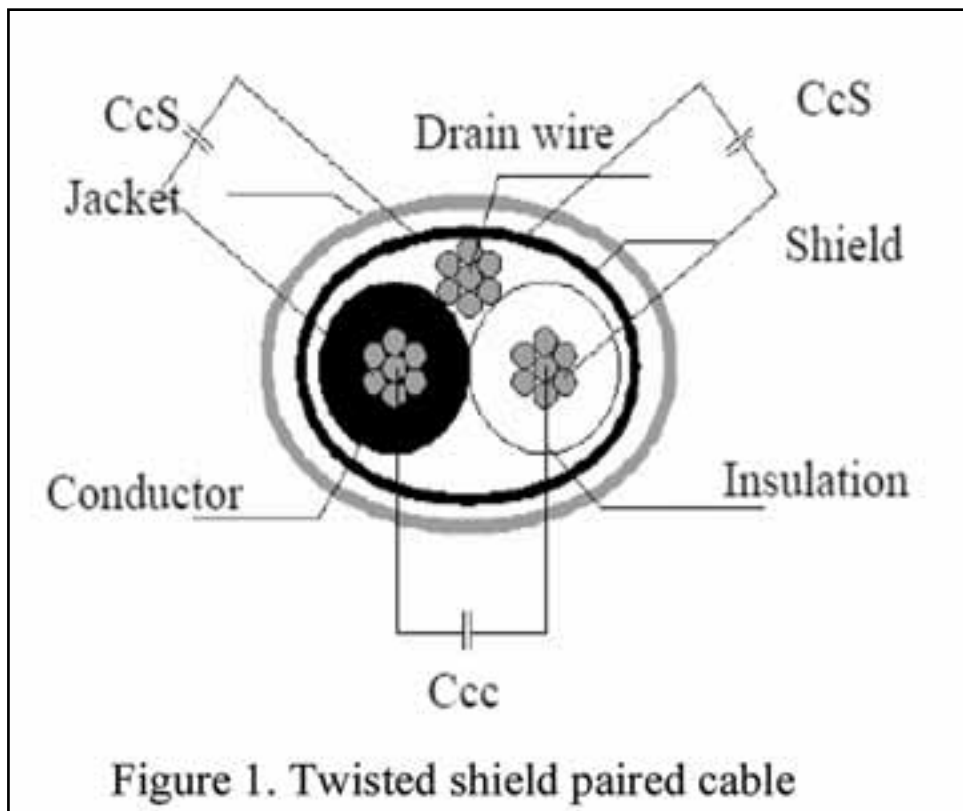


Figure 1. Twisted shield paired cable

the run length increases. In fact, long run lengths can have such a high capacitance that it becomes the limiting factor of the system. This is important to remember when measuring the capacitance of a cable. If you are using a hand-held capacitance meter, the length of the cable will need to be taken into account after measuring the cable capacitance.

Because digital signals are usually transmitted as square waves with sharp increases in voltage, the waveform is quite distinguishable by the receiver. This is one of the reasons digital communication is relatively noise immune. However, high capacitance can round

off the tops of the square waves through the aforementioned charging mechanism. If the square wave is affected too much, it can impact the successful transmission of the signal and cause communication errors.

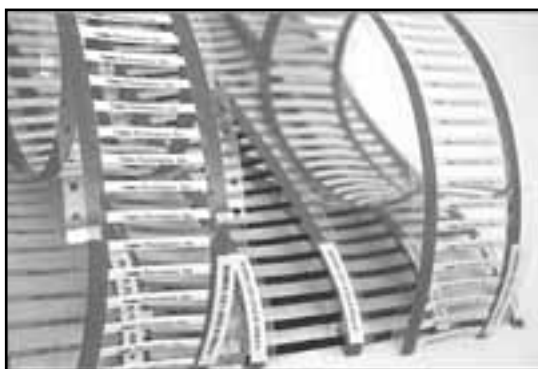
Fortunately for many common systems, maximum capacitance values are specified by the equipment supplier. For systems that don't specify a maximum capacitance, selecting a cable with the capacitance necessary to ensure robust performance without being too costly or too large can be confusing. However, with this basic understanding of cable capacitance, you will be better prepared to select just the right product.



**Introducing Our Hottest Item!**

**The MARK™ 321 Heat Shrinkable Wire Marker**

- SAE-AMS-DTL-23053/5 CL1&3
- MIL-M-81531
- Light Weight Marker
- 3:1 Shrink Ratio
- Drop in Replacement for Tyco TMS-SCE



Compatible with Tyco Printing Machines, WinTotal Software, and the Gamma Mark I & III Printing Systems.

**SAME DAY SHIPPING!!!**

**PHONE: 1-909-860-1479 • FAX: 1-909-839-4461**

**WWW.GAMMAELECTRONICS.NET**

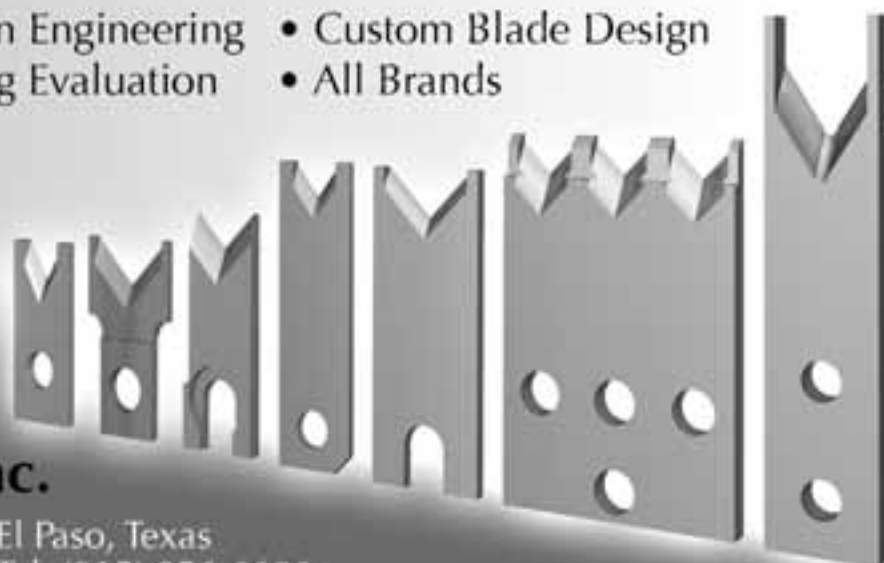


**Wherever YOU Are, We're There For You!**



*Lakes Precision, Inc. — Your single-source, global provider of high quality cutting-stripping blades, crimp tooling, & accessories.*

- Application Engineering
- Custom Blade Design
- Wire Sizing Evaluation
- All Brands



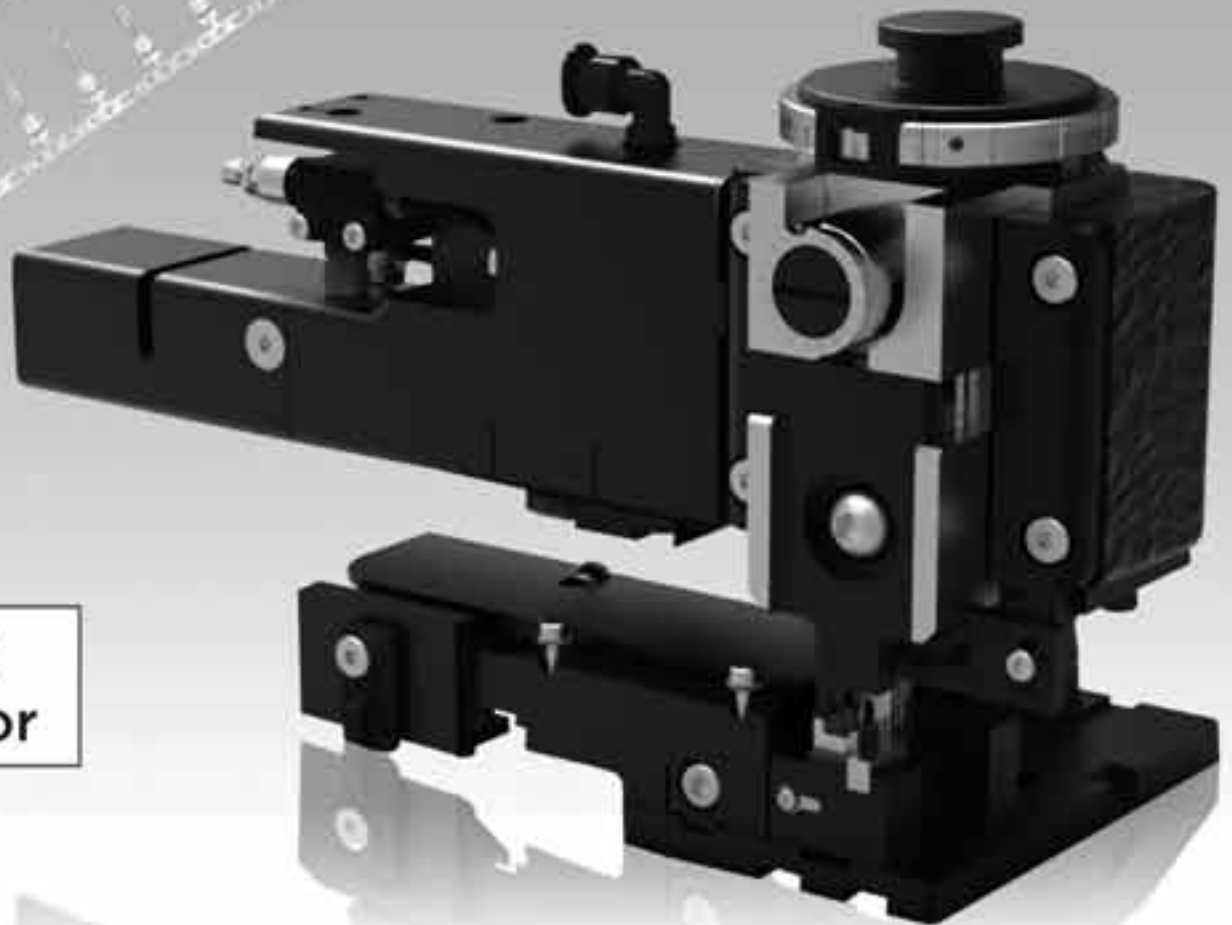
**Lakes Precision, Inc.**

Three Lakes, Wisconsin  
 Tel: (715) 546-3070  
 Fax: (715) 546-2565  
 tonya@lakesprecision.com

El Paso, Texas  
 Tel: (915) 856-6606  
 Fax: (915) 856-6608  
 laura@lakesprecision.com

[www.lakesprecision.com/global](http://www.lakesprecision.com/global) • ISO 9001:2008 Certified

## Introducing the Next Generation Applicator



# We've Done It Again!

Introducing the **Next Generation Applicator** which offers modular feed packages, the ability to upgrade in the field, and unparalleled manufacturing tolerances which deliver quality like never before.

### Why a new Tyco Electronics Applicator Design?

We listened to our customers, who told us they wanted a simplified modular design with increased flexibility. With this information and years of development, our engineers designed a state of the art applicator with easy adjustments, design consistency and global standardization, which in turn provides you with the benefits and quality you've come to expect from Tyco Electronics.

The **Next Generation Applicator** is designed to be backward compatible to run all common terminator and leadmakers. It can also be upgraded to run on the new System III compatible machines.

Call your Tyco Electronics sales professional at 888-777-5917 or 1-717-810-2080 for a demonstration of the Next Generation Applicator and see how your factory can improve with its use.

Next Generation  
Servo Series



Next Generation  
Pneumatic Series



Next Generation  
Mechanical Series



[www.tooling.tycoelectronics.com](http://www.tooling.tycoelectronics.com)  
[www.tooling.tycoelectronics.com/europe](http://www.tooling.tycoelectronics.com/europe)  
[www.tooling.tycoelectronics.com/china](http://www.tooling.tycoelectronics.com/china)

Ph: 1-888-777-5917 or 1-717-810-2080; [toolingsales@tycoelectronics.com](mailto:toolingsales@tycoelectronics.com) © 2010 Tyco Electronics Corporation. All rights reserved. AMP-O-ELECTRIC, the TE logo and Tyco Electronics are trademarks.

 **Tyco Electronics**  
Our commitment. Your advantage.

# Mando Can Do.



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

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

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

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

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

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

Mando exemplifies the Eubanks business experience—highest-quality, U.S.A.-built wire strippers and markers backed by dedicated people itching to solve your wire problems.

Call us today. We’ll put this “can do” attitude to work for you till the cows come home.



## Eubanks®

### HAPPY ENDINGS

Eubanks Engineering Co.  
950 E. Royal Oaks Drive, Monrovia, CA 91016  
(626) 357-7011 Fax (626) 357-4718  
[www.eubanks.com](http://www.eubanks.com)



# Developing Nimble Techniques in the Wire Harness Manufacturing Process

Continued from page 1

observe the performance of the production process to highlight variations as they occurred. By quickly identifying quality problems, waste could be further eliminated.

At the end of WWII, American experts were sent to Japan to help with the rebuilding efforts. The Japanese built on the American principles, and began to develop the Kaizen method of continuous improvement. By doing little things better through teamwork, establishing quality circles, and promoting a zeal for improvement; kaizen set increasingly higher standards. Through the years, Japanese manufacturers distinguished between innovation (single point discovery) and Kaizen (continuous discovery).

In the 1950's, two Toyota engineers, Taiichi Ohno and Shigeo Shingo began to develop the Toyota Production System. Unlike Ford who concentrated on producing millions of cars, TPS was a series of production processes developed to produce small batches, where and when they were needed (just-in-time). The goal was to eliminate waste, improve quality, and promote evenness in the production flow.

Kaizen was officially introduced to the West by Masaaki Imai in his 1986 book *Kaizen: The Key to Japan's Competitive Success*. Not long after, in 1988, the term Lean Manufacturing was used in an article by John Krafcik, quality engineer at the Toyota-GM joint venture in CA; and then in the international best-selling book, co-authored by Jim Womack and Daniel Jones, called *The Machine That Changed the World: The story of Lean Production*.

For the purpose of discussion, TPS and Lean are very similar. Both consider expenditure of resources for any goal other than the creation of value for the customer to be wasteful, and thus a target for elimination. By steadily removing waste and improving work flow, quality issues are identified and lead times are improved. The basic difference is that Lean is a somewhat west-

ernized version that concentrates on various tools to reach the goal. Among these are Kiazen events, Value Stream Mapping, and Six Sigma. TPS uses many of the same tools, but is a more holistic way of thinking.

While TPS and Lean are essential in meeting the cost and quality objectives in today's competitive marketplace, they tend to orient towards manufacturing a high volume/low product mix. For the small to mid-level harness manufacturer, there is an added need to address agility. Speed and flexibility become para-

mount to success. Companies must leverage technology in order to provide easy setups, quick changeovers, and equipment integration. In a world of standard products, harness manufacturers can differentiate themselves by providing customized options. They must pay even more attention to develop a responsive supply chain to optimize performance. Equipment suppliers must specify the technology to muscle up existing equipment in order for the quick changeover model to work.

Continued on page 28



**JWB**  
Manufacturing LLC

Delivering High Quality Products Worldwide  
"The Blade People"

A full line manufacturer of wire  
Cutting & Stripping Blades for all  
types of wire processing equipment.

[www.jwbmanufacturing.com](http://www.jwbmanufacturing.com)

841 W Fairmont Dr, Ste 103  
Tempe, AZ 85282  
Tel. 480.967.4600 Fax 480.967.4466  
Email: [sales@jwbmanufacturing.com](mailto:sales@jwbmanufacturing.com)

## Does your Cable Tester:



If not, contact Dynalab today for more information!

[www.DynalabTesters.com](http://www.DynalabTesters.com)

Wiring Harness  
and Hipot Testers

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


**Dynalab**  
TEST SYSTEMS



# Developing Nimble Techniques in the Wire Harness Manufacturing Process

Continued from page 27

**We Manufacture  
Spring Test Probes**



**LONE STAR INDUSTRIAL®**

6985 Industrial • El Paso, Texas 79915  
Tel: (915) 779-7255 • Fax: (915) 779-7328  
Email: lonestarind@mindspring.com  
Website: www.lonestarindustrial.com

## Quick Changeover Developments at Komax

Over the past several years, equipment suppliers have responded positively to this notion. Erich Moeri, Applications Engineering Manager at Komax Corporation, recently outlined several ways his company has used software enhancements to help harness manufacturers meet this competitive challenge. Integration with other equipment is crucial, Moeri suggests, and Komax has developed many interface upgrades. "We have actually changed our software to make it easier for our equipment to talk to, and receive feedback from other

(third party) equipment." Moeri then outlined the way Komax has buttressed software by enhancing the network interface. With an easier interface, Moeri explains, setups can be uploaded along with process integrated pull out force, crimp height, and other measurements gathered during production.

Physical upgrades also give Komax equipment a wider range. This is most evident, Moeri indicates, with the Zeta line of harness machines "where you can actually set up a number of crimping presses on one machine and the pro-

Continued on page 32



Komax Zeta 633 Wire Processing System Block Loading Module.

## YOUR CONNECTION FOR... Amphenol® Industrial

Amphenol Industrial's innovative products include **Amphe-Lite** composite, **ACA-B & GT** reverse coupling bayonet, & **Amphe-Com & Amphe-PD** connectors enhanced with **RADSOK®** high amperage low insertion force contacts.

ECCO's extensive Amphenol inventory includes the popular **5015 style 97 A & B** in standard, **RoHS** compliant, & reverse bayonet versions. We also stock the **Mil-C-5015 (E, F, & R)** miniature cylindrical **PT (MS26482-I)**, **48**, environment resistant **Mini E 67**, miniature standard **165**, & high density circular **348 (M81511)** series.

Our assembly capabilities allow us to quickly fulfill your requirements.

For responsive, experienced service, call Electronic Connector at

**800-742-3262**

FAX: 773-767-9634  
e-mail [sales@eccoichicago.com](mailto:sales@eccoichicago.com)  
[www.eccoichicago.com](http://www.eccoichicago.com)

CONNECTORS FOR ALL REASONS



**ELECTRONIC CONNECTOR CORP.**  
6332 S. Central Ave. • Chicago, IL 60638  
773-767-2200 • An ARRIS Company



© 2008 ECCO



**GRAYLINE  
INC**

## MANUFACTURING WIRE HARNESS TUBING SINCE 1966!

- ▶ Flexible PVC Tubing
- ▶ Heat Shrinkable PVC Tubing
- ▶ Heat Shrinkable Polyolefin Tubing
- ▶ Halogen-Free Tubing
- ▶ UL/CS, ASTM, Military, EU (RoHS, ELV, Pb-Free)

Two-week Lead Time on  
Everything We Manufacture

100% On-Time Shipping Guarantee

2101 AIRPORT ROAD ▶ WAUKESHA, WISCONSIN 53188-2455  
[www.graylineinc.com](http://www.graylineinc.com) ▶ 1-800-394-5762 ▶ [sales@graylineinc.com](mailto:sales@graylineinc.com)

Does it really matter  
where the next wire goes?



It matters to these guys.



Pin it Right with **PIN-SIGHT™** Patent Pending

### Error-proof the insertion of wires/pins into a connector

- Eliminate mis-wires with video guided pinning
- Eliminate paper diagrams and cross-reference lists
- Reduce eye strain and operator fatigue
- Ideal for seal plugs too
- Rapid \$\$ payback through speed and quality



- Verify contacts are "locked-in" with force sensing
- No mating cables or connectors

Transparency setting lets you "see through" wires and fingers

Super zoom-in on target cavity

Wire cavity and color are displayed and spoken

Gauge shows push/pull force

Operator enters wire ID via barcode, keypad or speech

More Info at: [www.cirris.com/pin](http://www.cirris.com/pin)

**CIRRIS**  
Cable/Harness Testing Made Easy™  
Phone 800-441-9910 • 801-973-4600



**ECC**  
**Innovative Fixture Solutions for  
 Your Critical Testing Issues**

- Continuity Test Fixtures
- Slave Cables for Functional Testing
- "Burn-in" Test Fixtures
- Terminal Seating Testing
- Component Presence Detection
- Color Detection
- Wire Routing Products



- Reduce Cycle Time
- Reduce Maintenance Time
- Reduce Operator Fatigue
- Improve Quality

**Your Wiring Harness Solution Provider**

**ELECTRICAL CONTINUITY & COMPONENTS**  
 Ph. 614•409•9104 Fax. 614•409•9115  
[www.eccco.com](http://www.eccco.com)

## NEWS PLUGS continued



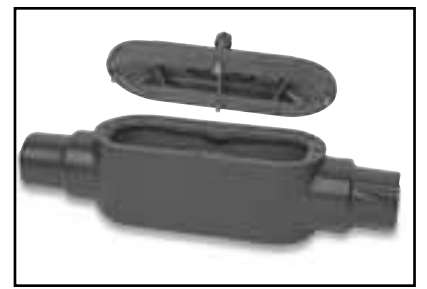
### Thomas & Betts' OCAL-BLUE® Type 4X Form 8 Conduit Body Features New Design

The newly designed OCAL-BLUE® Type 4X Form 8 conduit bodies from Thomas & Betts offer double-coated exteriors for enhanced protection in corrosive environments, as well as extending the service life of the conduit bodies. The interior and exterior are coated with .002 inches (2 mils) of blue urethane and the exterior is coated with an additional minimum of .040 inches (40 mils) of injection-molded polyvinylchloride (PVC), providing a new solution for corro-

sion-resistant protection in harsh-environment applications, such as wash-down areas and outdoor applications exposed to rain, ice and snow.

The covers for OCAL-BLUE Type 4X Form 8 conduit bodies offer additional features, such as an integral O-ring seal on the cover that seals against the flat base. Another feature is the encapsulated stainless-steel cover screws that meet UL-listed Type 4X and NEMA 4X requirements with simple hand-tightening to 15 foot-pounds of torque; competitive products typically require 35 foot-pounds of torque. No tools or separate gaskets are needed.

"Double-coated OCAL-BLUE conduit bodies provide an added layer of corrosion protection in harsh environments found in water and wastewater treatment facilities, food and



**OCAL-BLUE® Type  
 4X Form 8 Conduit Body**

beverage processing facilities, oil and gas refineries, and mining operations," said Mark Nowak, Thomas & Betts product manager for Ocal® products. "An added benefit is the ability to meet UL and NEMA Type 4X requirements by simply hand-tightening the cover screws."

OCAL-BLUE Type 4X Form 8 conduit bodies are made from cast iron and are available in sizes from one-half inch to two inches. The PVC coating is available in grey or can be custom molded to a customer's specification. Covers are also sold separately for replacement.

For more information visit [www.tnb.com](http://www.tnb.com) or contact Thomas & Betts at (800) 816-7809.

### Zeus Catalog Available in Six Languages

With a catalog translated in six languages, increased bilingual associates, and extended hours, Zeus is committed to providing a high quality of support to its international partners. Zeus, Inc., a global leader in material science and high performance polymer extrusions, announces it is now publishing its catalog in six languages: English, Chinese, French, German, Japanese, and Spanish. Zeus has also increased its number of bilingual Technical Account Managers and modified customer support hours to better accommodate partners in Asia. All six catalogs are available for download at [www.zeusinc.com](http://www.zeusinc.com). "Publishing our catalog in six languages is one of the ways in which we are enhancing convenience and accessibility for our partners across the globe," said Alan Andrews, Senior Vice President of Global Sales and Marketing.

"Overall, the goal is to maintain world-class support that is extremely responsive and customer-focused, from initial contact to completion of the project."

Zeus offers value-added services, such as flaring, flanging, etching, and pad printing. Zeus, Inc. is headquartered in Orangeburg, SC. For more information, visit [www.zeusinc.com](http://www.zeusinc.com).



## Short Lead Times...Quick Solutions

**Flat or round, shielded or unshielded, jacketed or unjacketed, discrete or ribbon – 3M has the cable to suit your wiring application.**

From the benchmark 3365 Series Flat Ribbon Cable, to Round Jacketed Twisted Pair, to the high-performance Pleated Foil-Shielded Cable, 3M has one of the industry's largest cable offerings. Serial or parallel signal applications, .025", .033", 1 mm, .050", .100", .156" centerlines, PVC, RoHS compliant TPE (no DecaBDE), Halogen Free insulation materials: we likely already have what you need.

Can't find your solution amongst our broad portfolio of standard products? Let us draw on our design and manufacturing expertise to construct a custom cable for your precise application requirements. Specifying a 3M cable is your assurance of quality, consistency and reliability... and a *quick* solution.

Heilind: The largest interconnect inventory in the world!

**HEILIND**  
 Performance. Trust. Innovation.

Call us... We're well connected! 866-887-2189  
[www.heilind.com/3M-cable](http://www.heilind.com/3M-cable) <http://estore.heilind.com>

# Inline Wire and Cable Identification

Continued from page 16

## Direct Thermal Transfer

Direct Thermal Transfer is a relative newcomer to wire ID. Instead of using thermal transfer technology to mark labels (see Labeling above), the thermal transfer system marks directly onto the wire or cable. Like hotstamp marking or labeling, the wire or cable must stop during the marking process. The cycle time is slightly longer than hotstamp at approximately 1 - 2 seconds. An advantage of thermal transfer marking over labeling is that the cost per mark is much less since there are no labels to purchase. A unique function is used to roll the wire or cable to enable marking over a greater circumference than would otherwise be possible. Like hotstamp, foil colors can be easily changed, making it possible to print on all insulation colors.

## Inkjet

Inkjet marking systems used for marking wire and cable are of the continuous inkjet (CIJ) type. Newer inkjet printers on the market are simpler, faster and more reliable than their predecessors. They feature automatic startup / shutdown cycles and much better process control. They use far less makeup solvent per unit time, resulting in less odor and improved air quality.

Inkjet marking can be used on most wire insulation types except PTFE/Teflon. Permanence and abrasion resistance is excellent on most PVC type insulations.



It's always best for customers to get their wire samples marked so they can determine if the results will meet their application requirements. Depending on the system hardware and software, additional features may be available to the user. The user can select the font size to match the wire size. The standard text format is horizontal orientation but it's possible to change it to vertical, also known as "tower" orientation. Special codes can be programmed to automatically print the time, date or a different serial number on each wire. This is very useful for production traceability. Bold, underline and italics font attributes are

Continued on page 34

## CONNECTING THE WORLD

CONNECTORS • CONTACTS • ACCESSORIES • TOOLS

International authorized distributor for:

**RMS Connectors**  
 Mil-C 26500 Series  
 Boeing Qualified  
 BACC45's/BACC63's  
 ALS24264R's/MS24266R's

MIL-C-5015, MIL-C-24308, MIL-C-26482,  
 MIL-C-26500, MIL-C-38999, MIL-C-39029,  
 MIL-C-81511, MIL-I-81969, MIL-C-83723,  
 MIL-E-83733, MIL-C-85049, ARINC 404,  
 ARINC 600

- ARRAY Galley/Buffer Connectors
- THE PHOENIX COMPANY  
D-Sub Connectors
- MIL-EDN Audio Connectors

**INTRO CORPORATION**

5121 Industry Drive, Unit 104 Melbourne, FL 32940  
 TEL: 321-757-6330 • FAX: 321-757-8973 • TOLL-FREE: 1-800-722-2233  
 www.introcorp.com • info@introcorp.com



## An Eye for Innovation

Bringing Precision, Flexibility and Experience to Wire Processing

### NEW PowerStrip 9550

- Measures, cuts and strips up to 2/0 AWG and jacketed cables up to 0.630" in diameter
- Extensive libraries with predefined cable types and processes
- Servo driven transport units offer unparalleled speed and stripping power
- Turret guide on left side rotates to accommodate full range of wire sizes
- Modular design allows future upgrades to base models
- Complete range of options and accessories available for a customized system



[www.schleuniger-na.com/cutstrip\\_whn](http://www.schleuniger-na.com/cutstrip_whn)  
 (603) 668-8117

**Schleuniger®**  
 To Be Precise.



**LTL Tooling** www.LTLtooling.com

**STOP** Hand Injuries  
AND Increase Production

**HCAP-02**  
Split-Cycle Hand Crimp Press

Patented Design Made in U.S.A.

- Heavy-duty air cylinder for crimping larger gauge wire.
- Secures terminal in tool before crimping.
- 30 second tool change-over.
- Use your existing hand tools.
- Three (3) FREE tool modifications with each HCAP-02 or HCAP-01 purchase. (You can use tool by hand or in press with the modification)
- Same Day turn-around on tool modification.

Call for our FREE demo CD

Also available: The HCAP-01 Many of the benefits of the split cycle (HCAP-02) at an economical value.... including speed controller.

**LTL Tooling & Assembly**  
P.O. Box 1976 Manitowoc, WI 54221-1976  
Phone: 920.739.9265 Fax: 920.954.8729  
Email: claude@ltooling.com

## Developing Nimble Techniques in the Wire Harness Manufacturing Process

Continued from page 28

gram takes over. "The system can select between 1 - 30 wires which are always on the machine" which greatly enhances flexibility on the shop floor, he added.

Moeri strongly asserts that while the concept of interface and quick changeover is important, it can't happen without in-process quality monitoring. "You must have crimp force and other similar outputs from the machine to improve quality and traceability," Moeri reminded.

To capstone his company's

efforts to aid agility, Moeri stressed Komax's ability to run next-job setups concurrent with current production. Changeovers on Komax equipment have become quicker and more automated following machine stop, he noted. He finally reiterated Komax's commitment to providing tailor-made solutions for the tasks necessary to combine automation with flexibility.

### In The Trenches With Wiring Looms Australia

The nimble approach to manufacturing was exemplified in a recent interview with Rob

White, Managing Director of Wiring Looms Australia in Brisbane, Australia. Four years ago, after 17 years of ownership, White began to narrow his focus to low volume/high mix production. "We started with a Lean Manufacturing consultant, but only got so far," he said. White began to feel that not all the tenets of Lean fit what they were doing. It did, however, highlight the type of business they should be chasing. "We knew we couldn't compete with China making millions of harnesses," notes White, "but felt we could make it very hard for them to compete on low volume." White further explained his competitive strategy by noting that manufacturing in China or Taiwan requires a large cash outlay. "They have to commit to a large order, they have to buy six months worth, and they have to pay for it up front," Rob reminded. "When you add in the freight cost and the fact that we offer thirty day terms, it just makes more sense for some customers to deal with us." White has been able to sell the value of his model to customers in automotive aftermarket, quick service kitchen equip-



Zeta Insertion Head

## Wire Terminal Pull Testers

**Motorized WTTM-110/220**

**NEW**

Automatic Simplicity... Set the adjustable pull speed, load the wire and close the protective cover. The test runs automatically with the peak "pull-off" force stored on the display at completion.

Two motorized models offer

- 7 selectable pull speeds from 1 inch per min (25 mm per min) to 10 inches per min (250 mm per min).
- 2 capacities: 100 lb/50 Kg/500 N for wire sizes AWG 12 to 28 and 220 lb/100Kg/1000N for wire sizes AWG 8 to 28.

**Manual WTT-110**

The WTT-110 is easy to use: Simply insert the wire into the appropriate slot in the terminal fixture (12 slots accommodate a wide range of sizes). Select the Peak-Hold or Continuous Measurement mode via the keypad. Then rotate the easy-glide lever clockwise, clamping the wire and creating a consistent, repeatable pull force with minimal effort.

**Fast, Accurate, Repeatable and Very Easy To Use**

CHECK-LINE'S® WTT Wire Terminal Pull Testers accurately measure the pull-off force on soldered and solderless wire terminals. These all in one solutions don't require additional grips, fixtures or accessories.

- Current force and breaking force appear on the digital display.
- Conforms to all international test standards: MIL, UL, SAE, DIN, IEC, BS and EN.
- Operates on AC power or built-in rechargeable battery (adapter/charger supplied).
- RS-232 and analog outputs available for data transfer.

Rotating fixture has slots of different widths to hold various materials.

**DISTRIBUTORS WANTED**

For more information, contact Andrew Kaner, Product Manager, at 1-800-645-4330, 1-516-295-4399 (fax)

**www.checkline.com**

**CHECK-LINE**  
BY ELECTRONIC

"WORLD'S LARGEST INVENTORY OF TERMINALS AND FUSES"

## ELECTRICAL PRODUCTS SALES CORP.

1333 S.W. 30th Avenue  
Deerfield Beach, Florida 33442  
Established 1947

Tel: 954-428-1788 • Fax: 954-429-1511  
Toll Free: 1-800-342-1422

E-mail: sales@electricalproducts.com • www.electricalproducts.com

LUGS • TERMINALS • SPLICES • FERRULES • DISCONNECTS  
END CAPS • JUMPERS • CABLE TIES • SOLDER SLEEVES  
HEAT SHRINKABLE TUBING • FUSES • FUSEHOLDERS  
FUSE CLIPS • MIL SPECS OUR SPECIALTY

MS25036 • MS20659 • MS17143 • MS3367 • MS3368 • MS3339 - MS3341  
MS21980 • MS21981 • MS35431 • MS77066 - MS77074 • MS25274  
MS25435 - MS25439 • M83519 • M23053 • MS21266 • M23190  
NAS1744-NAS1746 • MS25083 • MIL-C-83413/8 AND MANY OTHERS

**AUTHORIZED DISTRIBUTORS FOR:**

BURNDY Thomas & Betts 3M  
SUMITOMO ELECTRIC Interconnect Products, Inc. CATAMOUNT MOLIX ETC  
COOPER Bussmann HellermannTyton Panduit ELECTRICAL GROUP  
HOLLINGSWORTH SOLID STATE TERMINAL CO. EPS

ELECTRICAL PRODUCTS SALES CORP. has one of the largest inventories of terminals and fuses in the United States. When you receive requests for these items, use our vast inventory to draw from.

Access our Line Card and Inventory on the World Wide Web:  
http://www.electricalproducts.com

Your Best Source Since 1947  
**Call Today 1-800-342-1422**  
**Fast Delivery!**





ment, service vehicle, RV, and other industries. "In some applications, we are actually finding we can get under Taiwan prices," White said. And there are other financial considerations for customers. WLA has one customer that was previously using a Taiwanese supplier. "They ran into an issue that if they had a very good month, they couldn't ramp up the Taiwanese production." The desire to forgo that opportunity cost led the customer to shift significant orders to WLA.

It was not easy getting where they are today, White cautioned, "and we still have a long way to go." The most difficult thing, he indicated, was getting the staff to think differently. "We want them to design the way we do set ups, instead of relying on a supervisor." He contends this empowerment helps his company develop more streamlined processes. "We have a motto around here: nothings a monument," added White. "When they take the initiative to move something to improve flow or flexibility we say 'good on ya', and encourage more!"

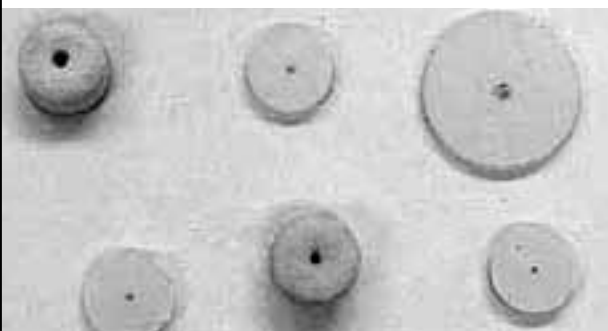
Rob White agrees that equipment manufacturers have come a long way, but insists WLA still has to make changes to incoming equipment to facilitate quick changeovers. White contended that small things make a big difference when he discussed a recent issue with a spool on a pre-feeder. "Usually there is a nut that holds the spool in place, but our guys developed a quick release where the spools can come off in seconds." They are also using a pre-feeder with no accumulator. White explained that "wrapping wires around pulley after pulley takes a lot of time. We've actually got a light sensor that reads the cables slackness, so there is no need to run the accumulator." WLA has also adapted feeder pulleys with an air lift instead of the manual switch that came on the equipment. Again, sensors have been installed that activate the lifters. "We are talking about seconds with these changes, but when multiplied 300 to 400 times a day, it becomes significant."

The biggest change for WLA right now, is equipment streamlining. "Where we had 70 to 80 presses set up to run individual terminals, we want to have three or four. This means we are going to cartridge all the applicators and terminals, so we can get a 20 to 30 second changeover from terminal to terminal."

White lamented the importance of having suppliers on board with his agile strategy, but admits it has been a struggle. "We are using Kanban so we don't want to carry excess stock" notes White. "We've said, look, were not going to hassle you on price, its service were chasing." White has had some success getting suppliers to understand what they are trying to do, but relinquishes "we still have a lot of work to do with suppliers."

Rob White is quite passionate about his efforts towards this notion of nimble manufacturing. "It's a type of Lean Manufacturing that we are trying to adapt to the quick changeover setting," he notes. "Lean is great and we use it where applicable, but it is limited for our low volume/high product mix." White found it interesting that Toyota started its production system to do just that. He asserted that agility is not a fad or trend at WLA, and that it's crucial for the whole company to be on board. This daily commitment has nearly doubled output over the last couple of years, with only a 20% increase in staff. White concluded saying "management has to take it on and go with it. If you don't, you end up steps back from where you were."

## EIC Wipers



### WIRE CODING WIPERS

1/2" & 1" Dia in silicone, foam & felt  
Also 1-3/16" Dia gum rubber scrubbers.

For complete list & prices go to

**WWW.EICWIPERS.COM**

**Tel: 619-303-7924**

**Fax: 619-303-7925**

Same Day Shipping

Ask for Pete

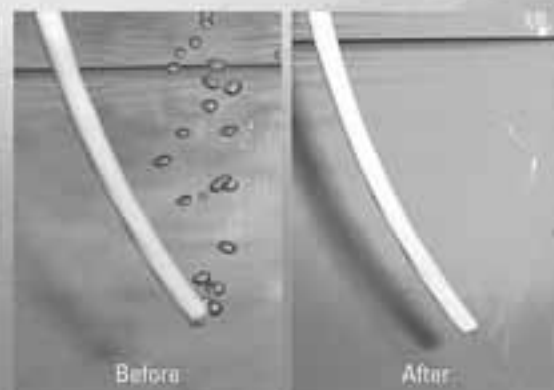
## Permanently Seal Out Contaminants... Permanently Seal in Reliability!

Enviroseal by Magna-Tech Manufacturing provides advanced sealing technology for wires and electronic components. The Enviroseal process fills and permanently seals the leak paths and voids of the part using the latest evolutionary resin technology. This process is effective, efficient and consistent: saving you the time and resources associated with failed or suspect components in the field.

Enviroseal by Magna-Tech Manufacturing is effective in wires, wire harnesses, terminated connectors, thermistors, over-molded coil windings, and insert and injection mold components that are exposed to harsh environmental conditions. This sealing process ensures part integrity and there is no change in the appearance or dimensional attributes of the wires or components.

#### Advantages:

- More Economical than traditional sealing methods
- Consistent Batch Process
- No dimensional changes
- High capacity and quick turn around
- Increased customer satisfaction

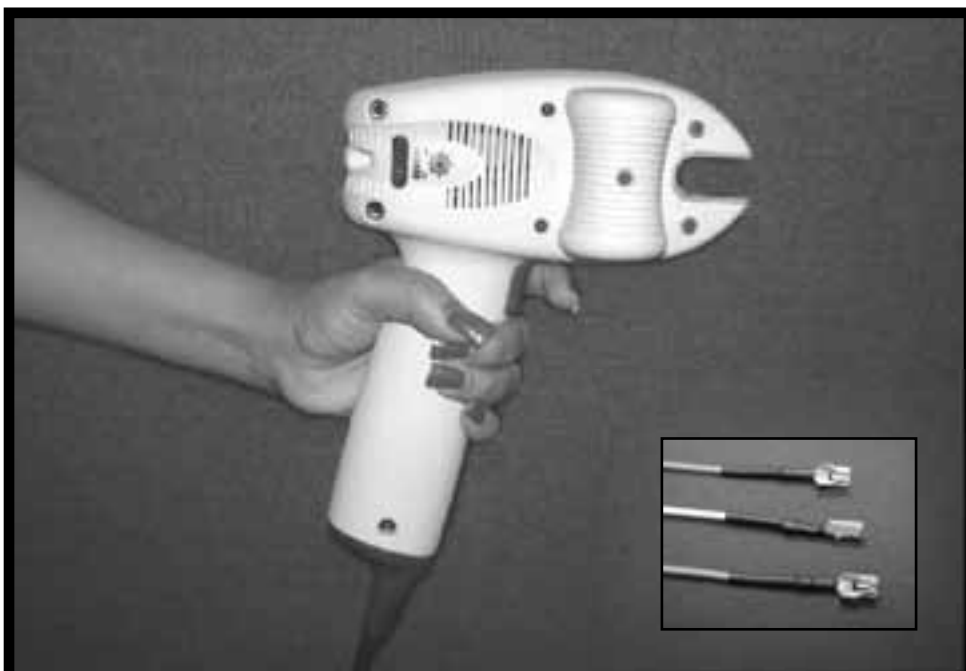


**Enviroseal**  
ELECTRONIC COMPONENT SEALING  
by Magna-Tech Manufacturing

**ESSEX BROWNELL**

☎ 260.461.4278

✉ Essex\_Brownell@SuperiorEssex.com



## Our Gun out-shrinks the competition 5 seconds vs. 12 seconds\*

\*polyolefin, 5" length

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

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

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

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



Judco Manufacturing, Inc.  
1429 W. 240th St., Harbor City, CA 90710 (310) 534-0959 [www.judco.net](http://www.judco.net)

**Focus-Lite™**  
Heat Shrink Processing Machines

# Inline Wire and Cable Identification

Continued from page 31

also possible. Mirror is a useful feature which rotates the text string 180 degrees on one end. This is sometimes necessary to ensure that all marker text is oriented the same way on a terminal strip, such as on a jumper wire in a control panel, for example.

New ink formulations have been developed specifically for wiring harness applications. These inks allow faster line speeds, better permanence as well as improved solvent and abrasion resistance. The basic colors are black and white, although other colors are available. Black inks are dye-based while white inks are pigmented. Dye based printers tend to be simpler and more reliable, therefore it's best to try to standardize with black ink on white or light colored wire.

The range of insulations types which can be successfully marked using inkjet can be expanded with additional processes such as plasma pre-treating and UV curing of UV curable inks. These additional process steps add significantly to system cost and complexity.

### Laser

There are a number of different laser sources that are used in wire marking. By far, the most common are those that produce wavelengths in the UV part of the spectrum. UV laser marking is used primarily for military and aerospace applications. This marking method produces superior, permanent marks, even on Teflon insulated wires. For UV laser marking to work satisfactorily, the wire insulation must have a sufficient amount of Titanium Dioxide (TiO<sub>2</sub>) in its composition for the color change to take place.

Fortunately, most wire insulations used in military and aerospace applications have an adequate amount of TiO<sub>2</sub>

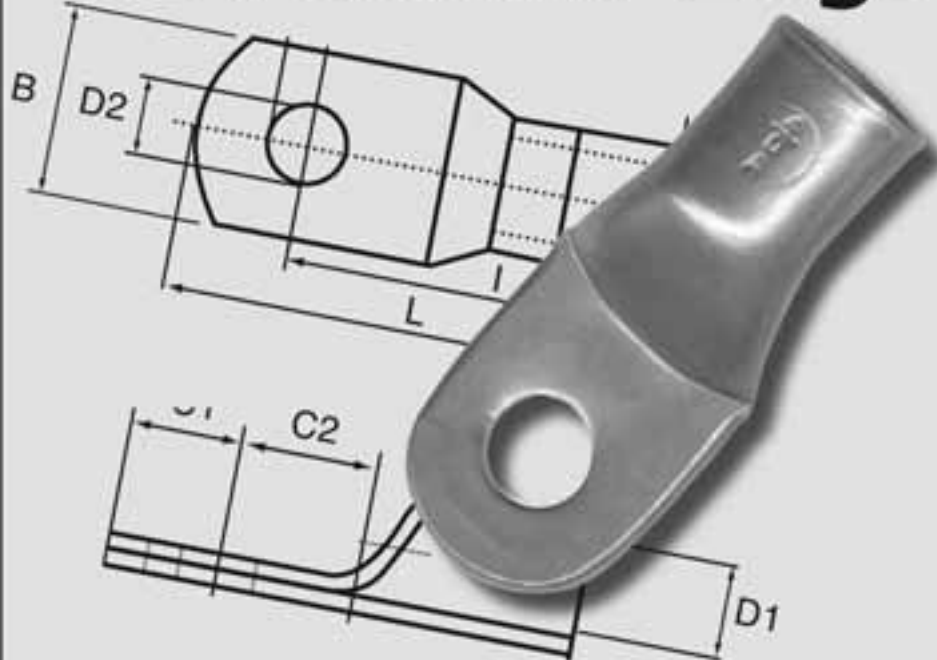
in them. Like inkjet wire marking, the laser marking process takes place while the wire is moving, allowing better production rates than hotstamp marking or labeling. Laser marking of wire for commercial applications is less common since it does not work as well on most commercial insulations such as PVC. Laser marking systems range in price from \$100k to \$500k or more. The more expensive systems can run at higher production rates while the entry level systems are typically used for low volume production and service work.

As wiring harnesses and cable assemblies become more and more complex, proper identification of individual wires and cables is crucial during wiring harness assembly, product assembly and testing as well as servicing. There are many different wire ID methods and each has its own pros and cons. Selecting the best system for a given company and application requires a thorough review, including:

- Applicable specifications
- Insulation types being marked
- Information which needs to be marked (number of characters required, logos, etc.)
- Typical batch sizes
- Processing speed
- Cost per mark

According to Lean Principles, the ideal batch size is a quantity of one. A completely integrated wire marking / processing system can produce an individual wire on demand or all of the individual wires necessary to build one complete wiring harness. This results in less Work-In-Process and all of the other benefits of One-Piece-Flow manufacturing.

## HEAVY DUTY Tubular Lugs



Trucks ■ Buses ■ Forklifts  
Automotive ■ Industrial Equipment

Made from High Quality Copper - 110 Cu ASTM B152

Seamless Barrels for Secure and Accurate Crimp

Annealed Terminals for Easy Crimping

With or Without Site Holes

Tin Plated or Non-Plated

UL Listed



HOFFMAN  
PRODUCTS

A TPC Wire & Cable Corp. Division

PHONE 800-645-2014 FAX 866-896-3017

[www.hoffmanproducts.com](http://www.hoffmanproducts.com)

[sales@hoffmanproducts.com](mailto:sales@hoffmanproducts.com)

## WIRE HARNESS ASSEMBLY STATIONS

*Designed for the ergonomic assembly of wire harnesses*

Surfaces tilt and adjust up and down

Holds boards from 24" x 24" up to 48" x 96".

Two models to choose from — Electric or Manual adjust

Adjustable front lip holds boards from .250" to .750".



*The Leading Edge  
in Modular Ergonomics*

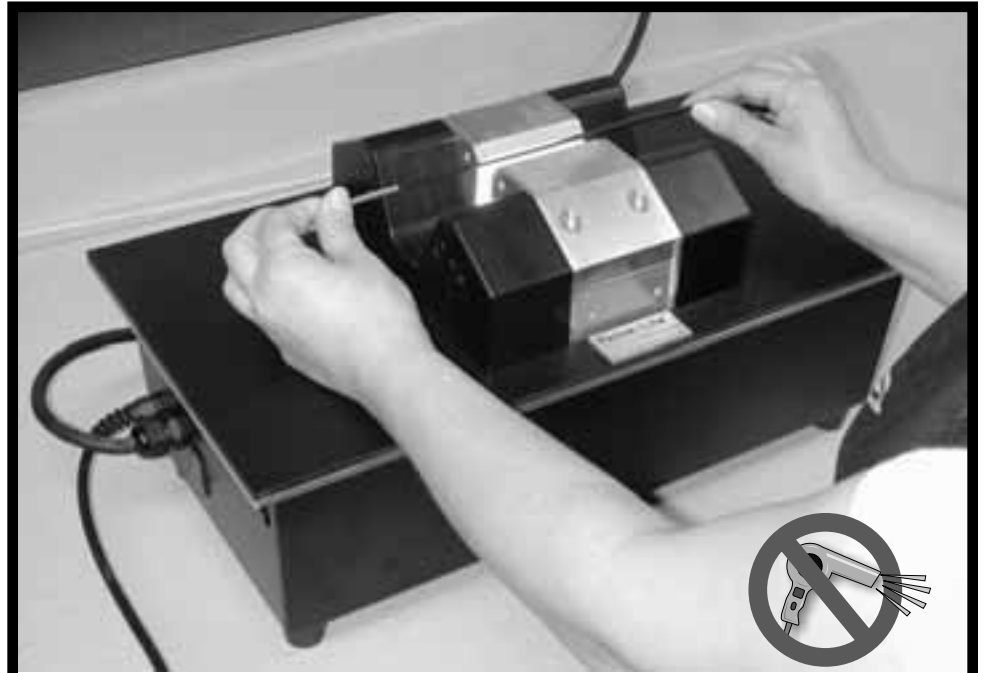
10 Avco Road  
Haverhill, MA 01835  
Ph: 800-739-9067  
Fx: 978-374-4885

[www.1proline.com](http://www.1proline.com)

[www.industrialworkbenches.com](http://www.industrialworkbenches.com)

E-mail [Bench@1proline.com](mailto:Bench@1proline.com)

| INLINE WIRE AND CABLE IDENTIFICATION SYSTEM COMPARISON |                  |  |  |
|--|------------------|--|--|
| Marking process  | Cycle time (sec) | Pros   | Cons   |
| Hotstamp   | 1                | Lowest cost wire ID system                                   | Wire must stop during process  |
|  |                  | Marks Teflon and Tefzel insulated wire                       | Marking disc typeface must match wire size - discs not easily changed      |
|  |                  | Marking foil available in many colors - easy foil changeover | Can damage insulation if settings not correct                              |
|  |                  | Full alphanumeric capability                                 | Radius of marking disc typeface must match radius of wire on smaller wires |
| Labeling   | 4 - 5            | 300 dpi print resolution                                     | Wire must stop during process  |
|  |                  | Multi-line marking possible                                  | Cycle time longer compared to other methods                                |
|  |                  | Print and apply in one cycle                                 | Higher cost per mark   |
|  |                  | Multiple label sizes and types available                     |  |
|  |                  | Self laminating labels protect mark                          |  |
|  |                  | Barcodes and logos possible                                  |  |
| Direct Thermal Transfer                                | 1 - 2            | 300 dpi print resolution                                     | Wire must stop during process  |
|  |                  | Multi-line marking possible                                  | Requires several adjustments when changing jobs                            |
|  |                  | Marks directly on wire or cable                              |  |
|  |                  | Barcodes and logos possible                                  |  |
| Inkjet   | 0                | Marks on-the-fly   | Can not easily change ink colors   |
|  |                  | Marks most insulation types except Teflon and Tefzel         | Ink and solvent are MEK based  |
|  |                  | Can be fully synchronized with wire processing system        |  |
|  |                  | Ink available in multiple colors                             |  |
|  |                  | Can mark wide range of wire and cable sizes                  |  |
|  |                  | Barcodes and logos possible                                  |  |
| Laser  | 0                | Marks on-the-fly* (only on higher end systems)               | Most expensive wire ID system  |
|  |                  | Marks Teflon and Tefzel insulated wires                      | Marks very limited range of insulation types                               |
|  |                  |  | Production rates are slow on all but the most expensive systems            |



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

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

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

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

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



Judco Manufacturing, Inc.  
1429 W. 240th St., Harbor City, CA 90710 (310) 534-0959 [www.judco.net](http://www.judco.net)

**Focus-Lite**  
Heat Shrink Processing Machines

**TECHFLEX**  
Braided Sleeving Products

Range of Sleeving Solutions

The Widest

Heavy Duty  
General Purpose  
Metal & Shielding  
Advanced Engineering  
Extreme Temperature  
Electrical Insulation  
Specialty Sleeving  
Heatshrink Tubing

[www.techflex.com](http://www.techflex.com) 800 323-5140 973 300-9242

**FUSES UNLIMITED**  
The Circuit Protection Specialist

AUTOMOTIVE FUSE PRODUCTS

Authorized Master Distributor for:

**Littelfuse**  
AUTOMOTIVE FUSES AND RELATED CIRCUIT PROTECTION PRODUCTS

Check our inventory on-line at:  
[www.fusesunlimited.com](http://www.fusesunlimited.com)  
TEL: (800) 255-1919

ISO 9001:2008 Registered





**It's not the change that impacts your business.  
It's your response to it that does.**

**Southwire® can help you succeed in a marketplace moving to RoHS compliancy.**

The industry is growing green. When your customers demand RoHS-compliant products, Southwire will help you deliver at no extra cost. And the restriction of hazardous materials will impact your community in a positive way. Get ahead of your competition by growing green now. Call **800.955.4590** to spec greenSpec™ wire. Or visit **southwire.com** for details.

**greenSpec™**  
RoHS COMPLIANT

 **Southwire®**  
OEM DIVISION

©2008 Southwire Company

**NEWS PLUGS** continued

with the help of business associates who champion our mutual goals. Congratulations to each of them on a

job well done, and thank you to the companies they represent for sharing these winners with Mouser."

**Mouser Electronics Awards "Best in Class" Partners for 2010**

The awards ceremony was held on August 2, 2010 during the 15th Annual Mouser-Supplier Golf Tournament. Winners of the Best in Class award were selected by Mouser using five criteria:

- Promoting the product line within Mouser,
- Finding solutions to grow Mouser and supplier market share,
- Strategic partnering with the Mouser team,
- Maximizing Mouser's unique value proposition within their own businesses.



Mouser's Best in Class Award

Mouser Electronics' website is updated daily and searches over 6.7 million products to locate over a 1.7 million part numbers available for easy online purchase. Mouser.com also houses an industry-first interactive catalog, data sheets, supplier-specific reference designs, application notes, technical design information, and engineering tools.

Mouser Electronics, Inc. is an electronic component distributor, focused on the rapid introduction of new products and technologies to electronic design engineers. For more information, visit <http://www.mouser.com>.

Winners of the Mouser Best in Class award:

Larry Buckley, National Distribution Manager, 3M Electronic Solutions

Canda Carr, General Manager Global Distribution, Tyco Electronics

Ryan Crouch, Corporate Sales Director, Freescale Semiconductor

Anna Greashaber, Marketing Communications Manager, Honeywell Sensing and Control

Scott Johnson, Corporate Account Manager, Texas Instruments

Dawn Manhart, Corporate Distribution Manager, Littelfuse

Steve Nye, Strategic Account Manager, Vishay

Sue Rios, Channel Sales Account Manager, Digi International

Steve Shoemaker, President, Advanced Web Off-set

Doug Steele, Global Vice President of Catalog Distribution, Harwin

Cheryl Swaim, Account Executive, KEMET

Caroline Wells, Distribution Sales Representative, Omron Corporation

Glenn Smith, Mouser President and CEO, commented, "It's a great pleasure to express our gratitude and publicly recognize the winners of the Mouser 2010 Best in Class award. These individuals were incredibly supportive and showed great creativity. Our record growth is due, in large part, to the unwavering commitment of suppliers who help us introduce the newest products and latest technologies. Our commitment to becoming the most preferred distributor of design engineers is strengthened

## Increased crimping flexibility, reduced costs

The Tape-Terminal Crimp Module and Tape Terminal Press from Molex will reduce tooling investments, reduce setup times and allow you more production flexibility.



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

### Features and Benefits of the Tape Terminal Crimp Module Include:

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

Heilind Electronics is the preferred stocking distributor for the new TM-4000™ Universal Crimp Press. Call for immediate shipment.



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.
- Has two safety interlock switches attached to the guard.

# molex®

Sockets

Terminal Blocks

Terminals

Connectors

# HEILIND

Performance. Trust. Innovation.

Call us... We're well connected! 866-887-2189  
[www.heilind.com/molex-whn](http://www.heilind.com/molex-whn) <http://estore.heilind.com>

# Ag Leader Technology

Continued from page 1

they are combined with ALT-made electronics (including printed circuit boards) and mechanical assemblies.

Paul Slifka, manager of manufacturing engineering, is confident the dramatic change in delivery time can be achieved. "Our area has been going through a lot of changes in the last three years," he said. "All the cables were pulled by hand before, but most of that is automated now."

Schleuniger, Kodera and Komax equipment has been installed that does cutting, stripping, terminating and tinning. Stapla ultrasonic welders have replaced much of the hand soldering.

Processes were examined and refined. Both employees and machines were dedicated to certain processes and work orders. The 34 people in the department work at nine build boards, 24 benches and three universal troughs.

One change involved cutting according to circuits instead of harnesses. People doing the cutting no longer sort, coil and shelve the wires. Other employees route the wires to key areas.

Production is determined by decisions and priorities made by a planner. Orders are scanned into an enterprise resource planning system, and processes follow from there.

"Our focus is on a high mix and a small volume," said Slifka, 37, who has



Custom made testing software works with the ERP system and a tester. Employees enter in the work order number the computer enters the test in the tester.

worked seven years at ALT. "We'll make one, 10 or 100 of one thing. We keep batches small so we can fill a lot of

orders at once and not tie up people and equipment."

The changes have boosted production immensely. Current output is 20,000 to 30,000 harnesses and cables a month. In contrast, in 2007 monthly production was 3,000 to 7,000. Just one two-inch wire may meet a requirement, or it may necessitate a harness 85 feet long with up to 40 circuits. The average harness is 10-20 feet long.

Besides visual inspection, testing is performed with Cirris equipment. It checks for terminations that meet A-620 standards by IPC and the Wiring Harness Manufacturers Association.

The quality goal of a mere half percent defective cables and harnesses was set at ALT in late summer. Quality used to be based on customer returns, which, according to Slifka, were "very, very low. But, we wanted more internal measurement. Inspectors track everything on a weekly basis, and we have weekly continuous-improvement meetings to look at all problem areas."

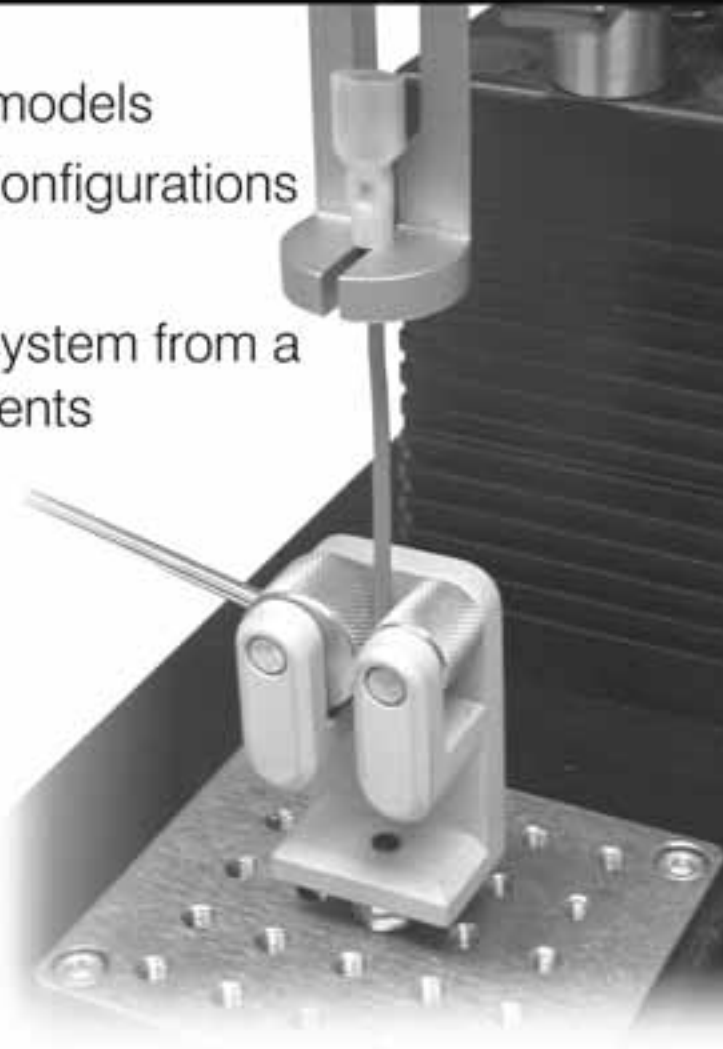
Those meetings are led by Irene Postma the cable supervisor and attended by manufacturing engineer Chris Cran. Chris is then able to develop plans for improvement to the area.

The department, which continues to add employees, works one shift. Overtime is necessary during busy periods in December-May and late July through early October.

"We have a very quality-focused culture," Slifka said. "We look out for the customer and have a good sense of pride in what we do. People on the floor

## Terminal / Crimp Pull Testers

- Motorized and manual models
- Vertical and horizontal configurations
- Data outputs available
- Configure your testing system from a wide choice of components



**MARK-10**

We make a measurable difference in force and torque measurement

888-MARK-TEN ■ www.mark-10.com ■ info@mark-10.com



Force gauges



Torque gauges



Grips & accessories



Force testing systems



Torque testing systems



are involved, and they make the difference whether something will work or not.

"There have been a lot of good suggestions from employees," Slifka said. "They have helped a lot in the company's growth."

He recalled one instance in which employees suggested three designs for a cable assembly cell. All the designs were evaluated and one cell was implemented on the production floor. Employee input in to the cell design resulted in a 50-percent cut in build time. The reduction aligned with the company's emphasis on lean processes.

"This is a very exciting place to work," Slifka said. "It is very fast paced because we're very engineering driven and try to get products to market quick-

ly. We go the extra mile to make sure our products work for the customer right out of the box. It's great to see everything come together. It's a wonderful feeling."

Slifka, the 200 other people who work at ALT, and thousands of customers owe everything to the ingeniousness of Al Myers, the 62-year-old founder, president and sole owner of ALT. He spent nearly seven years developing it before going into business in June 1992.

Most of Myers' initial effort went into a monitor that measured the yields of corn, soybeans and wheat as they were being harvested. The sensing device was mounted on the clean grain elevator of a combine, and the operator could read

*Continued on page 40*



A one piece flow setup with a Stapla welder, and focus light help keep the product moving.

## DSG-CANUSA, YOUR COMPLETE SOLUTION

### HEAT SHRINK SPECIALISTS FOR THE AUTOMOTIVE, ELECTRICAL, MILITARY & AEROSPACE MARKETS

HEAT SHRINK TUBING

**ELECTRICAL INSULATION**

**SPLICE SEALING**

**MECHANICAL PROTECTION**

**STRAIN RELIEF**

**IDENTIFICATION**

**WIRE BUNDLING**

**DSG-CANUSA**  
A SwireCox Company  
[www.dsgcanusa.com](http://www.dsgcanusa.com)

# CableEye® . . .

## Much More than a Harness Tester!

**1 - Fast**

**3 - Live Interactive Video Graphic Display**

**4 - Superb Documentation**

**2 - Reliable PC-Based Hardware**  
Expandable to 2500 Points

- Shared Cable Database on your Server
- Built-In Report and Label Printing
- Built-In Scripting for Test Control
- Automatic Serial Number Generation
- Permanent Archival Database
- Bar Code Scanning and Printing
- Data Logging with Batch Reports
- Login Controls for Data Security
- Export-Import in CSV or XML Form
- Guided Assembly Available
- English, Spanish Screen Labels
- Voice Commands Available

*Comments from a CableEye User:*

"I found the testing system intuitive and well-rounded to serve many applications. I once again would like to tell you how impressed I am with your customer service and overall product presentation. Life would be much easier if more of my vendors operated in the same manner."

Win 2000, XP, Vista

**4 - Superb Documentation**

**Try a FREE Demo System Today!**

**Turnkey Custom Interface Assembly Service Available**

[www.cableeye.com/comments](http://www.cableeye.com/comments)

**(800) 776-0414**

Click here to see more comments from our customers!

**CAMI Research Inc.**  
530 Main Street, Acton, Massachusetts 01720

## You Expect More From Coastel



### The CT4 Coastelmatic Pneumatic Tool Holder

The CT4 Coastelmatic hand tool holder is a device that uses air to activate spring retracted hand tools. The CT4 Coastelmatic is a great low cost alternative to automatic crimping, stripping, and cutting machines. The CT4 Coastelmatic can be set up to work crimpers, strippers and cutters. The patent pending tool holder in the applicator securely holds all tools in place, allowing the operator to use his hands freely. This new and improved cylinder delivers 10% more power through dual activation for tough jobs. Each unit is pre-assembled, tested and ready for use.

**Call NOW for details!**



344 East Brighton Avenue  
Syracuse, NY 13210

Ph: (315) 471-5361 • Fx: (315) 472-1765  
Internet: [www.coasteltools.com](http://www.coasteltools.com)

# Ag Leader Technology

Continued from page 39

how yields varied while he was going up and down a field.

Why a yield monitor? The answer requires a bit of background. It starts with Myers growing up on a grain farm near Watseka, Ill., 100 miles south of Chicago. He received bachelor's and master's degrees in Ag Engineering from the University of Illinois in Champaign and Urbana.

Myers intended to become a machine or engine designer for Caterpillar or John Deere. He had a summer job at each firm. But, due

to a sour economy he could not find a job at either company after completing his formal education.

He settled on a design engineering position at Sundstrand in Rockford, Ill. The large corporation specialized in hydraulics and hydrostatic transmissions.

Myers started there in 1971 and the following year transferred to the company's operation in Ames. He remained there until ALT opened and held other positions of engineering supervisor and application engineering department manager.

In the mid-1980s, with a weak

economy forcing companies to tighten their budgets, product innovation and development stagnated. Dissatisfied with his career, Myers began brainstorming products he could design that could launch his company.

Myers settled on the yield monitor because of the impacts it could have on farming. "I thought the monitor would happen someday, but technically it was not an easy thing to do," he said. "But if it was difficult to do, then there would be less likelihood that it would be copied, and I'd have less competition."

Prototype design was carried out in the dining room of Myers' Ames home. In his garage he set up a grain flow test stand with a sensor made largely from parts bought at Radio Shack. He financed the venture himself, often relying on several credit cards.

Only Myers' father and three farmers who tested the invention in their fields knew about it. Once ALT started in 1992, many people found out about the device and the consequential analysis of cropping practices that meant dramatic yield increases.

In the first two years less than 150 monitors were sold. Once Myers set up dealers to handle



The use of the striper crimper have been a great help with jacketed wire.

## Staying Focused on Your Core Competency is Crucial

### With Anixter, You Keep Your Attention Where It Needs to Be.

With 265 locations in 52 countries and more than \$900 million of inventory, Anixter is a global leader in the distribution of electrical and electronic wire and cable, industrial automation products, network cabling solutions and supporting products. Anixter's unparalleled industry expertise and highly trained sales specialists can help you find the best solutions for all of your product and service requirements.

Teaming with Anixter allows customers to shift the responsibility of their current supply chain processes and to focus on their core competencies. Through its **READY!™ Material Management Services**, Anixter will work with you to design a program that ensures you receive the right materials when, where and how you need them.

**READY!**  
MATERIAL MANAGEMENT SERVICES

READY!™ Material Management Services by Anixter leverage our distribution and Supply Chain Services to help our customers optimize a just-in-time material management program in their production facility. Our replenishment solutions lower the total cost of ownership, improve productivity and scale to meet production demands.



If you have the responsibility of designing, specifying or ordering wire and cable, visit [anixter.com](http://anixter.com) to order your FREE copy of the Electrical and Electronic Wire & Cable Products catalog.

1.800.ANIXTER [anixter.com](http://anixter.com)

**ANIXTER**

Anixter is a leading global provider of wire and cable products, electrical and electronic wire and cable, industrial and other metal components. We help our customers specify, source and deliver critical wiring services around the world, including installation and removal services. Throughout the world, we provide innovative supply chain management services to help our customers' keep out of production and maintenance.



sales, 500 units were purchased in 1994. With sales through dealers, Myers focused on designing, manufacturing and software programming.

"Sometimes I wondered if I would ever get to where I wanted to be with it," Myers said. "I'm glad I stuck with it. I'm in control of my own destiny. There has been success, and that is very satisfying."

"I created a world-leading product that has yet to be equaled," Myers said. "I also have the satisfaction of giving a lot of young, hard-working people jobs here. I have given opportunities to people to do exciting things."

In early 1993 Myers moved his business to an 1,800-square-foot space in a small office building. The next move was in late 1994 to a new 7,200-square-foot building, which was doubled in size in 1996.

More space was required, so ALT moved in 1998 into a 54,000-square-foot building on seven acres. Myers purchased the structure in 2004 and four years later expanded it by 95,000 square feet. A 25,000-square-foot training facility, in a separate building on 3-1/2 acres, opened in late 2009. Testing is done on a 100-acre farm purchased in 2008 that is two miles from the other two buildings.

Facilities were needed because of substantial company growth. Myers estimated between 50,000 and 100,000 products have been sold so far. The biggest ALT customer is Case New Holland, followed by Kinze and Claas of North America.

ALT has more than 1,000 dealers and distributors in North America and another 50 in 25 foreign countries. Thirty-three dealers have earned Blue Delta status, meaning they have advanced levels of training, knowledge and service. Dealers are developed and serviced by an in-house sales staff of 20.

A comprehensive marketing program is in place. It includes print advertising, direct mail, trade shows (60-70 a year), product literature, dealer events, newsletter, e-mail, public relations, website and social media. All company products must be purchased through dealers except for software. Anyone may buy it directly from ALT.

Myers stated his company has grown 3,000 percent since start-up 18 years ago and 500 percent in just the last six years. Overall, growth has averaged 10 percent annually. 2008 was a record year, but 2009 meant a 27-percent drop in sales.

ALT rebounded this year, but it is

not expected to match 2008. Sales next year should set a record. Profits have been "very good," Myers said. "In 2007 and 2008 they grew 50 percent each year. We have been profitable the last seven years and expect to stay that way."

"We have become large enough so we can keep moving ahead," Myers said. "We are in a strong position in the industry. The ag business is a good one to be in. It has the promise to be healthy, and recessions don't affect it because people have to eat."

"We invest heavily in new products to try to keep us at the forefront of precision ag," Myers said. Product development is handled by many of the 31 engineers on staff, some of whom have attended Iowa State University in Ames.

"What also makes us different is that we're very strong in people with direct farming background," Myers said. "Other companies in the field that don't have such people don't understand the mentality of our customers. You can't just let talk be talk. You take care of your customers, and you do right by them. That is the culture of this company."

For more information, call 515-232-5363, e-mail sales@agleader.com, fax 515-232-3595, visit www.agleader.com or write Ag Leader Technology, 2202 S. River-side Dr., Ames, IA 50010.



For maximum efficiency all workstations are set up the same.

## HARNESSES Braiding & Shielding

As the industry leader in cable harness shielding, Hamilton Products will meet your most demanding requirements for textile and/or wire shields.

Our capacity of 1 to 1,000 harnesses and our extensive knowledge of specialty braiding and shielding allows us to manufacture to your specifications, or custom design to meet your installation requirements.

*For the best, call the best. Call Hamilton Products.*

### HAMILTON PRODUCTS, INC.

P.O. Box 1100 • 43A Rte 12 South • Sherburne, New York 13460

Phone: (607) 674-2030 • FAX (607) 674-9367

E-Mail: a\_critton@iwgbwd.com or s\_mallo@iwgbwd.com

Home Page: <http://www.hamprods.com>

## Best Price for Best Connectors

Hu Lane Associate (Taipei, Shenzhen and Nanjing) has been dedicated to Automotive Connectors for over 30 years and keeps on developing innovative technology to meet market needs. We supply quality products of Automotive, Motorbike, Electronic and Medical Connectors from Asia to our customers worldwide.



**Auto World,  
We Connect**

**Hu Lane Associate Inc.**  
marketing@hulane.com.tw  
<http://www.hulane.com>

## Seal Your Toughest Splices & Terminals

DSG-Canusa's CDR: the next generation in splice sealing

Heat Shrink Tubing



Diesel Resistant

Adhesive Lined

Semi-Rigid

4:1 Heat Shrink Tubing



**DSG-CANUSA**  
A SearCo Company

Distributed by: **LAPP TANNEHILL**

[www.dsgcanusa.com](http://www.dsgcanusa.com)  
1 800 422-6872

[www.lapptannehill.com](http://www.lapptannehill.com)  
1 800 633-6339



**NEWS PLUGS** continued**Model G10S Bench Wire Twister Offered by Eraser Company**

Eraser's Model G10S Bench Wire Twister is used for many diverse twisting needs. The unit can twist pre-stripped stranded wires, twist strands of two or more wires together, twist wrapped

**Model G20S Bench Wire Twister**

shields on coaxial cables and tighten the twist of already twisted wire.

The Model G10S is supplied with one set of three twist length spacers to vary the twist length, depending on application needs. Twisting inserts can be ordered depending on wire size to be twisted. Specifications are as follows:

Wire Sizes:12-18 AWG (2.06-1.02mm $\phi$ )18-24 AWG (1.02-0.51mm $\phi$ )22-26 AWG (0.64-0.41mm $\phi$ )Twist Length:

Up to 1" (25.4mm) dependent on spacers used.

Twisted Pair:

Not to exceed 2 18 AWG (1.02mm $\phi$ ).

Three Size Spacers:

1/2" (12.7mm) thick

1/4" (6.35mm) thick

1/8" (3.18mm) thick

Power:

115V, 60Hz or 220/240V, 50Hz

For more information on Eraser's entire product line visit [www.eraser.com](http://www.eraser.com) or call 315-454-3237.

**Teknor Apex Exclusive North American Distributor of TPU Wire and Cable Compounds from COIM**

The Italian chemical company COIM S.p.A. has appointed Teknor Apex Company to be the exclusive distributor of COIM's Laripur™ thermoplastic polyurethane (TPU) elastomer compounds to wire and cable manufacturers in the U.S., Canada, and Mexico.

Teknor Apex's Vinyl Division, a supplier of compounds for wire and cable, will supply the Laripur materials. The agreement with COIM also enables Teknor Apex to broaden its portfolio by using COIM's TPU products to develop plastics compounds for use outside the wire and cable

industry, according to Teknor Apex vice president Louis R. Cappucci.

"We are very pleased to engage in a strategic co-operation with a high-value partner like Teknor Apex," said COIM's Antonio Piroddi, division manager for Laripur TPU. "Their technical and commercial capabilities combined with COIM's TPU expertise and broad product offering provides a valuable new resource for wire and cable customers in North America."

The agreement between COIM and Teknor Apex provides North American wire and cable manufacturers with direct access to COIM's diversified range of internationally specified TPU compounds, noted Louis Cappucci. "TPUs are particularly valuable for withstanding rugged end-use conditions because of their resistance to abrasion, chemicals, microbial attack, and hydrolysis, as well as flexibility at low temperatures."

Laripur compounds are available in grades ranging in hardness from 60 Shore A to 75 Shore D. As elastomers they are inherently flexible and contain no plasticizers except as required for certain specialty formulations.

Typical applications include cables for automotive sensor and antilock brake systems and for mining, seismic monitoring, oil exploration, and other end uses requiring ruggedness and cold weather performance.

For further information visit [www.teknorapex.com](http://www.teknorapex.com).

**BURNDY® Announces New Lithium-ion Line of PATRIOT® Crimping Tools**

BURNDY®, a leading manufacturer and provider of connector solutions to the industrial, energy, construction, telecommunication, petrochemical, data center, and transportation industries, announces the introduction of our lithium-ion line of PATRIOT® battery actuated crimping tools.

BURNDY® has incorporated lithium-ion (Li-ion) technology, enhanced electronics and refined hydraulic systems advancing the PATRIOT® line of crimping and cutting tools to the forefront of performance, speed, and reliability.

The advantages of the new 18-volt 3.0 Ah lithium-ion technology over Ni-Cd and Ni-MH are no memory effects, no self discharge, no conditioning required and a longer battery life — 2.5 times more charge/discharge cycles than traditional Ni-Cd batteries and provides 430% more lifetime work. The charge time is only 30 minutes, twice as fast as Ni-Cd and the battery

# SCHIMMELMAN

NEW



## SYSTEM 2 LASER WIRE MARKING SYSTEM

*STATE OF THE ART DIODE PUMPED UV LASER WIRE MARKING MACHINE*

- COMPETATIVELY PRICED
- AUTOMATIC PULL, COUNT, MEASURE, CUT AND MARK
- USER-FRIENDLY OPERATION
- LOWER MAINTENANCE COST
- FULLY COMPLIANT WITH LATEST AVIATION INDUSTRY STANDARDS

SAE AS5649 / ARP5607 / SAE AS50881 (formerly MIL 5088 L) / BAC 5152 / AIPS

SEE OUR FULL LINE OF WIRE MARKING PRODUCTS

[www.rectube.com](http://www.rectube.com)

[sales@rectube.com](mailto:sales@rectube.com)

Manufactured by **RTI**

333 Newquist Place • City of Industry, CA 91745 • (626) 333-7884 • (626) 333-0774 fax

LESS  
THAN  
\$50,000



**Lithium-ion PATRIOT® Crimping Tool**

weights 40% less than Ni-MH batteries.

The new Li-ion tools have over-molded handles for comfort and improved grip. All BURNDY® PATRIOT® tools are proudly made in the USA.

BURNDY® will continue to offer the current line of Ni-MH PATRIOT® tools allowing customers choice and flexibility.

For additional information, visit website at [www.BURNDY.com](http://www.BURNDY.com).

**New and Improved Sta-Kon® Comfort Crimp® Compression Tool from Thomas & Betts**

In a continuing effort to produce the safest, most ergonomically advanced tools on the market, Thomas & Betts recently redesigned the Sta-Kon® Comfort Crimp® Compression Tool. An award-winning product, the redesigned tool requires 25 percent less handle force to complete a crimp than earlier versions and up to 75 percent less handle force than similar tools on the market.

Additional ergonomic features include special over-molded handles that naturally place the hands in a safe, strain-reduc-

ing position, while creating a soft cushion for both fingers and palms. A new Crimp-Assist® foot stabilizes the tool when the user needs to place it on a work surface for additional leverage to crimp larger connectors.

In addition, the patented Shure-Stake® mechanism ensures a complete crimp cycle is made before it will release to the open position. The Sta-Kon tool also incorporates interchangeable dies with color-coded die nests for easy matching with Sta-Kon insulated terminals.

"T&B is committed to creating the best user experience possible in terms of comfort and strain reduction," said Matt Willard, product manager with Thomas & Betts. "Equipment manufacturers, maintenance professionals and field technicians have come to trust and rely on the Sta-Kon compression tool for a safe, constant crimp every time."

Sta-Kon Comfort Crimp Compression Tools are UL Listed for use with Sta-Kon connectors. Similar Sta-Kon tools are



**Sta-Kon® Comfort Crimp® Compression Tool**

available for terminals, flags, ferrules and disconnects ranging from 6-22AWG with both insulated and non-insulated jackets.

For more information on the Sta-Kon

Comfort Crimp Compression Tool, visit your T&B authorized distributor, contact T&B by calling (800) 816-7809, or visit [www.tnb.com](http://www.tnb.com).

**2011 Annual Wire Harness Conference San Diego, CA - March 2-4**

**SDI** Meeting Your Requirements for Performance  
New website: [www.sheyennedakota.com](http://www.sheyennedakota.com)  
**Sheyenne Dakota, Inc.**  
Call 877.668.6377 today!

**We'll get it done!**  
877.668.6377 • 200 7th Ave., N.W. • West Fargo, ND 58078

This

makes this

*run faster.*

**New Look Same High Quality Components**

Visit us to see what other cool components we can produce for you  
.....  
[www.preplus.com](http://www.preplus.com)  
ph 262.743.1700 fx 262.743.1701

**PRECISION PLUS, INC.**  
SWISS TURNED COMPONENTS

840 Koopman Ln. PO Box 168 Elkhorn, Wisconsin 53121

**YOUR CONNECTION FOR... Amphenol® RF Solutions**

ECCO specializes in RF, Microwave, and Coaxial connectors from Amphenol® RF. These connectors are ideal for RF, broadband, wireless, microwave, and cellular applications. We stock a wide variety of these connectors including standards: **UHF, N, HN, C, Twinax, & Triax Miniatures; BNC, TNC, Mini-UHF, & MHV Sub-Miniatures; SMA, SMB, & SMC Microminiatures; MCX & MMCX** as well as precision connectors, adapters, accessories, and assembly tools. Our extensive Amphenol inventory includes many factory special, low volume, and hard to find items allowing us to quickly fulfill your interconnection needs.

For responsive, experienced service, call Electronic Connector at  
**800-742-3262**

FAX: 773-767-9634 e-mail [sales@eccoichicago.com](mailto:sales@eccoichicago.com)  
[www.eccoichicago.com](http://www.eccoichicago.com)

**CONNECTORS FOR ALL REASONS**

**ELECTRONIC CONNECTOR CORP.**  
6332 S. Central Ave. • Chicago, IL 60638  
773-767-2200 • An ARRIS Company

ISO 9001 Certified

© 2005 ECCO

## CHIEF SUPPLY INC.

**EMPTY REELS WANTED**

*We buy  
empty reels...*

Plastic • Wood • Cardboard  
Almost any size or shape

**CHIEF SUPPLY INC.**  
**(847) 290-8686**

185 Martin Lane Fax: (847) 290-8689  
Elk Grove Village, IL 60007 Phone: (847) 290-8686

## NEWS PLUGS *continued*

### Peterson Adds ECK® Corrosion Fighter to its Product Line

Peterson Manufacturing Company has augmented its vehicle safety lighting line by adding ECK® corrosion prevention products from Van Nay, LLC.

ECK® (Electrolysis Corrosion Kontrol) is a unique dielectric coating patented by Van Nay in 1998. Its breakthrough formulation has proven highly effective in preventing dissimilar metal corrosion of all metals, including stainless steel, aluminum, copper, brass, cold-rolled steel and black oxide.

Field tested for over 12 years,

ECK® not only protects all metals and electrical connections, it also prevents all types of corrosion: electrolysis, galvanic, magnesium and calcium chloride. It is safe to use with both rubber and plastic, will not harm paint, and withstands high temperatures up to 1000° Fahrenheit. Peterson will be selling ECK® in the United States only.

"Harsh road conditions including chemicals, moisture and temperature changes are always an issue, no matter the manufacturer," said Kristen Goodson, Director of Product Management for Peterson. "By offering ECK® as a value added product for the safety lighting needs of our customers, we're helping ensure that their trucks and trailers keep on rolling instead of sitting idle due to corrosion issues."

Peterson will offer ECK® in tubes of



**ECK® Corrosion Prevention Products**

brushable liquid that applies easily to electrical connections and different metals being assembled. ECK® was specially engineered to outperform such industry standard products as silicones, tapes, and coated hardware. And unlike other dielectric coatings, the ECK® formulation incorporates zinc powders to create a lasting barrier against the corrosion that always occurs between dissimilar metals such as aluminum and steel. This barrier absorbs the energy from any electrochemical reaction, thus preventing corrosion -- the only patented product proven to do so.

"But ECK® is more than a unique corrosion fighter," Goodson added. "It also provides bedding protection for hardware and fasteners, contains anti-seizing lubricants for threads, and is perfect for use with electrical connectors. Peterson products are all about performance, and we're proud to offer ECK® as a great way for customers to protect that performance."

Richard Nay, Van Nay's president, said: "We're pleased to have a world-class safety lighting manufacturer such as Peterson using ECK® to fight corrosion. The top two warranty and downtime issues in the trucking industry are dissimilar metal corrosion and lighting/wiring corrosion. Our product tackles both."

Van Nay, LLC headquarters in Elgin, Illinois and owns the patent for dissimilar metal corrosion prevention with their ECK® coating.

## IPC/WHMA-A-620 Recertification at the 2011 Wire Processing Technology Expo

### A-620 Challenge Testing for Recertification

- Testing will be by appointment **ONLY**. Appointments will be accepted through April 29th, 2011.
- Testing will be conducted during the 2011 Wire Processing Expo, May 18-19 - testing will begin any time between 8:00am - 1:00pm
- To schedule your appointment call Rick Hawthorne at 717-810-2417 or visit [www.tooling.tycoelectronics.com/maier/a620\\_cit\\_rfq.asp](http://www.tooling.tycoelectronics.com/maier/a620_cit_rfq.asp)
- Receive a **5% discount** by scheduling your appointment before April 29th. Walk-ins are welcome at the expo at full price of \$525.

\*\*Dont forget to bring a copy of your current or expired A-620 Certificate

### BYOB!

*Bring Your Own  
A-620 Book or  
borrow one of ours.*



Testing will be held at the Midwest Airlines Convention Center in Milwaukee during the 2011 Wire Processing Technology Expo. Certifications expiring up to the end of August may recertify now without losing any time on the current certification. The new expiration date will be the month of current expiration in 2013.

Phone: 717-810-2417  
[www.tooling.tycoelectronics.com/a-620.asp](http://www.tooling.tycoelectronics.com/a-620.asp)

**Tyco Electronics**  
Our commitment. Your advantage.



# A Superior Wire Harness Begins With the Selection of Quality Tooling



*Mil Qualified Crimpers*



*Pneumatic Crimpers*



*Battery Powered Crimpers*



*Hydraulic Crimpers*



*Backshell Torque Tools*



*Wire Strippers*



*Wire Crimp Pull Testers*

# 60

Celebrating 60 Years!

**DMC** DANIELS  
MANUFACTURING  
CORPORATION

With 60 years of industry experience, Daniels Manufacturing Corporation is the leading manufacturer of Mil-Qualified Crimp Termination Tools and Insertion/Removal Tools. DMC also supplies BETA Backshell Torque Tools and ALPHATRON Wire Crimp Pull Testers. DMC products are used on virtually every defense system, aircraft program, land or sea transport system, and space exploration program.

Visit our web-site or call for prices and more information.

[www.DMCTools.com](http://www.DMCTools.com)

E-mail: [DMC@DMCTools.com](mailto:DMC@DMCTools.com) • Telephone: 407.855.6161

An ISO9001:2000,  
AS9100:2004  
Registered Company



## CABLE SUPPLIER OF CHOICE!



With Multi/Cable **YOU** get to choose high quality, speciality cable, and receive exceptional service, and fast turnaround at competitive pricing!

### THE ADVANTAGE OF CHOICE

With off-the-shelf cable products you don't get the chance to decide on many critical features of the finished product such as: design, materials, tolerances, and manufacturing techniques.

### Custom designed and manufactured cables:

- Special Constructions • Instrumentation • Control • Tray
- Thermocouple • High Temperature • Audio & Sound
- Shielded • Direct Burial • Underwater



PO Box 797, Bristol, CT 06011  
Tel: 860.589.9035  
Fax: 860.589.7520  
[www.MultiCable.com](http://www.MultiCable.com)  
[info@multicable.com](mailto:info@multicable.com)

## NEWS PLUGS continued



Continued from page 44

Peterson Manufacturing Company is a world-leading innovator in the production of a complete line of vehicle safety lighting, mirrors, reflectors, antennas and related products.

For further information visit [www.pmlights.com](http://www.pmlights.com).

### Dow Introduces World's First PVC/Halogen-Free Solution to Meet Key Global Standards

Electronics OEMs looking for PVC alternatives to make flexible cords safer and more environmentally sustainable now have options thanks to the introduction of DOW SUSTAIN™ halogen-free com-

pounds from The Dow Chemical Company. Developed by Dow Wire & Cable, a business unit of The Dow Chemical Company, DOW SUSTAIN offers the first PVC and halogen-free compounds that meet key global industry standards for continuous operating temperature, low smoke and heat deformation. Four different product grades for jacketing and insulation are now available in sample quantities for producers of wires, cables and cord sets for personal electronics, large and small appliances, TVs, DVD/DVR devices, gaming systems, computers/monitors/USB attachments, etc.

"With the demand for PVC alternatives in an electronics market growing fast, Dow has made a significant investment over the last three years in perfecting halogen-free compounds," says Simon Leung, Platform Leader for Personal Electronics, Dow Wire & Cable. "DOW SUSTAIN is the first halogen-free offering qualified to meet UL 62, JCS4509 and HD21.14 requirements on a commercial scale while delivering excellent look and feel as well as enhanced product and extrusion performance."

The ability to achieve key regional standards is what differentiates DOW SUSTAIN.

In addition, DOW SUSTAIN™ exhibits good chemical resistivity, low corrosive off gassing in the event of a fire, and flexibility that is essential for ease of handling during manufacturing and the overall look and feel of the end product.

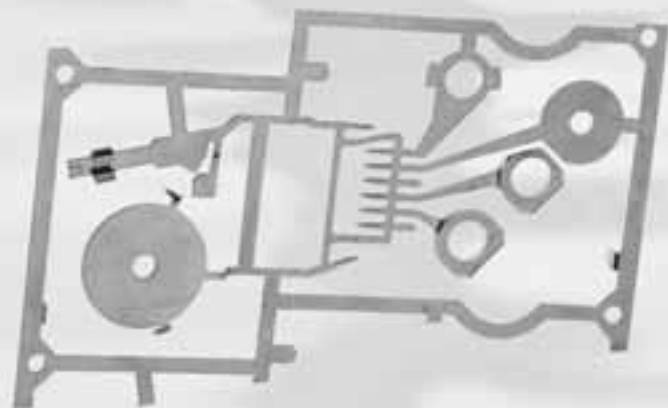
Dow Wire & Cable worked with Shenzhen Bao-Hing Electric Wire & Cable Manufacture Co., Ltd. and Volex, a recognized global leader in the manufacture of power cords, to trial DOW SUSTAIN™ in actual manufacturing conditions. The companies were able to meet key global standards using the new Dow Wire & Cable compounds.

"Dow Wire & Cable has been a good working relationship with the product development and technical know-how to help us efficiently run their product," says Chris Rutherford, VP of Global Supply Chain, Volex Group plc. "The new compound can achieve production rates similar to PVC with only minor investments for extruder screw design and drying conditions."

The launch of Dow SUSTAIN is the next in a series of planned product innovations that Dow is introducing to the wire and cable industry. With the introduction of this product, Dow is bringing forward a new technology that can be

## A little help here, please!

### ETCO bails out a customer with a supplier problem.



A supplier of an electronic component for a major automobile manufacturer went out of business leaving the automaker with no ISO/TS 16949 supplier. While the automobile company was able to get the die for the part during the supplier's bankruptcy, the tool package & documentation was lost.

At the automakers request, ETCO took the die and reverse engineered the tool package & process. Once that was achieved, ETCO was able to start producing the part quickly and efficiently, helping the manufacturer out of a tight spot on very short timing.

Don't stress over order minimums – ETCO order minimums are just 25,000 for terminals and 1,000 for boots.

If you have a problem or a need for a custom product solution call Sean Dunn at 401.467.2400 X 103 or e-mail him at [sdunn@etco.com](mailto:sdunn@etco.com). He'll assemble a team of ETCO engineers to address your problem.

Continued on page 49



## Minimize tooling costs. Maximize crimp quality.

### The TM-3000™ and TM-4000™ Universal Crimp Presses ensure your terminals are crimped correctly — every time.

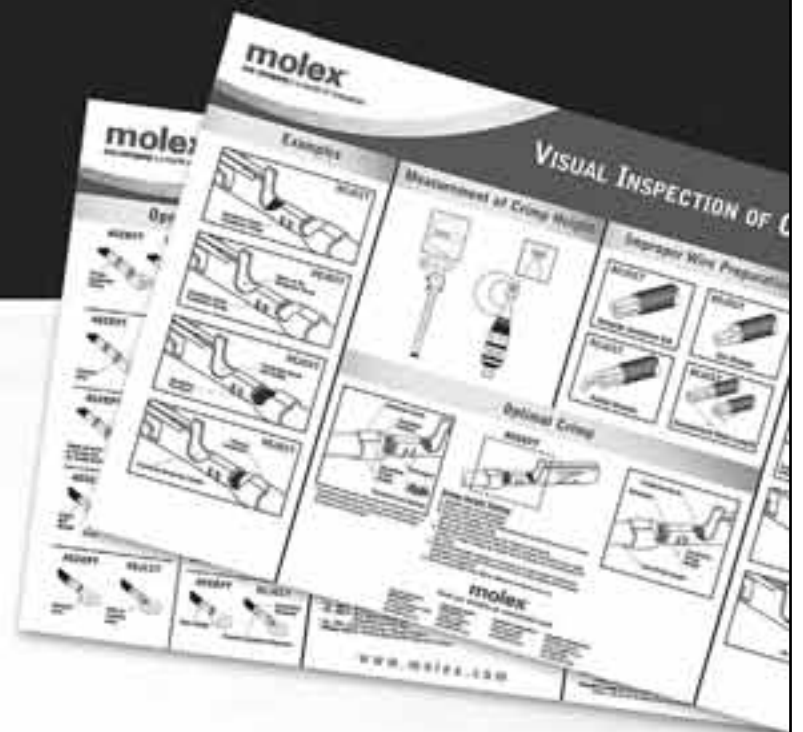
Reduce your applied costs and maximize your production efficiency by applying your terminals with a Molex TM-3000 or TM-4000 crimp press. Designed specifically for use with industry standard applicators, these cost-effective bench presses not only expedite the entire tooling changeover process, they're also the best options for applying side- and rear-feed terminals to a wide range of wire sizes.

The TM-3000 and TM-4000 also feature:

- 3.5 tons of crimp force for terminals up to 4 AWG with the TM-4000 and 2.0 tons of crimp force for terminals up to 10 AWG with the TM-3000
- Lower overall applied cost
- Two safety interlock switches for user protection

Don't put the quality of your crimps at risk. Demand Molex crimp presses — the tooling solution that won't compromise the design and functionality of your products.

[www.molex.com/link/applicationtooling.html](http://www.molex.com/link/applicationtooling.html)



### CRIMP CORRECTLY.

Visit [www.qualitycrimps.com](http://www.qualitycrimps.com) for your FREE instructional posters — available in 15 languages.

**molex**  
one company > a world of innovation



# Wiring Harness Supplier Directory

## "Keeping You Connected"

**JWB MANUFACTURING LLC**  
841 W. Fairmont Drive, Suite 103  
Tempe, AZ 85282  
PH: 877-889-4601 or 480-967-4600  
Fx: 480-967-4466

Email: [sales@jwbmanufacturing.com](mailto:sales@jwbmanufacturing.com)  
Web: [www.jwbmanufacturing.com](http://www.jwbmanufacturing.com)

JWB Manufacturing LLC is a full line manufacture of aftermarket wire cutting and stripping blades, and is a small family owned business. The "Worlds Finest Strippers" try harder to earn your business.

**COMPOSITE & WIRE MACHINERY INC.**  
490 Old Baptist Road  
North Kingstown, RI 02852  
PH: 401-884-4760  
Fx: 401-885-2499

E-mail: [jack@compositewire.com](mailto:jack@compositewire.com)  
Web: [www.compositewire.com](http://www.compositewire.com)

For 20 years, Jack Dennehy and Composite & Wire Machinery have provided new design and completely rebuilt braiding machines for many industries while keeping delivery times to a minimum. Expert technical assistance is an integral part of our line of braiders.

**DANIELS MANUFACTURING CORP.**  
526 Thorpe Rd.  
Orlando, FL 32824  
PH: (407) 855-6161  
FX: (407) 855-6884

Email: [www.DMCTools.com](mailto:www.DMCTools.com)  
Web: [DMCTools.com](http://DMCTools.com)

With over fifty years of industry experience, Daniels Manufacturing Corporation (DMC) is the leading manufacturer of Mil-Qualified Crimp Termination Tools, Wiring System Maintenance Tool Kits, and Insertion/Removal Tools. DMC also supplies Backshell Assembly Tools, ALPHATRON Wire Crimp Pull Testers, and SAFE-T-CABLE, the time saving substitute for safety Lockwire.

**ECC**  
5905 Green Pointe Drive, Suite G  
Groveport, OH 43125  
PH: 614-409-9104, Fx: 614-409-9115  
E-mail: [sales@ecco.com](mailto:sales@ecco.com)  
Web: [www.ecco.com](http://www.ecco.com)

ECC provides continuity test fixtures for any connector and can incorporate features such as: locking mechanisms, marking ability, lock and clip verification, terminal seating verification, pressure testing for seals or cavity plugs, color sensing. ECC builds custom wire harness build/test boards for manufacturers that are looking for a turnkey product. ECC also makes specialized

fixtures for performing functional tests, especially where ease of connection is essential. Additionally, an array of wire harness assembly aids such as standoffs, cable bundlers, and other wire routing products are also offered.

**THE ERASER COMPANY, INC.**  
123 Oliva Drive, PO Box 4961  
Syracuse, NY 13221  
PH: 315-454-3237 or 800-724-0594  
Fx: 315-454-3090  
E-mail: [info@eraser.com](mailto:info@eraser.com)  
Web: [www.eraser.com](http://www.eraser.com)

The Eraser Company, Inc., celebrating its 99th anniversary in business, manufactures a wide range of industrial products including wire, cable and tubing cutters, wire and cable strippers, wire twisters, wire brush wheels, dereelers, infrared heating equipment, measuring tools, and fyBRglass® erasers. Custom design services. Free sample program. ISO 9001:2000 certified.

**PLASTIC EXTRUDED PARTS, INC.**  
WIRE & CABLE MARKERS  
5229 NY Rt. 203, PO Box 540  
Nassau, NY 12123-0540.  
PH: 518-766-9878  
FX: 518-766-3229

Email: [sales@pepico.com](mailto:sales@pepico.com)  
Web: [www.pepico.com](http://www.pepico.com)  
Markers (RoHS) for the permanent identifi-

cation of wire, cable, tubing and bundles are manufactured in and distributed from our facility in upstate NY. Plastic markers with heat embossed codes are available in many colors, multiple or single character letters, numbers, electrical symbols and icons. Also computer cable bands and clips (Cat 5 etc.).

**SONOBOND ULTRASONICS, INC.**  
1191 McDermott Drive  
West Chester, PA 19380  
PH: 610-696-4710, Fx: 610-692-0674  
E-mail: [Sales@SonobondUltrasonics.com](mailto:Sales@SonobondUltrasonics.com)  
Web: [www.SonobondUltrasonics.com](http://www.SonobondUltrasonics.com)

Sonobond Ultrasonics pioneered the development and application of ultrasonic technology, acquiring the first patent in ultrasonic metal welding in 1960. Its high-performance metal welders produce accurate energy-efficient welds without consumables and can weld tinned wire. They are ideal for wire harnesses used in cars, aircraft, appliances, and consumer electronics.

**THEAN HWA RESOURCES (M) SDN. BHD.** (402981-4)

THEAN HWA RESOURCES  
"technology and tooling  
for wire harness assembly"

Head Office : 12, Jalan Industri Beringin, Kawasan Perindustrian Beringin Juru, 14100 Juru, S.P.T., Penang, Malaysia.  
Tel: 604 - 5088 773, 5085 773 Fax: 604 - 5083 773 Email: [sales@th.com.my](mailto:sales@th.com.my)  
Website: [www.th.com.my](http://www.th.com.my)

**APPLICATOR (For END and SIDE type Terminal)**

MODEL : TH-JA1      MODEL : TH-JS2      MODEL : TH-ME3

SEMI-AUTOMATIC TERMINAL CRIMPING MACHINE

COMPUTERIZED AUTO WIRE STRIPPING TWISTING & CRIMPING MACHINE FE-1104

FE-2TC

AUTOMATIC WIRE CUTTING STRIPPING MACHINE FE2201

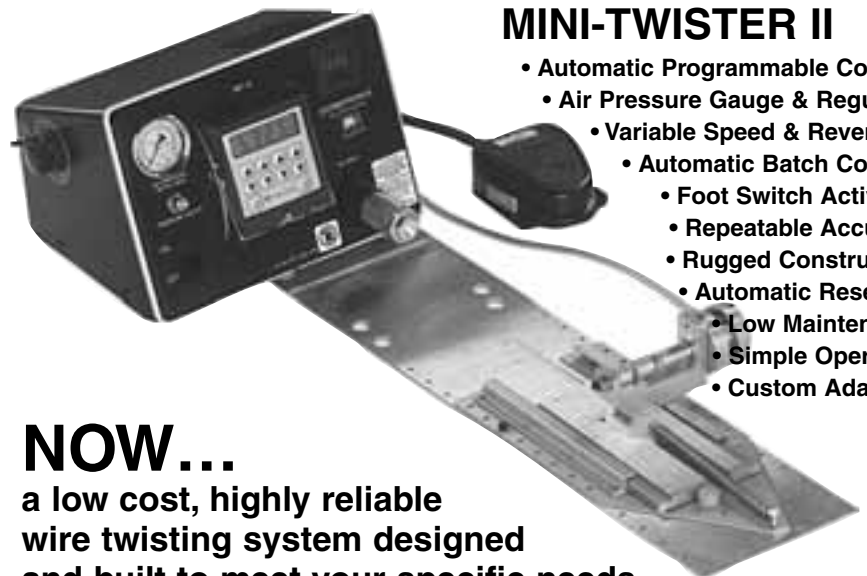
CRIMPING TOOLS

# STORMTRONICS

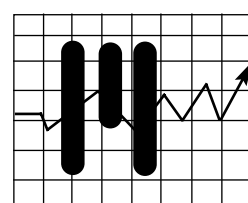
SEMI-AUTOMATIC WIRE TWISTING SYSTEMS

## MINI-TWISTER II

- Automatic Programmable Counter
- Air Pressure Gauge & Regulator
- Variable Speed & Reversible
- Automatic Batch Counter
- Foot Switch Activated
- Repeatable Accuracy
- Rugged Construction
- Automatic Resetting
- Low Maintenance
- Simple Operation
- Custom Adapters



**NOW...**  
a low cost, highly reliable  
wire twisting system designed  
and built to meet your specific needs.



**THE MELLO COMPANY, INC.**

P.O. Box 29301 • Dallas, TX 75229

PH: 214-350-7377 FX: 214-350-0521

[www.themellocompany.com](http://www.themellocompany.com)

**NEWS PLUGS** continued

Continued from page 46

extended beyond the personal electronics segment and planning a transition of the UNIGARD™ RE brand into the Dow SUSTAIN family.

Dow Wire & Cable is offering samples of Dow SUSTAIN as part of its Dow Inside program of working with select wire and cable manufacturers to combine Dow's material and technology expertise with excellent manufacturing processes with an agreement that all wires and cables produced through such collaboration will meet key global standards. For more information visit [www.dowwireandcable.com](http://www.dowwireandcable.com)

**Steve Wozniak to Keynote IPC APEX Expo 2011**

Apple Computer Co-Founder Steve Wozniak will deliver the opening keynote address at IPC APEX EXPO™ on Tuesday, April 12, 2011, at Mandalay Bay Resort & Convention Center.

Wozniak's theme, "How to Foster Creativity and Innovation in a Technical Environment," is a topic the Silicon Valley icon is uniquely equipped to discuss. Wozniak helped invent the personal computer with his design of Apple's first line of products, the Apple I and II, and contributed to the development of the Macintosh.

The keynote is free to all registered IPC

APEX EXPO attendees and exhibitors and will be followed by a book signing on the event's show floor. A published author, Wozniak will sign copies of his autobiography "From Computer Geek to Cult Icon", giving attendees an opportunity to meet the legend face-to-face. Wozniak will also attend the PCB and EMS Executive Management Meetings dinner on April 11.

"We are delighted to welcome Steve Wozniak," says IPC President Denny McGuirk. "When we invited him, he said he had a special place in his heart for electronics manufacturing and was looking forward to meeting the people in our industry. Having a legend like Wozniak kick off our event adds another wow factor to our show, along with the technologies and equipment on display, and should be a big thrill for our exhibitors and attendees."

For his achievements at Apple Computer, Wozniak was awarded the National Medal of Technology by the President of the United States in 1985, the highest honor bestowed on America's leading innovators.

In 2000, Wozniak was inducted into the Inventors Hall of Fame and was awarded the prestigious Heinz Award in Technology, the Economy and Employment for "single-handedly designing the first personal computer and for then redirecting his lifelong passion for mathematics and electronics toward lighting the fires of excitement for education in grade school students and their teachers." Wozniak founded the Electronic Frontier Foundation, and was the founding sponsor of the Tech Museum, Silicon Valley Ballet and

Children's Discovery Museum of San Jose. He is currently co-founder and chief technology officer for Acquicor Technology, Inc.

Registration for IPC APEX EXPO opens in early November. The IPC APEX EXPO conference and exhibition will run April 12-14, 2011; standards development meetings, professional development courses and other show activities will take place April 10-14.

Visit [www.IPCAPEXEXPO.org](http://www.IPCAPEXEXPO.org) to sign

up for show notifications. Silicon Valley Legend Adds More Sparkle to Las Vegas

The keynote is free to all registered IPC APEX EXPO attendees and exhibitors and will be followed by a book signing on the event's show floor. A published author, Wozniak will sign copies of his autobiography iWoz: From Computer Geek to Cult Icon, giving attendees an opportunity to meet the legend face-to-face.

Continued on page 50

## Industrial Heat Guns Aimed at Your Needs

*Variable Temperatures, Powerful Air Flow and Specialized Attachments for Your Wiring Harness Production Applications*

**NEW**

VTS Model with pivoting stand

**Benchtop Performers**

HG Model with adjustable base

Shrink tubing up to 2"

Shrink tubing up to 3/4"

Heat Sprayable Connectors

• Up to 1000°F

• 3000 FPM, 23 CFM

• Rugged die-cast Aluminum housing

• Replaceable ceramic heating elements

**MASTER APPLIANCE**  
Designers and Manufacturers of Heat Tools for Industry

**www.masterappliance.com**

See our website for more Heat Shrink Systems for Wiring Harness Assembly

**An Eye for Innovation**

Bringing Precision, Flexibility and Experience to Wire Processing

**NEW UniStrip 2300**

- Fully programmable benchtop wire stripper
- Strips wire from 10 - 32 AWG and jacketed cables up to 0.22" in diameter
- Intuitive color touchscreen user interface
- No mechanical adjustments required when changing wire sizes
- Can strip inner conductors of jacketed cables with short breakout lengths
- Trigger sensitivity automatically adjusted based on wire size



[www.schleuniger-na.com/US2300\\_wn](http://www.schleuniger-na.com/US2300_wn)  
(603) 668-8117

**Schleuniger**  
To Be Precise.

NEWS PLUGS **continued**

Continued from page 49

Wozniak will also attend the PCB and EMS Executive Management Meetings dinner on April 11.

"We are delighted to welcome Steve Wozniak," says IPC President Denny McGuirk. "When we invited him, he said he had a special place in his heart for electronics manufacturing and was looking forward to meeting the people in our industry. Having a legend like Wozniak kick off our event adds another wow factor to our show, along with the technologies and equipment on display, and should be a big thrill for our exhibitors and attendees."

For his achievements at Apple Comput-

er, Wozniak was awarded the National Medal of Technology by the President of the United States in 1985, the highest honor bestowed on America's leading innovators.

In 2000, Wozniak was inducted into the Inventors Hall of Fame and was awarded the prestigious Heinz Award in Technology, the Economy and Employment for "single-handedly designing the first personal computer and for then redirecting his lifelong passion for mathematics and electronics toward lighting the fires of excitement for education in grade school students and their teachers." Wozniak founded the Electronic Frontier Foundation, and was the founding sponsor of the Tech Museum, Silicon Valley Ballet and Children's Discovery Museum of San Jose. He is currently co-founder and chief technology officer for Acquicor Technology, Inc.

Registration for IPC APEX EXPO opens

in early November. The IPC APEX EXPO conference and exhibition will run April 12-14, 2011; standards development meetings, professional development courses and other show activities will take place April 10-14. Visit [www.IPCAPEXEXPO.org](http://www.IPCAPEXEXPO.org) to sign up for show notifications.

#### New 48-Hour Service Program speeds Subassembly Prototype Production

Tyco Electronics, a leading global provider of electrical components, connectors, network solutions and specialty products, announced a new 48-hour delivery (shipping) program to TE direct customers on certain commonly used molded parts, including straight boots, right angle boots and transitions.

TE molded parts (and other harness components) protect cable and equipment from corrosion and mechanical abuse. These boots, ordered under the new 48-Hour Service Program, will be

provided without adhesive lining, allowing customers to add their own preferred adhesive tape or epoxy for sealing. The boots can be ordered in increments of five (5) pieces, up to 20 pieces per order. Multiple styles of parts can be ordered together on one purchase order. There will be a slight price premium for this packaging and shipping method.

"The Tyco Electronics advantage that our company is built upon goes far beyond our robust, high quality product offerings, to include service, resources and support that help our customers take the lead in highly competitive marketplaces," said John Kuster, product manager, Tyco Electronics. "We believe that this special quick-turn process on small quantity, commonly used molded parts will greatly assist our customers in producing and delivering subassembly prototypes to their clients in a speedy manner."

Parts ordered under this program will

be identified with a special "CS48HR" designator at the end of the normal description (see list on following page). In order to participate in this program, customers must be registered as a direct customer and have shipping and billing information available in the TE order processing system. TE distributors are exempt from this program.

For more information and to follow all the latest product news, visit [www.tyco-electronics.com](http://www.tyco-electronics.com) or follow us on Twitter @TycoElectronics. TE (logo) and Tyco Electronics are trademarks.



## BT 3500 Battery-Hydraulic Hand Tool

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

### Tyco Electronics introduces the BT 3500 Battery Hydraulic Hand Tool!

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

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

Despite the lightweight of the power unit, the tool can produce over 200 10 AWG crimps between charges. This is made possible through a ten ounce, 10.8 Volt Lithium-Ion battery that can re-charge in only 25 minutes, thereby giving plenty of time for production.

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

**Call Us - We're Well Connected!**

**For more information, visit [www.heilind.com/tyco\\_wnh](http://www.heilind.com/tyco_wnh) or call us at 866-887-2189**

#### Carry Options



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



BT 3500 Port with multiple storage pockets

**HEILIND**  
Performance. Trust. Innovation.

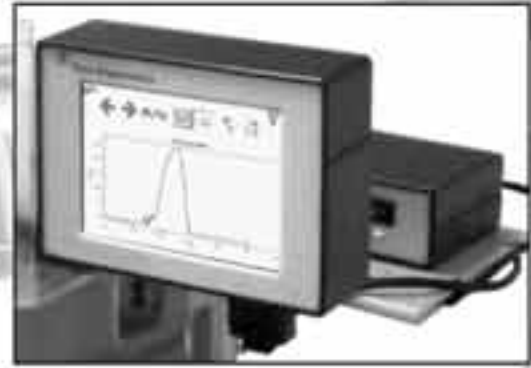
**Tyco Electronics**  
Authorized Distributor

**Electrical Wire Processing Technology Expo**  
**May 18 & 19, 2011**  
**Milwaukee, Wisconsin**





Tyco Electronics New Crimp Quality Monitor (CQM)



The AMP 3K/40 and AMP 5K/40 accepts the New Tyco Electronics Next Generation Applicator Series



## AMP 3K/40 Terminator



The AMP 3K/40 Terminator is based upon the field proven AMP-O-LECTRIC Model "G" Terminator and is the latest in the series of machines for terminating wire using reeled terminals and contacts. As a value oriented terminator, the AMP 3K/40 is designed for customers that require the increased output and quality of a semiautomatic machine at a competitive price. By incorporating the most commonly requested features as a standard and offering a long list of optional equipment, this terminator offers flexibility to meet the specific needs of various applications at the lowest possible cost.

The AMP 3K/40 Terminator was designed with speed, convenience, and ease of use in mind. The design accepts the **New Next Generation Applicator Series** and has the crimp force capacity of 3,000 pounds and is capable of crimping 32-14 AWG wire.

An AMP 5K/40 Terminator is also available with a 5,000 pound crimp force and is capable of crimping 32-10 AWG wire.

For a quick, effective response whether you need a quote, expert advice or product information, contact us at: 1-888-777-5917 or 1-717-810-2080 or e-mail us at [toolingsales@tycoelectronics.com](mailto:toolingsales@tycoelectronics.com).

To learn more call us or visit: <http://tooling.tycoelectronics.com/bench equip.asp>

[www.tooling.tycoelectronics.com](http://www.tooling.tycoelectronics.com)  
[www.tooling.tycoelectronics.com/europe](http://www.tooling.tycoelectronics.com/europe)  
[www.tooling.tycoelectronics.com/china](http://www.tooling.tycoelectronics.com/china)

Ph: 1-888-777-5917 or 1-717-810-2080; [toolingsales@tycoelectronics.com](mailto:toolingsales@tycoelectronics.com) © 2010 Tyco Electronics Corporation. All rights reserved. AMP-O-LECTRIC, the TE logo and Tyco Electronics are trademarks.

 **Tyco Electronics**  
 Our commitment. Your advantage.

### Custom Cable Receives its first Telcordia GR-326 Certification for Fiber Optic Connector

Custom Cable Industries, Inc., (<http://www.customcable.com>) a leading connectivity company with national presence and global distribution, has successfully completed GR-326 certification for SC ultra physical contact (UPC) single-mode fiber optic connector assemblies, with certification given for the latest issue 4, dated February 2010.

The current GR-326 CORE standards update, compared with the September 1999 issue 3, is aimed at increasing the overall reliability of products for the demands of today's bandwidth-intensive network infrastructure. Most significantly, optical performance is measured at additional wavelengths including 1490nm and 1625nm in order to certify performance at the limits of current fiber optic networks. As network technology, capacity and density increase, it is essential to comply with the latest optical connectivity certification requirements to maximize investment and ensure long term reliability.

"Not many U.S. manufacturers of fiber optic assemblies can claim the product will perform as well in 20 years as it did the day it was assembled. The GR-326 CORE requirements have been designed to certify fiber optic connectivity suppliers in this regard," says Gregg Stewart, Custom Cable general manager. "As a value-added assembler, we are extremely pleased to receive this significant certification."

The certification enhances Custom Cable's U.S. fiber assembly manufacturing capabilities that include simplex/duplex

jumpers and distribution fiber trunks utilizing bend insensitive (BIF) singlemode fiber and OM1 through OM4 laser optimized (10-Gigabit) multimode fiber. Such assemblies are used in central office, data center, outside plant (MDU/RT) and customer premise (CPE) applications.

To receive the certification, Custom Cable successfully completed all Service Life and Reliability requirements. Service Life testing consists of a concise sequence of mechanical tests that simulate the stresses that fiber optic connector assemblies may be subjected to while in service within a telecommunications plant. Reliability testing establishes long-term reliability of the fiber optic connectors via rigorous environmental conditions designed to simulate the entire life of a product in all types of conditions.

"Compliance with the reliability portion of GR-326 is quite difficult to achieve due to extensive environmental aging," says Stewart. "We continue to invest in our internal environmental testing capabilities to ensure that all our products meet rigorous reliability standards. This is a valued requirement for fiber optic networks."

Founded in 1980, Custom Cable Industries, Inc. is a leading connectivity company with national presence and global distribution. Custom Cable is both TL 9000:2008 and ISO 9000:2008 certified.

#### New Catalog #39 from Micro Plastics

Micro Plastics, Inc. introduces a new product Catalog #39, which details their extensive inventory of plastic fasteners. With 290 pages, this catalog contains thousands of fastener items.



Micro Plastics new product catalog offers 500 new items.

This year's publication features 12 new product lines with over 500 NEW items added.

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

Micro Plastics' manufactures millions upon millions of fasteners daily. They offer over 20,000 items and maintain an inventory of over 250 million parts. See details at <https://secure.microplastics.com>.

#### Model BTS1 Thermal Wire Stripper from Eraser Company

Eraser's Model BTS1 Thermal Wire Stripper is a bench mounted thermal stripper for solid and stranded wire and cables up to 1/2" OD (12.7mm $\phi$ ). The temperature of the stripping elements is infinitely variable up to 1400°F (760°C).

The unit has an infinitely adjustable strip length stop from 0 to 1-1/2" (38mm) and has a self-contained fume extraction system. The optional 90° element kit is available to provide infinite strip length or window stripping.

The Eraser Company, Inc., celebrating its 99th anniversary in business, manufactures a wide range of industrial products

including wire, cable and tubing cutters, wire and cable strippers, wire twisters, wire brush wheels, dereelers, infrared heating equipment, measuring tools, and fyBRglass® erasers.

The company is ISO 9001:2000 certified. The company offers Free E.S.P. (Eraser Sample Program). Send a 10-20 foot sample of your material and Eraser will recommend the best solution for your processing needs from its line of more than 200 products. For unique processing needs, Eraser will custom design a solution for you.



Eraser's Model BTS1 Thermal Wire Stripper

For more information on Eraser's entire product line visit [www.eraser.com](http://www.eraser.com) or call 315-454-3237.

QUALITY INDUSTRIAL PRODUCTS SINCE 1911

Made in Syracuse, NY  
Used around the world!  
[www.eraser.com](http://www.eraser.com)  
[info@eraser.com](mailto:info@eraser.com)

- WIRE, CABLE & TUBING CUTTERS
- INFRARED HEATING EQUIPMENT
- CUSTOM DESIGN SERVICES
- FYBRGLASS® ERASERS
- REELERS & DEREELERS
- STRIPPERS • TWISTERS
- ISO 9001:2000 QMS CERTIFIED

Take advantage of FREE ESP. Send a 10-20 foot sample of your material and Eraser will recommend the best solution for your processing needs from its line of more than 200 products. For unique processing needs, Eraser will custom design a solution for you. 315.454.3237 or 800.724.0594.



## ATLAS WIRE CORPORATION

### Insulators of Electrical Wires & Cables

- ✓ ISO 9001:2000 Certified
- ✓ Facilities in Illinois & Arizona
- ✓ Huge Inventory of Conductor
- ✓ Customized Print & Packaging
- ✓ Striping (Spiral & Extruded Line)
- ✓ Bonding & Twisting
- ✓ Drum Pack
- ✓ Small Min. Order Quantities
- ✓ Short Lead Times
- Lead & Hook Up Wire
- 125C & 150C Cross-Link
- UL & CSA
- MTW
- Building & Fixture Wire
- Military
- Automotive/Marine
- Nylon
- Speaker Wire

[www.atlaswirecorp.com](http://www.atlaswirecorp.com)

9525 River Street  
Schiller Park, IL 60176  
(847) 678-1210  
(847) 678-1281 fax  
[info@atlaswirecorp.com](mailto:info@atlaswirecorp.com)



4705 S. Coach Drive  
Tucson, AZ 85714  
(520) 747-4500  
(520) 747-5800 fax  
[tomatlas@worldnet.att.net](mailto:tomatlas@worldnet.att.net)

# Delphi Working to Make Electric Vehicle Wireless Charging a Reality

Delphi Automotive has reached an agreement with WiTricity Corp., a wireless energy transfer technology provider, to develop automatic wireless charging products for hybrid and electric vehicles. The collaboration between the two companies will help establish a global infrastructure of safe and convenient charging options for consumer and commercial electric vehicles.

"This is groundbreaking technology that could enable automotive manufacturers to integrate wireless charging directly into the design of their hybrid and electric vehicles," said Randy Sumner, director, global hybrid vehicle development, Delphi Packard Electrical/Electronic Architecture. "Delphi's expertise in global engineering, validation and manufacturing coupled with WiTricity's patented wireless energy transfer technology uniquely positions us to make wireless charging of electric vehicles a reality."

Sumner said the wireless charging system would involve no plugs or charging cords. Drivers would simply park their electric vehicle over a wireless energy source that sits on the garage floor, or is embedded in a paved parking spot. The system will automatically transfer power to the battery charger on the vehicle.

According to Eric Giler, chief executive officer, WiTricity, their wireless system can already transfer over 3,300 watts - enough to fully charge an electric car at the same rate as most residential plug-in chargers.

"Charging an electric car should be as easy as parking it in your garage or parking spot," Giler said. "WiTricity's high efficiency wireless energy transfer technology is ideally suited for electric vehicle charging, and our partnership with Delphi will help to quickly get this technology deployed in OEM vehicles and infrastructure projects worldwide."

"Delphi can bridge the gap between the laboratory and the highway by providing E/E systems integration expertise, a global manufacturing and engineering footprint and high-voltage, high-power com-

ponents specifically engineered for the hybrid and electric vehicles of today and tomorrow," Sumner said.

Wireless charging technology will need to co-exist with plug-in charging solutions, Sumner added, so that electric vehicle drivers have the ability to charge their vehicle when they are away from their wireless charging source.

Delphi also makes a Portable Electric Vehicle Charger that fits conveniently in the trunk of an electric vehicle. The user-friendly, UL-listed charging system plugs into any standard 120-volt outlet to enable safe electric vehicle battery

charging at home or away. The charging unit can also be integrated into stationary charging applications.

Delphi is a leading global supplier of electronics and technologies for automotive, commercial vehicle and other market segments. Operating major technical centers, manufacturing sites and customer support facilities in 30 countries, Delphi delivers real-world innovations that make products smarter and safer as well as more powerful and efficient. Connect to innovation at [www.delphi.com](http://www.delphi.com)

WiTricity Corporation designs, devel-

ops, manufactures, and markets patented technology for wireless energy transfer. Founded in 2007, the company is commercializing technology invented by a team of MIT physicists in 2006. This technology utilizes magnetism to transfer energy without wires in a way that is safe, efficient, and that works over distance. WiTricity is developing wireless energy transfer solutions for a broad range of consumer electronics, electric vehicle, medical, industrial, and military applications. For more information, visit [www.witricity.com](http://www.witricity.com)

## SHRINKAGE UP TO 6:1



Shrinkage is our business and as China's largest manufacturer of heat shrink tubing, CYG produces a comprehensive range of products in various colors and shrink ratios. Manufactured under TS16949 Quality System and ISO14001/IS9001 Environment System certifications, CYG's products are produced to meet or exceed UL/224/MIL approval requirements. CYG products are also certified under the following agencies, U/L, TUV, VDE, C-UL, F-Mark and are registered "Green Partners" with Sony and Samsung Electronics.

If you're manufacturing wire harnesses, rest assured CYG probably offers a tubing to meet your requirements. Our products are certified under the following standards: ROHS, AMS-DTL-23053/4/5, SAE-AS81531, MIL-STD-202 whether your primary focus is automotive, communications, construction, electrical, electronic, energy...CYG has got you covered.

**For more information about CYG and its products please contact us today!**



A DIVISION OF DLC, INC  
12753 Moore St  
Cerritos CA 90703  
Phone: (800) 421-3536  
Fax: (562) 404-9698  
Email: [Sales@thermosleeve-CYG.com](mailto:Sales@thermosleeve-CYG.com)  
Web: <http://thermosleeve-CYG.com>



# THE NEXT WAVE IN WIRING.

---

2011 ANNUAL  
**WIRE HARNESS CONFERENCE**  
SAN DIEGO, CA – MARCH 2 - 4  
WESTIN HOTEL

## PROGRAM HIGHLIGHTS

MEET LEADING INDUSTRY SUPPLIERS  
LEARN ABOUT NEW PRODUCTS AND SERVICES  
TAKE YOUR BUSINESS TO THE NEXT LEVEL  
ATTEND INFORMATIVE SESSIONS  
PLAY A ROUND OF GOLF  
ENJOY THE BEAUTIFUL SAN DIEGO WATERFRONT



---

REGISTER ONLINE AT  
**WWW.WHMA.ORG**  
OR CALL  
**952-253-6085**

---

# CLASSIFIEDS

## BRAIDERS WANTED

**ALL SIZES, TYPES, OR QUANTITIES.  
ANY CONDITION**

**Call: Tony Ross, Hamilton Products**  
**Voice: 607-674-2030**  
**Fax: 607-674-9367**  
**E-mail: t\_ross@iwgbwd.com**

## Listinventory.com

Search for a Part Number

000-AAA-000

**Free Part Searches!**  
**Free Inventory Listing!**  
**Free message boards!**

**5 million parts listed so far in our system.**  
**ListInventory.com is completely FREE.**

Search for Parts A - Z to find what you need.

Whether you're buying or selling equipment or connectors  
listinventory.com is for you!

List your inventory from one item to a million items all for free.

**List all your inventory and help boost sales**  
[www.listinventory.com](http://www.listinventory.com)

**Tri-Tech**  **KODERA**

### Machine Sales Ltd

16601 West Glendale Drive, New Berlin, Wisconsin 53151  
Phone 262/782/4352 FAX 262/782/6237  
[www.tritechkoder.com](http://www.tritechkoder.com) [sales@tritechkoder.com](mailto:sales@tritechkoder.com)

### Hot Stamp Marking Wheels

Used Eubanks Hot Stamp marking wheels  
These also fit on the Kingsley SI-14 and KIP-20

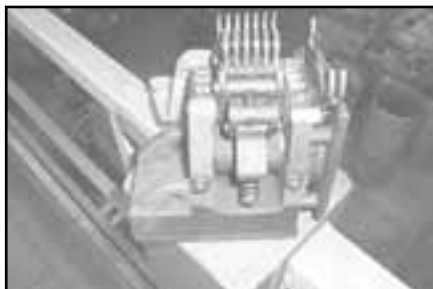
#### *I have:*

63504 TB 104R Minimum wire OD 0.060 - horizontal - 8 wheels available  
60431 TB 205R Minimum wire OD 0.060 - vertical - 6 wheels available  
63505 TB 105R Minimum wire OD 0.070 - horizontal - 8 wheels available  
63626 TB 106R Minimum wire OD 0.080 - horizontal - 2 wheels available  
63430-II TB 204R Minimum wire OD 0.035 - vertical - 3 wheels available

**We are asking \$200.00 each for these wheels.**

We have many Artos CS-10 & 11  
Spare parts. Pictured here we have  
the AF-254-500 Clamp assembly

**MANY NEW KOMAX 40  
SPARE PARTS AVAILABLE.**  
**KENCO AND AMP K PRESSES  
ARE IN STOCK AS WELL**



If you have any questions please feel free to contact Harvey at  
262-782-4352, or [sales@tritechkoder.com](mailto:sales@tritechkoder.com).

## FOR SALE

### AMP "K" PRESSES \$1,995<sup>00</sup>

*(Remanufactured by Factory Trained Field Engineer)*

Completely reconditioned—Repainted & Replated Exterior and includes  
work lamp, applicator brackets, terminal fixtures, & heavy duty flywheel cover  
Shut height set and ready for production - Six months warranty

#### ALSO AVAILABLE FOR SALE

AMP APPLICATORS AMP MTA / IDC TOOLS  
AMP HAND TOOLS NON AMP APPLICATORS  
AMP MACHINE PARTS-CLS'S - T PRESS - S/C & OTHERS

*WE WILL REPAIR YOUR APPLICATOR IN OUR SHOP*

Check our website for more information and lists  
[www.cmstechnologyinc.com](http://www.cmstechnologyinc.com)

## CMS TECHNOLOGY, INC.

"SPECIALIZING IN AMP MACHINES & PARTS"

Phone: 336-853-7435 • Fax 336-853-1120  
[jddavis@cmstechnologyinc.com](mailto:jddavis@cmstechnologyinc.com)

## CONNECTOR DISTRIBUTION CORPORATION

2985 E. HARCOURT STREET  
RANCHO DOMINGUEZ, CA 90221

310-632-2466 • Fax: 310-632-5413  
<http://www.cdc-online.com>

### MILITARY PREFIXES

MS3100 - MS3108  
MS3400 - MS3456  
M3933  
M21097  
M24308  
MS3110 - MS3128  
MS3470 - MS3476  
MS24264 - MS24266  
MS24285 - MS24286  
MS20026 - MS27478  
M28731  
M28748  
M28804  
M28840  
MS27466 - MS27515  
D38999  
M38999  
M39012  
M39024  
M39029  
M55302  
M55339  
M81511  
M81659  
M83723  
M83733  
M85049  
MS90555 - MS90558

**Connectors**

**Contacts**

**Accessories**

# CLASSIFIEDS

## HARNESS COMPANIES:

\$1M to \$5M [Revenue]

### ACQUISITION OPPORTUNITY

Lost a key customer?  
Cash flow problems?  
**WE CAN HELP**

- We acquire troubled harness companies,
- We structure fair deals
- We leave current management in place.

**YOU DON'T HAVE TO STRUGGLE!**

Respond in total confidence to

Wiring Harness News  
PO Box 527 • Richmond, IL 60071  
Attn: DL#522

### REPS WANTED

AMTI, Division of Maxant, Inc, Niles, Illinois, a manufacturer of SLICE & SHRINK precision cutting, marking and shrinking equipment for the industry, is looking for energetic sales representatives in selected states.

Please contact Tom Hanlon at (847) 588-2280 or  
e-mail: [thanlon@maxant.com](mailto:thanlon@maxant.com)  
[www.anti-products.com](http://www.anti-products.com)

## GLADDING BRAIDING MACHINES



"We build, sell, and even buy harness braiding equipment."

We also supply braider bobbins wound with material.

Products and Services

- Braids; Wire and Textile
- Bobbin Winding
- Harness, Overbraiding, & Shielding
- Buss Wire

Visit [www.gladdingbraid.com](http://www.gladdingbraid.com)

(315) 653-7211

Huge  
Inventory!!

Surplus  
**RAYCHEM**

Great  
Prices!!!

Sleeves • Connectors • Contacts  
Tools • Accessories

Contact Beulah at Electro Mavin. E-mail [beulah@mavin.com](mailto:beulah@mavin.com)

**Fax (310) 632-3557**

**BUY & SELL**

## FOR SALE Artos MTX-5 Series 2005 \$30,000

High speed wire strip and terminate, excellent condition, still in production.

- Wire Sizes-24 to 10 AWG, Wire lengths-2" and up, Strip lengths - 0 to 0.630".
- Servo driven swing arms with programmable wire-terminal set-up
- Servo driven cutter head with programmable wire diameter and stripping set-up
- P.C. operator interface with Windows 2000 W/UPS for PC back-up
- Two process mounting bases with hand-wheel height adjustment
- Two terminal reel holders
- Two EPS2010 electronic crimping units
- Two tonking units
- One wire guide kit
- Wire straightener (vertical and horizontal) with cross-link wire roller
- Split cycle operation for closed barrel terminals (both units)
- Air feed die kit (both units)
- Crimp force monitor CFM-1000M
- Terminal run-out detection (2 units)
- Automatic termination mounting base height adjustment (2 units)
- Paper take-up device (each)

**For more Information call (478) 971-7020**

## Tyco Electronics

### Used and Reconditioned Equipment

High quality used equipment is inspected and reconditioned by our technicians and offered at a significant savings.

#### USED & RECONDITIONED EQUIPMENT AVAILABLE:

##### Wire Prep Machines

- Komax Cosmic 927R Micro-Cable Stripper
- Komax Kappa 210 Cut and Strip
- Komax Kappa 225 Cut and Strip



##### Automatic Cut, Strip and Terminate Machines

- AMPOMATOR CLS IV+ Leadmaker

##### Bench Crimping Machines

- AMP 3K/40 Terminator
- Model G Terminator
- Model K Terminator
- TAPETRONIC Terminator
- Stripper Crimper



Supplies are very limited. For additional information or to place an order, call us toll free at 1-888-777-5917 or 717-810-2080 or email us at [toolingsales@tycoelectronics.com](mailto:toolingsales@tycoelectronics.com).

View the most current list of available equipment at:  
[www.tooling.tycoelectronics.com/recond equip.asp](http://www.tooling.tycoelectronics.com/recond equip.asp)

[www.tooling.tycoelectronics.com](http://www.tooling.tycoelectronics.com)

**Tyco Electronics**  
Our commitment. Your advantage.





# CALENDAR OF EVENTS

## **National Marine Electronics Association Expo** **October 29 - November 1, 2010**

The NMEA brings to life the products and services of the marine electronics industry. If your products are used in the marine electronics industry, the NMEA International Conference and Expo is the ideal opportunity to position your company as a leader and promote the benefits and solutions you provide. Register at [www.nmea.org](http://www.nmea.org).

**Sheraton Seattle**  
**Seattle, Washington**

## **Electronics East** **April 21-22, 2011**

Electronics New England brings you fact to face with the technical experts who can help you streamline your electronics manufacturing process and stay competitive. Electronics New England is one of the high-level pioneer discussion forums for the electronics sector. Contact Canon Communications at 310-445-4200 for details.

**Boston Convention Center**  
**Boston Massachusetts**

## **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](http://www.mexitronica.com).

**Expo Guadalajara Centro**  
**Guadalajara, Jalisco, Mexico**

## **Del Mar Electronics Show** **May 4-5, 2011**

A high value design and manufacturing show, this event serves the electronics, medical and biotech industries. The Del Mar show's technical program offers key insights to manufacturers who have serious concerns over advanced electronic components in the medical dvies. In addition, the show will play host to an impressive list of exhibitors.

**Del Mar Fairgrounds**  
**Del Mar, California**

## **Printed Electronics USA** **December 1-2, 2010**

Printed Electronics USA 2010 will reflect the huge momentum building in the industry as the market moves from RD to commercialized product and the wealth of new market opportunities beginning to be realized. Focused on the commercialization of printed and flexible electronics Printed Electronics USA is the key platform for end users to source suppliers from across the value chain.

**Santa Clara Convention Center**  
**Santa Clara, California**

## **Interwire 2011** **May 3-5, 2011**

Introduced in 1981, Interwire is the largest and longest-running wire and cable marketplace in the Americas. It is an international trade event that includes exhibiting companies, speakers, and attendees from more than 50 countries around the world. Interwire is ranked as one of the 200 largest trade shows in the U.S. by Tradeshow Week magazine. Interwire is the venue where buyers, sellers, researchers, and speakers connect with new contacts and colleagues. The show crosses dozens of vertical industries including automotive, construction, aerospace, transportation, and communications, among others. Visit [www.wirenet.org](http://www.wirenet.org) for exhibitor and attendee information.

**Georgia World Congress Center**  
**Atlanta, Georgia**

## **Electronics West** **February 8-10, 2011**

See all aspects of electronics manufacturing, including components, subassemblies, software, contract services, assembly, test and inspection products. Get input on your upcoming project from hundreds of experienced companies, all in one day! You can develop supplier alliances, technology licensing, partnerships and joint ventures to expand your business. The NEW Innovation Briefs Theatre features 30-40 minutes sessions on current manufacturing topics. Delivered by industry experts from the world's leading OEM suppliers, you can find them right on the show floor, for FREE. Our schedule of speakers and topics will be finalized in the near future. For further information visit [www.ElectronicsWestShow.com](http://www.ElectronicsWestShow.com).

**Anaheim Convention Center**  
**Anaheim, California**

## **MEDCon – Medical Electronic Device Conference/Expo Navy Pier, Chicago** **May 16-18, 2011**

The Medical Electronic Device Conference & Expo focuses on specific needs of electrical and design engineers for medical devices. The conference addresses key challenges in designed next generation devices. See [www.medicaldevicesexpo.com](http://www.medicaldevicesexpo.com).

**Chicago, Illinois**

## **Wiring Harness Manufacturer's Conference (WHMA)** **March 2-4, 2011**

Once a year WHMA sponsors a conference that offers members the opportunity to participate in committee sessions, attend educational programs and check out the industry's latest at the suppliers' technology exhibits. For further information visit [www.whma.org](http://www.whma.org) or call (952) 253-6085.

**Westin San Diego**  
**San Diego, California**

## **National Electrical Wire Processing Technology Expo** **May 18-19, 2011**

The National Electrical Wire Processing Technology Expo features new products and services for electronic cable assemblies, cord sets, wiring harnesses and other products within the wire processing industry. Meet over 100 world-class suppliers and service companies in the wire and cable processing industry. Discover the secrets to solve your wire processing problems. Visit [www.expoproductions.com](http://www.expoproductions.com) for exhibitor and attendee information.

**Frontier Airlines Center**  
**Milwaukee, Wisconsin**

## **Aircraft Electronics Association Annual Convention** **March 22-25, 2011**

The 54th Annual AEA International Convention & Trade Show is a unique opportunity to connect with manufacturers, distributors, technicians and business leaders as we shap the future of avionics together. For more information visit [www.aea.net/convention](http://www.aea.net/convention).

**Grand Sierra Resort**  
**Reno, Nevada**

## **IPC/APEX Expo 2011** **April 12-14, 2011**

The largest show for the electronics interconnect industry. You will see everyone from designers and printed circuit board companies to electronics manufacturing service companies to OEMs to suppliers. This even includes a premier comprehensive technical conference, professional development courses and networking activities specifically for designers, engineers, manufacturing personnel, managers and senior officers. Contact [MaryMacKinnon@ipc.org](mailto:MaryMacKinnon@ipc.org) for details.

**Mandalay Bay Resort & Casino**  
**Las Vegas, Nevada**

**If you have an event you would like to have listed here, send it to Marilyn Magowan**  
**[marilynmagowan@yahoo.com](mailto:marilynmagowan@yahoo.com)**

|   |  |  |
|---|--|--|
| AMTI American Mfg & Technologies Inc.....16     | Eubanks .....26                            | Mello Company Inc., The.....48                 |
| Anixter.....41                                  | Fuses Unlimited.....35                     | Molex .....47                                  |
| Applitek Technologies Corp.....21               | Gamma Electronics.....24                   | Multi/Cable Corp. ....46                       |
| Artos Engineering Company.....2                 | Grayline.....28                            | National Wire.....7                            |
| Atlas Wire Corporation.....52                   | Hamilton Products, Inc.....41              | OES, Inc. ....14                               |
| ATS Application Tooling Solutions.....15        | Heilind Electronics.....30, 37, 50         | Precision Plus, Inc. ....43                    |
| Cablescan .....9                                | HellermannTyton.....19                     | Proline .....34                                |
| Calendar of Events.....57                       | Hoffman Products.....34                    | RPC Manufacturing Solutions, LLC.....20        |
| CAMI Research, Inc.....23, 39                   | Hu Lane Associate, Inc.....41              | RTI Manufacturing.....42                       |
| Cirris Systems Corp.....10, 29                  | Industrial Wire and Cable Corp.....13      | Schaefer Megomat USA Inc. ....18               |
| Chief Supply Inc. ....44                        | Imada.....4                                | Schaefer Technologies LLC.....5                |
| Coastel Cable Tools.....41                      | INSCO .....4, 6, 8, 10                     | Schleuniger Inc.....8, 31, 49                  |
| Collectron, CK Technologies, Inc.....7          | Insulation Supply.....4, 6, 8, 10          | Sentry Air Systems, Inc.....23                 |
| Compaero.....4                                  | Intro Corporation.....31                   | Shenenne Dakota, Inc.....43                    |
| Composite & Wire Machinery, Inc.....3           | Judco Manufacturing Inc.....34 - 35        | ShinMaywa.....6                                |
| Crimping & Stamping Technologies, Inc.....20    | JWB Manufacturing, LLC.....27              | Southwire.....36                               |
| CYG, Division of DLC, Inc.....53                | Kingsley Machines.....37                   | Strunk Connect.....17                          |
| Daniels Manufacturing Corp.....45               | Kodera/Tri-Tech Machine Sales, Ltd .....22 | Techflex.....35                                |
| DSG Canusa .....39, 41                          | Komax.....7, 60                            | Thean HWA Resources (M) SDN, BHD.....48        |
| Dynalab Test Systems.....27                     | Lakes Precision Inc.....24                 | Tri-Tech/Kodera Machine Sales, Ltd .....22     |
| ECC.....30                                      | Lapp Tannehill.....41                      | Tyco Electronics .....25, 44, 51               |
| EIC Wipers.....33                               | Lone Star Industrial.....28                | Wezag Tools, Inc.....13                        |
| Electrical Products Sales Corp.....32           | LTL Tooling & Assembly.....32              | White Products Division (J.R.Greenleaf).....22 |
| Electrical Wire Processing Technology Expo...59 | Magna-Tech Mfg.....33                      | Wire Systems.....16                            |
| Electromatic.....32                             | Mark-10.....38                             | Wiring Harness Manufacturer's Assoc.....54     |
| Electronic Connector Corp .....28, 43           | Master Appliance Corp.....49               | Wiring Harness Supplier Directory.....48       |
| Eraser Company, The.....52                      | Mecal.....11                               | www.ferrulesdirect.com.....14                  |
| Etco.....46                                     | Mechtrix Corporation.....12                | Z-Tech Engineering LLC.....17                  |

**DON'T RUIN YOUR PAPER! COPY THIS FORM AND MAIL OR FAX TODAY.**



**IMPORTANT...** *Wiring Harness News* has a very large promotional list which we use on a rotating basis. You may occasionally receive a complimentary copy of this paper but a subscription will insure that you receive every information packed issue.  
**DON'T DELAY... SUBSCRIBE TODAY!**

**SUBSCRIPTION ORDER FORM**

NOVEMBER/DECEMBER 2010

**Dear Kathy:**

Yes, keep me informed on the latest trends in the Wire Processing Industry. Please sign me up for a one-year subscription to *Wiring Harness News* for \$39.00\*. (You may phone in your charge orders to 888-709-8179.)

\*Canada & Mexico=\$44.00 (U.S.) All other countries=\$54.00 (U.S.).

Foreign subscriptions must use a credit card or U.S. dollars drawn on a U.S. bank.

Check enclosed.  Bill me. (P.O. number, if any \_\_\_\_\_)

Visa  MasterCard  Discover  American Express

Card No. \_\_\_\_\_ Name On Card \_\_\_\_\_

Exp. Date \_\_\_\_\_

Name \_\_\_\_\_ Title \_\_\_\_\_

Company Name \_\_\_\_\_

Street Address \_\_\_\_\_ P.O.Box \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_ Country \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_

Email \_\_\_\_\_ Internet \_\_\_\_\_



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.

**Wiring Harness News is published bi-monthly.**

- JANUARY/FEBRUARY
- MARCH/APRIL
- MAY/JUNE
- JULY/AUGUST
- SEPTEMBER/OCTOBER
- NOVEMBER/DECEMBER

**Please make your check payable to Wiring Harness News  
 MAIL YOUR COMPLETED SUBSCRIPTION FORM TO:**

WIRING HARNESS NEWS, P.O. Box 527, Richmond, IL 60071 OR FAX IT TO: (888) 709-8179  
 We also offer bulk copy subscription rates – call for rate card.

# Exhibit at the NATION'S LARGEST Dedicated Wire Processing Event!



The Electrical Wire Processing Industry Meets in Milwaukee in May

## REASONS TO EXHIBIT WITH US

- 1 This is your industry's show – a show tailored expressly for those in the electrical wire and cable processing industries.
- 2 Meet with more key buyers and quality attendees looking to your products for solutions to their problems. No need to sort out non-industry attendees. Everyone is here because of their interest in wire processing.
- 3 Conduct business in a relaxed and friendly atmosphere. Free beverages and food breaks held each day.
- 4 Present your company as a major player in the industry as you cement relationships with current customers and build your customer base.
- 5 Booth space, electrical services, decorating and freight costs are all extremely reasonable, in some cases half the cost of Chicago shows.



OUR  
11<sup>th</sup>  
SHOW!

ELECTRICAL

wire  
PROCESSING  
TECHNOLOGY  
E X P O

# May 18 & 19, 2011

Frontier Airlines Center  
Milwaukee, Wisconsin

800-367-5520



[www.ElectricalWireShow.com](http://www.ElectricalWireShow.com)



# How strong is your bench?



## The Komax Wire Processing Team Covers Coax to Multiconductor Cable and Everything in Between!



**Kappa 310**



**Kappa 321**



**Kappa 320**



**Cosmic 48R**



**Cosmic 927RX**



**Cosmic 42R**

*Our lineup of wire cutting and stripping machines carries powerful advantages:* Quick cycle times. Network enabled. Tool-less changeover setups. Intuitive interfaces, including many modeled after the exclusive TopWin™ software used in Komax fully-automatic equipment. And much, much more.

Kappa units cover a broad range of processing, including difficult materials. Cosmic units can store up to 1,000 different setups for quick cycle times whether stripping coaxial, multi-core or standard wires. To learn more about fielding these remarkable machines, on your benchtop team, just contact us.

# **komax**

[www.komaxusa.com](http://www.komaxusa.com)

Professionals in Advanced Automation

CERTIFIED  
ISO 9001  
CERTIFIED