

This Issue Features:

- Jack Dennehy Retires
- Help Overcoming COVID's Disruptions - Part 2
- Top 10 Tips: Successful Manufacturers Get Things Done
- Hybrid Connectors - More Than the Sum of Their Parts
- Recent Changes to DoD's CMMC Cybersecurity Framework
- Thermosleeve USA Announces Move to Central US Location
- The Battery Show and Electric & Hybrid Vehicle Technology Expo
- Box Builds to Brave the Elements: Understanding Enclosure NEMA Ratings

SUBSCRIBE FREE
WiringHarnessNews.com



Company Profile: InSource

By Joe Tito
Wiring Harness News

It's not uncommon for a contract manufacturer to take an indirect journey to harness production. It's a big part of what makes these Company Profiles so interesting. It's also why I was excited to have a chat with Larry Manz, Director of Sales & Marketing at InSource. We first met Larry at the WHMA Conference back in February. The InSource booth was next to ours at the event and we inevitably struck up a conversation with Larry and his cousin Fred Manz from Marketing and Sales at the company. We later caught up with them at the exhibitor party at the recent EWPT Expo in Milwaukee. What were they doing exhibiting at these events? Well, that's an interesting story in itself, and we'll get to that later.

To learn the whole story, Larry took us back to the early 1990's when

his father Ken, InSource founder, was a key engineer at a manufacturer of components and peripherals for the HVAC industry. "He held several patents there and was instrumental in the freon recycling and recovery industry," Larry described. "Prior to that, they didn't know they needed to care about freon emissions."

Around that period, the EPA came out with with an SAE standard to deal with the problem. Ken sat on that committee and played a key role in drafting the regulation that launched R-134a, which did not have the ozone depleting properties of R-12 and R-22 refrigerants. Within his company, he helped develop the first equipment that would recycle the R-12 and R-22 refrigerants, capturing the ozone depleting elements of the gases.

The company flourished in this new industry, but as a union shop, the labor costs were quite high. As competitors jumped in, they feared losing business to Mexico or China. Ken saw



InSource boasts many innovations in their harness operation. Will Manz, Tony Manz, Fred Manz, and Nick Flint show BraiderBot at EWPT '22.

an opportunity to become a contract manufacturer supplying the company, thus keeping good jobs in Ohio. In fact, that was the inspiration for the name of his new company, InSource.

He began in 1997 with a 2,520 ft.² facility making one product, a refrigerant identifier. The briefcase sized unit had a substantial amount of wiring and InSource actually bought the wires from a local supplier. "Then, in 1998, we purchased a wiring harness company in central Ohio that served the forestry equipment industry and began to make our own wires for the product," Larry said. "We had new products that came in, and by the end of 1998, we were building harnesses as a contract manufacturer."

It was at this time that they added another 9,000 ft.² of manufactur-

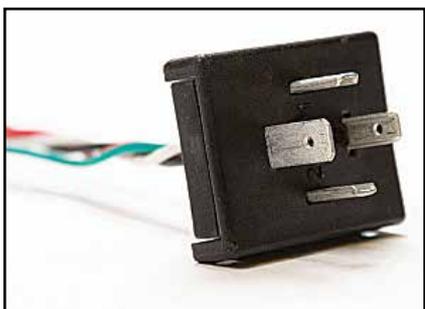
ing space. The company's growing engineering department also added Embedded C software capabilities as they started production of leak detectors and vacuum gauges.

In order to bring in new business, Ken hired a family friend as a sales consultant. "This was before everybody was using the internet, and he would go to the library and sit down with The Thomas Registry looking at the target markets and regions we had identified. He made cold calls and asked for an appointment," Larry chronicled. "Sometimes he would get them, sometimes he wouldn't — it was a different world then."

In the early 2000's, the company

Continued on page 21

Sealing Electronics With Vacuum Impregnation



Vacuum sealed assembly.

Electronics have made products faster, safer, and more reliable. They have become so prevalent that they're practically a commodity in the same way aluminum and steel are. As this trend continues, manufacturers need solutions that address the leak paths that occur

naturally during manufacturing these components.

However, the connection is not commonly made that vacuum impregnation is just as effective for electronic assemblies, including wiring and plastics. All engineers know that plastic components must be protected before assembly to ensure optimum effectiveness. Still, when it comes time to prepare their parts for shipping to the customer, most turn to more familiar, but less effective methods like O-rings, epoxy, silicone or topcoats.

Yet, this lack of information could affect the quality of parts and ultimately lead to a failing or poorly per-

forming product in the field. Whether you're a design engineer for a vendor or an installation engineer for an OEM, your reputation as an individual and a company relies on your knowledge of the latest techniques in avoiding field failures. Only then can you deliver a quality product to the customer that can be relied upon every time.

Vacuum impregnation is a process that was developed in the 1940s to seal die cast aluminum porosity. Over time, the process has evolved to seal other materials in addition to aluminum.

This piece is a guide that will help you understand how vacuum impregnation seals electronics and the benefits of vacuum impregnation. **The Vacuum Impregnation Process**

Generally, the process occurs in the following four steps:

Step 1: The part is placed in an impregnation chamber, where a deep vacuum is created to evacuate air from the leak path.

Step 2: The evacuated leak path is filled with sealant by covering the part with the sealant while under vacuum. When the vacuum is released, positive pressure is applied while the part is still covered.

Step 3: The part is moved to a wash/rinse station. Here, the residual sealant is washed from the part's internal passages, taps, pockets, and features where the sealant is undesirable.

Step 4: The part is moved to a cure station. Here, the impregnated sealant is polymerized in the leak path.

Why Electronics Need to be Sealed

A leak path is any gap or void between materials in an electronic component. These gaps or voids happen during manufacturing when different materials contract at different rates due to their natural properties. These voids may not

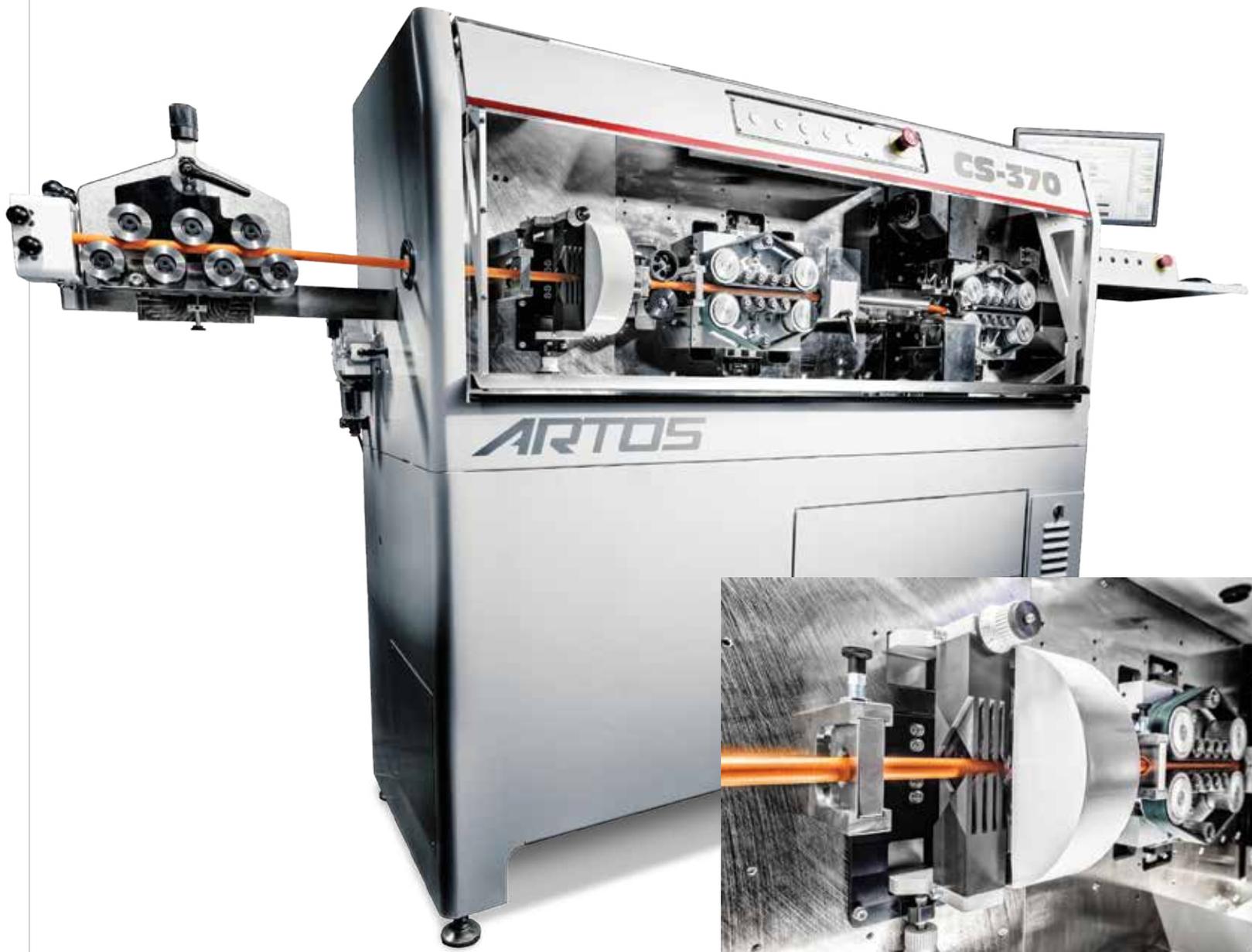
Continued on page 14

PRSRST STD
US POSTAGE
PAID
ABT

WE ARE THE
END OF WIRE
EXPERTS



INTRODUCING A NEW SPIN ON HEAVY CABLE PROCESSING



INCREASE EFFICIENCY WITH ARTOS ROTARY CUTTING AND STRIPPING

As wiring harnesses become more complicated it's critical to make multiple cuts and strip wire without losing production time for setup or blade changes.

The rotary incision unit (RIU) on the CS-370 offers multiple stripping options for multi-layer and shielded cables up to 300mm², making it ideal for complicated wiring harnesses, like those used for electric vehicles. The RIU can be built into new CS-370 units or retrofitted.

With options for wire slitting and ink

jet marking, the CS-370 is as versatile as it is dependable for large wire applications.

Artos and Komax together. Prepare for the future, now. Call: 262.252.4545 or email sales@artosnet.com.

*Artos Engineering is ISO-9001:
2015 certified.*

The first name in wire processing

ARTOS
ENGINEERING COMPANY

Komax Corporation | 21605 Gateway Ct. | Brookfield, WI 53045 USA
Phone 262.252.4545 | www.artosengineering.com | e-mail sales@artosnet.com

July/August 2022

FEATURES

Industry Profile:

InSource 1
InSource is an amazing company with an amazing culture. The creativity they foster in streamlining their operations has led to many innovations - some worthy of marketing separately. Read how these folks take customer service and team appreciation to a new level.

Sealing Electronics With Vacuum Impregnation 1
What if you could seal your assemblies from the inside out? Read how this mature technology has been adapted in new ways to seal electronic assemblies from the folks at Godfrey & Wing.

Jack Dennehy Retires6
Jack Dennehy has been a stalwart in our industry for over 50 years. We wish him the best of luck in retirement with this short tribute.

Thermosleeve USA Announces Move to Central US Location 13
It has been an incredible year of growth for the new owners of Thermosleeve. Learn how their move from the west coast to a more central location in Indiana will help them better serve their US and Canadian customers.

Why Exhibit at M-EXPO - An Exhibitors Perspective 30
Have an operation in the all-important Juarez manufacturing corridor? Looking for ways to market wire processing equipment there? Find out about M-EXPO!

Recent Changes to DoD's CMMC Cybersecurity Framework 36
There have been some changes to the CMMC Cybersecurity framework. Read about the updates in Version 2.0.

The Battery Show and Electric & Hybrid Vehicle Technology Expo ...47
This gathering has great relevance to the harness and cable assembly industry. Read about this important show.

Box Builds to Brave The Elements: Understanding Enclosure NEMA Ratings 48
Industrial enclosures are classified based on their ability to protect their components and the humans around them. This is where the National Electrical Manufacturers Association (NEMA) ratings come in. They are key in choosing the right enclosure.

New Advertiser Offers Low-Cost Crimper 50
Read how this manufacturer of specialty electronic assembly equipment is filling a niche in the bench-top crimping arena.

IPC Celebrating 10 Years of Success in India53
India has become a key player in the world harness market. Learn how IPC has helped through skill training & certification.

EWPT EXPO NEW PRODUCT

Daniels Manufacturing29
LaceLok® Cable Lacing Fastener is a revolutionary way to provide secondary support for wire harnesses.

Mecal by Starn31
In conjunction with Raydiall Automotive, and C & S Technologies Mecal by Starn has developed a 3-Zone sensing system for coaxial cable and FAKRA terminals.

CAMI Research40
The New M2Z Low Voltage Multi-Conductor Cable Tester checks for opens, shorts, miswires, intermittent faults and diode orientation.

IN EVERY ISSUE

Leadership 8
Paul Hogendoorn rounds out his Top 10 Tips. He tells how two quotes he encountered on his path can be key to organizational success and getting things done.

M & A 10119
Most folks are aware of the Payroll Protection Program from the US Government, but Loren wants folks to know about the Employee Retention Credit.

Wire Wisdom34
We are all very familiar with the use of Teflon® as insulation material. But did you ever wonder how and why it was developed? Learn about the physical and electrical properties of this 20th century marvel.

Back to Basics 44
Hybrid Connectors marry signal, data and power into one connector. Discover the inner workings of these highly functional connectors.

News Plugs 51
Read about the latest products on the market and points of interest about companies and people in the industry.

WHMA - Wired In 55
WHMA recognized the accomplishments and contributions of leaders in our industry at two recent events.



EDITORIAL CONTENT MANAGER

Joe Tito
joe@wiringharnessnews.com
Phone (407) 739-9811

ACCOUNT MANAGER

Jim Brown
jim@wiringharnessnews.com
Phone (708) 594-7764

Wiring Harness News (ISSN 1097-0789) is distributed bi-monthly to wiring harness & cable assembly shops, cord set manufacturers, and to companies (OEMs) that process electric and optical wire & cable.

Copyright 2022
International Harness Resources Inc.,
(IHR Inc.)

Wiring Harness News
PO Box 669 • Schererville, IN 46375 USA
wiringharnessnews.com

Office Hours: 8:00 a.m. - 4:00 p.m. CST
(Monday-Thursday)
Printed in the USA

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.

SUBSCRIBE FREE
WiringHarnessNews.com

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

PRE-EXISTING CONNECTORS? NO PROBLEM!

EASILY ADD FLEXO® F6® AT THE FIRST STEP OR LAST STEP OF YOUR WIRE HARNESS BUILD

TECHFLEX
Braided Sleeving Products

From the Editor

I had a couple subjects I wanted to touch on, so here goes:

EWPT 2022 - We had a very successful show and the comments from other exhibitors were very positive. We did notice a lack of visitors from abroad and OEMs seemed a bit underrepresented. That was expected, however, and our overall experience was quite positive. One interesting item of note for me was the number of new people in our industry—both on the visitor and exhibitor side. It was great to see so many new faces along with the familiar ones we missed so much.

WHN Rebranding - Did you notice our new look at the show? It was definitely time for some fresh branding, and we decided to debut it at the show. We will be rolling it out to the print publication and website throughout the remainder of the year.

Birdhouses - I got a lot of feedback from the *Are You Still Building Birdhouses* piece in the last issue. It dealt with having to part ways with customers who no longer fit your business model. I'd like to do a follow up article and I'd love to hear **YOUR** thoughts. Take a glance at the article in the May/June issue (or enter the word 'birdhouses' in the search box at www.wiringharnessnews.com). Drop me a line—it would be greatly appreciated.

Keep plugging away!

Joe



Joe Tito
Editor
Joe@wiringharnessnews.com
407-739-9811

LAKES PRECISION^{INC.}

Your Global Source for Wire
Processing Perishable Tooling

- ✓ COST EFFICIENT TOOLING TO OEM SPECIFICATIONS
- ✓ CUSTOM BLADE DESIGN & MANUFACTURING
- ✓ APPLICATION ENGINEERING
- ✓ STOCKING PROGRAMS

GLOBAL HEADQUARTERS
1900 Epler Court, Three Lakes, WI 54562
P: (715) 546-3070 | F: (715) 546-2565 | blades@lakesprecision.com

EL PASO, TX
12350 Montwood, Suite 200 | El Paso, TX 79928, U.S.A.
P: (915) 856-6606 | F: (915) 856-6608 | laura@lakesprecision.com

WWW.LAKESPRECISION.COM
9001-2015 ISO CERTIFIED



Schaefer Technologies LLC

751 N. Raddant Road
Batavia, IL 60510, USA

Phone: +1 630 406 9377

Fax: +1 630 406 938

E-Mail: batavia@schaefer.biz

Web: www.schaefer.biz



SEAL-CRIMP MACHINE SSC3

SEALING OF THREE-CORE CABLES

- Stripping, sealing and crimping of multi-core cables
- Wide range of potential applications
- Short set-up time and high flexibility
- Powerful touch interface for intuitive operating
- Integrated vacuum cleaner
- Optional quality equipment
- Useable with all common seal types



Samec Machine s.r.l.

Via delle Prese, 45
36014 Santorso (VI) - Italy

Phone: +39 445 576 149

Fax: +39 445 501 255

E-Mail: service@samecmacchine.it

Web: www.samecmacchine.it



Cutting-Stripping Machine TSA-25

Automatic processing of cables with large diameters with batch collection options



Crimping Machine Megomat 800

Processing of wires with cross sections of 0.20 - 6 mm² for individual applications



THERMOSLEEVE | USA
HEAT SHRINK TUBING

the leading supplier of heat shrinkable products

- * 2:1 Single-Wall Heat Shrink
- * 3:1 Dual-Wall Adhesive Heat Shrink
- * Medium-Wall/Heavy-Wall Heat Shrink
- * Special Design Single-Wall Heat Shrink
- * Extrusion Tubing
- * Cold Shrink
- * Standard Expandable Sleeving
- * Cable Wrap
- * Special Expandable Sleeving
- * Insulating Sleeving and Tubing

LARGE INVENTORY OF HEAT SHRINK TUBING
In Stock & Ready for JIT delivery - contact us to place your order

tel 833-753-3831 email orders@thermosleeve-usa.com
www.thermosleeve-usa.com

Jack Dennehy Retires

After 50 years in the business, Jack Dennehy, Owner of Composite & Wire Machinery, has decided to retire. If you know Jack, you can probably guess he is not one to talk about himself. But after a fair amount of arm twisting, he acquiesced to spending a few minutes with me talking about his years in the industry. "I had a couple key employees retire," Jack said, "so after 50 years in the braiding industry, I decided to retire." At 82, Jack is as sharp and spry as ever and decided to finally pursue a more leisurely lifestyle. "God has been good to me health wise, so I decided it was time to slow it down."

Jack stopped taking new orders in May of 2021. "We still had a banner year! We had those machines built and shipped out by October," he detailed. He has spent the past months winding down the business and is finally at a point where he can relax. "I was very fortunate in that another company in town had their eye on my real estate for the last three years. They approached me when they found out I was going to wind it down and they bought the building. So, everything just kind of worked out lovely."

Jack has kept his old phone number and email address and hopes to stay in contact with folks in the industry. He has decided to refer his customers to John Tomaz at Wardwell Braiding when they call him for parts or new equipment. "I've always stuck with the New England design, so almost any parts for my machines they will be able to get from John."

As a testimony to Jack's hard work and attention to detail, one of his good customers bugged him to build them some machines late last year. "They said, c'mon Jack...you must have some spare parts to build some machines. But I told them 'no, I'm done guys.'" Jack has a tremendous amount of respect for his loyal customers who made it all possible for him over the years. "I was selling to the grandchildren of people I sold to back when I was with New England Butt," he recalled proudly.

Jack asked me to keep this short, so I will. I speak often about the class and dignity of folks in this industry, and Jack Dennehy is a wonderful example. I'm so honored to call him my friend, and so appreciative of the wisdom and knowledge he has shared. Join me in wishing him all the best in retirement.

TRD701 ShinMaywa **New** Automatic Wire Terminating Machine

High speed processing (5,300 pcs/ H)

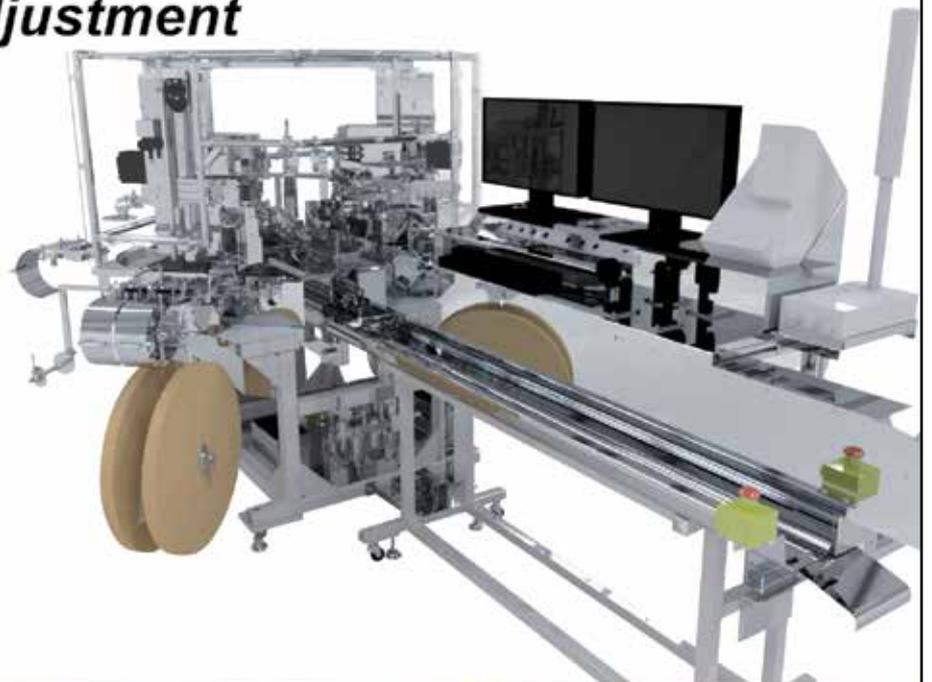
Accurate sensors to detect tiny defects

Quick changeover & shorter adjustment

Ready for extra built-in options

100th

Tradition and Innovation
Celebrating 100 years in business



ShinMaywa
Brighten Your Future

ShinMaywa (America), Ltd.
10737 Gateway West, Suite 240 El Paso, Texas 79935, U.S.A.
TEL: +1-915-594-9862 FAX: +1-915-594-9866
E-mail: info@shinmaywaamerica.com
<https://www.shinmaywa.co.jp/america/>

CIRRIS®

Member of the Schleuniger Group



High Voltage & Functional Test Systems for the Rail Industry

When building, updating, and testing railway vehicle circuits, you want to be time-efficient and thorough. We can help you automate the process to ensure quality.



Software that simplifies test program development and data import



Readily automate the testing of switching cabinets and cab panels



High voltage testing up to 6000 VDC and 5000 VAC



Intelligent test cables that can connect anywhere in the test point interface



Higher current capacity for testing circuits that span one or multiple cars



Print reports or export test results to a database or to separate files



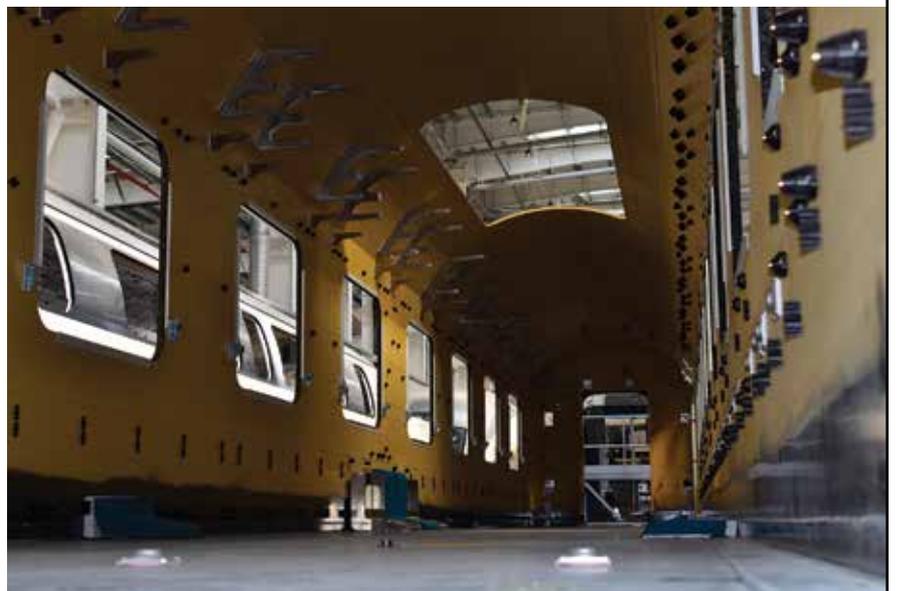
Up to 132,768 test points in a central cabinet, or distribute them in smaller boxes around or within a large assembly



Complete test solutions from concept through implementation, including training, ongoing support, and calibration

Learn about our complete testing solutions.

RAIL.CIRRIS.COM | 1-801-973-4600



SCHLEUNIGER TESTING ALLIANCE

To Be Best in Test.

Uncompromising Quality Control!

Using built-in scripting with operator prompts to automate a test procedure is only one way in which the flexible, intuitive **CableEye®** cable and harness test system adapts to meet your needs.



Production Continuity & Hipot Pass/Fail Check GUI

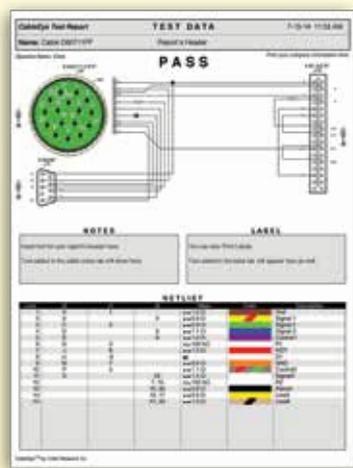
- If you want a clear, simple operator interface for production workers, it's easy!

- If you need to display work instructions with images, or change the screen language, we have your back.



Pop-Up Work Instructions with Photos, Interactive Buttons, Triggers

- If you need measurement data in a report showing resistances, voltages, and leakage current for every connection, we can provide this, automatically.



Out-of-the-box, Customizable Reports

- If you need reliable, fast diagnostic tools to locate opens, shorts, miswires, or intermittent connections, our live graphic wiring display makes this a snap.



Diagnostic Netlist/Schematic

- If you need to protect stored cable data from inadvertent erasure or tampering, our operator log-in privilege settings are there for you.

- If you prefer to readily share files and auto-detected fixtures between different models, our common software platform and network interface makes that a cinch.



LabVIEW™ and API Interfaces Available

- If you require your system to be Future-Proof, you will like that we do not use embedded computers or screens.

- If you insist on reliable hardware and rock-solid support, we insist on that too. Here's what others have to say:

camiresearch.com/testimonials

Continuity • Resistance • 4 Wire • Capacitance • HiPot

2 Yr Renewable Warranty
with Free S/W Updates, Tech Support!

CableEye®
CAMI Research Inc.

+1 978-266-2655 | sales@camiresearch.com
© CableEye and the logo are registered trademarks of CAMI Research Inc.

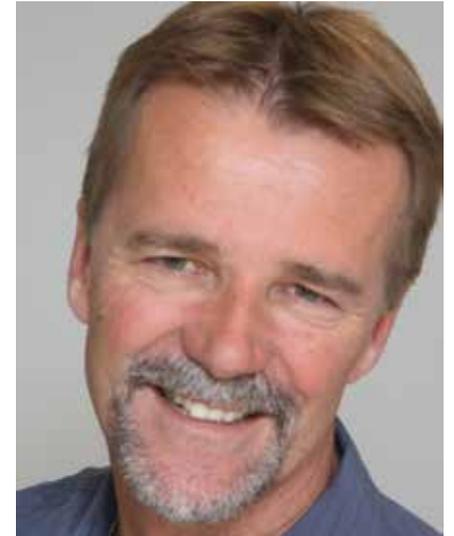
Try a Demo System!

LEADERSHIP

PUTTING INSIGHTS INTO ACTION

Top 10 Tips: Successful Manufacturers Get Things Done

By Paul Hogendoorn



Paul Hogendoorn

I'm continuing the Top 10 Tips gleaned from successful companies and leaders that I've worked with over my 40-year career. Although the two Tips shared in this column (Tip 8 & 9) are very similar and intricately related, they are also critically distinct.

The first tip comes from something someone said to me many years ago in a non-manufacturing context, but it is something I have observed plenty of times in successful manufacturing operations. It was said by a colleague on a church board many years ago, as the two of us were assigned yet another task (on our already compressed personal schedules). He said: "if you want to get something important done, then ask a busy person."

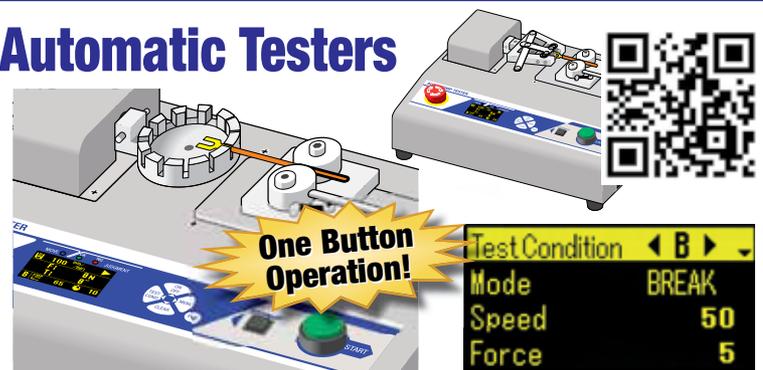
Here's why that's a great tip. Truly busy people in manufacturing have a knack for getting things done - that's why they're busy people. They are not looking to put new things on their list but instead are trying to

find the quickest way to get an item off their list. Yes, there are people in manufacturing (like everywhere in our society) that know how to make themselves busy or keep themselves busy, but successful company leaders innately know the difference between routinely busy people and truly busy people that get things done. How do I know this is true? Easy. A task that is critical and really needs

Continued on page 10

Wire Crimp Pull Testers

Automatic Testers



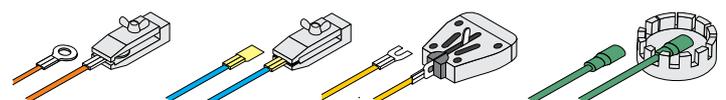
- Program Destructive or Non-Destructive Modes, Force, Speed and Time
- Save up to 26 Test Configurations • Quick Change Attachments Available

Manual Testers



- Simple One Stroke Operation
- Economical Solution
- Up to 220 lbf

Many Types of Gripping Attachments & Fixtures Available



Call 800-373-9989 or Visit imada.com

imada.com
ISO 9001 Registered ISO/IEC 17025 Accredited

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

MODULAR AND FLEXIBLE FOR CHALLENGING CONDUCTORS



to the live experience

KAPPA 330 Cut and Strip

Available as Single Head or Dual Head, the Kappa 330 is extremely flexible and offers various special knives for simultaneous cutting and stripping. Up to three processing steps can be carried out in one pass. The optional slitting unit, the inner conductor separation unit and the ribbon cable processing are perfect for customers who want to process a very wide range of challenging cables.

komax
komaxgroup.com

Top 10 Tips: Successful Manufacturers Get Things Done

Continued from page 8

to get done seldom gets assigned to a person with a track record of managing never ending projects that seem to go on and on, they get assigned to people trusted to deliver an outcome. Without even deliberately knowing they delegate tasks in this way, they do. The truly busy people get assigned the important tasks because the expectation is that they will get the task done, while the routinely busy people have a knack for keeping visibly busy (and therefore important) by keeping projects open and problems unresolved. Truly busy people know how to delegate, when

to stay out of the way, and when to roll up their sleeves and just do it themselves. Their focus is getting the important tasks done and making themselves less busy. Routinely busy people are looking to remain busy (or important), and often without knowing they are doing it, they keep tasks open and keep themselves positioned as a critical communications conduit; they resist closing the task out to get assigned another task, or worse (in their minds), have no important task assigned to them. Truly busy people don't have this aversion, because as soon as they have any bandwidth at all, other important

tasks are assigned (or reassigned) to them. What I've observed over the last 4 decades is that most progressive company and department leaders already instinctively know this, they just aren't aware of it. The key is to not burn out your truly busy people, but instead, let them graduate up the ranks as they succeed, confident that there is another high achieving candidate ready to follow their lead and fill their shoes.

The second tip comes from someone I was also on a board with. We faced many challenging situations together, some big, some small. His closing mantra was "leaders find a way."

And indeed, they do. The leader is not the person with the position or title, or the education, or the letters behind their name. The leader is simply the person that finds a way when others don't or can't. In all of our workplaces, there are many people that can point out the reasons why something can't get done, and in fact, we often admire, empower, and even promote individuals that have great abilities to foresee or articulate problems that others can't see. But how does that get a company ahead? At best, it keeps the company from going backwards - but it doesn't pull the company forward. Not going back-

wards does not equal going forward. Many managers are to some degree inclined to keep companies from going backwards, but leaders are more often inclined to find a way forward. There are leaders in every organization, in roles up and down the org chart. In the most successful organizations I have encountered, the people that find a way (leaders) are supported, encouraged, and appreciated. In less successful organizations, the folks that have a knack of finding a way become discouraged and move on. If a leader's true role is to develop new leaders, the company's culture will foster and encourage its people to imagine, plan and persist - to find ways to move forward, and not just prevent ways of moving backwards.

This is a key differentiator that I've observed that sets succeeding and thriving manufacturers apart: they build on the people that take them forward. As they empower, enable and grow those people, they build their businesses.

Who are those people in your organization - the ones that find a way and get things done? Are you building on them?

Feel free to send me a note at Hogendoorn.paul@gmail.com if you have tips to share. We are in this together!

Use ultrasonic welding for strong and reliable connections

DON'T LET YOUR CABLES DOWN

Strong, reliable and without any loss of conductivity: Connect your wire and terminal applications in the shortest time possible and with little energy – all thanks to the power of ultrasonics!

Let's develop your ultrasonic welding solution:

www.herrmannultrasonics.com

See you at

The Battery Show

September 13 - 15, 2022

Novi, USA, booth 1932



**BONDING –
MORE THAN
MATERIALS**

WH **Herrmann**
Ultrasonics

Wire Crimp Pull Testing



Whether pulling to a break, pulling to a force, or holding at a force, rely on Mark-10 pull testers to satisfy your UL, ISO, ASTM, SAE, MIL, and other testing requirements up to 1,500 lbF / 6.7 kN of force.

Select from manually operated, motorized, or handheld solutions - all engineered, manufactured, and supported in the USA.

▶ Visit www.mark-10.com for videos, complete specifications, and pricing.

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



Plan on Building Harnesses for Aerospace & Defense?

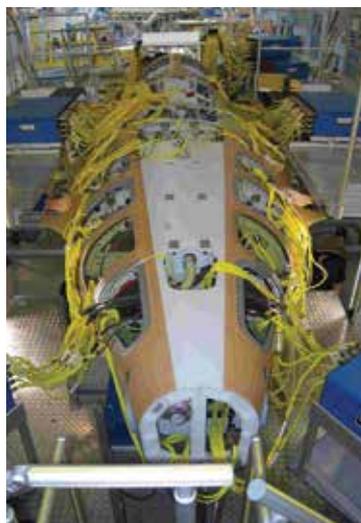


Then Plan on Testing With a DIT-MCO



There's a reason every branch of the US Military and every one of their Tier 1 suppliers use DIT-MCO wiring analyzers. From cables, harnesses and relay racks, to panels, black boxes and LRUs, DIT-MCO has been the #1 tester of choice for over 60 years. You might use other wiring analyzers for commercial customers, but you'll want DIT-MCO for your defense customers.

More than just selling you a tester, DIT-MCO strives to assure that you produce quality wiring products more efficiently with us as your complete partner.



Complete Aircraft Wiring Test



Custom Adapter Cables and Test Programming

Call or e-mail DIT-MCO today to discuss your next wiring test application with one of our experienced test experts.



www.ditmco.com

800-821-3487 • 816-444-9700

Thermosleeve USA Announces Move to Central US Location

WHN speaks with Vice President about the move and other developments.

I recently got an email blast from Thermosleeve announcing their pending move to a new location. I knew the company had changed hands about a year ago, and thought it was a good time to contact them to get more details about the move, and see what other changes may be taking place there.

I chatted with Tim Bagley, Vice President of Thermosleeve USA, and he brought me up to speed. "We purchased the business about a year ago and we have grown it tremendously in the old location," Tim reported. The company is currently located in California and Tim mentioned it can take 5 to 6 days to ship product to the East Coast. "The new building in Noblesville Indiana will allow us to ship coast to coast within a couple days. This central location means we'll be able to service our customers faster. At the same time it's a much bigger facility and will allow us room for growth and space for additional

inventory to meet our customers' demands for heat shrink tubing."

The new facility will also house Thermosleeve's sister division Cable Tie Express. The Cable Tie division made the move in late May/early June, and the Thermosleeve move should be final by the end of July. "Our goal is to do the move in stages so that we don't disrupt our shipments," Tim indicated. "We're going to start shipping overstock product from the new facility in late June. Then, during the month of July, we will slowly transition the remaining product lines into the new location." The company already has staff in the new facility, and the existing staff in California will be fulfilling orders until the move is complete, so there will be no disruption in service.

I asked Tim to explain their phenomenal growth over the past year. "First, we've been very aggressive in the marketplace promoting the company and calling on new customers. Also, we began working with national wire distributors in the US and Canada to promote the brand and develop new opportunities," he explained.



Tim feels confident the number one thing that helped propel their recent success has been their investment in stock. "As you know, over the past 12 to 14 months, inventory has been gold. While our competitors have been out of stock, we've been able to capitalize in that we have product on the shelves and can ship right away."

Tim is very happy with the success they've had over the past year, and looks forward to the future in Indiana. Stay tuned for further developments as Tim and his team intend to take on new challenges to better serve the industry. Check out Thermosleeve at www.thermosleeve-usa.com. Don't forget to also take a look at their sister company, Cable Tie Express, at cabletieexpress.com.



MEXICO ASSEMBLY
WIRETECH

THE BIGGEST EXPO
DEDICATED TO ELECTRICAL
HARNESSES IN MEXICO



SEPTEMBER
07 & 08
2022

EXPO
CHIHUAHUA
CHIHUAHUA, CHIH

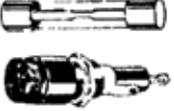
"WORLD'S LARGEST INVENTORY OF TERMINALS AND FUSES"

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:

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!*
Please visit our new on-line store at electricalproductsstore.com

BRAIDERS - NEW & REBUILT

SPECIALIZING IN NEW ENGLAND BUTT STYLE BRAIDERS:

#2 Harness Braiders

CB1 Cable Braiders

Specialty Application Braiders

Custom built 24 carrier, 32 carrier, 48 carrier braiders (plus even bigger) for wire and textile raw materials.

WE BUILD,
BUY & SELL
HARNESSES
BRAIDERS

**GLADDING
BRAIDING
MACHINES**

www.gladdingbraid.com

(315) 653-7211

SHORTEST
POSSIBLE
DELIVERY!

Sealing Electronics With Vacuum Impregnation

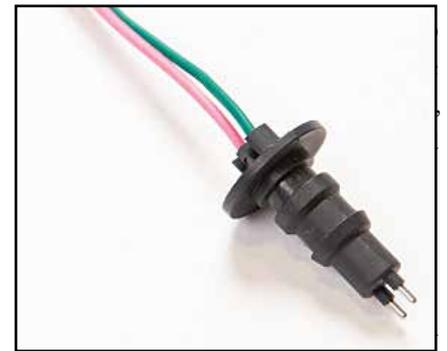
Continued from page 1

be visible, but they are disastrous. Moisture or corrosive agents can seep into the leak path, causing a part to be ineffective, leading to a field failure.

The automotive industry needs vacuum impregnation because specifications often demand that components like fuel pumps, wiring harnesses, or encapsulated coils meet leak requirements to protect them from road salt and moisture, leaks from the transmission or brake fluid, or gasoline.

Most electronic parts must also be protected from heat, whether from an engine manifold or the hot temperatures inside today's high-powered Pentium computers. Heat can cause plastic and metal to fluctuate at different temperatures, loosening the joint and reducing effectiveness.

If one seals a part with a rubber O-ring, it will become brittle and then crack over time. Likewise, if one puts a dollop of silicone around the connectors on the surface, that silicone is exposed to the elements, resulting in expansion, contraction, and thermal breakdown. Even a topcoat has the potential to crack,



process can be used for sealing all types of electronic components. Traditionally, it's mainly been used for things you might find under the hood of a vehicle, such as a connector, wire assemblies, and wire harnesses. But the drive toward zero fault tolerance has prompted the sealing of parts used in electronic equipment, even in commercial equipment. This includes computer cables, windings for electric motors, and portable wireless applications, where mechanical shock can cause connection failures.

The Benefits of Vacuum Impregnation

With electronics, there are three main reasons why vacuum impregnation is used.

1. Seal Leak Paths: Vacuum impregnation prevents fluids from leaking by sealing the leak paths.

Continued on page 16

WE BUY EMPTY REELS

We buy all types and sizes of reels (even cardboard drum reels)

Routine pick-ups to reduce your garbage cost

Drop trailers to reduce dock space being used by empty reels

CONTACT US

Chief Supply Inc.
 1301 Ardmore Ave Itasca, IL 60143
 chiefsupply3@outlook.com
 847-290-8686
www.chiefsupplyinc.com

HUGE

WAREHOUSE MOVING SALE!

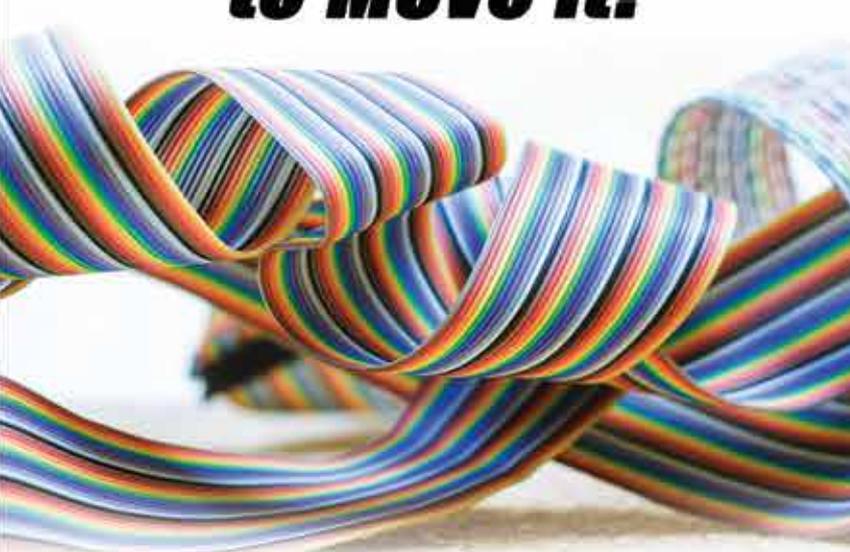
LARGEST SHRINK TUBING INVENTORY
IN THE US - 50,000 SQ. FT!!



LET US SHRINK YOUR SHRINK TUBING COSTS

All Sizes, Types and Color
Every Major Shrink Tube Manufacturer
Where your Local Distributor Shops

We Don't Want to Move it!



MANY SIZES OF RIBBON CABLE
AVAILABLE!

Call or email to let us know
your requirements

800.443.6528

jaguar@jaguarind.com



PORTABLE POWER CRIMPING

EMC3300
Electro-Mechanical
Full-Cycle Control



HXE4B
Battery Hydraulic
MIL-Qualified Dies



The EMC3300 and HXE4B battery powered crimp tools accommodate a wire range of 26-10 AWG. These open-frame tools provide an ergonomic solution for producing form crimps on outer contact bushings, ferrules, terminals, splices, and shielding.

The dies are interchangeable within each tool line. Choose from thousands of existing dies or have our team design a custom die for your application.

A Die for Every Job

- Hexagonal
 - B Crimp
 - Circular
 - Nest and Indent
- Other die configurations available

EMC3300 Dies



HXE4B "Y" Dies



407.855.6161
dmc@dmctools.com
www.dmctools.com



Sealing Electronics With Vacuum Impregnation

Continued from page 1

Vacuum impregnation permanently seals the leak path, and the sealant will last the part's life.

2. Prevent Corrosion: From either oxidation or galvanization, corrosion reduces current-carrying capacity and causes part failure. Vacuum impregnation prevents corrosion by sealing the leak path that oxygen and moisture can follow.

3. Enable Design Freedom: Vacuum impregnation does not change the part's dimensions, allowing engineers to design and make parts to the net shape. Since the process does not leave any sealant on the surface, an engineer does not need to incorporate dimensional allowance.

Vacuum impregnation seals parts that may otherwise have been scrapped. The process ensures the

part quality and helps ensure profitability.

In Summary

The surge in electronics has made porosity sealing crucial. Properly sealing the porosity ensures the component's quality meets its performance requirements. Vacuum impregnation is the most effective solution for sealing leak paths and preventing corrosion while enabling design freedom.

Many thanks to Andrew Marin of Godfrey & Wing for helping compile this article. Godfrey & Wing markets equipment, resins and other peripherals for companies who wish to engage in this game-changing technology for their OEM customers. They can also perform vacuum impregnation as a custom service to harness manufacturers who wish to offer this technology.



technology at work for you

Robert Technologies has been a trusted source for custom design connectors for over three decades. Whether military or commercial, our series of products plugs you into our standards of quality, integrity, and prideful manufacturing.



MS9055C32412S
Mil-DTL-22992 QWLD Class L



RT90556C44412P
Mil-DTL-22992 Comm. Class L



RTS00-37P SAE-AS81703
Series 2 Commercial



RT9606-37P SAE-AS81703
Series 1 Commercial

Specialized, standard, or engineered connectors are a click away at Robert-Technologies.com

(732) 254-6389 | info@roberttechinc.com

[@roberttechnologies](https://www.facebook.com/roberttechnologies) [@roberttechnologies](https://www.instagram.com/roberttechnologies)



Scan for additional information



SUBSCRIBE FREE
WiringHarnessNews.com



Save \$'s Wrap A Spot Tape Automatically

Gettig Taping Equipment measures and cuts from a roll, a piece of plain or preprinted pressure sensitive tape and wraps it around an object in about **One Second.**

Object Diameter:
1/16" to 1-1/2"

Tape Widths:
1/2" to 2"

SPRING MILLS MANUFACTURING, INC.
104 East Streamside Place • PO Box 85 • Spring Mills, PA 16875-0085
P: (814)422-8892 • F: (814)422-8011 • info@SpringMillsMfg.com
www.SpringMillsMfg.com



ECONOLASE



LASER MARKERS



MULTI WIRE



INK JET MARKERS



AUTO CRIMPERS



PLASMA

MAKE YOUR MARK

WITH OUR WIRE PROCESSING EQUIPMENT

TRI-STAR
TECHNOLOGIES INC.



UV LASER WIRE MARKERS

INK JET WIRE MARKERS

PLASMA PRE-TREATMENT

AUTOMATIC CONTACT
CRIMPERS

CUSTOM WIRE PROCESSING
EQUIPMENT

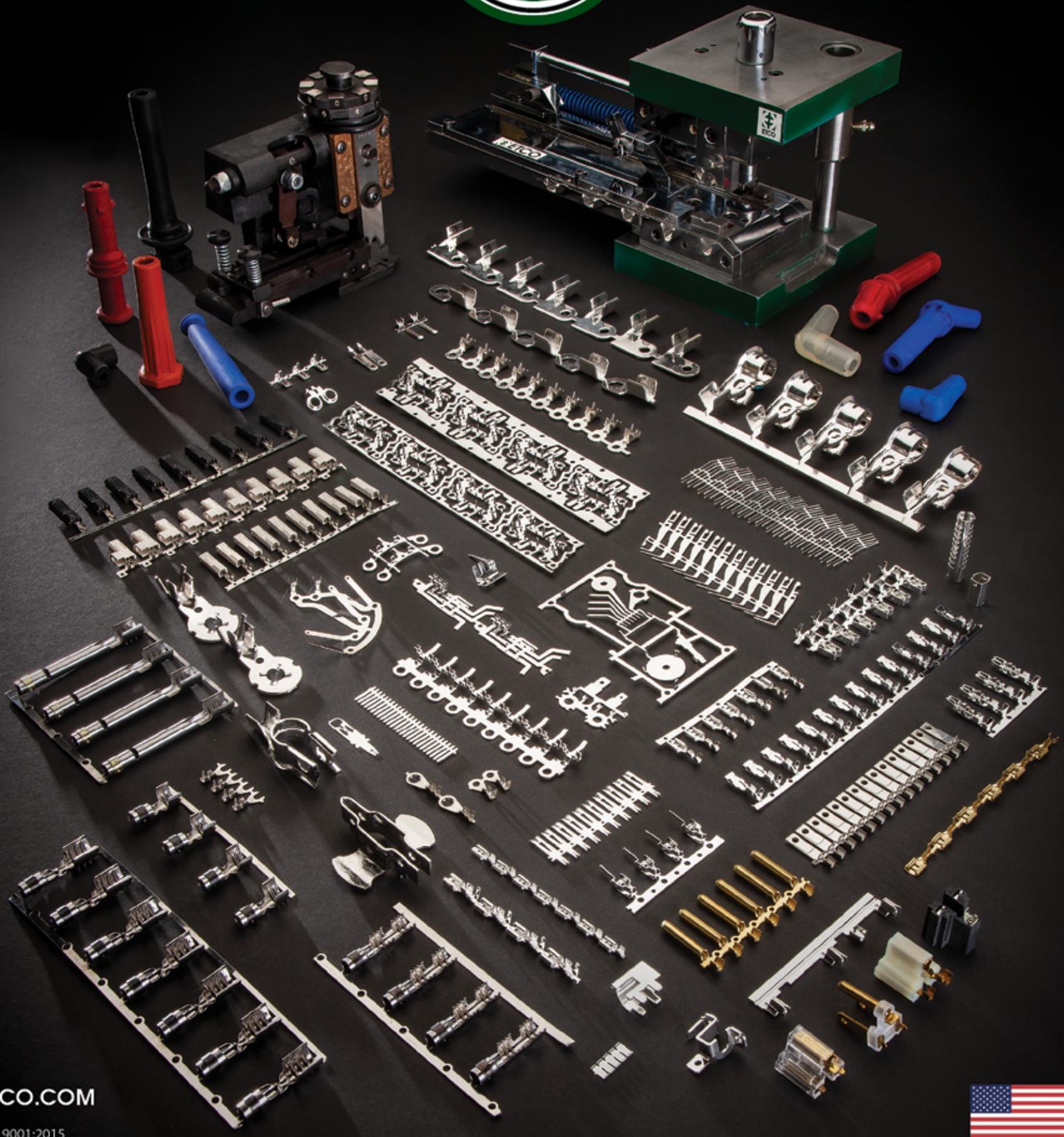


CALL US NOW!

323.347.5767

tri-star-technologies.com
sales@tri-star-technologies.com

ETCO Is Turning 75



ETCO.COM

ISO 9001:2015
IATF 16949:2016



MADE IN THE USA

Our Product Line Is Our Spokesperson

Superior quality across a broad range of standard and custom products, reliable delivery and extremely responsive customer service are the three main reasons why our customers are so loyal.

For 75 years we have been focused on these goals. If your supplier seems to be throwing up hurdles, contact ETCO at **1-800-689-3826**.



M & A 101: Lessons learned from decades of deals

Help Overcoming COVID's Disruptions - Part 2

By Loren Smith

The disruption COVID wreaked on the wire harness industry was--and to some degree continues to be--substantial. And while the Payroll Protection Program (PPP) was well known and widely used by those in our industry, I want to make sure my colleagues are aware of another federal government program that can help offset some of the overhanging COVID pain: Employee Retention Credit (ERC).

Unfortunately, ERC was not well publicized and is not well understood. Many harness companies never heard of it, or they and their advisors have checked into it and concluded they are not eligible.

The Employee Retention Credit was part of the March 2021 legislation of the American Rescue Plan Act, which expanded and extended the ERC program and allows eligible employers to benefit from both the PPP and the ERC.

I recently became aware of a division of a well-known consulting firm whose total focus is helping companies navigate the complex



Loren Smith CEO
Blue Valley Capital

rules for applying for ERC funds. They do this by using their own specialized software to put a dedicated infrastructure in place that is totally focused on the ERC application process. They have performed this service for many companies like ours, securing refunds as high as \$26,000 per employee.

I have already put a number of harness owners in touch with this firm with exceptional results. All had heard of the ERC, but their initial investigation led them to conclude

that they were not eligible.

The window on the ERC legislation is closing, but there's still time to apply, and the program has ample funds in place. If your company has fewer than 500 employees, and if you have not applied for or received ERC funds, please let me know if you'd

like me to help you get in touch with this firm.

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



ATLAS WIRE LLC

Insulators of Electrical Wires & Cables

<ul style="list-style-type: none"> ✓ 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 	<ul style="list-style-type: none"> ➤ Lead & Hook Up Wire ➤ 125C & 150C Cross-Link ➤ UL & CSA ➤ MTW ➤ Building & Fixture Wire ➤ Military ➤ Automotive/Marine ➤ Nylon ➤ Speaker Wire
---	---

www.atlaswirecorp.com

1601 Glenlake Ave Itasca, IL 60143 (847) 678-1210 (847) 678-1281 fax info@atlaswirecorp.com	 ATLAS WIRE LLC Registered to ISO9001 Certificate No. 10000854 IATF16	4705 S. Coach Drive Tucson, AZ 85714 (520) 747-4500 (520) 747-5800 fax info@atlaswirecorp.com
---	---	---



“

SHORT LEAD TIMES

TO EASE

THE SUPPLY CHAIN STRAIN

”

- 24 HOUR RESPONSE**
TIME ON QUOTES
- NO EXPEDITING FEE'S**
ON SPARE TOOLING IF YOU HAVE A LINE DOWN
- REVERSE ENGINEERING**
ON ALL SPARE TOOLING



2

WEEK

LEAD TIME ON SPARE TOOLING

3

WEEK

LEAD TIME ON STANDARD APPLICATORS

BEST AFTER-THE-SALE SUPPORT

★ 2 WEEK LEAD TIME ON STANDARD CRIMP TOOLING

★ 2-3 DAY TURNAROUND FOR RUSH ORDERS on Standard Crimp Tooling with no expediting fees

📞 Response time: **24/hrs. OR LESS**

👉 Visit our updated website: mecalbystarn.com

OEM APPROVED APPLICATOR PROVIDER FOR



TERMINALS.

MECAL BY STARN
20524 BLOOMING VALLEY RD.
MEADVILLE, PA 16335

Contacts: ▶ Sam Myers | 814.724.1057 x 123 | smyers@starn.com | mecalbystarn.com
 ▶ Gavin Wasko | 814.724.1057 x 203 | gavinw@starn.com | mecalbystarn.com

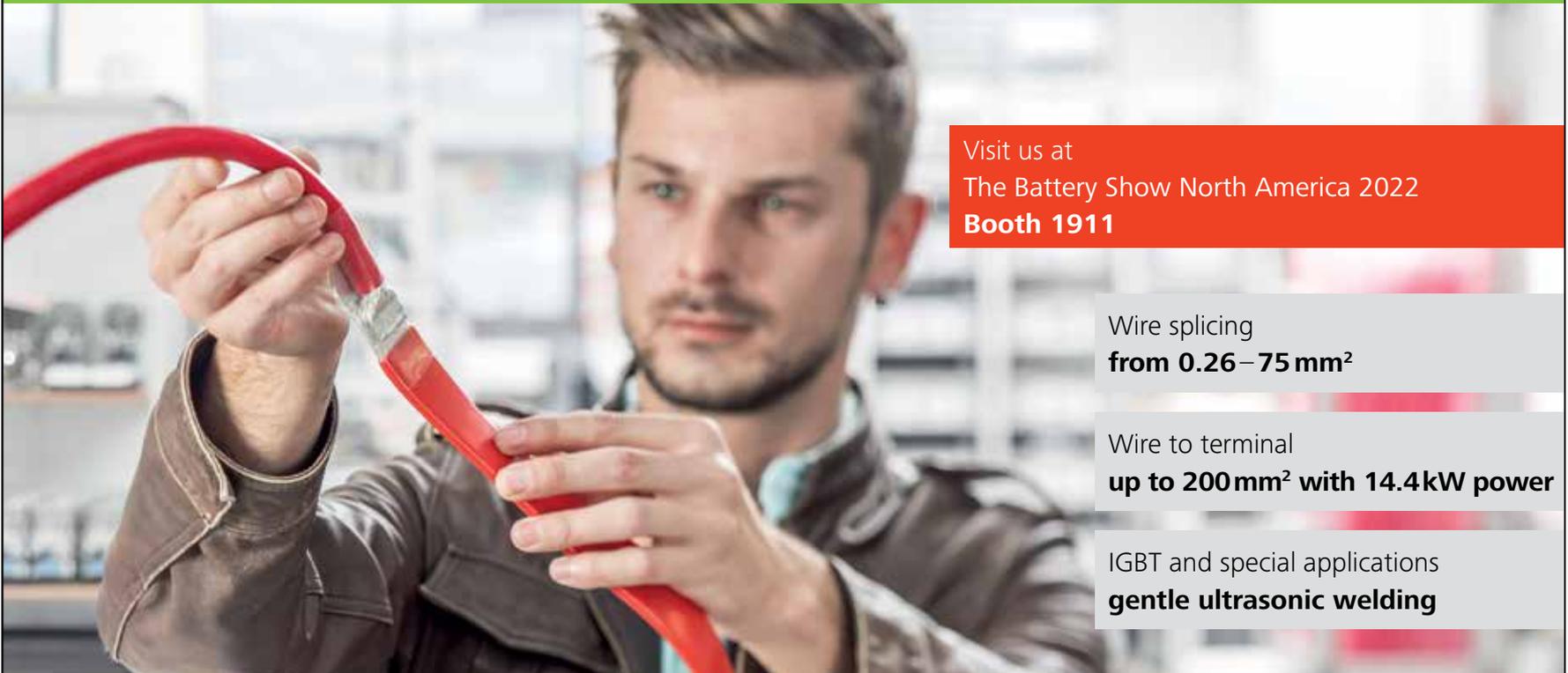
Follow us on

TELSONIC

ULTRASONICS

ULTRASONIC METAL WELDING

Wire splicing | Wire to terminal | IGBT | Special applications



Visit us at
The Battery Show North America 2022
Booth 1911

- Wire splicing
from 0.26–75 mm²
- Wire to terminal
up to 200 mm² with 14.4 kW power
- IGBT and special applications
gentle ultrasonic welding

Telsonic takes an innovative path to new solutions in ultrasonic metal welding. Our high powered systems and **unique torsional welding** expand the metal welding spectrum, facilitating the joining of a wide range of materials, sizes and geometries previously outside the capability of ultrasonic metal welding.



Wire to terminal
Aluminum wire on 3D terminal



Wire to terminal
Copper wire on MAK



Terminal to bus bar
Connection bolt on aluminum conductor



IGBT application
Copper terminal on copper plated ceramic



Wire splicing
Copper and aluminum combinations



Wire splicing
Multi-conductor cables
Twisted wires

TELSONIC Solutions, LLC | 16 Esquire Road | Billerica, MA 01862 | USA
Tel. +1 617 244 0400 | Fax +1 617 415 1555 | E-Mail info.boston(at)telsonic.com | www.telsonic.com

THE POWERHOUSE OF ULTRASONICS

InSource

Continued from page 1 _____



Laser etched and uniquely overmolded assemblies.

began to build harnesses and chassis assemblies for the emergency vehicle market. On the HVAC component side of the business, they also began to supply copper tubes and brazed assemblies. By the mid-2000s, they began development on a groundbreaking agricultural product. "We were instrumental in the design of a system that could track the seed placement of corn," Larry detailed. "Basically, it was a small laptop that went in the planter and connected a bunch of sensors to gather data. It was wildly successful, and the company kept coming out with different electromechanical

modules that could make changes to the seed placement, versus just getting readings, so it was really an agriculture technology revolution."

These products required a great deal of custom PCBs. "By 2010, we decided that in order to drive our own destiny with lead times, we would start to build our own circuit boards." In the 13 previous years, the company had gone through 10 different circuit board manufacturers. "They just couldn't understand that in the agriculture business, if you miss a planting season, you have nine

Continued on page 23

★★★ FOR SALE ★★★

- 2 - AMP 'K' Presses, P/N 535435-5-AJ
- 1 - ASHBY CROSS 1125 VR Variable Ratio Dispensing System
- 2 - BRADY Wraptors
- 1 - BURNDY PAT644XT-18V Hydraulic Crimp Tool
- 6 - CABLESCAN 512 Continuity Testers
- 1 - CAM INNOVATION RHT Taping Machine
- 19 - CIRRISS Signature 1000RX Testers
- 1 - DATRON Neo CNC Milling Machine, 2017
- 1 - DDM NOVASTAR GF-12HC-HT-1611316 Benchtop Reflow Oven
- 2 - DIT-MCO 2115 Benchtop Testers
- 2 - DMC APLHATRON MPT-250B Pull Testers
- 1 - HANKE 963 Crimp Press, 2011 (ARTOS Crimpmatic 963)
- 1 - JST Press, Model AP-K2N, w/four (4) Applicators
- 1 - KOMAX BT752 Bench Top Crimper, 2014
- 1 - KOMAX Gamma 263 Crimp to Crimp Machine, 2014
- 1 - KOMAX DPS272 Coiler
- 1 - MAJOR 5002 Bench Top Stripper
- 1 - MECMESIN MultiTest 5-I Tester, 2015
- 1 - MOLEX TM2000 Crimp Press
- 1 - MOLEX Crimping Tool, P/N 1928 60107
- 1 - MORGAN G-100T Molding Press, 2015
- 1 - NEB 64-Carrier Harness Braider
- 1 - ONDAL Linear TaperS, 2016
- 2 - PINES Model CNC10 Coaxial Tube Benders
- 1 - RAMATECH Prefeed, Model ABW 800/300, 2005
- 1 - REELPOWER TUC-2 Reel Tip-up Cart
- 1 - SCHAFFER MEGOMAT Primo-XLT Wire Processing Machine w/MECH-TRIX MPF-35
- 1 - SCHLEUNIGER CP1250, CP1500 Coilers
- 1 - SCHLEUNIGER CenterStrip CSU
- 1 - SCHLEUNIGER PF3000 Prefeed
- 1 - SCHLEUNIGER US2015 Wire Stripper
- 10 - SCHLEUNIGER US2500 Wire Strippers
- 1 - SUMIMARK IV Marking System, 2014
- 1 - TE High Voltage Hydraulic Crimping Machine, P/N 528008-4, 2014
- 2 - TRUEBLOOD Injection Molding Machines, A-25-4, A-50-4
- 27 - AMPITYCO, KM USA, MECAL, MOLEX Applicators



Contact: Martin Kenner
COMMISSION BROKERS, Inc.
 P.O. Box 8456 • Cranston, RI 02920-0456
 Tel: (401) 943-3777 • Fax: (401) 943-3670
 Website: www.commissionbrokers.com
 E-mail: marty137@aol.com

TTI + AIM

Experience the Power of TTI Advanced Inventory Management.



When you choose TTI and TTI AIM for your component needs and supply chain management, you add decades of service, experience, and supply chain understanding.

Let the TTI Specialists help you develop a supply chain program that's flexible, scalable and tailored to your requirements.

Visit tti.com or call
1.800.CALL.TTI to learn more.



The
**Electronic
 Component
 Specialists**

TTI, Inc.
 A Berkshire Hathaway Company
 1.800.CALL.TTI • tti.com



THE EXPERTS IN CONNECTION.
WWW.STRUNK-CONNECT.COM



TECHNOLOGIES, THAT CREATE CONNECTIONS. FROM MANUAL TO AUTOMATIC. E-MOBILITY: E-DRIVES - POWER DISTRIBUTION - BATTERY - INVERTER

E-DRIVES & CHARGING SYSTEMS



STATORS & ROTORS



MAGNET WIRES & COMBINATIONS



HF - LITZ WIRES / HAIRPIN



CU - WIRES

POWER DISTRIBUTION: HV-CONNECTORS TO WIRES & BUSBARS CONNECTIONS



BUSBARS TO CONNECTORS



BUSBARS TO CONNECTORS



STAR/PHASE CONNECTION BY BUSBAR



HV - WIRES

HV-STORAGE, BATTERY & INVERTER: MODULE CONNECTORS & FILTER SYSTEMS

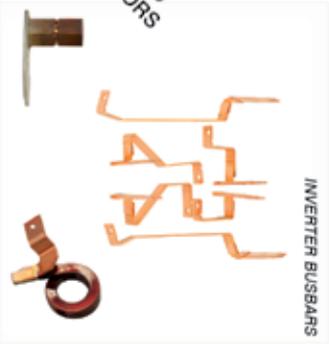


HV - BUSBARS CONNECTIONS



HV - MODULE BUTT CONNECTORS

NEW !! BUTT WELDED BATTERY CONNECTORS



INVERTER BUSBARS



FILTER SYSTEMS



HOT CRIMPING



BRAZING SPLICING



BUTT WELDING HOT STACKING



NEW !! BUTT WELDED BATTERY CONNECTORS



STRUNK CONNECT
AUTOMATED SOLUTIONS, INC.
(860) 227 0683

InSource Continued from page 21

months before you can launch into the next cycle. You can't miss the target no matter what," he implored. "We didn't get into building circuit boards for ourselves based on cost, even though we were able to keep that margin. It was because we needed the parts when we needed them."

Larry described some of the other technology enhancements the company made along the way to further their position as a crucial supplier to their customers. Among the most significant were the addition of automated crimping stations, laser etching of connectors, overmolding capability, and braided looming of harnesses. These enhancements greatly in-

creased the companies design options and consistency. "We were also one of the first to go with ultrasonic splicing in the markets we serve. At that point it wasn't even a UL recognized connection, but we were able to work with them and demonstrate that if you ultrasonically splice wires and put heat shrink over them, it's as good or better than a butt connector."

InSource developed a rather innovative solution in their overmolding process to help keep their customers tooling costs to a minimum. They actually designed a modular system that has three interchangeable sets of two-piece

Continued on page 25



Harness layout boards using the pegboard method.



HEAT SHRINK SYSTEMS



 MECALBI ENGINEERING SOLUTIONS, LDA
Castelo Branco, Portugal

CERTIFIED
ISO 9001

 MECALBI USA, LLC
9100 Mayflower Ave., Suite H, El Paso, TX 79925, USA
T. +1 915 227 5885 E. sales.usa@mecalbi.us

 MECALBI - ENGINEERING SOLUTIONS MEXICO S. DE R.L. DE C.V.
Avenida Reforma, #3131 - 5C, Colonia Melchor Ocampo,
CP. 32380 Cd. Juarez - Chihuahua - México
T. +52 (1) 656 611 6477 E. sales.mexico@mecalbi.mx



WWW.MECALBI.COM

 **MECALBI**

TTI + PHOENIX CONTACT

Trust in Phoenix Contact and TOOLFox for All Your Hand Tool Needs.



PHOENIX CONTACT

TTI and Phoenix Contact deliver the trust you need – from order to application.

Cut, strip, and crimp using TOOLfox family of hand tools. No matter what the application, this complete line of durable and ergonomic hand tools provides high levels of efficiency and quality – and they're all covered by Phoenix Contact's Limited Lifetime Warranty.

Visit tti.com or call
1.800.CALL.TTI to learn more.

 **The Electronic Component Specialists**

TTI, Inc.
A Berkshire Hathaway Company
1.800.CALL.TTI • tti.com



Wire Harness Design, Quoting, Manufacturing, & Documentation

Simplify the use of automated
manufacturing and assembly solutions
using intelligent
harness design software

Easily drive
harnesses from quote
to manufacturing

Harness Builder for E³.series

ZUKEN[®]

zuken.com/us/harnessbuilder

InSource

Continued from page 23

tooling for common connectors. This gives them an arsenal of modular tooling options. “The connector body might be straight, or a 90°, but everything else is the same. It’s the same cable and connector end. Or it’s the same connector and same body, but the cable diameter is different. So, once we have that set, we can just exchange them with different modules, so it’s very rare that we have to charge a customer for tooling,” Larry indicated.

Quick Response Manufacturing

On the heels of their ISO certification in 2016, and along with an additional 12,000 ft.² of production space, InSource launched its Quick Response Manufacturing system

(QRM). Larry began his explanation of QRM saying there is definitely a Lean Manufacturing element to QRM, but that Lean Theory concentrates heavily on machine time. “What Lean does not focus on, specifically in a high-mix/low-volume shop like ours, is the time in between. We focus on MCT (Manufacturing Critical Time) which goes from the day the order is placed to the day you ship it to the customer.”

InSource analyzed what was happening in their facility and noted there were a lot of times when nothing was being done. “The order was placed, and we would wait for parts to come in. Then, after another wait

Continued on page 27



One of InSource’s harness cell teams.



THE BEGINNING OF A GOOD CONNECTION

Ferrules, Terminals & Hand Tools

Wire End Ferrule Processing

Wire Stripping & Cutting Machines

Machined Contact Processing Systems









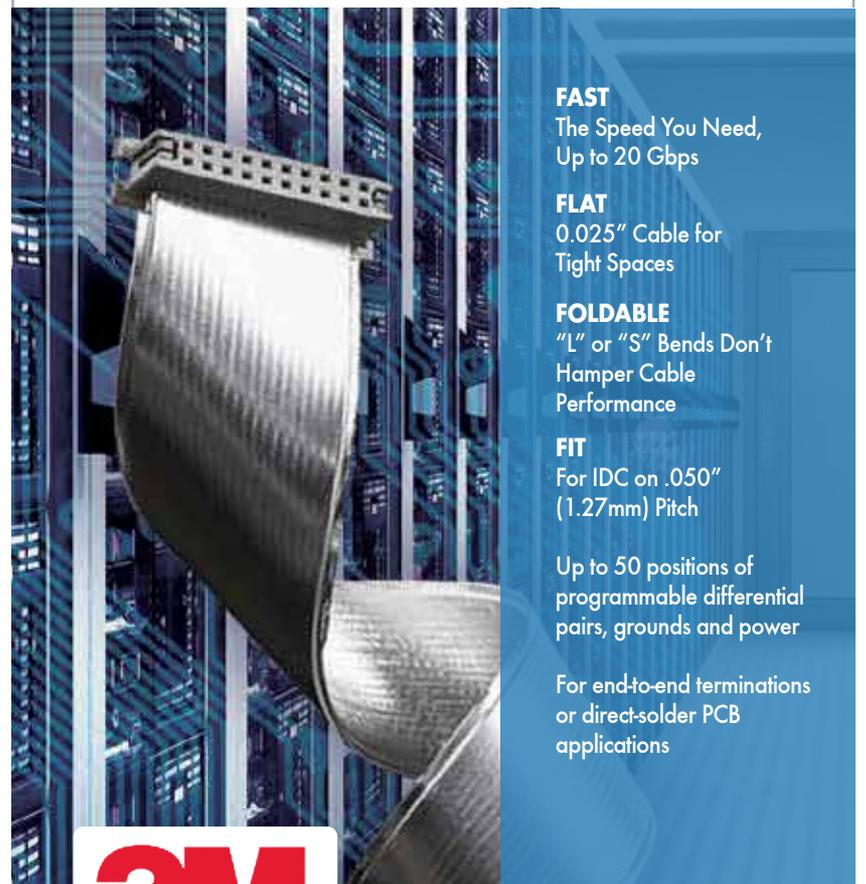
Z+F USA Inc.
700 Old Pond Road, Suite 606
Bridgeville, PA 15017
Info@zf-usa.com



Scan for more info

TTI + 3M

Flexibility is the Word with 3M™
Round Conductor Flat, Controlled
Impedance Cable, 7700 Series.



FAST
The Speed You Need,
Up to 20 Gbps

FLAT
0.025" Cable for
Tight Spaces

FOLDABLE
"L" or "S" Bends Don't
Hamper Cable
Performance

FIT
For IDC on .050"
(1.27mm) Pitch

Up to 50 positions of
programmable differential
pairs, grounds and power

For end-to-end terminations
or direct-solder PCB
applications

3M

Make TTI and 3M™ Round Conductor, Controlled Impedance Flat Cable, 7700 Series your go to for controlled impedance, low-voltage differential signaling, wire-to-board applications.

Get the flexibility and speed you need to get those tough jobs done right – every time.

Visit tti.com or call
1.800.CALL.TTI to learn more.

3M is a registered trademark of 3M Company.

 **The
Electronic
Component
Specialists**

TTI, Inc.
A Berkshire Hathaway Company
1.800.CALL.TTI • tti.com



On the GO!



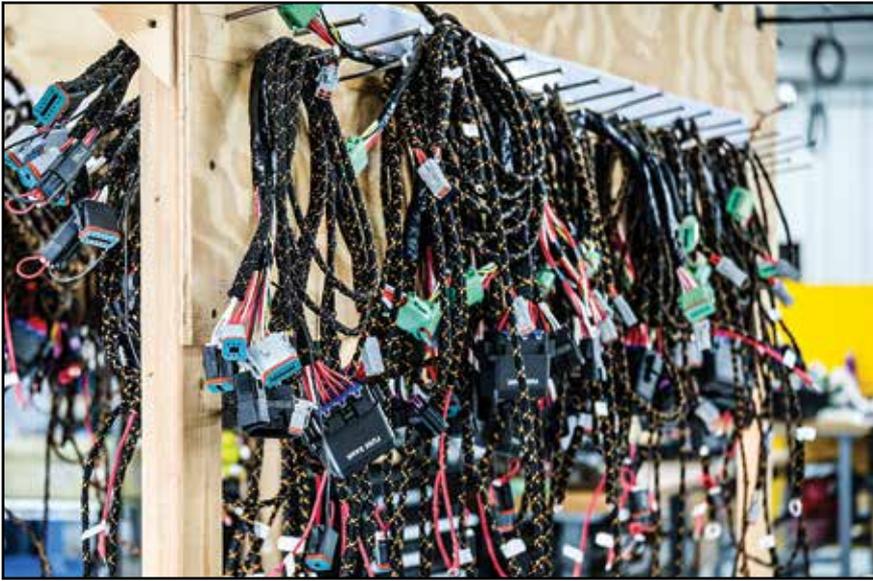
App-controlled portable printer for wire marking

With the new battery-powered THERMOMARK GO label printer and the MARKING system app, you can create labels anywhere! Continuous and pre-cut formats for flag labels, wrap-around labels, and cable markers affixed with a wire tie are easily printed. The THERMOMARK GO joins the THERMOMARK GO.K handheld printer in helping users quickly create and print labels around the shop and in the field. Both printers are available alone and as a set.

www.phoenixcontact.com/us-go

InSource

Continued from page 25 _____



Harnesses ready to be tested and braided.

for machine time, it ran and sat off in the corner waiting for the next machine. The more orders you run through such a system, the longer the time between jobs,” he noted.

According to Larry, most companies handle this by extending their lead-times, but they found the longer the lead-times, the less accurate their forecasts were. “When you focus on what happens in between jobs, you naturally shorten your lead-times, and the focus of QRM is that once you start a job, it doesn’t shut down until it ships to the customer.”

InSource has been able to reduce their MCT dramatically. They went from averaging 56 days (including

materials acquisition) when they first started the analysis, to about 28 days today. “Build days” went from 21 days to about 14.

QRM does require much stronger partnerships with suppliers, however. “I can tell you the “build days” number is actually up from our low of eight days about two years ago, so we have actually lost some ground because of supply chain issues,” he lamented.

The company actually has nine cells running. Each cell has its bespoke cutters, splicers, braiders, testers and all the things it takes to produce a particular product. Instead of

_____ Continued on page 28

XURON[®] CORP.

Xuron[®] Model 440 Mini-Scissors Cuts Clean Without Fraying

- Versatile, compact and easy to use
- Clean cuts lacing tape and other non-aramid materials
- Comfortable: No finger loops
- Ergonomic: Return spring re-opens tool after each cut

440
Mini-Scissors

Made in the

USA

Discover our full line of
wiring harness tools at
XuronIndustrial.com



TTI +

TE connectivity

The Specialization You Need – TE Connectivity High Voltage Tooling and HEMS Kits.



HV-20T Crimping Machine

High force crimping for cables up to 120mm²

Integrated monitoring and vacuum system

Single button design for safety and simplicity

Adjustable die platform allows front, left or right side operation

TE
connectivity

AUTHORIZED DISTRIBUTOR

TTI and the experts at TE Connectivity (TE) understand the unique challenges of working with Hybrid & Electric Mobility Solutions (HEMS) cables. Knowing the potential problem areas can help wiring harness manufacturers address issues before they begin to impact project outcomes.

With TE HEMS Kits and HV-20T series termination machines you’ll have the tools necessary to make sure your EV projects arrive on time, and on budget – helping to realize your ROI.

Visit tti.com or call
1.800.CALL.TTI to learn more.

TE Connectivity and TE connectivity (logo) are registered trademarks

 The
Electronic
Component
Specialists

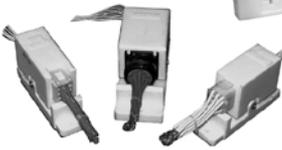
TTI, Inc.
A Berkshire Hathaway Company

1.800.CALL.TTI • tti.com

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

InSource

Continued from page 27

cutting all of the wire for a particular order at once, for example, it's done in smaller batches. This enables InSource to be very flexible with respect to product changes and re-designs. "One of the biggest benefits of the system is the customer can change anything they want because we're manufacturing in smaller batches."

JobFlow

That brings us to the February WHMA conference, and the recent EWPT Expo in Milwaukee where Larry and his

crew were exhibiting. But they weren't exhibiting the products from InSource. They were gauging the response to a new product from their newest business unit called JobFlow.

Like most manufacturers, InSource has purchased a lot of equipment and experimented with different manufacturing strategies through the years. "In every case we've been chasing the same thing: higher output efficiency," Larry contended. "More specifically, how can we get more jobs completed with the resources we already have."

In order to accomplish this goal, InSource has come up with many adaptations to existing products. Some of these innovations have been so successful, the company has decided to explore marketing them. One such product is their BraiderBot (See page 1). It's an add-on for common harness braiders that allows a single worker to run multiple braiders at once, thus removing a lot of the repetitive boredom from the job. Its robotic arms allow it to be operate hands-free on straight runs. Built-in sensors make sure there's a perfect cone angle for clean consistent braids.

Other sensors watch for, and automatically stop, at branches and termination points. For a quick look at this product, go to the YouTube search box and enter BraiderBot.

InSource has traditionally maintained three separate business units, those being Electronics, Refrigeration, and Wire Harness units. JobFlow will join them as the fourth unit. Each unit shares the functions of sales administration and finance, but they all have their own engineering, quality and production teams.

InSource is a family-owned business, but Larry and the management team seek to deemphasize that. "We like to look at the whole company as a family," he stressed. "We work with our employees so they can take time off when they need and can have hours that work best with their family needs. That's something that we've always tried to maintain; that we care about these people and we think of them as the InSource family. We have a great deal of loyalty with our customers. The community thinks highly of us, and that is certainly our desire."



WIRE & CABLE

for every industry



- Solar & Wind
- Elevator & Lift
- Crane & Hoist
- Mining
- Specialty Military
- Electrical & Electronics
- Industrial Automation
- Specialty Oil & Gas
- Specialty Communications
- Custom & Specialty Cable

JAMES MONROE WIRE & CABLE CORPORATION

A CUSTOM CABLE MANUFACTURER FOR OVER 40 YEARS



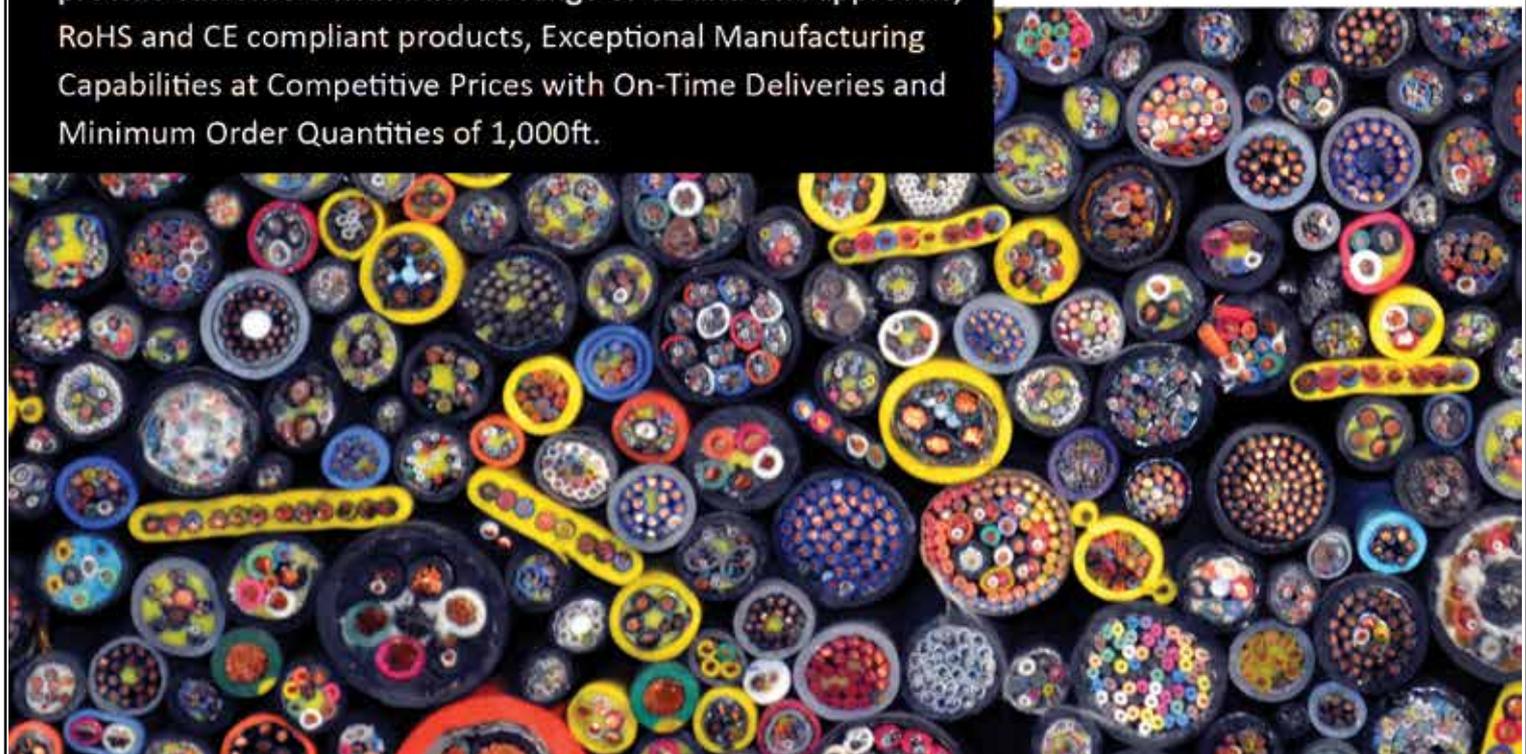
Custom Cable Solutions

We Design, Manufacture and Deliver Solutions for a wide variety of Specialized Wire and Cable Applications. We also provide customers with a broad range of UL and CSA approvals, RoHS and CE compliant products, Exceptional Manufacturing Capabilities at Competitive Prices with On-Time Deliveries and Minimum Order Quantities of 1,000ft.

www.jamesmonroewire.com

info@jamesmonroewire.com

978-368-0131 / 800-316-8877



EWPT EXPO NEW PRODUCT

DMC's LaceLok® Cable Lacing Fasteners



Daniels Manufacturing Corporation® (DMC) is proud to introduce LaceLok® Cable Lacing Fasteners. This revolutionary product is an entirely new way to provide secondary support for wire harnesses.

For more than 50 years, hand tied lace or plastic cable ties have been the only options for wire harness secondary support. These methods have serious ergonomic, safety, and inconsistency issues. Hand tied lace often causes fatigue and injury due to the repetitive motion required. Hand tied lace can also be applied inconsistently from operator to operator, or even from the beginning of the shift to the end of the shift due to operator fatigue. Plastic cable ties often cause safety hazards due to the sharp edges that can occur on the cut end of the cable tie. Plastic cable ties are also prone to loosening over time resulting in additional stress on the wire harness. For these and other reasons, plastic cable ties are restricted for use per AS50881 and NAVAIR 01-1A-505-1.

LaceLok® combines the ease of cable ties with the abrasion and chemical resistance of lacing tape. The LaceLok® system consists of Cable Lacing Fasteners (CLF) and the LaceLok® Installation Tool. The CLF is constructed with the same Nomex® lacing tape used in hand tied lace. The Nomex® lace is attached with aramid fiber to an ultra-high temperature thermoplastic fastener head to create the CLF. The CLF can withstand extreme

temperatures from -65°C to 260°C and are resistant to hydraulic fluid, jet fuel, lubricating oil, and isopropyl alcohol. CLF comes in a variety of lengths from 6 inches to 24 inches long and can be wrapped multiple times to provide tensile strengths of 55lbs to 165lbs.

Using LaceLok® is simple and ergonomic. The user wraps the CLF around the bundle and then through the CLF head. The end of the tape is loaded into the LaceLok® Installation Tool. The operator squeezes the trigger and the tool automatically tightens and cuts the end of the CLF. The innovative LaceLok® Installation Tool automatically applies the correct amount of tension every time making results consistent and repeatable and therefore eliminating the risk of over or under tensioning wire bundles.

The LaceLok® system is available for purchase, approved for use per NAVAIR 01-1A-505-1 and is pending qualification under the MIL-DTL-32554B and MIL-DTL-32555A. For more information visit DMC's website at dmctools.com/products/lacelok/.

About Daniels Manufacturing Corporation

For over seven decades, Daniels Manufacturing Corporation® (DMC) has been recognized as the leading manufacturer of Mil Spec qualified crimp tooling for aerospace and other high-reliability electrical systems. For more information, visit www.DMCtools.com or follow DMC on Facebook, Twitter, LinkedIn or YouTube.



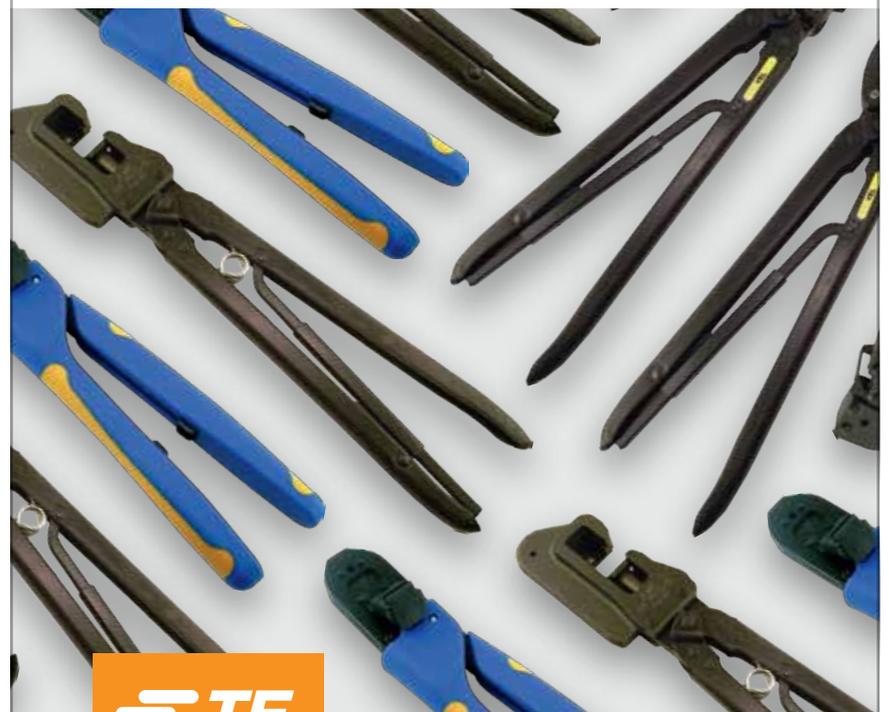
From left to right: Ryan Totolo, DMC Assistant General Manager; John Conner, Engineering Manager; Mike Timney, National Account Executive.

TTI+



AUTHORIZED DISTRIBUTOR

Get Top-of-the-Line Certi-Crimp Portable Tools for Optimum Performance.



AUTHORIZED DISTRIBUTOR

Anyone can make a tool to crimp terminals onto a wire. But not everyone can manufacture a tool to crimp the terminals properly. Crimp termination of wires isn't easy. At least, doing it right isn't easy. We know. We started it.

Choose high-quality TE Certi-Crimp and Pro-Crimper III portable tools for optimum performance and results on all of your residential and commercial wiring projects.

Visit tti.com or call
1.800.CALL.TTI to learn more.

TE Connectivity and TE Connectivity (logo) are registered trademarks



TTI, Inc.
A Berkshire Hathaway Company

1.800.CALL.TTI • tti.com

Why Exhibit at M-EXPO - An Exhibitors Perspective

Several companies exhibiting at M-EXPO 2022 were interviewed for their insight regarding the upcoming show. You will learn about the importance of M-EXPO in this region through these interviews. Visit www.mexpowire.com to learn more.

Why is the M-EXPO show important to the wire harness industry?

"We have been serving manufacturers in Mexico for over 30 years and see tremendous opportunity to expand our service coverage and build business relationships with additional manufacturers," states Khoi Nguyen, Director of Marketing, LAPP Tannehill.

"One thing I really like about M-EXPO is that it is very, very industry-specific. People are coming there to

learn more about wire cutting, stripping, product wire management, crimping, and things like that are very specific. So, you know your audience is prequalified. Not everyone needs the parts and products that you offer but you know they are prequalified because they touch the things you represent and understand what you do. So, engagement there is a lot higher," states Jeff Barth, President and Founder, JWB Manufacturing.

"The fact that we're going there for the first time and making a presentation in Spanish designed to address the local population says that there is a need for that. Over the past six years at EWPT, we saw a diversity of attendees coming from Europe, Canada, and Mexico. Unfortunately, due to COVID, we saw a lot less this year,

so I think holding a show in Mexico is very important to the industry to bring the message where it's needed. Again, bringing solutions to a sector of the industry that may not be able to travel to the US," states John Tomaz, Wardwell Braiding.

Why is your company exhibiting at the upcoming M-EXPO Wire Processing Technology Expo on September 27-29, 2022?

"There's more manufacturing of wire harnesses in Mexico than anywhere else, even the Americas. As a result, Mexico has a strong focus for harness manufacturing, and this is our new main focus for our software - manufacturing harnesses," states Fergus Kendall, CPO and Co-Founder, Cadonix, Inc.

"More than ever, as leaders in our

teams, companies, and industry, we need to prioritize the carving out precious time to step out of the day-to-day and look out ahead and 'out there' for both challenges and opportunities BEFORE they happen or pass us by.

Otherwise, we'll always be in reactive mode with respect to change. While the Web and digital communications are great, Google can only do so much with providing in-depth, practical, real-world awareness of problems and solutions that may or may not be in our field of vision. You don't know what you don't know, and you can't 'Google' what you've never heard of.

That is why M-EXPO is so important for our industry, as it sits at the crossroads (figuratively AND geo-

graphically) of what is happening in our industry. Bringing together like minds who are encountering problems that we may also be experiencing (or that may be hiding right around the corner for us), along with people who are at the forefront of solving these challenges with technologies, practices, and people resources that we may not be aware of. With all the uniqueness of our industry, the ROI from sending our thought leaders to M-EXPO and engaging with other like-minded thought leaders is immeasurable," states Khoi Nguyen, Director of Marketing, LAPP Tannehill.

"As I continue to expand my business and reach, I enjoy working with Mexican companies. Many of these companies are US-based and are either shoring or re-shoring, so there are a lot of commonalities. I enjoy the value systems of the people in Mexico. In Mexico, it's more relationship-based than transactional-based. Networking is a big part because it is a very tight-knit industry, and I feel very comfortable going and talking with anyone about their business and my business. It's a great networking thing; you never know who you will meet and hear their challenges. Some people are nervous about sharing too much about their business, but that's not me. I look for individuals who want to develop a deep relationship, not just a transactional one," states Jeff Barth, President and Founder, JWB Manufacturing.



NEED REPLACEMENT PARTS FOR YOUR WARDWELL BRAIDERS? WE GOT'EM.

NEED TRAINING FOR NEW EMPLOYEES? WE'LL DO IT.

NEED REPAIR OR RETROFIT WORK DONE ONSITE FOR YOUR OLD MACHINES? WE'LL BE THERE.

Since 1911, **Wardwell** has designed, engineered and built braiding and winding machines in Central Falls, Rhode Island. Today, we are a global leader in machine technology, supported by our **Wilms** partner companies.

The best built machine must be provided with high-level training so your team can get the most out of it. Plus, we all know things eventually wear and need replacement.

Finally, although our machines are built to last (and they do), technology is constantly evolving and a retrofit might be a smart move to keep your machines at peak performance.

We offer **harness braiders** from 16 Carrier through 72 Carrier in both vertical and horizontal configuration.

Contact **Wardwell** at 401-724-8800 or sales@wardwell.com for help today.



Wardwell Braiding Co.
1211 High Street Central Falls
Rhode Island, 02863

EWPT EXPO NEW PRODUCT

Mecal by Starn 3-Zone CFM For Coaxial Crimping



From left to right, Manuel Vitasse, Sam Myers, and Gavin Wasko.

In conjunction with Raydiall Automotive, and C & S Technologies we have developed a 3-Zone sensing system for coaxial cable and FAKRA Terminals. This semi-automated solution reduces costs and equipment by crimping all 3 zones at once with Crimp Force Monitor (CFM) capabilities. This solution decreases cycle time, while offering

higher repeatability and reliability.

Mecal by Starn is the distributor and manufacturer of the Mecal product line in North America. The partnership of Mecal and Starn Tool, creating Mecal by Starn, provides world class applicators and spare tooling for the wire harness industry. Mecal was established in 1976 with the aim of supplying the wire harness industry with the best crimping equipment available. In less than 30 years Mecal reached and kept a respected position at the top of its market. Starn Tool and Manufacturing is Meadville, PA's oldest tool and die shop established in 1945, they are a leader in precision machining. Together their products are extensively used by the automotive, communication and IT industry, and wherever a high-quality connection is needed.

For more information, Contact the Mecal By Starn Team at www.Mecalbystarn.com




HOOK UP WIRE

FEP Mil-Spec Wire

M16878/11-12-13 NEMA HP4

PRODUCT HIGHLIGHTS

- 1** FEP is resistant to chemicals, oil, fuels, solvents, moisture and sunlight
- 2** Used for military, security, defense, and high frequency circuitry applications
- 3** EU RoHS and Reach Compliant
- 4** 1,000' minimum runs for smaller sized projects

EMPOWERING YOU TO DESIGN

- CONDUCTOR MATERIAL AND SIZE
- CONDUCTOR STRANDING
- SPECIAL COLOR CODES
- VOLTAGES 250V / 600V / 1000V





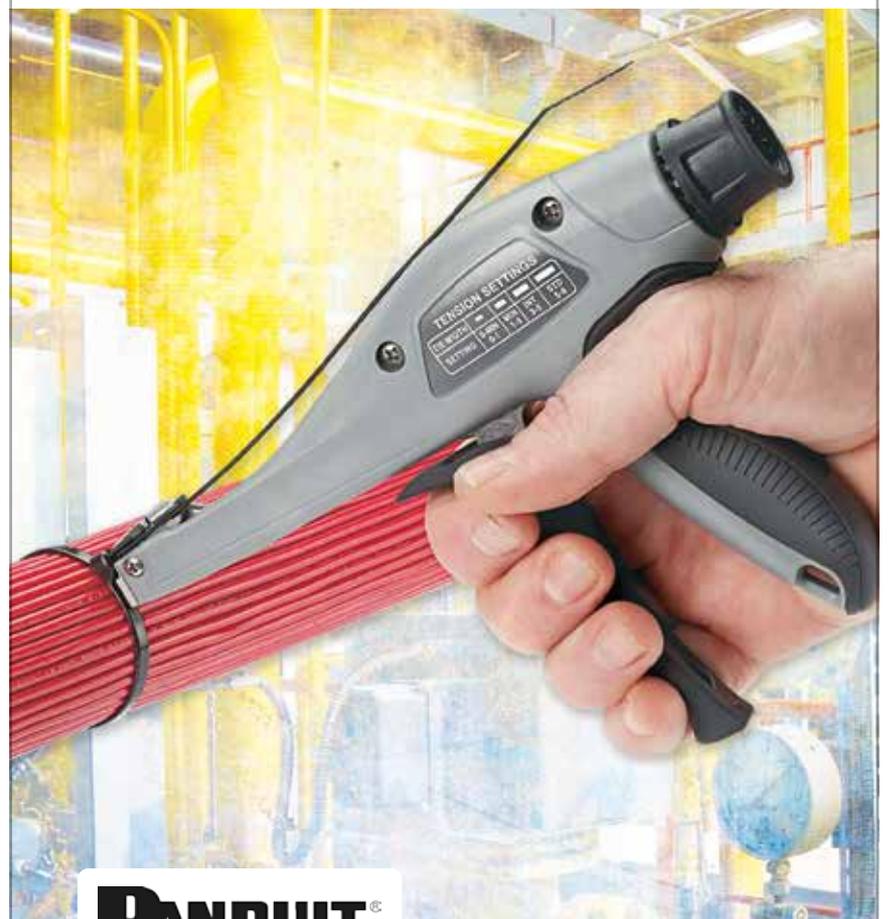




PHONE: 1800-395-0200
FAX: 1718-358-2522
EMAIL: SALES@AEROSPACEWIRE.COM

TTI + PANDUIT

Get the **Comfort** of Panduit Ergonomic Cable Tie Installation Hand Tools.



PANDUIT

Let TTI and Panduit help you improve your productivity and minimize downtime.

Panduit's ergonomic series of hand-operated, tool-controlled tension, and cut-off cable tie installation tools will keep you in control of your cable requirements. These versatile, medium volume tools can be used for production, maintenance or construction applications.

Visit tti.com or call 1.800.CALL.TTI to learn more.

 **The Electronic Component Specialists**

TTI, Inc.
A Berkshire Hathaway Company
1.800.CALL.TTI • tti.com




To Be Creative

Strip Series B300



Powerful, Fast, and Intuitive Stripping Machine

The B300 opens up new possibilities for fast and reliable stripping of cables with cross-sections from 0.03 to 8 mm² (32 to 8 AWG). Repeat accuracy, mechanical precision and short working cycles ensure high productivity in common strip applications. And the new ergonomic machine design and revised user interface offers unrivaled ease of use.

- Compact modular design
- High-resolution 5" color touch screen
- Fast and intuitive operation
- LED lighting for clear view of work area
- Highly sensitive trigger mechanism - ideal for small and flexible cables
- High process reliability due to permanent axis monitoring

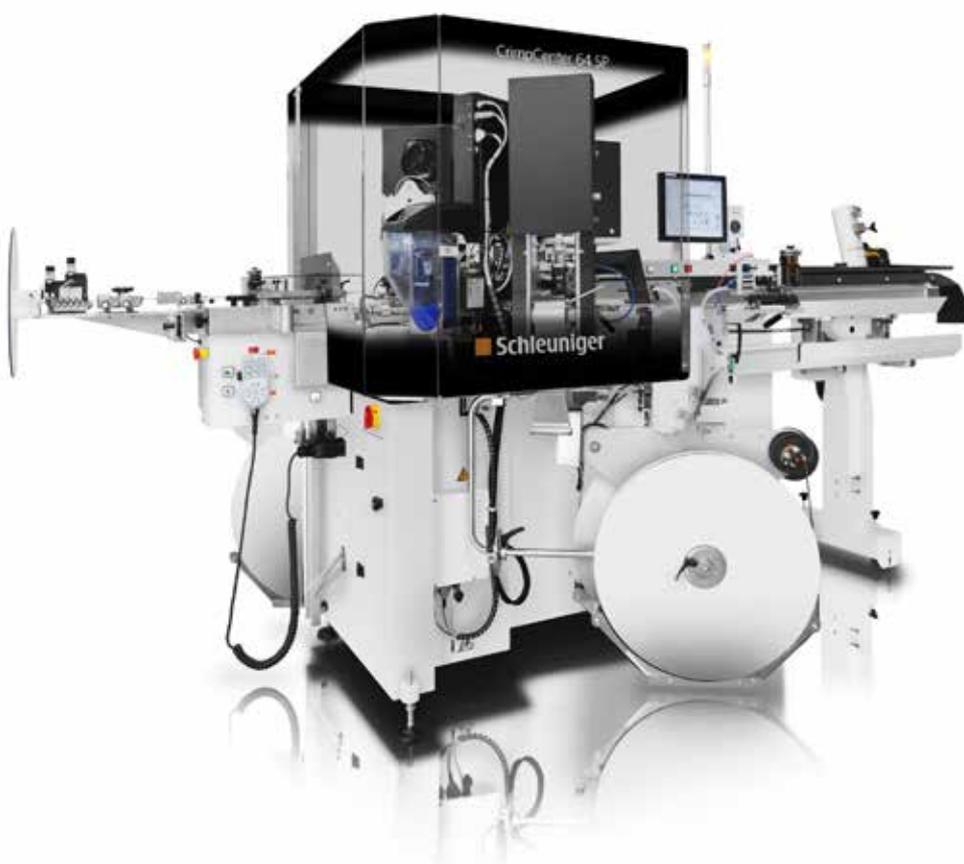
Wire Solutions for a Connected World

■ **Schleuniger**



To Be Strategic

CrimpCenter 64 SP



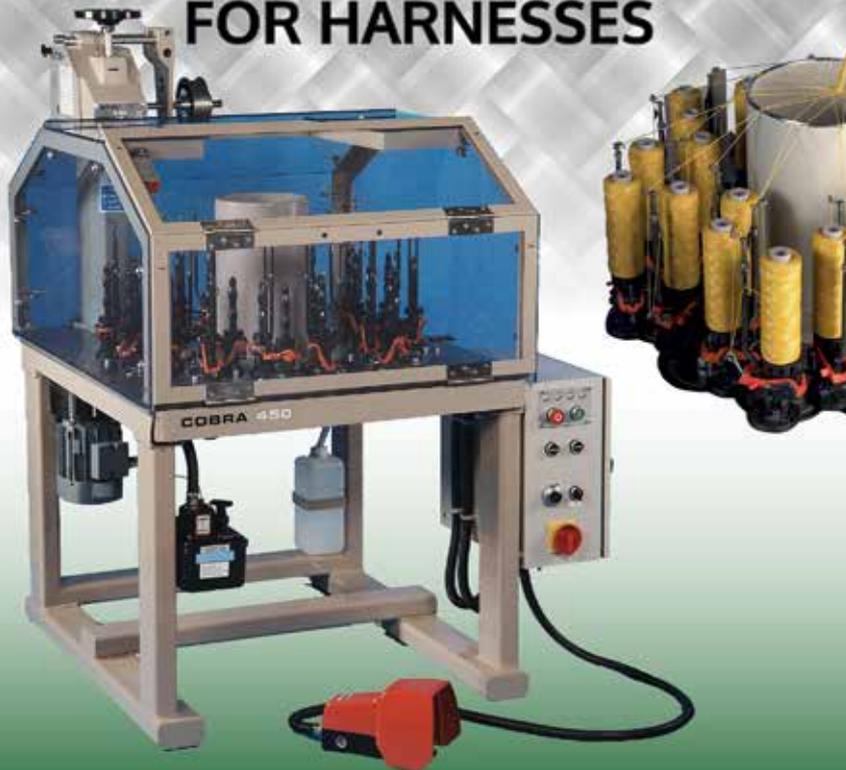
Produce Faster, More Precisely, and More Cost Effectively

The CrimpCenter 64 SP processes wires with conductor cross sections from 0.13 to 6 mm² and features the latest quality assurance options, such as SmartDetect, WireCam and Guided Feasibility Study, to ensure transparency and traceability of important production data. These features, along with a number of performance enhancements, qualify the CrimpCenter 64 SP as a first-class machine for complex, high-precision production with high quality requirements.

- Reliable, high precision technology
- Increased effective performance
- Minimized setup times
- Significant cost-per-lead advantage
- Optimized parameter settings
- Enhanced deposit quality

Wire Solutions for a Connected World

BRAIDING MACHINERY FOR HARNESSSES



WHY CHOOSE COBRA?

- Reputable brand with North American client base
 - High performance machinery
- High speed operation for improved efficiency
 - Reduced reworking
- Lower downtime and higher productivity
 - Minimal operational noise

COBRA
BRAIDING MACHINERY

sales@cobrabraids.com
www.cobrabraids.com

wesco WIREwisdom

The Unlikely Development, and Purposeful Use of Teflon

The story of Teflon® began April 6, 1938, at DuPont's Jackson Laboratory in New Jersey. DuPont chemist, Dr. Roy J. Plunkett, was working with gases related to Freon® refrigerants, another DuPont product. Upon checking a frozen, compressed sample of tetrafluoroethylene, he and his associates discovered that the sample had polymerized spontaneously into a white, waxy solid to form polytetrafluoroethylene (PTFE). PTFE is a high-molecular-weight compound consisting of carbon and fluorine. Perfluorocarbons or PFCs, are organofluorine that contain only carbon and fluorine bonded together in strong carbon-fluorine bonds. The carbon-fluorine bond is referred to as the strongest in organic chemistry because of stability added by its partial ionic character; it forms the strongest single bond to carbon. The ionic character is a result of the electronegativity of fluorine. It induces partial charges on the carbon and

fluorine atoms, leading to electrostatic attraction, making the bond short and strong. PTFE is a thermoplastic polymer, which, at room temperature, is a white solid with a density of about 2.2 g/cm³ and melting point of 327°C. Its mechanical properties will degrade above 260°C. Polytetrafluoroethylene (PTFE) is a synthetic fluoropolymer of tetrafluoroethylene that is widely used in wire and cable and tubing products today. PTFE is inert to virtually all chemicals, and it is the most thermally-stable of all carbonaceous insulating compounds. It is considered the third most slippery material in existence. Because of PTFE's chemical inertness, it cannot be cross-linked like an elastomer. It has sunlight and moisture resistance. Because PTFE's electrical properties are stable across a broad range of frequencies and its -90°C to 250°C temperature range, PTFE has been a standard in the aerospace/defense industry for many years. Popular specifications include MIL-DTL-16878, MIL-W-22759, MIL-DTL-17 and MIL-DTL-27500. It is also used in numerous commercial applications. PTFE is an excellent dielectric for coax cables due to a low dissipation factor and low dielectric constant at low and high frequencies.



We build, connect, power and protect the world.

Most of us expect life to run smoothly. But we don't spend much time thinking about what it takes to make that happen. Wesco does. Every day we leverage our tech-enabled supply chain solutions and help build a world you can depend on.

So you can live life uninterrupted.

Ingenuity delivered.

[Wesco.com/ingenuitydelivered](https://www.wesco.com/ingenuitydelivered)

210999A002 © 2022 Wesco International

wesco

PTFE Extrusion of Wire and Cable and Tubing

1. The free-flowing white powder is extruded using liquid organic extrusions aids like naphtha which wet the resin and turn it into a paste-like mixture. It is then chilled until it reaches the correct viscosity for extrusion.

2. This paste-like mixture is performed under light pressure into a tube and extruded by means of a ram extruder.

3. At this point the PTFE insulation looks like string cheese

4. The processes is complete by running the insulation and jackets through a sintering tower to the crystallization point at 700°F to 750°F *Note: Due to the high processing temperature, PTFE must be extruded over silver-plated or nickel-plated wire.*

Physical and Electrical Properties

- PTFE has reliable service at high and low temperatures, with outstanding high frequency electrical properties; the maximum operating temperature for PTFE-insulated wire is typically 200°C for silver and 260°C for nickel

- It has resistance to solvents, hydraulic fluids and corrosive chemicals

- The dielectric constant is low and stable with changing frequency and temperature

- The low dissipation factor remains unchanged within a broad range of frequencies

- There are low-smoke, low flame-spread characteristics and excellent flexibility with small bend radii

- PTFE has excellent resistance to damage during soldering

- It has a low coefficient of friction

Disadvantages of PTFE Wire and Cable and Tubing

- It is eight to 10 times the cost of PVC

- Lengths can be short due to the ram extrusion process, typically up to five lengths per reel

- It must be etched in order to terminate in an epoxy connector

- Etched wire has a relatively short shelf life

- Etched wire colors are muted

- It has cold-flow properties also known as "creep"

Reference https://www.chemours.com/Teflon/en_US/assets/downloads/pdf/teflon-introduction-fluoropolymers.pdf



Heavy-Duty Battery Cable Lugs from Molex

With seamless connection performance in mind, Molex battery cable lugs are ideal for use in harsh environments.

Designed for commercial vehicle and industrial applications, these lugs are constructed with a heavy wall for maximum amperage and conductivity.

- Heavy-duty 600V+ applications
- 100% conductive
- Available in bare or tin-plated copper

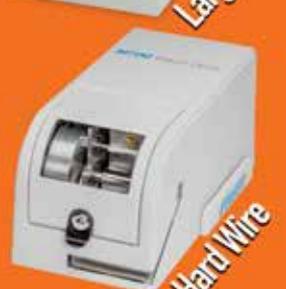


In Stock and Ready to Ship!

For stocking information visit www.waytekwire.com/molex-bcl

See the VALUE of VERSATILITY

Eraser's M700 Series is a wire and tube processing system unlike anything in the industry. Thanks to an innovative modular design, preparing to cut different materials or gauges takes just seconds. Simply swap out separate cutting modules to meet your changing needs.



Call a sales engineer at 315-454-3237 or email us at info@eraser.com

ERASER
Always Moving Forward®

Find your processing solution by sending in a sample material today

www.eraser.com/ecp

Recent Changes to DoD's CMMC Cybersecurity Framework

CMMC Version 2.0

In the January/February issue of last year, WHN introduced readers to the DoD's new cybersecurity protocol that it will require of all prime and subcontractors. In the article, we interviewed Nicholas McBride, Cybersecurity Consultant at Ecuron, who took us through the steps for compliance. Nicholas recently contacted us to provide important updates for the CMMC Protocols.

There is a link to our original report at the end of this article for full review. Basically, the Office of the Under Secretary of Defense for Acquisition and Sustainment, in conjunction

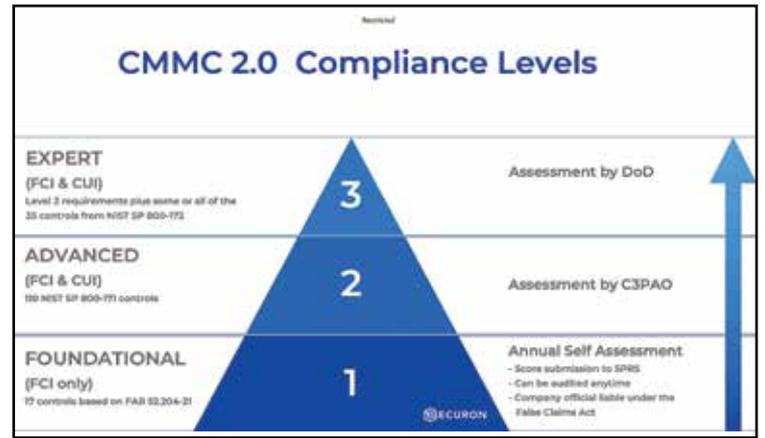


FIGURE 1. CMMC Security Levels for Version 2.0

with DoD stakeholders, have developed the new CMMC Certification as a means to protect sensitive information from a range of cyber threats. The intent is to combat the loss of intellectual property and certain unclassified information from

the DoD supply chain. This past November, the DoD put out a rule saying they were changing the CMMC program. It has taken a few months for the changes to obtain a level of clarity, and Nicolas outlined the major changes for us.

The previous version was version 1.2, and the new version is 2.0. "The two big take-aways were that they got rid of all of the requirements that went above and beyond the NISTSP 800-171 controls. So that means there were an additional 20 controls for CMMC at Level III. They removed those and it is now just the same 110 controls from the NIST standard," Nicholas detailed. He also mentioned they got rid of the additional maturity requirements but warned that even though they are not explicitly mentioned, they are implicitly required.

The next big difference is the streamlining of the security levels. The old CMMC model had five levels, with most people aiming for Level I or Level III (Level II having been an intermediary step, and not really a compliance level). The new version only has three levels (fig. 1). Level I has not changed. The new Level II is the same as the old Level III (eliminating the intermediary step), and the new Level III is the same as the old Level V, (eliminating the old Level IV intermediary step). It is still expected that most companies will

DIAGRAPH

Prints in-line with most major wire processors and a wide range of wire size.

Kingsley Ribbon
Specially formulated to print on a variety of substrates

KINGSLEY KIP-20
HOT STAMP WIRE PRINTER

Call or E-mail for a quote!
866-421-9898
kingsley@diagramhmsp.com

Does your Cable Tester:

Print a bar code label only if the harness passes?

Restrict an operator from altering the program?

Identify the operator for labels and data collection?

Verify the bar code label is applied to the harness?

Transfer programs to tester via a memory card?

Send alert if harness is removed prematurely?

Connect to a network for file transfers and data collection?

Work as a standalone system without needing a computer?

If not, contact Dynalab today for more information!
www.DynalabTesters.com

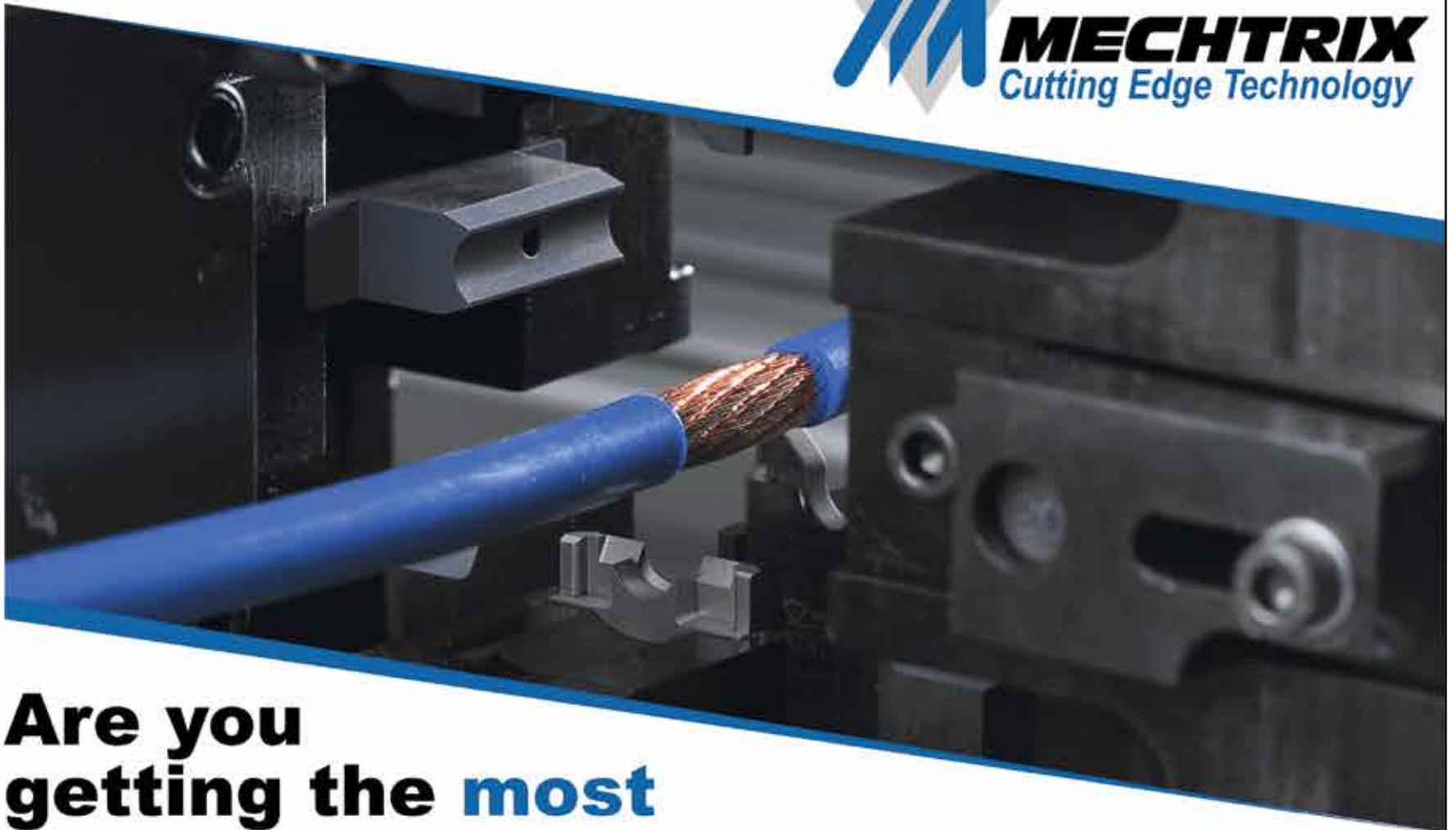
Wiring Harness and Hipot Testers

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

Dynalab
TEST SYSTEMS

Dynalab Test Systems, Inc. | Reynoldsburg, OH USA | www.DynalabTesters.com | 614.729.6550

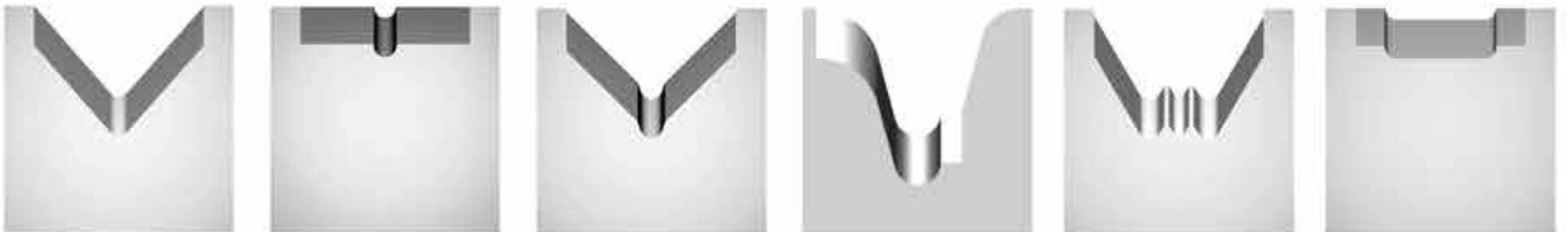
Continued on page 38



Are you getting the most out of your current automatic wire processing equipment?

Optimize your process with Mechtrix Stripping Blades

35,000+ standard and custom designed stripping blades for all of the major wire processing machines including: **Artos • Eubanks • Kodera • Komax • Schäfer-Megomat • Schleuniger • ShinMaywa • Tyco/TE • and many others...**



Improve your operations with Mechtrix Equipment

Engineered to enhance your wire processing systems, Mechtrix's unique offering of auxiliary equipment is designed to maximize your current processes by increasing efficiency, reducing downtime, and solving other process challenges.



- Wire Prefeeding Systems
- Center Stripping Machines
- Bench-Top Cable Strippers
- Terminal Applicators
- Carrier Strip Cutters
- Paper Tape Winders

VIEW OUR **NEW WEBSITE & EXPANDED CATALOG** NOW AVAILABLE AT WWW.MECHTRIX.COM

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

Recent Changes to DoD's CMMC Cybersecurity Framework

Continued from page 36

need Level I or Level II certification, with only a small subset requiring the new Level III.

"The next thing they changed is the rollout," Nicholas advised. "The previous CMMC Version 1.2 had a phased rollout up through 2025, releasing more contracts every year, starting with 15 last year, all the way up to several hundred by 2025." Instead, they announced, somewhat ambiguously, there will be a cutover date, likely within the next 9 to 24 months. "There have been updates since then in which they have stated they want that date to be May of 2023," he clarified.

The DoD also stated that CMMC Certification may not be necessary for every single contract following May 2023. "They are still slightly unclear on whether it will be every contract, or just a majority of contracts. But my personal speculation is that most people will need to think about it because, if nothing else, the prime contractors are going to be asking for those certifications for their own vendor risk management programs."

Under the CMMC Framework, the DoD will certify third party assessment organizations who will be able to certify companies to CMMC. Nicholas disclosed that, to date, no companies have been authorized by the DoD to audit companies for certification. "There are still a few minor details they are trying to hammer out, and current speculation puts it around August 2022. Hopefully by then, the 3rd party companies will start performing certification assessments. One thing we do know for sure is there are currently 213 companies who are 3rd party candidates, but they still have to go through their own CMMC assessment from the federal government." Asked why the holdup on accreditation of the 3rd party companies, Nicholas said the DoD wouldn't be specific, but indicated the auditing companies were having difficulty developing documentation for the maturity levels.

Current Prime Contractor Requirements

Even though there is ambiguity on the part of the government on dates of implementation and the number

of contracts affected, the basic framework is in place and all subcontractors should be well on the path to certification by now. More importantly, he advised that most prime contractors are taking steps to make sure their subcontractors are implementing the framework. "Over the past year, prime contractors have been sending out self-assessment questionnaires (SPRS) to their subcontractors asking if they have assessed their cybersecurity practices against the NIST SP 800-171 guidelines. The next thing they will often ask is if companies have implemented multi-factor authentication and encryption and whether or not the encryption is up to a Federal Information Processing Standards (FIPS) validated standard. This is because the DoD is highly concerned about multi-factor authentication and FIPS validated encryption is now the mandatory standard."

Nicholas mentioned the prime contractors are also asking if their subcontractors have adhered to the basic cyber security protocols has put forth by FAR 52.204-21, and whether or not they are planning on becoming CMMC registered, and what the timeline for that is.

Nicholas summed up the current situation with CMMC. "It's still coming. They've tightened up their timeline and made it slightly less complicated, but they are still being just as strict about ensuring that people meet the requirements. We fully expect this to be in place by May 2023."

About Ecuron

Ecuron is a boutique cybersecurity consulting company that specializes in preparing companies to face cyber threats. Their mission is to create a partnership with you, securing your data and protecting your organization every step of the way. For help developing and implementing an information and cybersecurity strategy for your organization and for more information visit <https://www.ecuron.com>

You can contact Nicholas at nicholas.mcbride@ecuron.com or at (713) 646-5044.

Follow this link to the original WHN article <https://bit.ly/3md1pnu>



ASTRO TOOL CORP.
CONNECTOR ASSEMBLY TOOLING

ASTRO TOOL CORP.
CONNECTOR ASSEMBLY TOOLING

Electrical Connector Tooling
FOR MILITARY, AEROSPACE, MEDICAL AND TELECOMMUNICATION INDUSTRIES.

ASTRO TOOLS AND SERVICES

- Crimp Tool Products
- Pneumatic Crimp Tools
- Insertion and Removal Tools
- Custom Designing for Special Tooling Requirements
- MIL-Spec Tool Kits
- Custom Tool Kits
- FREE Cross-Reference Services
- Made in the USA



Need proven connector assembly and service tooling quickly & reliably?

Contact Astro Tool Corp.

We have been designing, qualifying and manufacturing a wide variety of crimping and insertion/removal tools for more than 50 years.

Items in stock ship right away!

Lead times are short and reliable!

Astro Tool Corporation
sales@astrotool.com

www.astrotool.com
503-642-9853



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

TEL: (800) 255-1919



ISO 9001:2015 Registered



THE BATTERY SHOW
NORTH AMERICA 2022

CO-LOCATED WITH:



September 13-15, 2022 | Novi, MI, USA
Suburban Collection Showplace

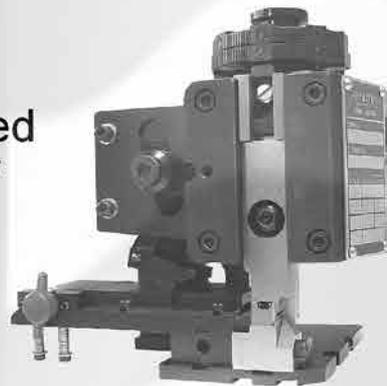


AppliteK
TECHNOLOGIES CORPORATION

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.

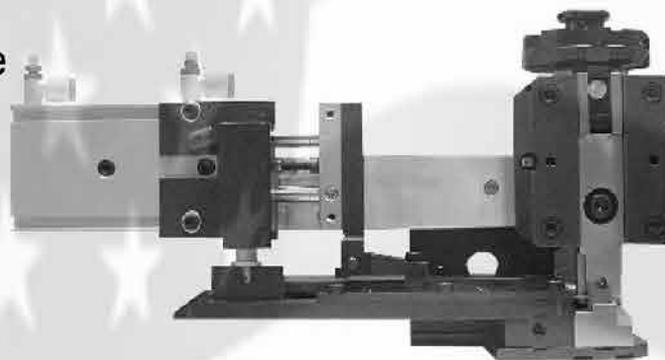


Model 1700

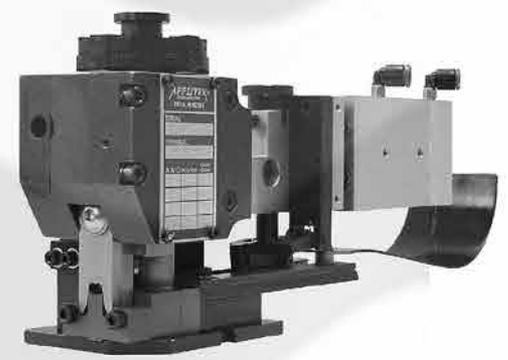


Model 2000

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

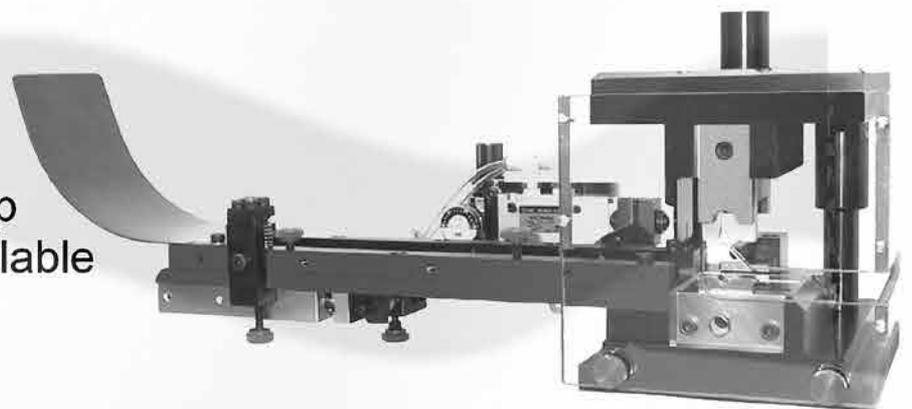


Model 1500



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

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

EWPT EXPO NEW PRODUCT

CAMI Research Introduces M2Z Low Voltage Multi-Conductor Cable Tester

CAMI Research Inc. (Acton, MA), manufacturer of the CableEye® brand of automation-ready cable and harness test systems, will release the model M2Z low voltage test system at the EWPT in Milwaukee. In addition to checking for opens, shorts, and miswires, this entry-level tester checks for intermittent faults and diode orientation. The control module has 128 test points and includes a probe socket with probe. The M2Z ships with comprehensive, automation-ready software that allows for tester management, troubleshooting, pass/fail testing, and testing of any product volume and mix from prototyping through to batch testing.

Configuration

A leader in the development of PC-based cable and wire harness test systems, CAMI offers the CableEye suite of products complete with accessories - including auto-detected, plug-in connector boards for fast, convenient set-up and testing of standard cables. When pre-populated and pre-configured boards are used, the software automatically displays a graphic of the connectors in addition to the wiring under test. The tester can be readily programmed to do the same for custom boards and fixtures. These boards are designed to fit all CableEye testers.

With a single click, the wiring schematic switches to a customiz-

able netlist view which can be set to display wiring colors. In both views, a large PASS/FAIL indicator is clearly visible and distinctive audible tones are played.

Each test board may be paired with other CableEye adapter boards to accommodate any combination of connectors. An incredibly versatile test system, most CableEye testers are expandable to accommodate large and complex harnesses, and users can connect, and configure them in numerous ways — set up an array of QuickMount™ housings fitted connector boards, plug custom interface cables directly into any of the 64 pin headers on the control and expansion modules, or use a test interface panel, perhaps on a rack-mounted system. Not just for testing, CableEye systems provide complete cable management offering features not available on any other cable test equipment, and may be used to test unlimited types of connectors.

The entry-level M2Z provides basic continuity measurement in cables



and small wire harnesses. It is suitable for cables carrying digital signals or any electronic signaling where small amounts of resistance in the cable or connections will not affect the function of equipment to which the cables are connected. The entire cable may be scanned for intermittent connections at a fast cycle rate to test for bad connections that may result from motion or flexing. The unit has 128 test points which is enough to test cables or wire harnesses with up to 64 conductors. Other models can be expanded up to 2,560 +24 test points by connecting expansion modules

(128-points permodule).

A probe is included which works with our software to identify unterminated wires. Other models include a remotecontrol socket to be used for either an optional external foot-switch, or for a custom remote control to extendpanel indicators and test button, and an accessory socket for minihook connectors or a probe for use withAutoBuild™ guided assembly.

M2Z Software

The M2Z ships with comprehensive, automation-ready software that allows for tester management, troubleshooting, pass/fail testing, and testing of any product volume and mix. Touch-screen compatible, the software provides maximum flexibility for the widest range of test needs: From prototyping and R&D through to batch testing, from High Mix Low Volume (HMLV) through to Low Mix

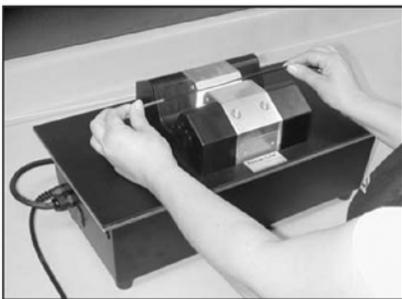


Continued on page 42

SAVE UP TO 80% OF YOUR LABOR COST ON HEAT SHRINK OPERATIONS

The Focus-Lite will shrink all types of heat shrink tube with consistent quality and none of the drawbacks of conventional heat guns.

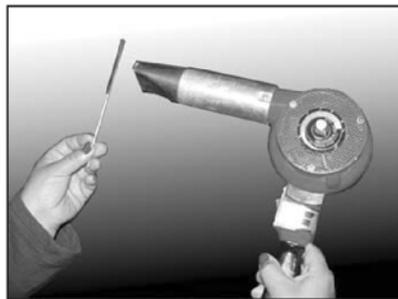
OURS
2 SECONDS



Based on Polyolefin

VS

THEIRS
13 SECONDS



Based on Polyolefin

- Zero Noise / No Heat at Work Station
- Foot Pedal activated for ease of use
- Superior, consistent shrink
- Time and Heat control
- Uses much less energy (200-300 watts), only on when you need it.
- Low Maintenance
- Long Life / Rugged Design

- Excessive noise and heat
- Operator fatigue
- Inconsistent shrinking
- No control
- Uses up to 1500 watts (always on)
- Frequent Replacment
- Short Life Span

The Focus-Lite™, by Judco Manufacturing, Inc., is the solution to the outdated heat gun. You can say goodbye to the high labor cost, excessive heat, and inefficiency. 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.

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. Choose from 1", 2.5", 8", & 15.5" models. Any length of shrink tube can be processed in each machine, with the shrink time the same for all lengths. The Focus-Lite™ will improve both the quality and consistency of your shrink operation. Visit our website at www.judco.net and **Focus-in** on the savings.

HellermannTyton
www.HellermannTyton.com

No cord. No limits.

Break free of power supplies, cords and hoses. The **CPK Hybrid** is the **world's first fully automated, cordless cable tie application tool**.

Hybrid means you can apply cable ties with battery power for ultra-portability or corded for nonstop performance.

- Blistering speed – up to 92 ties per minute
- 18V 2.0 Ah Li-Ion battery will process at least 8,000 cable ties on a single charge
- On-screen process data and status
- Integrate into fully automated workflows

Out in the field or inside the shop, take the CPK Hybrid wherever the job is.

MADE FOR REAL



Cut the tie, not the wire.

Using a wire cutter to cut off ties? No wonder you're nicking your wires.

Cut time out of this tedious task and eliminate the risk of slicing through wire insulation with **EVO® Cut**, your soon-to-be go-to tool for quickly and safely removing cable ties.

M2Z Low Voltage Multi-Conductor Cable Tester

Continued from page 40 _____

High Volume (LMHV):

- Set up measurement, reporting (e.g. documentation), networking, and log-in requirements.

- Block unauthorized access and unauthorized changes to stored data and scripts.

- Design, debug, and test automation scripts created with simple built-in macros. Activate scripts with barcode reader to automate testing and ensure consistency: Control tower lights, lock and release latches, divert gates, label printers and more.

- Set up complex automation tasks with built-in JavaScript.



Cristina and Hugo Alvarez

- Create pop-up windows for operator work instructions. Follow displayed instructions and photos to set up and test batches of cables and automatically generate labels and reports.

- Design First-Article cables and modify others.

- Link custom test fixtures to CableEye software using the optional PinMap™ software module.

- Manage integration with other test instruments using the optional Applications Programming Interface (API) software module: Control the M2Z with your custom GUI software interface, LabView™, Visual Basic®, Visual C++®, and Visual C#® scripting languages or Microsoft®.NET™ framework.

- With single-click or barcode reader activation, enable the Production Mode to display only a limited set of essential controls and information to the production worker.

- Update the software anytime with a simple download and ensure your test system remains current.

Industry Standards

All low voltage CableEye systems easily handle low voltage electrical testing requirements of the IPC/WH-MA-A-620 guidelines in addition to the most exacting reporting requirements of government-contracted and ISO 9000-style certified companies.

Warranty

All new testers ship ready-to-use with a two-year Product Support Subscription (PSS) comprising warranty, free tech support, complimentary software upgrades and more. The PSS is renewable, though not required for tester operation.

Availability & Domestic

US Pricing

Accepting orders from 10 May 2022 for July delivery, the M2Z starts at \$1,495 USD and includes automation-ready operating software, a standard connector board set (CB15C), and probe. Requires any Windows®-capable computer running Windows 7 or later. Compatible with touch-screen and laptop PCs.

Contact sales@camiresearch.com or (978) 266-2655 for a quote.



Blue Valley Capital LLC
M&A Advisor

We Get It Done

Recent transactions arranged
by Blue Valley Capital

BHC Cable Assemblies, Inc.

Hamilton, Ontario, Canada

Sold to

Electronic Components International

St. Louis, Missouri

Shine Wire Products, Inc.

Adams, Massachusetts

Sold to

ComSonics, Inc.

Harrisonburg, Virginia

www.bluevalleycapital.com



FreePoint™
Technologies Inc.

getfreepoint.com

Maintain Remote Visibility in your shop

FreePoint's non-invasive and cost-effective industrial IoT system monitors **Job, Operator and Machine** data from any of your new and legacy machines delivering performance information in **real time** to the people that can make a difference **right away**.

Insulation Supply Company

Your Electrical Interconnect Distributor

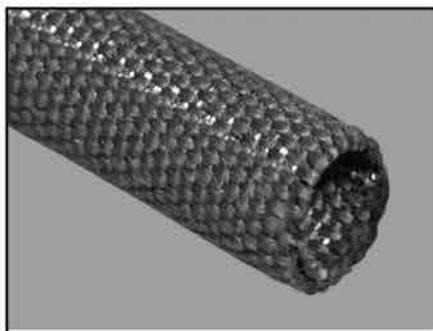
We Stock and Distribute Heat-Shrinkable Tubing, Adhesive Coated Heat-Shrinkable Tubing, Heat-Shrinkable Molded Parts, Crimp Splices, Solder Splices, Heat Guns, Wire Identification Solutions - Labels, Software, Label Printers, Tape, Electrical Protection Sleeving, Lacing & Tying Cord, Cable Ties, Spiral Cut Tubing, Split Loom Tubing, Corrugated Tubing, Medical Grade Tubing, PVC Tubing, PTFE Tubing, PEEK Tubing and Value Added Services.

Industries We Support:

- Aerospace
- Aircraft
- Automotive
- Defense
- Electrical Appliance
- Electronics
- Energy
- Medical
- Rail
- Utilities



Electrical Interconnect Heat-Shrinkable Solutions



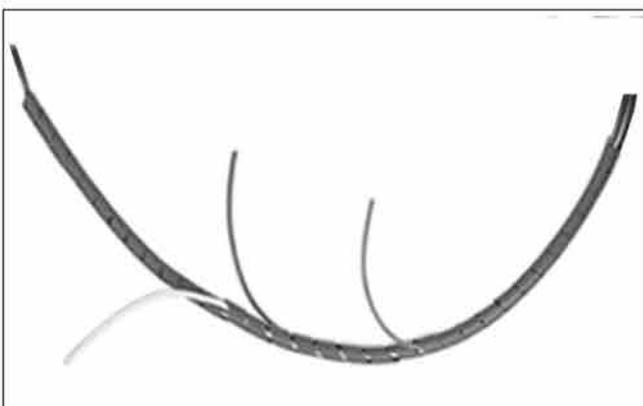
Nomex & PPS Abrasion & Bundling Solutions



Heavy Wall Heat-Shrinkable Tubing



Thermal Transfer Printers, Software, Labels and Wire Markers



PTFE Spiral-Cut Cable Wrap



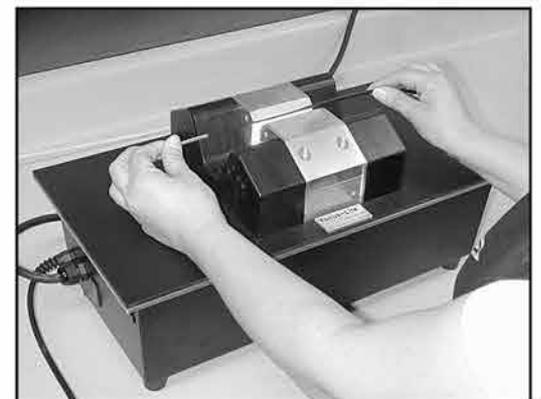
PTFE Heat-Shrinkable Tubing



Heat-Shrinkable Wire Identification

Our Top Product Lines:

- Atkins & Pearce/Ben-Har & Suflex
- Brady Product, Facility & Safety Identification
- Breyden/Gudebrod
- CYG/THERMOSLEEVE/USA
- DSG-CANUSA
- Federal Mogul/Bentley Harris Protection Products
- Grayline
- Hilec/Delfingen
- Insultab
- Judco/Focus-Lite
- LS Cable/Dunbar
- Panduit
- Permacel
- Steinel
- TE Connectivity/Raychem
- Thomas & Betts
- Varflex
- Western Filament
- Zeus



Judco/Focus-Lite Heat-Shrinkable Tubing Processing Machine



TE Connectivity (Raychem Products)
Americas Specialty Distributor of the Year - 2012



insulation supply company

Since 1952



TUV USA Inc.
ISO 9001:2008/AS9100C
Certificate Registration No.14-1561



www.inscoinc.com

(800) 457-7715

info@inscoinc.com

Back to Basics

Hybrid Connectors - More Than the Sum of Their Parts

Gerhard Liewer, Product Marketing, Pluscon circular, Phoenix Contact

Equipping machines, systems, and automation components with separate cables for signals, data, and power

is time consuming and costly. With more complex regulations and control tasks comes greater cabling complexity and, thus, a greater impact on the availability of the entire system. Hybrid connectors - for transmitting signals, data, and power over a single cable - offer a way out of this dilemma.

The versatile hybrid connectors are more than the sum of their parts: they provide a new level of flexibility when cabling highly automated systems. Along with the established application for cabling servo motors, M23 and M40 hybrid connectors are well-suited for a variety of sophisticated tasks.

solutions were bus systems. Hybrid connector technology, now available in M40 size, can now be paired with hybrid servo cables. This makes it possible to implement serial communication with signals, data, and power. To do this, each device in the supply chain is equipped with two device connectors. One of these is equipped with pin contacts and the other with socket contacts. The connectors are based on the familiar servo motor design and combine suitable contacts for transmitting signals, data, and power in one housing. This makes hybrid connectors suitable for high voltages and currents.

Hybrid connectors for serial cabling

In frequency-controlled drive solutions, the circuit connecting the control cabinet to the engine still commonly uses a star distribution. Previously, almost all serial cabling



ANMAR
Experts in ThermoPlasticElastomer and Flexible PVC Electrical plugs and receptacles

An-Mar Wiring Systems, Inc.
711 E. Grove St. • Mishawaka, IN 46545
Phone: 574-255-5523 Fax: 574-255-5355
Email: sales@anmarwiring.com
www.AnMarWiring.com

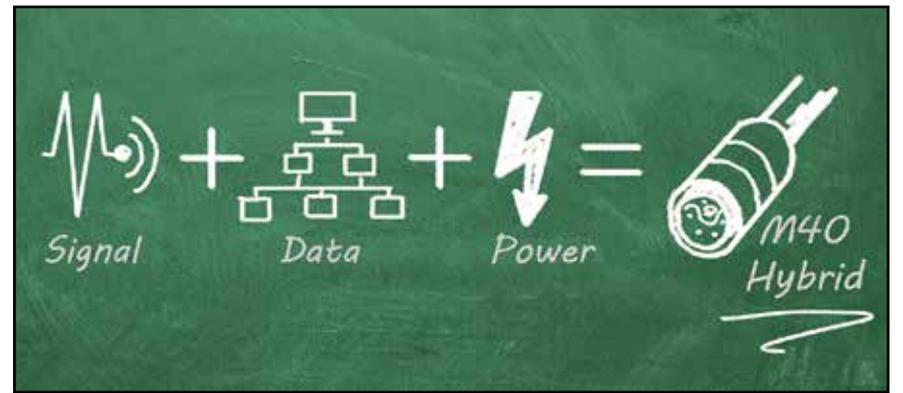
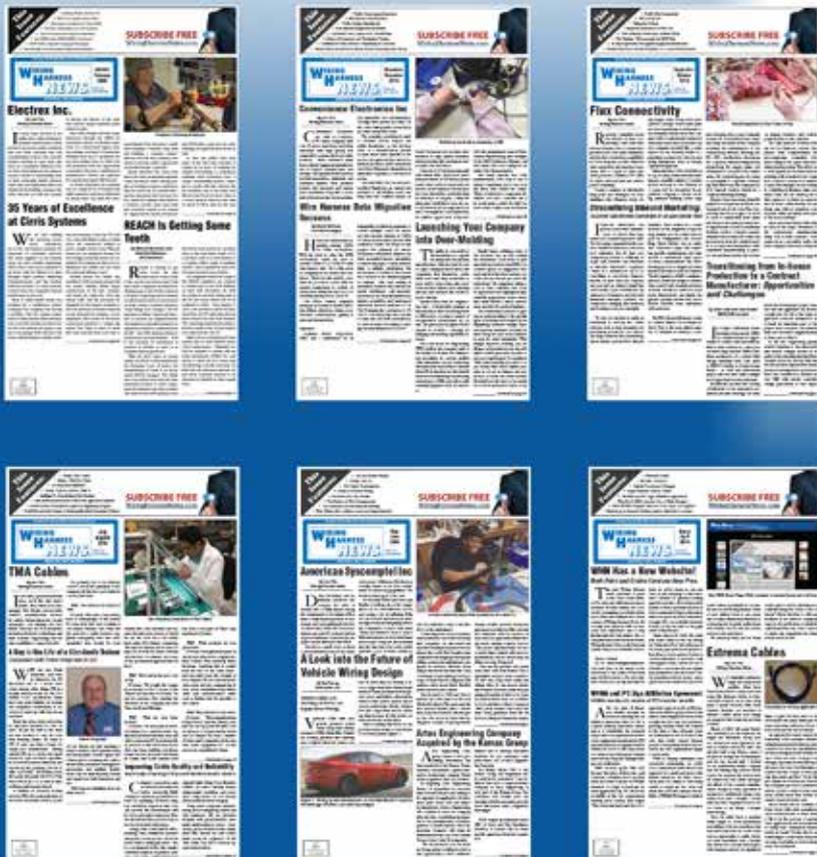


Figure 1. Intelligent solution: hybrid connectors simultaneously transmit signals, data, and power.

Read Past Issues:




Always with you.



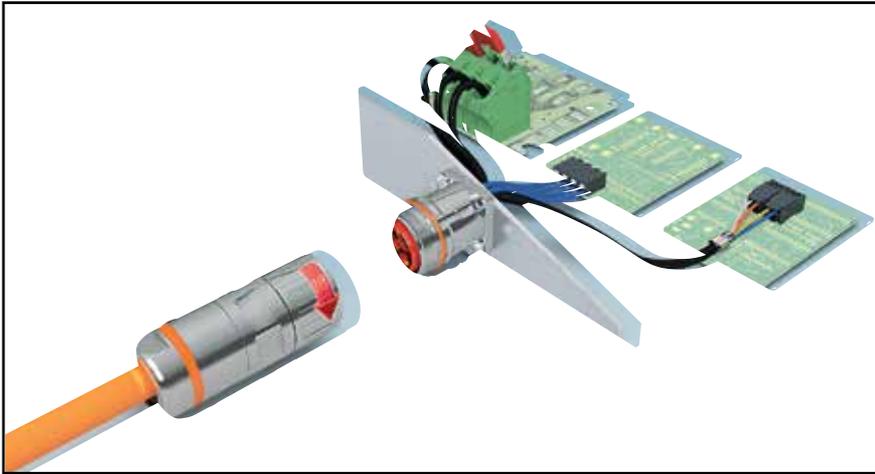


Figure 2. Fast-locking system: SPEEDCON locks cables and device connectors with just half a turn.

Higher system availability, lower costs

Hybrid connection technology does more than just reduce the space requirements on the device or in the control cabinet. Machine and system cabling has become much more organized, because it only requires routing a single cable. The resulting narrower cable routes also reduce the costs for the cable run and cable duct.

Hybrid system cabling also offers easy start-up and repairs for devices, machines, and system parts, as it reduces required connections by two-thirds. For example, many machine and system builders carry out the startup process during in-house manufacturing. After successfully passing this test, the systems must be quickly and securely dismantled, packaged, and shipped, and then once again brought into operation by the end customer. A fast-locking connection system is particularly helpful in these cases. Just half of a turn reliably locks the cable connector system to its

counterpiece. Devices can be connected quickly and reliably in this way with only two hand movements (Figure 2).

More functionality, same size

The newest M40 hybrid connectors have a broad area of application. For example, for distributed servo drivers, some models implement a three-phase supply including L1-3, N, PE signals as well as direct current supplies with up to 850 V DC. Connectors that use different codings and colored housing markings can help prevent incorrect insertion.

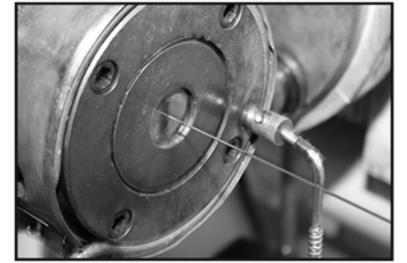
Easy, reliable assembly can be enabled by choosing models designed with larger, more robust contacts. Regardless of the connector size, variations that use four-position CAT5 elements for data transmission are great due to their compatibility with nearly all common bus systems and custom data interfaces.

Continued on page 46

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
- Cross 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: 847-726-7644

Visit our website
www.industwire.com

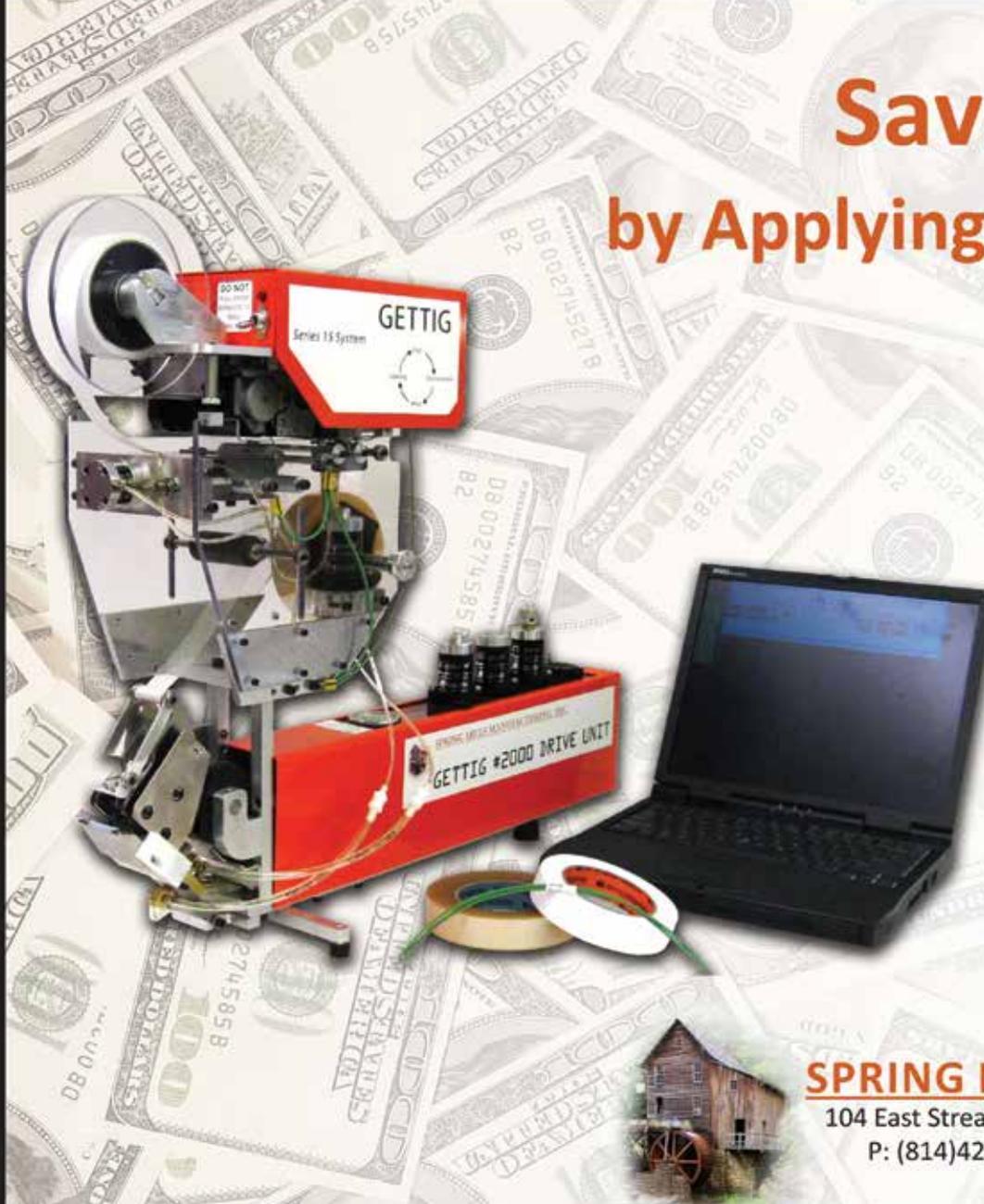


Industrial Wire and Cable Corp.

66 N Buesching Road • Lake Zurich, IL 60047

Save \$\$\$\$

by Applying a Custom Label



- Computer Generated
- Printed & Applied in only 1 second
- Costs start at four-tenths of a cent depending on the size
- Replaces expensive peel-off labels, while **drastically** reducing labor costs
- Print one, or thousands, of the same label

SPRING MILLS MANUFACTURING, INC.
 104 East Streamside Place • PO Box 85 • Spring Mills, PA 16875-0085
 P: (814)422-8892 • F: (814)422-8011 • info@SpringMillsMfg.com
www.SpringMillsMfg.com

Hybrid Connectors - More Than the Sum of Their Parts

Continued from page 45

Versions for numerous applications

The CAT5 data element can be replaced by a 4-position unshielded signal element in applications that do not require a shielded data interface. For this reason, a connector is available with eight 1 mm signal contacts, which offers the same performance features as the power contacts. Cur-

rents up to 8A per contact and a wire cross section up to 1.5 mm² make it possible to implement applications for control electronics including hardware shutdowns. Signal contacts allow voltages of up to 500 V AC to be supplied, thanks to appropriate air clearances and creepage distances (Figure 4).

Numerous housing designs are available both in terms of cabling and



Figure 3. Space advantage: round hybrid connectors are compact and as a result save a great deal of space.

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_malloy@iwgbwd.com
Home Page: <http://www.hamprods.com>

devices. Customer-specific designs, even entire system cabling options, are available. The user receives tested fully cables, even for high power and data rates.

Summary

Automation technology is advancing steadily, especially in relation to the Industrial Internet of Things (IIoT). As part of this, large companies in the automation industry are opting to consistently network their products on the controller and communication level. Industrial applications, machines, and systems are equipped with intelligent control units and interfaces on an ever more regular basis. There is an enormous range of applications for M23 and M40 hybrid connectors, as this affects almost all areas of automation.



Figure 4. Transmission in the most confined space: featuring four contacts per signal (top left and right), data (center), as well as power (bottom), and +PE (top), the M40 hybrid connector allows for versatile use.

About Phoenix Contact

Phoenix Contact produces future-oriented components, systems, and solutions for electrical controls, networking, and automation. With a worldwide network reaching across more than 100 countries with over 17,100 employees, Phoenix Contact maintains close relationships with its customers, which are essential for shared success. The company's wide variety of products makes it easy for engineers to implement the latest technology in various applications and industries.

THE BATTERY SHOW
NORTH AMERICA 2022

CO-LOCATED WITH:
electric & hybrid
vehicle technology expo

September 13-15, 2022 | Novi, MI, USA

getfreepoint.com

FreePoint Technologies

Maintain Remote Visibility in your shop

Monitor Job, Operator and Machine data from any of your new and legacy machines

The Battery Show and Electric & Hybrid Vehicle Technology Expo

The Battery Show, North America's largest and most comprehensive advanced battery technology event, and Electric & Hybrid Vehicle Technology Expo, the only trade show and conference exclusively dedicated to the drive train and power system in electric and hybrid electric vehicles, announced their return to the Suburban Collection Showcase in Novi, Michigan with a sold-out show floor and more than 700 exhibitors booked to date.

Slated to take place from September 13-15, 2022, the co-located trade show expanded the show floor to accommodate an extra 8,000 NSF, packed full of hundreds more industry-leading suppliers. Notable exhibitors confirmed include 6K Energy, American Battery Solutions, Beckhoff Automation, DEWESOFT, Engel, Festo, IMA Spa, Lion Energy, Magna Powertrain, Marelli, National Instruments, Navistar, Thermo Fisher Scientific, and Xalt Energy, among others.

"With the global battery technology market forecasted to grow from 92 billion in 2020 to 152+ billion by 2025, consumers and OEMs alike are increasingly interested and investing in an electric and battery-powered future," said Kayle Kvinge, event manager of The Battery Show and Electric & Hybrid Vehicle Technology Expo.

Kvinge continued, "We're proud to provide an outlet for networking and facilitate peer-to-peer educational content to help professionals in the advanced battery and automotive industries keep up with the ever-changing demands of the future."

The 2022 edition excitingly reveals new and returning programs included in this year's agenda, featuring an expertly curated four-track conference and an all-new 'Ride and Drive' program where attendees can demonstrate and test drive vehicles comprising all-new E/HV technology on the public roadways. More details on the all-new program to come.

Additionally, registration for the event is officially live and on track for attendees to meet with brands from all leading and emergent categories, including new methods of advanced battery design and latest technologies, battery manufacturing development, market supply chain, and regulatory outlook.

Returning Programs:

Conference - The three-day educational conference brings together battery and EV/HEV manufacturers, industry experts, thought leaders, and academics to discuss and help solve your manufacturing, supply chain, and production challenges, in addition to must-attend keynote sessions.

Open Tech Forum - Serves as the epicenter of the expo floor, hosting panel discussions, live demos, thought leadership presentations, and more.

Product Showcase - Get an under-the-hood look at new technologies from more than 25 exhibiting companies. Each exhibitor will host 15-minute live demonstrations offering a close examination of new and improved solutions for your applications.

New 2022 Features and Programs:

Battery Tech Theater - Access industry-leading educational sessions provided by suppliers such as ATS

Automation Tooling Systems, Thermo Fisher Scientific, Tekscan, and more.

Ride & Drive - Drivers test vehicles on the public roadways while accompanied by a representative from the sponsoring company. This program will be offered from 10:00 a.m. to 3:00 p.m. September 13-15 at the Suburban Collection Showplace Red Lot 1.

Oktoberfest - Oktoberfest celebration in Novi, Michigan. Network with the advanced battery and electric & hybrid vehicle community over German beers, pretzels, bratwurst, and more on Wednesday, September 14.

For further information please visit TheBatteryShow.com

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



37 Horizon Dr. Bristol, CT 06010
Tel: 860.589.9035
Fax: 860.589.7520
www.MultiCable.com
info@multicable.com

CableEye®

Highly Versatile Test and Cable Management System for Cables and Wire Harnesses

Whether you're an R&D engineer designing cables for a new product or a production worker checking hundreds of cables an hour, the unique **CableEye®** graphic wiring display tells you what you need to know clearly and immediately.

Graphically see missing or shorted conductors, miswired cables, reversed diodes, twisted-pair errors, and backward connectors.

Print crystal-clear test results including the wiring schematic.

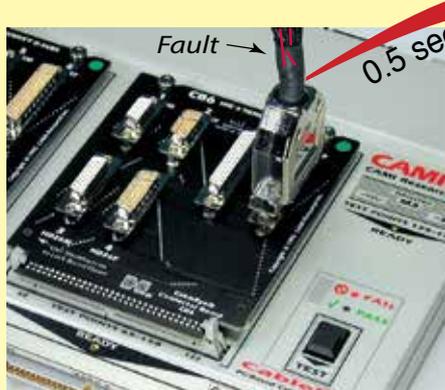
Graphically compare two cables by alternating the display between your test result and the ideal cable.

Run a high-speed resistance test loop while you flex the cable to check for intermittent connections.

Trace hidden wires graphically with our minihook probes.

Rapidly identify the wiring of unknown cables.

Set up electrical- or light-guided assembly for fast error-free connector pinning and harness assembly.



Model M3Z Expandable to Over 2500 Test Points. Use with Laptops Too!

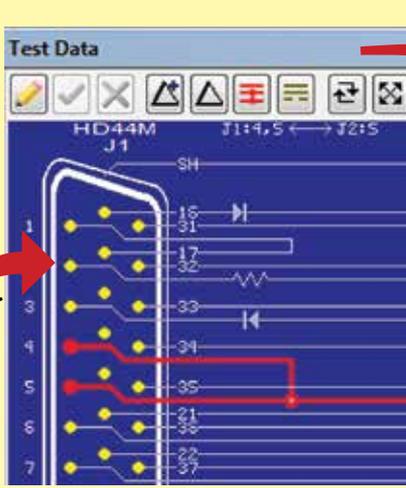
Easily automate your tests, log test results and print batch reports. Control tower lights, lock and release latches, diverter gates, label printers and more.

How much is your time worth? Chances are that it won't take long for your **CableEye** cable and harness test system to earn back your investment.

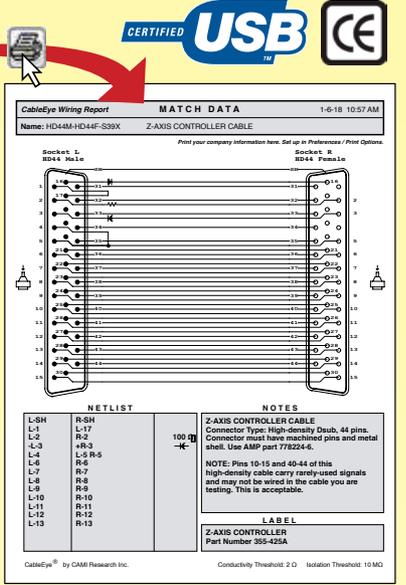
Basic systems start at \$1395.

Operating software included.

READY TO USE!



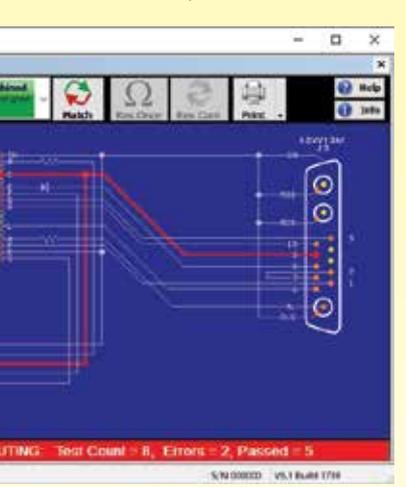
Visualize Wiring Schematically or by Netlist with Color-Coded Errors. See Full Measurement Data for Every Connection. Touch-Screen Compatible.



Fully Document Cables for your Own Records or for your Customers'!



Automate Batch Testing



Automate Batch Testing

Automation-Ready: Scan Barcodes • Control External Devices • Display Work Instructions

camiresearch.com/testimonials

Have an older serial port tester? Ask about our Hardware/Software/Cal/Warranty Bundle Upgrade.

TAKE A FREE 2 WK TEST DRIVE!



2 Yr Renewable Warranty
With Free S/W Updates, Tech Support

CableEye®

CAMI Research Inc.

+1 978-266-2655 | sales@camiresearch.com

Continuity • Resistance • 4 Wire • Capacitance • HiPot • Components

Box Builds to Brave The Elements: Understanding Enclosure NEMA Ratings

The name of the game with industrial enclosures is the capacity to protect the sensitive electronics that power industrial automation processes as well as safeguard the human beings that interact with these enclosures from electrical harm. And a large part of this protection stems from combatting the variety of harsh environmental conditions in today's manufacturing environments, be it indoors, outdoors, or some combination of both.

In order to achieve this, automation architects need a concrete understanding of how industrial enclosures are classified based on their ability to protect the components and humans alike. For North American manufacturers, this is where the **National Electrical Manufacturers Association (NEMA)** ratings play a mission-critical role in helping automation architects select the right enclosure based on the production environment and potential environmental hazards to enclosure protection and/or security.

UL standards, written by Underwriters Laboratories and product certification to the standards provided by the global certification organization UL, often have NEMA ratings specified in the standard. The NEMA ratings designate the level of protection industrial enclosures provide against environmental influences

such as dust, dirt, water, corrosion, ice formation, and other forms of ingress.

Let's examine in closer detail the different levels of NEMA standards for a better understanding of the ideal enclosure for industrial manufacturing applications.

How do NEMA ratings work?

Before we look at how the NEMA system rating classifies industrial enclosures in terms of safety and protection, it's important to understand the difference **between NEMA and its close cousin, IP ratings**, as confusion between the two is somewhat common.

In the most nuts-and-bolts sense, both NEMA and IP ratings classify enclosures by their ability to combat the ingress of solid and liquid particles while taking into account the potential for electrical interference or harm. NEMA ratings take into account protection and safety on a more environmental level including the potential for corrosion, damage, or harm from atmospheric conditions, and the capacity for electrical fault. Because the two systems are based on different testing parameters, there's no direct correlation, but rather an approximate correlation between NEMA and IP ratings; they are often used in concert to more accurately and holistically ascribe protection characteristics for industrial

enclosures.

In today's global manufacturing landscape, it's also important to note IP ratings are an international standard while NEMA ratings apply predominately to only North America.

While NEMA provides more than 600 standards for industrial enclosures and electrical cabinets, the most common NEMA ratings in today's manufacturing space are:

- **NEMA Type 1 and 2:** This classification denotes an enclosure's protection against human contact with electrically charged components in environments with dripping or light splashing water. NEMA 1 and 2 rating combats faults in normal atmospheric conditions and is suitable for use in general manufacturing applications.

- **NEMA Type 3, 3X, 3S, and 3RX:** NEMA 3 ratings designate enclosures that provide weather-resistant protection. This includes industrial enclosures that are rain tight, protect against ice formation, and are resistant to corrosion while also protect-

ing against falling dirt and other airborne particles.

- **NEMA Type 4 and 4X:** Engineered for indoor and outdoor use, NEMA 4 and 4X rated enclosures are watertight, dust tight, sleet-resistant, and designed to combat splashing water and/or hose-directed water streams. In addition, NEMA 4X enclosures are corrosion-resistant and are ideal for use in a variety of applications including the food and beverage industry.

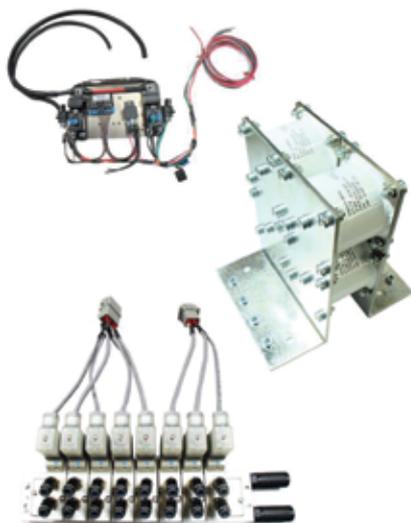
- **NEMA Type 5 and 12:** Industrial enclosures designed under NEMA 5 and 12 standards protect against falling dirt, circulating dust, and other large airborne agents including lint, fibers, and flyings. In addition, NEMA 5 and 12 rated industrial enclosures protect against dripping and splashing water as well as non-continuous spray of non-corrosive coolants. NEMA 5 and 12 enclosures are engineered for outdoor use in such applications as material handling space for distribution hubs.



MarVac is able to assemble your electromechanical components to meet your production requirements, improve your logistics, and provide production efficiency gains. MarVac Assemblies, your solutions Partner.

MacVac Assemblies Solutions:

Wire Processing
Packaging & Kitting
Harness Capabilities
RoHS Soldering
Box Build
Mech Sub-Assemblies



414-479-3288

sales@marvacassemblies.com



Merger & Acquisition Advisory
Serving the Wire Harness Industry



Loren M. Smith, CEO

lms@blvcapital.com
www.bluevalleycapital.com
913-660-8039



NEMA ratings and industrial enclosures

With an understanding of the most common NEMA ratings used in modern manufacturing, it's important to also understand what we mean when we say industrial enclosures. Just as there is some confusion about the difference between IP and NEMA ratings, so too is confusion about what industrial enclosures, IT cabinets, and junction boxes actually are and how these different industrial housings function as part of an automated production process.

The biggest difference in discussing these different boxes or cabinets is the misinformation surrounding them. Any enclosure housing electrical or electronic components can be referred to as an industrial enclosure, so that would include junction boxes. However, IT cabinets are often misconstrued as industrial enclosures. Industrial refers more to the environment (industrial factory vs. IT data center) or the controls within (industrial controls vs. IT equipment). So, each of these terms refer to very different parts of your automation infrastructure and help manufacturers carry out very different tasks.

- Industrial enclosures house and protect the mission-critical industrial panels and control manufacturing components that help power, control, or protect (switchgear) a manufacturing operation. Often used interchangeably with electrical cabinets, industrial enclosures are used in a variety of production environments and must range in NEMA ratings based on the environment in which the enclosure is deployed. Designed and engineered for innovation, durability, and reliability, Rittal's industrial enclosures solutions include small and compact, wallmount, modular, and unibody to meet a variety of NEMA rating

needs and industry applications.

- Junction boxes are a common element of an industrial automation infrastructure in that they house wire connections and protect these critical connections from environmental hazards that can have circuit faults, large-scale disruptions in production, and even fires. Rittal's line of junction boxes are engineered for a wide range of industrial applications and NEMA standards to help manufacturers enclose wire connections with superior protection and durability.

- IT cabinets house and protect IT components such as Edge computing equipment designed to gather, sort, and store large

amounts of data manufacturers produce via their automated production sequences. Much like industrial enclosures, Rittal's IT cabinets come in a variety of NEMA classifications to help manufacturers leverage data nearest the point of origin in a variety of industries and applications.

Many thanks to Rittal North America for providing this article. No matter your NEMA rating or type of enclosure need, Rittal's innovative approach to design and engineering will help you leverage superior protection and safety in creating an industrial automation framework that promotes productivity, efficiency, and growth.

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".

PROLINE
 THE LEADING EDGE IN MODULAR ERGONOMICS



*The Leading Edge
 in Modular Ergonomics*

**10 Avco Road
 Haverhill, MA 01835**
Ph: 800-739-9067
Fx: 978-374-4885
 E-mail: Bench@1proline.com

www.1proline.com
 www.industrialworkbenches.com



WireStar

HMI FOR WIRE PROCESSING MACHINES

NEW MEGOMAT INTERFACE WIRESTAR 30

- Configurable connection to various ERP systems
- Full downward compatibility to previous WireStar versions
- Scalability to support different layouts
- Third-party software integration
- Customer-specific data configuration
- Configurable quality process

INCREASE THE PRODUCTIVITY

CONNECT YOUR SYSTEMS

SECURE THE SOFTWARE

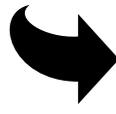
Schaefer Megomat USA Inc.

2349 S. Commerce Drive
 New Berlin, WI 53151, USA

Phone: +1 262 524 1100
 Fax: +1 262 524 1133

E-Mail: newberlin@schaefer.biz
 Web: www.schaefer.biz



 **UPDATE**
 YOUR MACHINES

New Advertiser Offers Low-Cost Crimper

Versatile, Reliable and Made in US

Over the past few issues of WHN, FKN Systek has introduced their C200 tabletop pneumatic crimp tool. It accepts a variety of dies, operates on standard shop air, and has a pressing capacity of 1200kp. The tool offers quick and easy changeout of dies and operates in a linear fashion unlike

a standard scissor crimp which can wear out tools quickly.

Two crimp contact positioning and holding systems are available. A simple crimp contact star for standard contacts, or a positioning slide for holding both the crimp contact and the wire. A tool set for IDC Ribbon Cable assembly is also available

and the company produces custom dies for unique crimping needs.

WHN caught up with Klaus Heumann of FKN Systek to find out more about the company. They began in 1996 in Millis Massachusetts with the sole purpose of supplying equipment and expertise to the electronics assembly industry. Their main product line has been PCB depanelizers and other PCB manufacturing peripherals. Following their customers' needs, they branched into harness assembly tools and even a wire pull tester. "What sets us apart from our competitors is the ability to supply custom solutions," Klaus detailed.

Although their standard equipment provides a wide variety of crimping options, he noted there are many occasions where unique geometry or particular designs call for non-standard applications. "Our in-house engineering and design team work with our customers to develop the tools they need to make their crimp process efficient and economical."

Standard tools are in stock, and ready to ship. If you have any questions or would like to discuss a special crimp application, you can contact them at (508) 376-2500 or send an email at fkn@fknsystek.com.

FKN Systek Inc.
Tools For Electronics Assembly

www.fknsystek.com

C200 Pneumatic Crimp Press

For more information
Call 508 376 2500

E mail fkn@fknsystek.com



Economical pneumatic benchtop crimp tool
Accepts a variety of dies from different manufacturers
Air operated using standard factory air 75-100 Psi.
Pressing capacity of up to 4,000 lbs.

Speed up your low to medium volume wire crimping process by using the FKN Systek benchtop crimp press to replace the hand crimping process. This tool uses the same dies you are presently using with your hand operated crimper.

FKN Systek 115 Pleasant Street Millis, MA 02054
Tel: 508 376 2500 Email fkn@fknsystek.com

We have you covered



Your Metri-Pack connector



Our ES10 CAP

Use your connector with our ES10 CAP to create a SEALED MINI FUSE HOLDER.

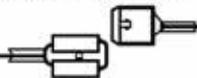
For harsh environments and engine compartment conditions • IMDS certified

Call (440) 871-0800 • Email sales@whiteproducts.com
www.whiteproducts.com

WHITE PRODUCTS

Harber Industrials, Inc

www.harberconnect.com



Independent Stocking Distributor
specializing in
Electronic Interconnecting Materials
since 1947.



- Standard Cable Connectors
- Ribbon Cable Connectors
- D-Subminiature
- I/O Connectors
- Headers, Housing & Contacts
- Circular Plastic Connectors & Accessories
- Pins & Sockets
- Ultra Fast Receptacles & Tabs
- Terminals
- Splices
- Superseal 1.5

Large Inventory - Same Day Shipping!
Competitive Pricing!

phone: 708-594-7744
fax: 708-594-7761
email: info@harberconnect.com
www.harberconnect.com

NEWS PLUGS



Wire Applicator Tooling Speeds Production and Reduces Changeovers

Custom crimp applicator tooling for attaching electrical terminals to wire, producing the strongest mechanical connection with the highest electrical conductivity, is being introduced by ETCO Incorporated of Bradenton, FL.



ETCO Applicator Tooling is custom manufactured from the highest quality tool steel to precisely match OEM electrical terminal attachment requirements and features a specialty coating that improves wear resistance. Proven to extend tool life by up to 140%, the coating allows the tooling to create a crimping slide without friction which increases production speeds and reduces

the frequency of changeovers. Offering greater toughness and lubricity to produce high quality crimp connections and cut tooling costs, the ETCO Applicator Tooling coating exhibits a compressive strength of -1.3/-1.5 GPa and a 0.30-0.35 dry coefficient of friction against steel. The coating also reduces the need for sharpening and shimming by re-coating the same applicator tooling.

ETCO Applicator Tooling is priced according to customer requirements and price quotations are provided after receipt of prints.

For more information contact: ETCO Incorporated, (800) 689-3826, www.etcocom.com.

Secure High-Density Push Pull Connector

PEI-Genesis offers LEMO's B-Series push pull connector: a secure, push pull latching system with high-density panel spacing, 360 degree EMI shielding and quick mating or unmating.

This LEMO push pull connector series is designed for indoor or vacuum-tight applications, making it an ideal choice for test and measurement instrumentation, medical devices, research, audio/video and applications where a highly reliable, quick-mating connector is needed.

Modular insert configurations include a wide range of high-density or hybrid electrical contacts, including solder, crimp, PCB straight or elbow, fibre, coax, thermocouple, pneumatic, fluidic or high voltage contacts. LEMO's proprietary keying system allows for a higher contact density while preventing mismatching. This LEMO push pull connector series includes the family size range of 0B to 5B.



PEI-Genesis' Value Add Services are available for the LEMO B-Series with rapid turnaround. Contact us today to discuss your next application.

For More information, contact PEI Genesis at Toll-Free: 866-734-9111. To order products, ecommerce@peigenesis.com. For technical questions, techsupport@peigenesis.com

LTL Tooling

STOP Hand Injuries
AND Increase Production

HCAP-02
Split-Cycle Hand Crimp Press
Patented Design Made in U.S.A.

Call for our FREE demo CD

- 30 second tool change-overs.**
- Make your hand tools semi-automatic.**
- Secures terminal in tool before crimping.**
- Use your tools by hand or in-press with modification.**
- Two (2) FREE tool modifications with purchase.**

Your best source for:

- Cable and Wire Pull Testers
- Pneumatic Cable Cutters
- Center Strip Equipment
- Cable & Wire Strippers
- Wire Twisters
- Wire Coilers

LTL's PT Series
Cable & Wire
Pull Testers

PT-1000
PT-500
PT-200

Call or visit our website for more information.
www.LTLTooling.com

LeTroLaq Tooling & Assembly

185 East Walnut Street | Sturgeon Bay, WI 54235
Phone: 920.858.0806 | Fax: 920.743.3811
www.LTLTooling.com | e-mail: claudel@ltrltooling.com

Harness Board Spot Taping System

Gettig Handheld Spot Taping Equipment



Save \$\$\$\$
Wrap a Spot Tape
Automatically

Applies a piece of tape in approximately **Two Seconds**

A faster, more efficient method to tape wires on a harness board

Gettig Taping Equipment measures and cuts from a roll, a piece of plain pressure sensitive tape, and wraps it around an object

Object Diameter:

1/8" - 1"

Tape Width:

1/2"



SPRING MILLS MANUFACTURING, INC.
104 East Streamside Place, PO Box 85
Spring Mills, PA 16875-0085
Phone: 814-422-8892 Fax: 814-422-8011
www.SpringMillsMfg.com



NEWS PLUGS continued



Lacing Tape Scissors Comfortable to Hold & Cuts Fast

An industrial-duty, ergonomic scissors that is designed for cutting lacing tape, cable jacketing, fiber and mesh insulation, other non-aramid fibers, and more has been introduced by Xuron Corp. of Saco, Maine.

The Xuron® 440 Mini-Scissors is an ergonomic hand tool that is well suited for cutting lacing tape and other fibrous materials. Eliminating awkward conventional finger loops, these lightweight scissors have soft rubber hand grips with an internal return spring, and produces a clean, square cut.



Featuring precise cutting tips and the mechanical leverage found in pliers, the Xuron® 440 Mini-Scissors cleanly cuts soft sheet metal up to 0.005" (0.1 mm), soft plastic, and non-aramid fibers. This compact scissors is ideal for repetitive assembly and repair tasks.

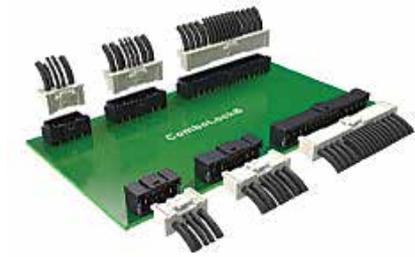
The Xuron® 440 Mini-Scissors is priced at \$26.25(list); made in the U.S.A. A complete product catalog and price list are available upon request.

For more information contact Xuron Corporation, 62 Industrial Park Rd, Saco, ME 04072-1840. Visit www.xuron.com

Amphenol FCI ComboLock Wire-to-Board Connector System in Stock at TTI

TTI, Inc., a leading specialty distributor of electronic components, announces the availability of the ComboLock Wire-to-Board Connector System from Amphenol FCI. This system is a modular, reliable and compact hybrid wire-to-board connector system that saves space and allows for simpler assembly and cable management. ComboLock Wire-to-Board Connectors feature a hybrid 1.00mm pitch signal and 3.00mm pitch power configuration with an active latching feature. These devices have a nominal current carrying capacity of 10A/pin maximum for power and 1.5A/pin maximum for signals where power wire sizes range from 26AWG to 18AWG and signal wire sizes from 30AWG to 24AWG.

Typical applications include con-



sumer, industrial and data solutions, to name a few. They are in stock and available today at TTI.

WireMasters Connects With Conesys as an Additional QPL-approved Value-add Distributor Partner

WireMasters is excited to announce a recent global partnership with California-based connector manufacturer, Aero-Electric Connector—A division of Conesys (Aero-Electric). WireMasters can now assemble Aero-Electric Mil-Spec connectors in their Mexicali, Mexico value-add connector facility.

As a category-C distributor for Aero-Electric, WireMasters is QPL approved to value-add the following connector product lines:

- MIL-DTL-38999 Series I, II, and III
- MIL-DTL-26482 Series 2
- MIL-DTL-83723

With the addition of this partnership, WireMasters now maintains more than \$10M in component inventory on-the-shelf—ready to be assembled into mil-circular connectors and quickly shipped for your application.

WireMasters has built a strong reputation in the industry through service excellence for wire and cable. It was a natural evolution to broaden our product portfolio over the last few years to become a trusted source for everything in your harness. The WireMasters approach to service has led to an exponential increase in demand for value-add connectors over the past twelve months. Adding Aero-Electric to our list of connector component suppliers for QPL-approved assembly is just one of many ways that we're excited to meet the increased demand and to provide our customers with more options and shorter lead times for Mil-Spec connectors, stated WireMasters' VP of Supply Chain, Clint Mendinsky.

Through this partnership, WireMas-



ters looks forward to providing customers a cost-effective and customizable connector offering that Aero-Electric can provide. With a common goal of superior quality and excellent service, WireMasters and Aero-Electric are destined for a successful partnership.

"We are excited to have WireMasters as a Value-Add distributor of Aero-Electric connector product. WireMasters continues to strategically expand its product offering and solidify their position within their customer base, and we are thrilled to support this ef-

fort and move forward together," stated Walter Neubauer, Jr., CEO of Conesys, Inc.

For more information about connectors from WireMasters, contact your WireMasters Account Executive, call us at 855-WM-38999 (855-963-8999) or visit www.wiremasters.net

Tactotek® licensee Nanogate is Ready for IMSE® Manufacturing to Benefit Home Appliance, Consumer Electronics, Medical, and Automotive Markets

Tactotek, the global leader in developing and industrializing in-mold structural electronics (IMSE) technology, announces that its licensee, Nanogate, a leading global specialist for design-oriented high-tech surfaces and components, is ready to mass produce IMSE parts. Nanogate recently completed the IMSE Builder® technology transfer and has verified IMSE manufacturing capabilities.

Tactotek's IMSE Builder includes intellectual property rights, know-how, and instruction for IMSE manufacturing, testing, and quality assurance, as well as access to the database of Tactotek-verified materials and components. Tactotek has a hands-on technology transfer process to ensure that licensees master IMSE manufacturing before undertaking production projects.

"The transfer of IMSE manufacturing technology begins with in-person training using IMSE Builder documentation to increase general technology understanding, help adaptation to IMSE processes, materials, and testing, and prepares our licensees for manufacturing. Nanogate specialists worked alongside Tactotek employees on our IMSE production floor to provide real hands-on experience with IMSE manufacturing, testing, and QA," says Marko Suo-Anttila, SVP Professional Services Tactotek. "The last technology transfer step was producing parts under serial conditions at Nanogate's own facility at Fohnsdorf, the 'SKINLINE', to verify that their team had the skills and capabilities to succeed."

Nanogate is part of the Techniplas Group and is globally known for producing high-quality, high-tech surfaces for home appliances, consumer electronics, medical, aviation, and automotive markets.

The Techniplas Group runs 28 sites worldwide with production, sales, and/or technology hubs and employs just under 4,000 staff members. The Austrian facility is the first factory ready for IMSE manufacturing.

According to Stefan Moitzi, General Manager of the Nanogate 'SKINLINE' facility at Fohnsdorf, "Tactotek's technology transfer process is very thorough and leaves nothing to chance—our team is confident in their ability to produce high-quality IMSE parts, having done so in both Tactotek's factory and our own. We have strong demand across the markets that we serve to integrate electronic functions in a wide variety of high-quality cosmetic surfaces, and that's a perfect fit with IMSE technology; moreover, today's increased emphasis on ease of sterilizing surfaces makes the seamless construction even more appealing."

About Tactotek

Tactotek is the leading provider of Injection Molded Structural Electronics (IMSE) solutions that integrate printed circuitry and electronic components into 3D injection molded plastics. Leading IMSE use cases include human-machine interfaces (HMI), connectivity, and electronic styling features for automotive, smart homes, appliances, and other markets. Tactotek develops and industrializes IMSE technology, creates mass production-ready IMSE prototypes, and licenses IMSE technology for 3rd party IMSE part design and global mass production.

Tactotek is funded by international leaders in finance and industry committed to advancing technology solutions that benefit consumers and the environment. Tactotek investors include 3M Ventures, Repsol Energy Ventures, Faurecia Ventures, Conor Venture Partners, Voima Ventures, Nordic Option Oy, Nidoco AB, and Cornes Technologies Limited. For more information, please visit www.tactotek.com.

About the Techniplas Group

Techniplas is a global supplier of sophisticated plastic components and design-focused, multifunctional surfaces that are primarily for the automotive sector, as well as the industrial, consumer goods, medical and other markets. The company's products follow industry trends like weight reduction and vehicle electrification, innovative operating concepts, high-quality surface finishes, and an increasing focus on convenience and safety.

The company serves customers and platforms around the world, focusing on technological expertise and collaboration with customers in the fields of design and engineering.



IPC Celebrating 10 Years of Success in India

Since 2010, IPC India Regional Office has helped OEMs, EMS, PCB manufacturers, cable/wiring harness manufacturers and electronics industry suppliers Build Electronics Better through skill training & certifications. The India office has certified more than 11,000 professionals from the electronics manufacturing industry in the region.

Electronics manufacturing has been growing quite significantly in India and IPC has supported the Government and industry mission by providing resources, helping electronics manufacturers create better quality products and enhancing job skills.

As part of the 10 years celebra-

tion, the IPC India office has started a series of activities like member networking events and skill challenge competitions throughout India from January 2022. It will culminate with the inaugural Integrated Electronics Manufacturing & Interconnections (IEMI) event scheduled in New Delhi on August 2 and Bengaluru on August 4, 2022.

The IEMI New Delhi event on August 2 will be dedicated to “India’s Transformation into Emerging Tech, Industry 4.0 & Mobile Manufacturing Hub” and the IEMI Bangalore event on August 4 will be focussed on “India - Emerging Aerospace Electronics Hub”.

The Indian wire harness market has been growing at a steady rate in recent years due to growth of automobile, aerospace, medical & consumer electronics manufacturing facilities. Wiring Harness companies from India will be participating at the Bangalore event focussed on aerospace sector.

The Government of India, IPC Members and several Indian & International Associations are supporting the event in India.

The global electronics industry event allows designers, manufacturers, traders, suppliers, service providers and technical experts to connect - communicate - collaborate - create

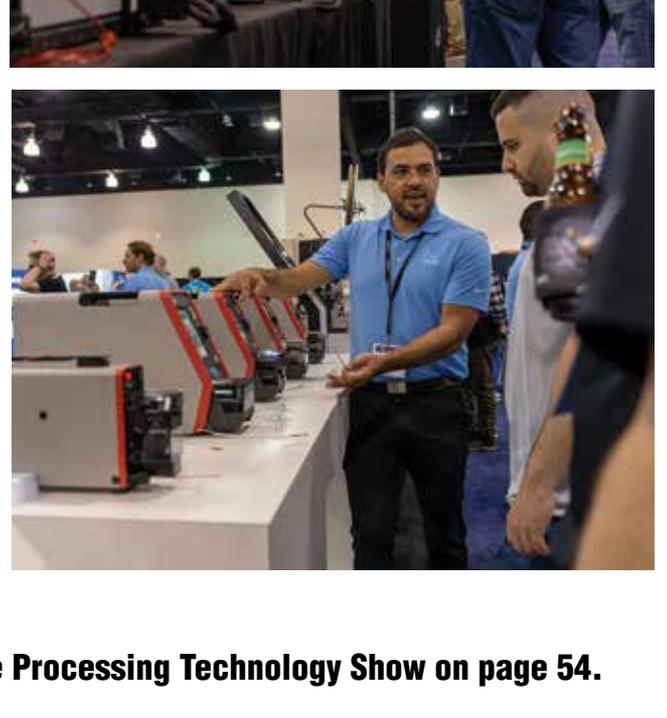
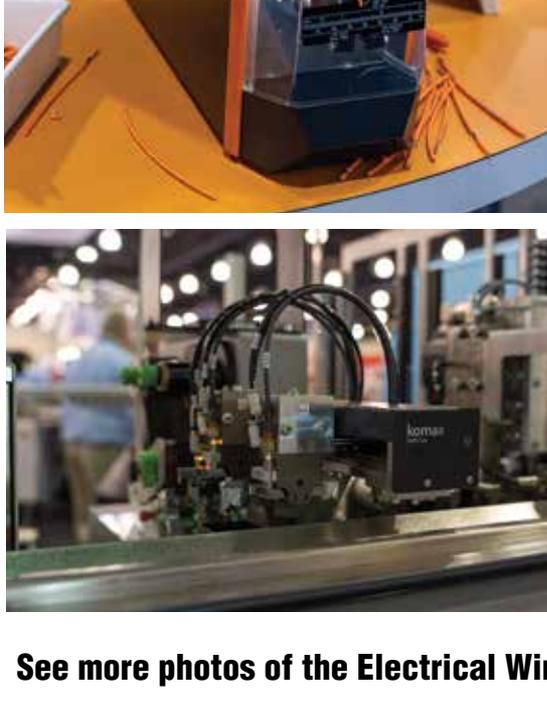
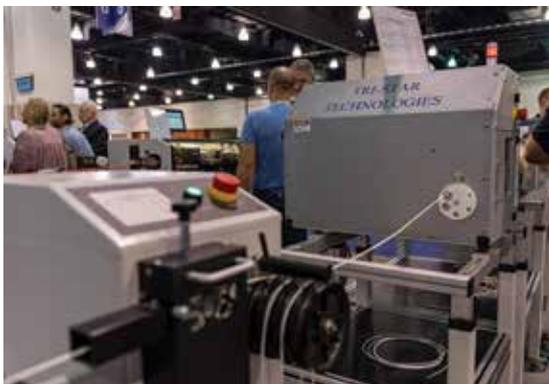
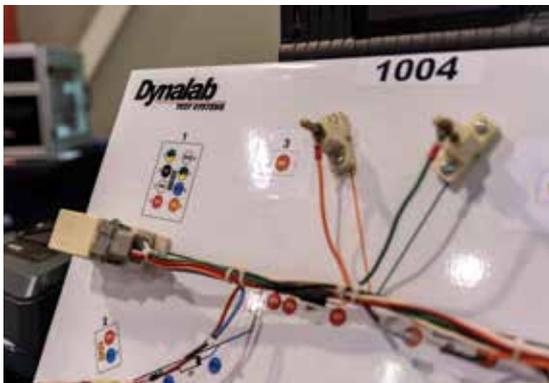
& develop relations. IPC is expecting 800+ delegates from India & international visiting the 2 cities.

IEMI 2022 will help forge new business partnerships and IPC hopes Wire Harness companies will find this forum key to expanding business horizons and will forge new strategic partnerships.

Event website: <https://www.ipcindia.org.in/iemi-website/>

IPC India Regional Office Contact - Gaurab Majumdar, Executive Director IPC, Phone: +91-80-26532211, Mobile: +91-9986366145, Email: ed-india@ipc.org, Web: www.ipc.org/ www.ipcindia.org.in

Great to be back In Milwaukee! Scenes from EWPT 2022



See more photos of the Electrical Wire Processing Technology Show on page 54.





WHMA Presents Awards at Recent Events

By Christine Siebert

Wiring Harness Manufacturers Association (WHMA) offers recognition awards each year to honor the accomplishments, leadership, and contributions of professionals working in the wire harness and cable assembly industry. These awards were distributed at the WHMA Annual Wire Harness Conference and the Electrical Wire Processing Technology Expo (EWPTE).

The first two awards, WHMA Hall of Fame and two WHMA Volunteer Excellence Awards, were presented at WHMA's 29th Annual Wire Harness Conference on February 16, 2022.

This WHMA Hall of Fame award recognizes extraordinary contributions with broad significance to the cable and wire harness industry and distinguished service to WHMA. Award recipients support the advancement of industry, consistent with the goals and mission of WHMA. This is the highest level of recognition WHMA can give to a member and is based on exceptional merit over the long term.

This year's inductees are Norm Sagon, NFS, and Bud Bowen, Winchester Interconnect.

Norm Sagon was recognized for his long-term service to WHMA as one of the association founders, Board of Directors member, and chair of the WHMA board, for many years of promoting WHMA and the programs of WHMA and for contributions to WHMA's mission to lead, educate and connect our members globally.

Bud Bowen was recognized for his long-term service, strategic leadership as a member of WHMA's Board of Directors, for his leadership representing WHMA's interest in the industry's acceptability standard, WHMA/IPC-A-620, and for contributions to WHMA's mission to lead, educate and connect our members globally.

"The Hall of Fame winners represent the best of the best—strategic, visionary and committed—Norm Sagon and Bud Bowen have demonstrated passion, dedication and a continued commitment to propel the harness, cable and interconnect industry forward," said Joe DeMan, chairman of the WHMA Board. "WHMA is honored to acknowledge the hard work of these exceptional leaders. They are truly the heroes and champions of our industry"

The next award is the WHMA Volunteer Excellence Award which honors individuals from WHMA-member

companies who have demonstrated ongoing leadership in WHMA activities and have contributed significant time and talent to the association and the cable and wire harness industry.

This year's recipients are Parker Garrett, EMSCO, and Cathy Hanlin, Precision Manufacturing Company Inc.

Parker Garrett was recognized for his contributions to the WHMA Board, the Board nominating committee, and his significant contributions to the WHMA annual meeting in the role of program committee member.

Cathy Hanlin was recognized for her leadership of the WHMA/IPC-A-620 committee, member of the A-620 "A-Team," and helping to achieve the highest rating of on-time comment resolution and on-time publication of the standard.

"The leadership shown by our Volunteer Excellence Award recipients has made a significant impact on WHMA and will do so for years to come," said DeMan. "We are privileged that Cathy and Parker have chosen to share their knowledge and expertise with us and with the entire global wire harness manufacturing industry."

WHMA introduced a new industry award, the WHMA Hall of Builders Award, during EWPTE in Milwaukee, Wisconsin on May 11, 2022.

The Hall of Builders Award was created to honor individuals from WHMA-member companies who have made significant contributions toward advancing the cable and wire harness industry. Hall of Builders inductees are industry veterans, leaders, and mentors retiring from active employment, but whose legacies live on in the wire and cable industry, today.

Tom Andrsek, sales manager at Pressmaster U.S., the first recipient of the WHMA Hall of Builders Award, epitomizes service and contribution to the cable and wire harness industry. Andrsek was personally involved in the development and introduction of more than 500 discrete hand tool crimp solutions for the North American market, promoting quality crimp solutions for 37 years.

"Tom is known by colleagues as the godfather of connector crimping and educated connector manufacturers on how to achieve a 'quality crimp' while continuing to build the North American Market," said Joe DeMan, WHMA Board chair. "We're thrilled to present him with the first Hall of Builders Award, and to thank him for his outstanding contributions



Randy Cherry presents Scott Morris of MarVac/Marsh Electronics with the IPC/WHMA-A-620 QML (Qualified Manufacturers List) Certificate.

to the cable and wire harness industry."

WHMA/IPC also recognized MarVac/Marsh Electronics for requalifying the IPC/WHMA-A-620 QML (Qualified Manufacturers List) program. QML is used to qualify EMS and OEM providers' assembly processes to IPC standards. MarVac's first 3-year qualification had expired, and the IPC Validation Services team renewed MarVac in late April. WHMA presented the certificate at the EWPTE show.

"MarVac Assemblies a division of

Marsh Electronics, Inc. has worked extremely hard to obtain this requalification to the IPC/WHMA-A-620 Qualified Manufacturers Listing (QML) for Class 2," said Randy Cherry, IPC Director, Validation Services. "We are pleased to recognize MarVac Assemblies for maintaining their participation in IPC's network of trusted QML suppliers."

To nominate candidates for future WHMA awards, visit <https://whma.org/recognition/> for award criteria and nomination form.



M-EXPO Wire Processing Technology Expo

Produced by:  






1 WHY ATTEND?
M-EXPO will feature expert-lead training and education focused on the cable and wire harness manufacturing industry.

2 WHY EXHIBIT?
Put your latest products, services and innovations in front of key decision makers.

3 LOCATION
The El Paso/Juarez region is a manufacturing epicenter for the wire harness global supply chain.

LEARN MORE AT
www.mexpowire.com

Conference: September 27-29, 2022
EXPO: September 28-29, 2022

Complejo Polanco
Ciudad Juárez, Chih., México

Now in its 4th year, M-EXPO is the premier exhibition for wire processing in the Ciudad Juárez/El Paso region providing an opportunity to learn, grow, share, and discover new approaches to many aspects of the wire harness industry.

M-EXPO is produced by the Wiring Harness Manufacturer's Association (WHMA), the ONLY trade association exclusively representing the cable and wire harness manufacturing industry including manufacturers, their suppliers and customers.



Harness the Power of TWO Industry Organizations with ONE Membership

WHMA/IPC membership allows you to:

- Enjoy a free single-user download of every new or updated **IPC standard**
- Receive exclusive member rates on all standards, registration for in-person events such as **WHMA Annual Conference** and **IPC APEX EXPO**, certification, and much more
- Be included on the WHMA.org Directory of Manufacturer and Supplier Members
- Listen to experts discuss the latest issues in our industry through our **FREE** Wisdom Wednesday webinars
- Receive **25% discount** on all IPC/WHMA-A-620 training materials
- Post your company job openings for **FREE** on WHMA's exclusive **Industry Job Posting Page**
- Enjoy a complimentary listing on the **IPC Global Marketplace**
- Receive exclusive **access to health plans** you typically only find with larger manufacturing companies. Visit IPC.NAMHealthcare.com, to learn more about NAM Health Care and to get a quote!
- Benefit from the advocacy work done by **IPC Global Government Relations** as they proactively engage policymakers in the United States, Europe and Asia to adopt policies that strengthen the talent pool, bolster the value chain, and right-size regulations to spur greater technological innovation and economic growth.



WHMA membership has provided our company the opportunity to share ideas, discuss challenges and innovate through networking opportunities. We have built relationships with colleagues, competitors, and industry specialists. Those relationships have been invaluable to our organization.

Jason Zoubek, Absolute Quality Mfg., Inc.



[Save 50% on your First Year's Membership! Sign up for multiple years to save more.](#)

Join Online

For more information, contact [Jerry Canada](#), WHMA/IPC sales representative.



M-EXPO Wire Processing Technology Expo

Produced by:



1 WHY ATTEND?

M-EXPO will feature expert-lead training and education focused on the cable and wire harness manufacturing industry.

2 WHY EXHIBIT?

Put your latest products, services and innovations in front of key decision makers.

3 LOCATION

The El Paso/Juarez region is a manufacturing epicenter for the wire harness global supply chain.

LEARN MORE AT
www.mexpowire.com

Conference: September 27-29, 2022

EXPO: September 28-29, 2022

Complejo Polanco
Ciudad Juárez, Chih., México

Now in its 4th year, M-EXPO is the premier exhibition for wire processing in the Ciudad Juárez/El Paso region providing an opportunity to learn, grow, share, and discover new approaches to many aspects of the wire harness industry.

M-EXPO is produced by the Wiring Harness Manufacturer's Association (WHMA), the ONLY trade association exclusively representing the cable and wire harness manufacturing industry including manufacturers, their suppliers and customers.

LEAD. EDUCATE. CONNECT.

THE BATTERY SHOW

NORTH AMERICA 2022

CO-LOCATED WITH:



September 13-15, 2022 | Novi, MI, USA
Suburban Collection Showplace



DON'T MISS
THE LARGEST
SHOWCASE OF
ADVANCED BATTERY
TECHNOLOGY
IN NORTH AMERICA

The Battery Show Exhibition & Conference is a showcase of advanced battery technology for electric & hybrid vehicles, utility & renewable energy support, portable electronics, medical technology, military, and telecommunications.

For more information please visit

TheBatteryShow.com

CLASSIFIEDS

MANUFACTURER SEEKING WIRE HARNESS AND INJECTION MOLDING REPS

OEM automotive and IATF certified manufacturer in business 50 years seeks motivated sales reps for new business development. Our Los Angeles headquarters house our injection molding and wire processing departments with 28 closed loop injection molding machines ranging in size from 28 ton to 165 ton and 15 high speed cut/strip and terminate machines. Our 40,000sq ft assembly plant is located in Mexicali, Mx and is staffed with 300+ operators. All sales are currently being handled in house from our Southern California and Detroit, Michigan locations.

Email with interest and details about your rep group to include: years in business, number of reps in your organization, customer base, line card to:

info@wiringharnessnews.com and reference #77439.

UNIQUE OPPORTUNITY

COMPANY FOR SALE OR MERGER WITH BUY-OUT OPTION

After more than 40 years, the founder and current owner is planning to retire. This ISO 9001-2015 certified company, located in the North East, is the leading US manufacturer of special molded and assembled electrical components. Having been and still being a vital and reliable supplier to Hundreds of OEMs and Distributors in North America the company could be an ideal addition to a small or mid-size company that is interested in new customers, instant increases in sales and profits.

Please contact us via; Wiring Harness News PO Box 669
Scherville, IN 46375 @ Attn: Classified Ad #99402
Email: Info@wiringharnessnews.com

Manufacturers Sales Rep Seeking Cable and Harness Line

Nighthawk Technology serves Southern California and has a customer base of Medical, Mil/Aerospace, and Automotive OEMs. We are currently looking for quality custom suppliers.

Please contact Michael Friedman at
Michael.friedman@nighthawk-tech.com or at 760-445-1664

REPS WANTED

Well established wire processing equipment manufacturer is seeking experienced and talented outside independent sales representation throughout the North American market. Contact us to discuss joining our team as we provide custom wire processing solutions for our diverse customer base during these turbulent times! We have a large range of equipment to offer, from handheld tools, to fully automated and customized transfer lines. We look forward to talking to you about this opportunity today!

Please contact us via: Wiring Harness News
PO Box 669 • Scherville, IN 46375
Classified ad # 77424
Email: info@wiringharnessnews.com

CASH FOR SCRAP WIRE & CABLE

Chicago Surplus & Recycling Inc
Ask for Jared 262-862-2517

PO Box 161 • 11304 260th Ave • Trevor, WI 53179-0161
Over 30 Years

SALES REPRESENTATIVE AVAILABLE FOR WIRE HARNESS / CABLE ASSEMBLY

Well established "hands on" personable individual with a very strong industry knowledge and proven experienced professional contract Sales/Marketing Representative for; Electrical Wire Harness, Electronic Cable Assembly along with Value Added product applications. My objective is seeking a long term business relationship with your organization that is presently challenged with future additional sales growth in your company's new business development efforts within the various marketplaces.

Please submit your company's interest of requirements, whereby we can mutually explore and strategies these great business opportunities confidentially to:

Wiring Harness News # PO Box 669
Scherville, IN. 46375 @ Attn: Classified Ad # 13263
Email: info@wiringharnessnews.com

SALES AND SERVICE G-TERMINATOR CONTROLS, AMP CLS CPU CONTROL BOARDS AND TOUCH SCREEN



G Terminators for Sale. Call for pricing.



Control Box Assembly
Part numbers 318900-1 & -2



Control Panel Assembly
Part number 354559-1



CLS Touch Screen Assembly



CLS CPU Computer Board

Call 717-215-0518
Gbon9999@yahoo.com

GF ELECTRONICS LLC
WWW.GFELECT.COM

AMP, AMP CLS AND G TERMINATOR
ARE TRADEMARKS OF TE CONNECTIVITY

To Place Your Classified Ad in
Wiring Harness News
Contact: jim@wiringharnessnews.com

CLASSIFIEDS

★★★★ FOR SALE ★★★★★

DELFINGEN NU-SLEEVE SG-200
Silicone rubber coated braided fiberglass sleeving
Part# ER5650013W - 1000 foot rolls

No reasonable offer refused

Call RPC Electronics, Ira Dryer • 440-461-4700 xt 1176

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

WWW.DRUMCONE.COM

HIGH SPEED WIRE FEED SYSTEM FOR AUTOMATED PROCESSING MACHINES



- Heavy-Duty Steel Construction
- Open Frame Design
- Fits Standard 24" Wire Drums
- Easy-to-Install Kit
- Quick Change Mounting
- Custom Sizes Available
- Made in USA

info@drumcone.com
678-929-5502 Ext 101

JOB DESCRIPTION

DO NOT APPLY unless you have performed **ALL** functions described --- **AND** meet **ALL** listed requirements.

Job Responsibilities - Cable/Harness Manufacturing Assembly Experience Necessary:

- Construct Prototype Wire Cable and Harness Assemblies from customer prints. using soldering, crimping, and other techniques as required in the WHMA-A-620 standards.
- Write detailed work instructions, including charts and/or pictures when possible.
- Work with Engineering, Production and Quality Managers.
- Solve problems with customer cable designs.

Must meet ALL Requirements:

- **NO EXCEPTIONS** - 5 years **minimum** wire cable and harness manufacturing assembly experience performing **ALL** job responsibilities listed above.
- Work with limited supervision.
- Knowledgeable in the use of hand tools, wire strippers, crimping applicators.
- Must have good oral and written communication skills and be able to read and write in English.
- Legal authorization to work in the US on a full-time basis.

Desired: WHMA-A-620 certification

Salary: Dependent upon ability to demonstrate knowledge of requirements

Location: Central Florida just North of Orlando in Sanford, FL

Job Type: Full-time

Pay: \$14.00 - \$20.00 per hour

Please contact us via: Wiring Harness News
PO Box 669 • Schererville, IN 46375 Classified ad # 28862
Email: info@wiringharnessnews.com

Wanted to Buy

Cable and Wire Harness Company.

I'm interested in buying a cable and wire harness company, preferably located in the Midwest to Texas or Florida but I'm open to other regions.

Prefer a family owned business with revenues of \$500,000 to \$10,000,000.

I look forward to hearing from you.

eselse2020@gmail.com

crimptools.com

"Specializing in Crimp Tool Needs"

Authorized Distributor For:

Pico Corp, Burndy, Rennsteig Tools,
Thomas and Betts, Sargent

Many Other Manufacturers:

Amp/Tyco, Daniels, Astro, Raychem, Kings,
Molex, Panduit, and many more

Stocking: Same Day Shipping

AMP Hand Tools 1000's
Hydraulic Crimpers/Crimp Heads and Dies
Pneumatic Crimpers
Hand Crimp Tools & Positioners
Install & Removal Tools
Raychem Heating Tools AA400, IR550, IR1759

**ALWAYS LOOKING TO
BUY EXCESS INVENTORY**

Dakota Electronics Inc.

512-852-8119

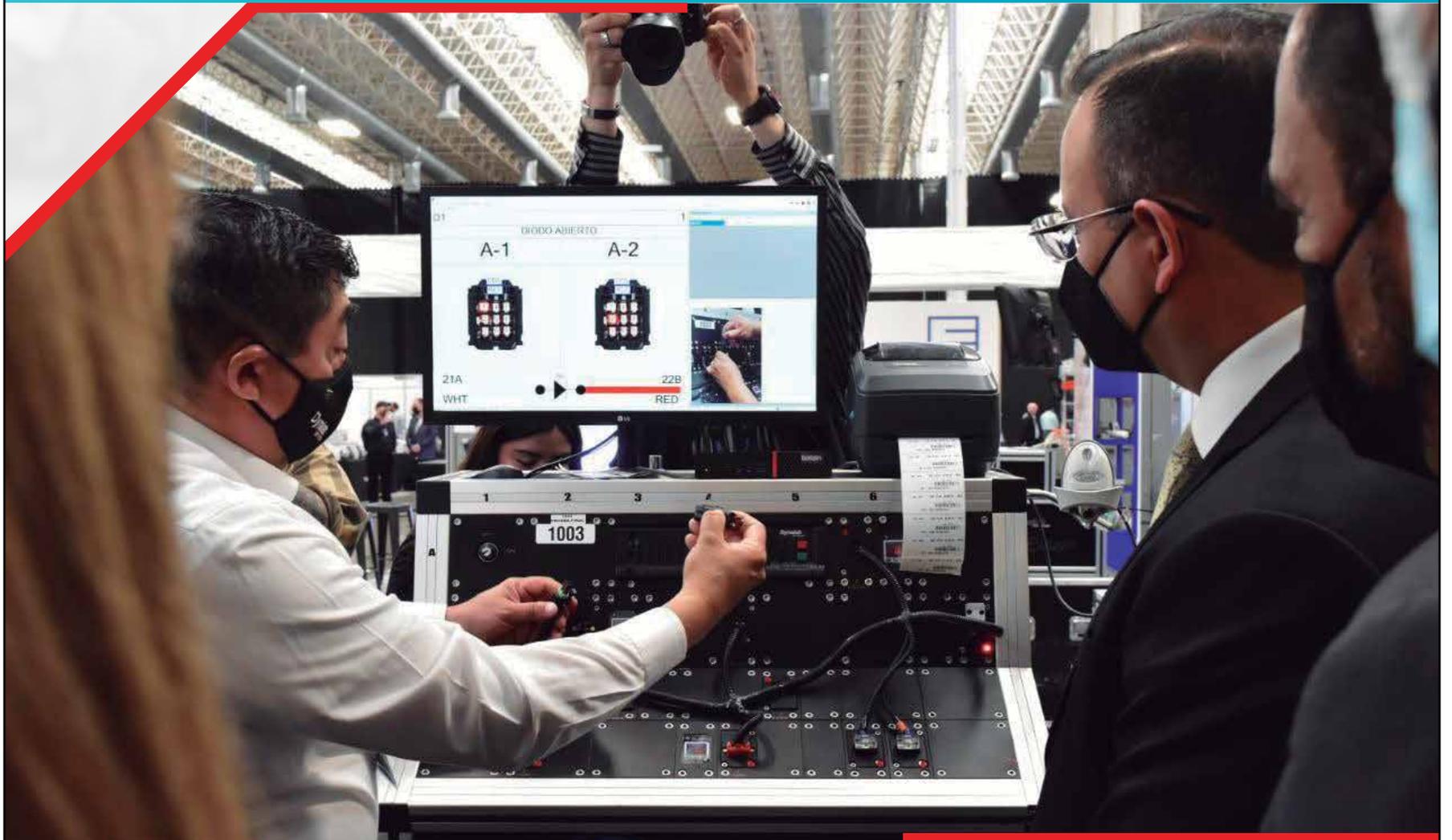
sales@crimptools.com



MEXICO ASSEMBLY
WIRETECH

***THE BIGGEST EXPO
DEDICATED TO ELECTRICAL***

HARNESSES IN MEXICO



SECOND EDITION

**SEPTEMBER
07 & 08
2022**

**EXPO
CHIHUAHUA
CHIHUAHUA, CHIH**

• EXHIBITION FLOOR • CONFERENCES • ONE-SITES B2B

MORE INFORMATION

+52 (656) 805 6421 | WWW.WIRETECHMX.COM

@EXPOWIREMEXICO | WIRETECH_EXPO | EXPO WIRETECH



ADVERTISERS DIRECTORY

Aerospace Wire & Cable	31	Gladding Braiding Products	13	Robert Technologies	16
AnMar	44	Hamilton Products, Inc	46	Schaefer Megomat USA Inc.	49
Applitek Technologies Corp	39	Harber Industrials.....	50	Schaefer Technologies LLC.....	5
Artos Engineering Company.....	2	HellermannTyton	41	Schleuniger Inc	32, 33
Astro Tool Corp	38	Herrmann Ultraschalltechnik	10	Schunk Sonosystems North America.....	63
Atlas Wire LLC.....	19	Imada, Inc	8	ShinMaywa	6
Battery Show	58	Industrial Wire & Cable Corp	45	Spring Mills Manufacturing.....	16, 45, 51
Blue Valley Capital	42, 48	INSCO/Insulation Supply	43	Strunk Connect Automated Solutions Inc.....	22
CAMI Research, Inc	8, 47	Jaguar	14	Techflex	3
Chief Supply Inc.	14	James Monroe Wire	28	Telsonic Solutions	20
Cirris Systems	7	Judco	40	Thermosleeve	6
Cobra Braiding.....	34	Komax Group.....	9, 64	Tri-Star Technologies.....	17
Commission Brokers Inc.....	21	Lakes Precision Inc	4	TTI	21, 23, 25, 27, 29, 31
Daniels Manufacturing Corp.....	15	LTL Tooling	51	Wardwell Braiding	30
Diagraph	36	Mark-10.....	11	Waytek	35
DIT-MCO International	12	MarVac Assemblies.....	48	Wesco/Anixter.....	34
Dynalab Test Systems	36	Mecalbi	23	White Products.....	50
ECC.....	28	Mecal by Starn	19	WHMA.....	56
Electrical Products Sales.....	13	Mechtrix Corporation.....	37	Wiretech Mexico.....	61
Eraser Company	35	Mello Company Inc The	3	Xuron Corp	27
Etco Inc.	18	M-Expo	57	Z+F.....	25
FKN Systek Inc	50	Multi/Cable Corp.	47	Zuken	24
FreePoint Technologies Inc.....	42, 46	Phoenix Contact	26		
Fuses Unlimited	38	Pro-Line	49		

Subscribe to Wiring Harness News
www.wiringharnessnews.com





Sonosystems®

Schunk Sonosystems

North America

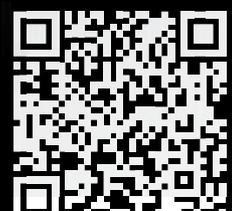
For high voltage cables with terminals...

Weld with the equipment that already has it in its name

HVT



www.schunk-sonosystems.com
250 Andover Street Wilmington, MA 01887
p. 978-658-9400 f. 978-658-6550
sonosystems.usa@schunk-group.com
parts.sso-us@schunk-group.com
service.sso-us@schunk-group.com



Contact Us !

MAXIMUM FLEXIBILITY

FULLY SEQUENTIAL AUTOMATION FOR PANEL BUILDS



ZETA 640/650 PLATFORM

Equipped with 13 process modules allowing many possibilities for small batches or sequences. This new generation Zeta automates all processes such as cutting to length, stripping, termination, ink-jet marketing, ultrasonic welding, and tube insertion, simultaneously on both wire ends, enabling production without the need for changeovers. The automatic wire changer provides up to 36 different wires over the entire cross-section range 26awg – 10awg.



M1650 TUBE MARKER

For additional information visit



komax
komaxgroup.com