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- The Case of the Rusty Sensor
- How Private Labels Can Benefit Your Business
- Wire Labeling: Making the Case for Print Automation



## Automatic Coax & Cable

#### By Joe Tito Wiring Harness News

Humble beginnings. That's a recurring theme in the Wire Harness News Company Profiles. This installment is certainly no different as we highlight Automatic Coax & Cable in Sanford, FL. I met with Gary Martinet on a recent hot September day. Gary, along with his wife Glenda, own and manage the business, and Gary shared their story of happenstance.

Back in 1986, Gary was selling mechanical screw machine parts. He had played on the University of Central Florida golf team and was teaching golf on the side. One of his students was also a friend and local business owner. One day he asked him, "Mike, what's your biggest headache - what do you lack in good supply?" Mike quickly replied that he had no reliable local source for cable assemblies. Gary wasn't quite sure what he meant by 'cable assemblies' but he plugged that in the back of his mind.

A few months later, Gary was cruising local garage sales looking for toys for his kids. He came up dry, but as he was walking away from his last stop, something caught his eye. In the back of the garage were several pieces of equipment, all nicely covered. He asked the owner what it was and she told him it was wire and cable assembly equipment. She and her husband had moved the equipment with them from California, and had intended to set up a cable assembly business in Central Florida. "Well the light went off right there. I asked her what happened, and she said that her husband had passed away." Gary thought with her knowledge and his efforts, they could perhaps start a business together, but she declined saying she would rather just sell the equipment. "I asked her how much she would want for it. I knew I had \$1,500 in the bank, and she said she would probably take \$1,400." He ran home and told his wife not to write any checks because they only had \$100 in the bank."I honestly don't re-



Assembly on one of the original Molex presses.

member what she said, but she didn't throw anything at me, and we are still together after 45 years."

Gary and some of his buddies loaded up the equipment and took it to his garage."I looked at it and said, 'now what?' I mean, I didn't have a clue." With no manuals, all he could do was contact the manufacturer. "One of the pieces of equipment said 'Eubanks' so I dialed information,

spoke with the manufacturer and got the number for a rep in Tampa." For \$25, he got a manual, some hands-on training, and some spacer blocks he would need to make the cables for his friend, Mike.

Gary heard about a cable assembly house that had closed, and managed to track down and hire a couple of

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#### Not Your Father's Flat Cable Innovative designs make flat cables strong

candidates for round cable replacement lat cable has been around that promises to overcome many of for about 60 years. Cicoil invented the ribbon cable

these production logistics issues. It was developed by Cicoil Corporation for IBM computers in 1956 (Figure and it opens the potential for engi-1). Over the decades, it has been a neers to capitalize on flat cable advantages, while utilizing the common cable prep tools and automated processes currently in use with round cables. But first, let's take a look at some of the reasons flat cable should be considered in the design phase.



favorite in high-end computing, military and aerospace, robotics and motion control devices. Its advantages include superior flexibility, electronic noise abatement, and packaging efficiency. The limiting factor over this time has been the need for unique termination techniques-prepping for connectors has largely required hand work. Later in this article a new type of flat cable will be introduced

#### Ten top reasons to use flat cables.

Reliability - The simplicity 1. of flat cable with its parallel conductor geometry eliminates many

#### Figure 1: Early ribbon cables in IBM computers circa 1956

of the common sources of wiring errors and malfunctions. Conductors are registered one-to-one with the terminating connector or board so proper contact assignment is almost automatic.

2. Weight reduction - The use of flat cable often eliminates much of the conventional wire weight. Such things as redundant insulating materials, fillers and tapes are unnecessary. In addition, the composite flat cable construction is mechanically strong enough to eliminate the need to include large conductors for strength. The copper cross-section can thus be reduced to only that necessary to carry current loads or to satisfy voltage drop requirements.

3. Space efficiency - Elimination of unnecessary insulation, fillers, and tapes reduces the bulk and physical volume of flat cables.

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## **Profile of an Entrepreneur**

By Loren Smith

uring the years I owned a wire harness manufacturing business, I was often asked what would prompt someone to leave the security of a large corporation and risk acquiring a marginally profitable business in the middle of nowhere. At the time, I could answer only for myself. But now that I am in the third phase of my career--having put deals together for dozens of other entrepreneurs--I see that my personal response aligns with the answer most entrepreneurs would give.

Contrary to the stereotype that individuals become entrepreneurs to get rich, the vast majority take the plunge for freedom and independence. Even when that means sacrificing outstanding job security.

Conversely, those who consider becoming their own boss but wind up not taking the risk find the prospect of giving up a regular paycheck too painful. Or, in many cases, their spouse cannot tolerate the lack of security.

The seeds of my willingness to take a shot at becoming an entrepre-



Loren Smith CEO **Blue Valley Capital** 

neur may have been planted long before I began the first phase of my career, working for a multinational corporation. I was still a kid when one of my uncles sat me down to offer some life advice:"Don't ever work for anybody," he told me, explaining that I couldn't control the degree to which he or she might be reasonable and fair. I shouldn't ever want to be in a position where my future was dependent on my boss.

Continued on page 6



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4	34	34	<b>£₩</b> 125 mΩ	11 P	< 1 µA	1499 V	>1G	0.204 mA	996 V	5 M
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## **Profile of an Entrepreneur**

Continued from page 4

I had deep respect for my uncle, and his advice echoed long after. Despite early success in a corporate environment, his words were always ringing in my ears. So much so that I eventually risked all to move my family from the East Coast to buy a small wire harness company in a town of 1000 in rural Iowa.

This was not an immediate "everyone lived happily ever after" story, however. I discovered that the wire harness company was in much greater financial distress than had been apparent. My life was thrown into disarray as I struggled to right the ship.

A year later, still in the throes of maintaining a company under siege--no cash and no bank credit, but plenty of customers tightening their quality and delivery requirements while looking for price reductions--I received a surprise call from a headhunter looking for somebody with my corporate experience. The opportunity sounded like a perfect fit, and it would be a ticket back to all that city life offered, on a healthy income. Because my family had still not adjusted to a dramatically altered lifestyle, the opportunity seemed a panacea for all of us.

I flew to the interview and thought it went extremely well. I had the background the connector company wanted, and I knew the company to be highly reputable. I was feeling a great sense of relief.

But then, as I reflected more fully, not only on the interview but also on what I really wanted, I could not get past one fundamental reality. Despite the arduous road that still lay ahead to make the wire harness business sound, I could not get comfortable with once again working for somebody else. I liked being my own boss, especially because I was blessed with a group of employees who knew the meaning of commitment and work.

When I got to the airport I called my wife to tell her if I did get offered the job I would not be taking it. The wire harness company was still treading water and still located in an obscure town, but it was my company, and my hard-won freedom was something I would never give up.

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

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## EADERS

## **The Amazing Race Continues**

By Paul Hogendoorn

egular readers of this column probably wonder if I am still working, or if I'm retired, given that so many of the columns I've written highlight many recent recreational pursuits or adventures, many of them with my granddaughter.

The truth is that not only am I still working, the last two years I've been working harder than I did in almost any other period in my 35 year career. The difference though, is that I have learned a few things on the ever-converging life and business journey, and one of those things is how to keep things in relative balance, even when going full throttle. Along with the stresses and challenges of starting up a new business that is bringing new technologies to a conservative industry and challenging decades old (centuries old?) paradigms, I've taken small breaks here and there to climb famous towers and bridges, hike Niagara escarpment trails, and drop anchor in places unchanged since before the first European settlers arrived here.And most of those things, I did with my granddaughter.

On our last such adventure, we talked about one day participating in the "Amazing Race Canada" reality TV show, and then concluded that, in effect, we were already doing that now. We were sitting on the back deck of



**Paul Hogendoorn** 

a boat just off shore at Grand Bend, and then a single moment later we were soaring 550 feet in the air. It was spectacular, and the whole experience caused me to think about how different things would have been, if I didn't say "yes" to many of the unusual requests I said yes to, with most of those requests coming from her.

It made me think of how the lessons we learn in life apply to us in business, and the lessons we learn in business, can apply to us in life. Not every question should be answered with "yes", but I've learned that my natural inclination for too many questions always seemed tilted toward "no". Sometimes its better to try, and fail, than never to have tried at all.

Continued on page 10



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#### Continued from page 8 \_

Sometimes these revelations come after long hours of hiking, or climbing, or riding, and sometimes they were epiphanies that come days later, upon reflection. With the parasail adventure, I knew the inspiration needed to come quickly, whatever it may be, because the whole thing was only going to last 10 or 12 minutes; one minute we would be sitting legs forward on the back deck, the next we would be soaring, feeling as if we were suspended, thumb tacked to a cloud. If only getting a company off the ground was that easy, I mused. But, it's not.

And then it hit me.

I found myself thinking those exact thoughts, wondering why it wasn't that easy to get a company or new idea off the ground, and why people are more inclined to say no and resist a new idea than embrace it and run with it. And then I thought about the boat that was pulling us, with its 600 cubic inch engine, and the sail that was suspending us, and the taut thin line in between, and I realized it was the resistance of the wind that lifted us to the sky, and not the pulling of the boat alone. Without the resistance, there would be no lift. If it was just a matter of power and speed, we would be skipping along the surface of the water, at perhaps 40 of 50 miles per hour, but we wouldn't get in the air. We wouldn't be enjoying the experience, in fact

after only a short while, we would be exhausted, beat up, and drenched. We needed the right balance of speed and power, along with resistance, to get into the air. Resistance is good, in fact, its necessary. We also needed thin taut rope to keep the two connected, and the best word to describe that rope when everything is working well is "under tension". There is always tension whenever there is resistance, and there is always resistance, where there is lift.

The person driving the vision, or idea, or company, is likely thinking primarily about the power and speed of the tow boat, and all its capacity, and may actually be thinking of all the resistance as a bad thing, when in fact, some of that resistance is a necessary thing, if indeed you really want your idea, or business, to soar.

My take away advice for this recent 12 minute adventure: 1) say yes more often to more paradigm changings things – get out of your comfort zone, and this incudes recreation as well as business, 2) expect resistance, even a lot of it, with healthy doses of fear, and 3) and learn how to discern which resistance is needed and constructive and can be leveraged to actually get you soaring in the air.

And work hard, because the Amazing Race(s) continues.

Paul Hogendoorn cofounded FreePoint Technologies. "Measure. Analyze. Share. Don't forget to share!" He can be reached at paul. bogendoorn@getfreepoint.com or www.getfreepoint.com



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#### By Jim Manke

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conference features presentations on topics important to wire harness manufacturers, OEM's and suppliers.

This year's conference keynote presenter will be Todd Buchholz with his presentation titled "New Ideas from Dead CEOs". Buchholz is the former White House senior economic advisor, Tiger hedge fund managing director and best-selling author. His lively and informative speaking engagements have earned him a place in Successful Meetings Magazine's "21 Top Speakers for the 21st Century and his best-selling books on economics and financial markets have been widely translated and are taught in universities worldwide.

As a frequent commentator on the state of the markets, Buchholz brings his experience as a former White House director of economic policy, a managing director of the \$15 billion Tiger hedge fund, and a Harvard economics teacher to the cutting edge of economics, fiscal politics, finance and business strategy. His presentation, "New Ideas from Dead CEOs " will bring to life history's greatest CEOs-from Steve Jobs to Ray Kroc to Akio Morita, Estée Lauder to Tom Watson Sr.-and shows how their lives. leadership and lessons can inform and inspire us in today's chaotic marketplace.



Todd Buchholz

to the CEO of Wal-Mart? How did Estée Lauder, a working-

class woman from Queens, convince the shoppers at Saks to buy her cosmetics? How did the San Francisco earthquake of 1906 eventually lead to A.P. Giannini's success as America's greatest banker?

In this speech, Buchholz answers these questions and shows today's business managers how to deploy their entrepreneurial secrets to benefit their companies in today's hyper-competitive global econo-

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Continued from page 13 \_

my. He uses his experience as a White House economist, Harvard scholar, and Wall Street professional to show investors what kinds of CEOs to invest with and what kinds of companies to steer away from. In addition, Todd lays out a forecast for the economy and the financial markets. You will come away from this keynote presentation with a fresh understanding of the competitive pressures we face today, and a road map to finding success.

Another session at the conference features Taylor St. Germain with a talk on, "Wire Harness Industry Economics – The Future and Now." Taylor is an Analyst at ITR Economics. ITR Economics<sup>™</sup>, content provider for IEWC's Hotwire<sup>®</sup> industry newsletter, provides industry-renowned

economic intelligence to reduce risk and drive practical and profitable business decisions. Since 1948, ITR has provided business leaders with economic information, insight, analysis, and strategy. With a knowledge base that spans six decades, ITR has an uncommon understanding of long-term economic trends and how to react to critical changes in market conditions.

This session will provide ITR's views of what to expect from the economy this year and beyond, covering such topics as industry and consumer trends, business to business activity, tax reform, trade, inflation, interest rates and more.Attendees will also learn about a method by which their company can take advantage of their own data and the economic environment.

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#### **How Private Label Cables Can Benefit Your Business**

By Anne Edgington Purchasing Manager, Consolidated Wire & Cable Group

rivate labeling involves the manufacturing of a product or item by one company for another, after which the second company sells the product under its name or brand. Many large corporations rely on private labeling if they don't have an in-house manufacturer for a certain part or product.As a result, they can ensure that their components are manufactured correctly and cost-effectively while staying true to their brand.

The advantage of private labeling is that a company can

obtain an essential component for a low cost without having to add additional facilities or staff. It also gives the company greater control over production and branding, since it has the ability to make changes whenever necessary. Most importantly, by using a manufacturer who specializes in a particular field or area, companies can be sure that they're receiving the highest-quality product available, which in turn increases the quality of their overall product, device, or system.

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While private labeling has taken off in numerous industries, it's become particularly

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hanging technologies that are driving the electronics industry will take center stage throughout the IPC APEX EXPO 2019 technical conference and professional development sessions, which will take place January 26-31 at the San Diego Convention Center in San Diego, California. Registration is now open at www.IP-CAPEXEXPO.org.

In keeping with the event's theme, "Technology's Future Comes Together," the technical conference will feature more than 30 technical sessions detailing original research and innovations from industry experts around the world. Subject-matter experts will cover topics in the areas of board fabrication and design, electronics assembly, reliability and test. In 2019, Design Forum courses will be incorporated into the technical conference program allowing all engineering and design staff to benefit from the wide selection of designfocused sessions.

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## Flat Cable

#### Continued from page 1

Additionally, their low profile enables flat cables to hug surfaces and take advantage of tight or normally unused space. A rectangular cross-section lets flat cables stack or layer with almost no wasted space between cables, providing maximum conductor density for a given volume.

4. Flexibility – Flat cable is extremely flexible when bent in the plane of its thin cross-section. This flexibility has been used in applications where continuous or high flexing is necessary, as in drawers, doors, rotating arms, and so forth.

5. Greater strength – Flat cables have high strength because all conductors and insulators equally share tensile loads.

6. Consistent electrical qualities – The conductor spacing is fixed and the geometry of the cable is constant. This geometry brings consistent electrical qualities that include impedance, capacitance, inductance, time, delay, crosstalk and attenuation.

7. Greater current-carrying capacity – Flat cables have greater surface-to-volume ratios than their round-cable counterparts. Consequently, flat cables dissipate heat more efficiently. This thermal efficiency lets them handle a higher current level for a given temperature rise and conductor cross-section.

8. Reduced skewing effects – Conductors have the exact same physical and electrical length and a consistent and continuous dielectric. This minimizes time delays between signals within a given flat cable.

9. High-density interconnections – Flat cable has a high wire-tocable cross-sectional density. So layers of flat cable pack more efficiently and provide a higher conductor density than in round cables.

10. Ease of handling – Flat cable folds and bends readily, conforms to the mounting area, fastens easily with clamps, adhesive, or double-faced tape, eliminating the installation and lacing difficulties associated with round wire cabling. Conductors are visible and in a fixed position within the dielectric, a factor that simplifies coding, inspection, and circuit tracing.

#### Flat vs Round

Most cable is round, which is a generally useful geometry. Examine a typical round electrical cable and you'll find insulated wires in a bundle surrounded by several layers of other "filler" material (Figure 2). These layers are there to retain a round pro-

Continued on page 23

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Figure 2: Typical Round Cable Elements

file, and to minimize frictional heating as the cable moves. Surrounding the wires and fillers is an outer jacket that holds it all together, and provides some level of protection against outside elements. While round cable is normally fine for general use, there are drawbacks with this construction.

Because round cables incorporate these multiple layers of wires, insulation, and fillers, heat dissipation from the wires can be problematic. Despite measures to reduce it, there is still frictional heat produced inside the cable during repetitive motion cycles. There is also the issue of electrical impedance alteration as conductors inside the cable move relative to one another.

With flat cables, each conductor is kept parallel with neighboring conductors to form a flat profile. Unlike round cable, conductors in flat cables don't move within the encapsulating jacket, so their electrical qualities remain constant. Similarly, the conductors in the cable all have the same physical and electrical length. This means that signal skewing, and differential time delays between signals in the cable, stay at a minimum.

Flat cable, isolates each conductor within the cable, keeping them stable and stationary. The result is that they need no low-friction tapes or fillers. This has the added advantage of reducing both weight and volume, which provides maximum packaging efficiency. And the greater surface to volume ratio of the flat form factor also dissipates heat far better. The larger surface area and heat dissipating capability enables flat cables to carry a higher current for a given temperature rise, and for conductors of a given cross section.

Furthermore, the flat form factor means that within the plane of its thin cross section, flat cables exhibit far more inherent flexibility than equivalent round cables.

Ultimately, where signal-to-noise purity, flexibility, heat, weight and volume efficiencies are paramount, flat cables have better inherent performance values than found in round cable. Until now round cable deficiencies have been tolerated, and engineered around, because it is very common, and tooling exists for efficient terminating and assembly. Fortunately, a new generation of flat cable have been developed that combines ease of use with an alreadyimpressive set of inherent advantages, and makes it possible to consider designing with flat cable instead of round versions for many applications.

#### Cicoils EZ-Flexx<sup>TM</sup>

A flat cable has been designed by Cicoil that finally addresses the challenge of termination, which has been the main drawback of using flat cable. It's called EZ-Flexx, and its constructed to be as easy to work with as common round cables, while also providing a long flex life, and all the other features and benefits of flat cable that were previously outlined. Ordinary manual or automated wire

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## **Flat Cable**

#### Continued from page 23

stripping tools can handle the stripping process. Conductors comprising an EZ-Flexx flat cable are easily split from the cable body revealing a traditional round shape for common terminating techniques. The process is straightforward: Split out the individual conductors in the cable, strip the outer jacket from the end of the conductors, strip the inner conductor insulation, and apply the connector in the usual way.

It is useful to understand the capabilities of modern EZ-Flexx flat cable by examining some older flat cabling technologies.

As noted earlier, the flat ribbon cable was introduced by Cicoil in 1956 for early mainframe computers. Ribbon cable allowed companies like IBM to replace bulky, stiff round cables with a low-profile alternative that could be terminated easily through use of insulation displacement connectors (IDCs). Ribbon cable is inexpensive and has a standard geometry.

A point to note is that ribbon cable is not really comparable to modern flat cable such as EZ-Flexx. It was not designed for repetitive flexing, as the PVC jacketing of most ribbon cables is relatively brittle (Cicoil's IDC ribbon cables, however, feature hiflex wires and jacketing). Plus, ribbon cables use just a single wire gauge for all conductors (28AWG) which limits their use.And finally, ribbon cable can emit electromagnetic interference in the absence of extra shielding.

Another type of flat cable uses a

simple external sheath, often of PTFE (branded by Dupont as Teflon<sup>®</sup>), to enclose bundles of conductors. Unlike ribbon cable or extruded flat cable like EZ-Flexx, wires in the PTFE jacket are not held in place within the jacketing material. They can creep from their initial position, or be pulled out of place, by forces from the terminating connections. To head off such difficulties, PTFE flat cable may employ clamps at regular intervals along the cable. PTFE jackets are also relatively brittle, and can crack with repetitive flexing, exposing the internal wires.

Another type of flat conductor technology is that of flex circuits. These are basically flexible versions of printed circuit boards. They are usually comprised of conductive traces either screen printed or plated onto, or sandwiched between, flexible plastic substrates.

The usual application for flex circuits is in forming a connection between circuit boards where space is at a premium and the geometries involved are difficult for ordinary connectors to handle. Flex circuits are generally not designed to handle repetitive motion. Moreover, because their conductors have dimensions that are on the order of circuit board traces, flex circuits have a limited ability to handle high power levels or lengthy trace runs.

#### Flat vs. Contoured Cable

Cicoil extruded flat cables are defined as a group of conductors (electrical, liquid or gas tubing, fiberoptics) aligned in parallel, and com-

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Figure 3: Anatomy of a contoured flat cable

pletely, seamlessly encapsulated in an insulating, protective jacket. Cicoil invented the patented extrusion process employed to manufacture this type of flat cable.

EZ-Flexx flat cables, consist of a variety of color-coded PFA-insulated electrical conductors, and Teflon® or polyurethane tubing elements, which are encapsulated overall within an ultra-pure, engineered rubber jacket (Figure 3).

This proprietary engineered rubber is called Flexx-Sil<sup>™</sup>, and delivers a number of useful properties. The distinguishing feature of EZ-Flexx flat cable is the combination of roundprofile conductors extruded with a Flexx-Sil encapsulation that maintains the individual round wire form factor needed for common hand and automated stripping equipment. The evolution from traditional flat cable can be seen in the profile image in Figure 4

The Flexx-Sil jacket strips easily from the PFA insulated conductors, and the PFA insulation strips easily from the conductor wires. A thin Flexx-Sil rubber strip - part of the overall extrusion - connects each of the individual elements to form the

\_ Continued on page 26



Figure 4: Evolution from traditional flat cable to EZ-Flexx



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## Flat Cable

#### Continued from page 25 \_

flat cable. Multiple conductor bundles can be separated out from a single cable, each terminated with their own connector (Figure 5).

Each conductor is kept parallel with neighboring conductors. Unlike round cable or PTFE "sheathed" flat cable, the conductors in an EZ-Flexx cable are held securely within the encapsulating Flexx-Sil jacket and don't move, so their electrical qualities remain constant. Virtually any type of electrical conductors required for power, signal, video and data may incorporated into this cable. This includes bare wire, insulated and shielded conductors, twisted pair, triaxial, and coax, etc., in sizes of 4 to 44 AWG, plus non-electrical conductors such as fiber optics and fluid tubing.

#### **Specific Applications**

EZ-Flexx flat cables work well in applications characterized by extreme environments, motion, and challenging space constraints. They are particularly durable, and advan-

Continued on page 28



Figure 5: Flexx-Sil jacket strips easily for termination of each conductor



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## **Flat Cable**

#### Continued from page 27

tageous where other kinds of cable fall short, like extreme temperatures ranging from -65°C to +260°C (-85°F to 500°F). In contrast, ordinary PVC cable jacketing starts to decompose when the temperature reaches 140°C (284°F), and starts to melt around 160°C (320°F).

EZ-Flexx cable excels at motion applications because the wire is extremely supple, as it is made from multiple bundles of fine 40-44 AWG base strands. This contrasts with a standard 24 AWG wire which is typically comprised of just seven, larger 32-AWG base strands, which results in a stiffer wire with larger bend radii that doesn't stand up to repeated flexing.

Because a flat profile takes up less volume than comparative round wire when stacked or bundled, flat cable saves valuable space. And because they naturally flex in a single plane, and incorporate the durable Flexx-Sil jacketing, they often don't need conduits or cable tracks-minimizing space, weight and noise, not to mention cost.

#### Composition of the **New Jacketing**

EZ Flexx cables are encapsulated with jackets made of material called Flexx-Sil. This engineered rubber developed for Cicoil's exclusive use, is ultra-pure, durable, and extremely versatile. The material is extruded seamlessly around each cable element to form a single flat cable, and it is clear so the individual conductors are visible. The PFA jacket insulating each of the conductors is color coded for easy gauge size identification anywhere along the cable length.

Flexx-Sil is a remarkable external

jacketing compound that provides superb flexibility while protecting conductors against sudden impact, severe vibration, and extreme G forces. It registers a Durometer value of 65 (Shore A); a SuperTuff<sup>™</sup> version goes up to 85 (ShoreA), and the material doesn't wear, crack or deform when exposed to tight bending, continuous flexing or operational stress. It requires no conduit for protection, is tear resistant, and self-healing from small punctures.

Encapsulation also features long term integrity, with near zero particulates, making EZ-Flexx Cables Class 1 Clean Room rated. And it maintains flexibility and operation integrity in extreme temperatures, as already noted. Flexx-Sil has passed UL 94V-0 flammability testing.

This jacketing material is waterproof (including immersion), resists most chemicals, and operates for years in intense UV and sunlight conditions. The Flexx-Sil™ formulation features virtually zero impurities, zero halogen, and a strong molecular bond meeting NASA's Spec 1124 for outgassing.

#### Summary

EZ-Flexx flat cable has introduced a new paradigm in flat cable designone that reduces the need to engineer around the performance limitations of round cable. The innovative cable marries flat cable performanceenhancing attributes such as Flexx-Sil jacketing and ultra-flex, fine-stranded wire conductors, with a physical profile matching that of standard wires found in common round cable. The new technology introduces the first flat cable ready for use with industrystandard assembly tooling and presents a cost-effective solution.



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## **Automatic Coax & Cable**

Continued from page 1



Precision assembly of aerospace harness.

employees. The original customer led to more, and soon the fledgling company moved out of the garage and into a 1000 sq ft building in Casselberry, FL. And it's was hot. Really hot. "With no A/C in the building it was 100 degrees and I was pouring with sweat. I'd use the one bathroom we had to clean up; then deliver parts and visit customers." In quick fashion, he picked up new business and customers the old-fashioned way. "I vowed that if I ever made anything out of this business, my people were never going to have to work like this."

The company was called Multi-Methods and Gary soon took on a

partner who brought his knowledge of PCB assembly to the table."He was a great guy, but he was more of a corporate guy who wanted to get big and go public, and that just wasn't my mindset." They decided to split the company. Gary took the cable division and moved to a new facility."We were both happier and remained friends." He named his half of the business Automatic Coax & Cable to place high in directories, and to call to attention to the coax assemblies they were building at the time.

Like many in his situation, Gary had to borrow money against his

Continued on page 30





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## **Automatic Coax & Cable**

Continued from page 29 \_\_\_\_

house to support the company in the early days. "My wife said, 'Now, why am I signing my house away?' So, I said, 'Ok, how about if we make you an owner with 51%,' and we became a women-owned business?" So, in 1992, Glenda went on board and learned everything about the business, from production to the financials. "I'm lucky that I married the right woman. She's just that sharp and that good and has the kind of abilities to make this business what it is - she's definitely smarter than me!"

Fast forward to today and Automatic Coax & Cable has 40 employees in a beautiful 10,000 sq ft, temperature controlled facility in Sanford Florida. They moved to the facility in 1996 and make full use of every square inch. In addition to a full and impressive spate of cable and harness processing and test equipment, the company also boasts full over molding capabilities with computer controlled molding machines, injection shuttle press, curing and potting ovens, and full CNC mold making capacity. They are certified to ISO

9001: 2015, ITAR and UL registered, and manufacture to IPC/ WHMA A-620 with trainers on staff. All equipment and components are RoHS compliant.

Automatic Coax & Cable builds many assemblies for mil-aero and DoD applications. Customers include General Dynamics, FLIR Systems, L3, Sanmina, and they just received an order in support of the Israeli Iron Dome missile defense system. They also build assemblies for medical devices, test equipment, avionics, solar and conservation systems, and just about anywhere

hi-reliability assemblies are required.

When asked what makes his business unique, Gary said, "The number one thing is the level of trust we have with our customers.We work with them the way we would like our vendors to work with us." He elaborated saying, "I've got customers who send us a PO and say 'just tell me how much it is." In cases like that, they will price it as accurately as possible and run it three times. More accurate adjustments to price can then be made. They just had a \$10 part that went through three production runs. The price was adjusted down to \$9.50 after a refinement in the process. "I think we have done some really good things for people, and we have become a much bigger asset and resource for them than they thought in the beginning."

Another unique feature is the company's philosophy of stocking high running parts. "I like to have 2 weeks of my customer's steady runners," Gary detailed. "It's not the JIT philosophy of today, but it works for me and my customers love it." Gary was also quick to credit his highly talented staff for making it all possible."We have some great people here. A lot of them go on to bigger and better jobs, but our average employee has been here about 15 years." Many key employees were serendipitous encounters Gary and Glenda have made along the way. They often met

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people at a crossroads in their career. "I've told them, 'come and hang your hat here while you are looking,' and they have just stayed."The tone is upbeat and everyone seems to genuinely enjoy being there."If you can't joke around, and have fun, this just isn't the place for you," he happily advised.

Just as Gary was quick to credit his employees, he was also eager to praise his outside sales reps as an asset that sets the company apart."I thoroughly believe in dealing with reps. I was a rep myself and I know they are in there on a weekly basis, and they understand the people, players, and know when the dynamics change." He has resisted any outside advice to change the marketing structure. "They have built the relationships over the years that I just can build over the phone or with the internet, and they just do a great job."

When asked about the future,

Gary advised that they are accepting no new business at this time."We did \$2.6 in sales last year and I've got about three times that currently in backlog." His dad always told him to beware of going out of business by growing too fast."I just turned down about \$1M in new business, and I told them it wouldn't be right for me to take the business and fail at their work, along with the work for my current customers." He appreciates the backlog as a blessing, but also a burden they have to solve as they build staff for a second shift.

Gary is very thankful for the successes of the business over the years and thinks often about it's unlikely beginning. "This business was an accident - I mean, I went to a garage sale! And I just think that for many people who end up in business for themselves, it's an accident by the grace of God."

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**WIREwisdom™ ANIXTER**. In every issue of Wiring Harness News Anixter will bring you

informative articles about wire and cable technology.

#### The Unlikely Development, and Purposeful Use of Teflon

he story of Teflon<sup>®</sup> 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 PT-FE'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.



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2. This paste-like mixture is preformed 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 PTFEinsulated 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 flamespread 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 relativity 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-fluropolymers.pdf



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

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## Mando Can Do.



When Armando Zacarias goes out on a Eubanks service call, unusual things happen. "Once I helped round up a cow that got loose in a customer's plant.

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

Customers report something unusual too: Mando's "can-do" attitude.

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

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# The Case of the Rusty Sensor

By Charles Fisher, VP of Sales RESCO Electronics

#### The Problem

Several years back, I was contacted by one of our customers that needed a temperature sensor for a deionized (DI) water tank. Although we have helped this customer engineer several different sensors over the years, RESCO had not been involved in this design. Our customer is a Fortune 50 medical equipment manufacturer in the in vitro diagnostics market and this sensor is part of one of their blood analyzers.

After about a year of supplying the assembly with no apparent problems, I was contacted by a manufacturing engineer at the customer to discuss a major issue that had occurred. Apparently rust was appearing in the water and they were able to trace it back to the sensor assembly. The manufacturer of the sensor assembly suggested changing to a different version of sensor but when we tried the result was still the same. After extensive testing by our customer, they determined that the UV light being used in the tank was causing a breakdown in the integrity of plating on the sensor and causing it to rust. Unfortunately, the original sensor manufacturer was unable or unwilling to offer any suggestions to address the issue.

#### The Solution

Since the late 1970's, RESCO has been partners with a leading thermistor and temperature sensing company. Together we had supported multiple customers, including this one, in both the medical and aerospace sectors. Working with the engineering teams across our two organizations we were able to come up with a solution.

First, the team engineered a tubular housing for the sensor that has sufficient thermal properties to get the precise readings that were required while being able to withstand the environment caused by the UV light. Our customer required that the housing on the new sensor use the same coating as used on the original sensor to avoid costly chemistry revalidation testing. For added reliability, a second thermistor was added to the probe at a very small incremental cost.

#### The Secondary Problem

Together with our customer and partner, we had resolved the engineering issue. The next problem was that the proposed solution was going to add significant cost to our customer's instrument at a time when every dollar was being scrutinized. Unfortunately, we could find no shortcuts or modifications to the design that would meet both the original cost and the system requirements.

However, we did find a solution, not by reducing the cost of the sensor but by increasing it! Yes, I know this sounds crazy, but what we did was look at the manufacturing process to install the sensor assembly in the DI water tank. We found that our customer was going through a series of time-consuming modifications to the tank to install the original sensor. To reduce these installation costs, we worked with our partner to modify the design of the sensor assembly to

Continued on page 38



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# **The Case of the Rusty Sensor**

Continued from page 37 \_\_\_\_\_

simplify its installation. The redesign was a success and now installation is much simpler and less costly. The manufacturing cost savings were far greater than the additional cost of the new sensor assembly, making the solution a significant win for our customer.

#### The Conclusion

This was an interesting and unique challenge for our team. Finding a solution that met both the technical requirements and didn't raise the overall cost of our customer's instrument took a collaborative effort. By leveraging our partnership with our partner we were able to solve this issue. That said, an even greater value comes from using these partnerships early in the design cycle so that pitfalls can be reduced and redesign costs avoided.

This same customer has recently launched a new platform that is using temperature sensing solutions from RESCO and our partner. During the engineering prototype testing, there were some engineering challenges that came to light due to the environment the sensor is located in. By leveraging the partnership among the customer, RESCO and our supplier, we were able to resolve these issues during design. As a result, we kept these issues from ever making it to market and avoided costs associated with instrument downtime and field replacements.

This article was originally published on the blog portion of RESCO's website. For more informative articles, navigate to the blog tab at www.rescoelectronics.com.





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#### Pelican Wire Wins Statewide 'Manufacturer of the Year' Award

Pelican Wire was named Manufacturer of the Year in the Small Business category at the 2018 Manufacturers Association of Florida 'MAF Exchange' conference and awards banquet. This year's event was hosted at the Vinoy Renaissance in St. Petersburg, Florida from September 19-21, Pelican Wire was selected from over fifty nominees spanning numerous industries and cities throughout the State of Florida.



Ted Bill, Presidet Pelican Wire

"What a tremendous honor for all the Employee-Owners of Pelican Wire to receive such a prestigious statewide award from the MAF and the panel of

judges, who are also peers in the manufacturing space," said Pelican Wire President Ted Bill. "We take great pride in representing our home community of Southwest Florida at the



This is the second time Pelican Wire has won the 'Manufacturer of the Year' award, having also won in 2014. "The application process is very thorough

State level."

"The application process is very thorough, and our judge's criteria touches almost every aspect of a business, including company culture, measurable growth & responsible resource management, to name a few. To win this award is truly a distinction of excellence. Pelican Wire has won twice in five years, a feat accomplished by less than a handful of companies across the State of Florida." said MAF Executive Director, Amanda Bowen.

Pelican Wire is an employee-owned manufacturer of applicationdriven wire solutions in the areas of thermocouple, resistance and custom wire. With specialties in the fine-gauge and high-temperature wire fields, Pelican Wire works globally across multiple industries, offering custom solutions in Aerospace, Medical, Industrial, Automotive, Defense and many other fields. For additional company or product information, please contact Pelican Wire at (239) 597-8555, email at sales@pelicanwire.com or online at PelicanWire. com. About Manufacturers Association of Florida (MAF): The MAF was formed in 2006 to improve the business climate for manufacturers in Florida. There are some 20,000 manufacturers in Florida investing in new technology, employing highly skilled workers and competing globally. For more information about MAF, visit www.MAFmfg.com.



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# **Most Overlooked Sales Tool in the Wire Harness Industry**

**By Christine Siebert** 

s we know, in the Wire Harness Industry, face to face meetings are the best sales tool we have to reaching a potential opportunity, but this is not always feasible. We want to be able to "show or demonstrate" our products and provide them with our knowledge of the industry.We currently use Sales Tools such as tradeshows, whitepapers, technical articles, case studies and more to position ourselves as the Industry Expert in our field. We know that a good brand carries a lot of weight. It gives our prospects and customers a name to trust, our business an identity to market, and a company name to attach to quality and reliable products. These are all quality sales tools but can take time to become exceedingly effective.

One of the Sales Tools that is most overlooked in this industry are Webinars.Yes, I know what you are thinking, "My company sells "XYZ product, such as terminals, contactors, tubing, actual harnesses, etc., we can't do webinars on that." Well, I'm here to tell you, YES, you can, and you should! You are missing a great opportunity to market your product, services and gain insights into an audience that is interested in your product and your knowledge.

There are a couple strategies you can take when hosting a webinar:

1. Product Demonstrations: During a webinar, you can showcase your products or services to your attendees and explain how your company can help them achieve their goals. If possible, show your product in action, if you are a software vendor, have an engineer provide a "live" demonstration or if you have other products or services, show a short video and/or provide images, data, charts and/or graphical representation of your solution throughout the webinar. When wrapping up, close the webinar with a live Q&A session. This will give your audience the confidence in your company's knowledge of your products and give you the insights into what your customers want from your products.

2. Case Studies. One of the most attended webinars are webinars that tell a true story. What better stories are there than your actual customer case studies! Whether you highlight using your own customer telling their partnership with your company or you have someone in your company share successful projects, audiences yearn for truthful projects on your



#### 3. Educational Webinars: Not all webinars have to be about your products or services. Think about hot topics in your industry and host a webinar on that topic. You can invite an industry leader to speak on the topic or someone in your company. The topic can highlight something such as explaining a standard within your industry ex: "IPC/ WHMA-A-620" or a new survey that has come out or a Political Topic, cough, cough, I think you get the idea. The benefit of these webinars is that it positions your company as an industry expert. When you conduct these webinars, you will share your knowledge and expertise with your audience. If you can



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mention your products or services within the webinar, great! If not, that's ok too. After the webinar, have the webinar tool take them back to your home page. Always put a company slide into the webinar, either at the beginning or at the end, this way you are able to present your company in such a way that your audience leaves your webinar feeling that you know what you are talking about, you will improve your credibility within your industry.

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Above I've highlighted some great ways to incorporate Webinars as Sales Tools for your organization. I hope it starts your company thinking of possible scenarios to use this low-cost sales tool that will build brand awareness and enable you to engage with more prospects at one time.

Webinars can seem like an overwhelming task but there are many software automation solutions on the market that can assist with the process. They vary in cost but even the low-cost solutions can be easy to use. I'll leave you with a few tips on how to successfully run your webinar program so that you will be generating new leads and sales in no time.

1. Promote Your Webinar Early and Frequently. Give yourself

at least 4 weeks to promote your webinar. My recommendation is to send emails at least once a week, social media, website and if possible through an Industry Publication and don't be afraid to ask your partners or associations to promote through their channels.

2. Be Sure to Engage Your Audience. A great benefit to live webinars is a live audience. You have the opportunity to ask your audience questions. Most webinar tools have polling capabilities so plan polls ahead of time and ask these polling questions throughout the webinar. This will give you more insight into your audience and keep the webinar engaging.

**3. Record the Webinar.** Offer an On-Demand version of the webinar. Many registrants try to make the webinar but due to other responsibilities are unable to attend. 4. Follow Up with Your Audience. To decide what type of follow up is needed, you can have a survey at the end of the webinar to gauge their level of interest, so you'll know which webinar attendees it may make sense for sales to reach out directly to schedule a demo or call. Or do they go into a marketing funnel. Depends on how you ask the questions. An example would be: Would you like for a member of our Sales Team to contact you ASAP? Or would you like for us to send you more information? Always send a post-webinar email to all attendees with the recording and any other resources that are relevant. Keep that interaction funnel going. Hopefully this explains all the reasons why I believe that all areas of the Wire Harness Industry can successfully use Webinars as a Sales Tool! If you have any further questions or comments, I would love to hear from you. Please contact me at christine@ siebertcg.com.

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# NEWS PLUGS continued

#### Boeing Extends Partnership with Siemens' Mentor Graphics

PLANO, TX – Siemens is proud to announce that Boeing has entered into an agreement to expand its use of Siemens' Mentor Graphics software as part of its Second Century Enterprise Systems (2CES) initiative to transform itself, and the aerospace industry, to meet the challenges of the twenty-first century. As the world's largest aerospace company, Boeing stands ready to lead the industry into the next

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100 years with Siemens as a partner, providing a set of technologies to enable the next generation of design and manufacturing through increased automation and digitalization.

This decision follows a comprehensive analysis of available solutions including current and future capabilities, technology flexibility to meet changing requirements in real world applications and overall business value to Boeing. The long-term agreement provides industryleading Siemens technology in the areas of electrical systems design, electronic products design and mechanical analysis as a foundation for Boeing to consistently deliver comprehensive and innovative solutions to its customers. Focusing on technologies from Siemens' Mentor Graphics acquisition, Boeing will standardize on a common, company-wide platform for semiconductor design and verification, printed wire board design and manufacture, electrical system design and manufacture (including wire harness) and thermal and fluid analysis of mechanical designs.

"Our partnership with the Siemens-Mentor team will combine best-in-class electrical design tools with Boeing's vast experience and knowledge in our 2CES transformation of electrical

> design," said John Harnagel, engineering director, Boeing Defense and Space.

"Siemens is proud to have been chosen as one of Boeing's partners for its second century vision and transformation. Our ability to help customers drive digitalization and realize innovation is our core strength, and we are pleased to see that Boeing values that strength," said Tony Hemmelgarn, president and CEO of Siemens PLM Software. "This partnership is a measure of Boeing's trust in Siemens to help them deliver its vision, and we at Siemens are looking forward to helping them make it happen."

About Siemens PLM Software

Siemens PLM Software, a business unit of the Siemens Digital Factory Division, is a leading global provider of software solutions to drive the digital transformation of industry, creating new opportunities for manufacturers to realize innovation. With headquarters in Plano, Texas, and over 140,000 customers worldwide, Siemens PLM Software works with companies of all sizes to transform the way ideas come to life, the way products are realized, and the way products and assets in operation are used and understood.



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# NEWS PLUGS continued

#### Heilind Electronics Now Stocking Alpha Wire's Cable Glands

WILMINGTON, Mass. — Heilind Electronics, a leading global distributor of electronic components and authorized distributor for Alpha Wire, is now stocking the manufacturer's cable glands – an effective solution for premium cable strain relief, and the latest addition to Alpha Wire's FIT Wire Management family of products.

In addition to providing high quality strain relief, Alpha Wire's cable glands feature IP68-level sealing against environmental factors such as flames, dust, sand and water. The products also come equipped with chloroprene rubber seals and are safe for use in temperatures ranging up to 150 degrees Celsius. This makes them ideal for applications in renewable energy, industrial automation and many other industries.



**Alpha Wire Cable Glands** 

Alpha Wire's portfolio of sealing products includes easy-to-install cable glands available in standard dome and flexible spiral designs, as well as sealing hole plugs. All glands are packaged with an accompanying locknut and gasket and are available in NPT, metric and PG tread sizes.

Visit Heilind's website for more information about Alpha Wire's Cable Glands at www.heilind.com

# Allied Wire and Cable Earns AS9100:2016 Rev. D Certification

Collegeville, PA—Allied Wire and Cable has received AS9100:2016 Rev. D certification, putting the wire and cable products distributor and manufacturer in a prime position to best serve all its aviation, space and MIL-SPEC customers with the stringent requirements built into the latest Quality

Management System standard.

Allied Wire and Cable's AS9100:2016 Rev. D certification means that the company has a premier, reliable quality system in place that meets the stringent needs of aviation, space and MIL-SPEC customers. Allied Wire and Cable received this certification from DQS, which is accredited by ANSI–ASQ National Accreditation Board (ANAB) and recognized by the Americas Aerospace Quality Group (AAQG).

"Allied Wire and Cable's earning AS9100:2016 Rev. D certification enables our company to continue being a trusted, top-tier provider of wire and cable products for our valued aviation, space and MIL-SPEC customers," said Tim Flynn, president of Allied Wire and Cable. "Gaining this certification is also a testament to the hard and detailoriented work of our team members,

> who are committed to Allied's mission of providing outstanding quality, pricing as well as value-added and customer service while meeting or exceeding the latest industry standards."

> The AS9100 standard is based on the globally recognized standard for quality management systems: ISO 9001. The Society of Automotive Engineers and the European Association of Aerospace Industries launched the AS9100 standard in 1999. The AS9100 and ISO 9001 standards have been established for distributors and manufacturers to satisfy customers by delivering products and services that meet customers' needs. The AS9100 standard is published by the International Aerospace Quality Group. ISO 9001 updates in 2015 gave rise to AS9100 standard updates in 2016. Now the format of the standard is set at AS9100:2016 Rev. D.

Some new requirements in AS9100:2016 Rev. D focus on product safety, counterfeit parts and human factors. Additional new clauses in AS9100:2016 Rev. D spotlight risk, awareness and configuration management. Allied Wire and Cable is one of the largest independent distributors of wire, cable, tubing and accessories in the United States and has been owned and operated since 1987 by the Flynn family. Allied Wire and Cable serves all global markets, including the aerospace, automotive, commercial, industrial and military industries.





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### THE POWERHOUSE OF ULTRASONICS

# Wire Labeling: Making the Case for Print Automation

**By Todd Fries** HellermannTyton

s simple as it ought to be, wire harness labeling seems to be fraught with opportunities for problems.

See if this sounds familiar: you label a batch of wire harnesses and later discover they were the wrong labels.

Or, the operator responsible for creating the labels misspelled a word, or mistyped some data, or changed a margin.

Or, it seems to take forever to print the various labels for a given job, what with all the different files to open and edit, the different label stocks. etc.

Has the least expensive part of your production process become the place where you see the greatest threats against productivity and profits? If you're like many of your peers, you feel the pain.

The unfortunate truth is, most of the trouble with label printing is due to the human element. Not to throw your operators under the bus; there are simply a lot of steps in the process where mistakes can happen. From futzing with print margins to mistyping data to having the wrong label stock loaded ... it's a constant challenge for some. What's a shop owner to do?

We pondered that question ourselves some time ago, while our label creation software, TagPrint Pro, was in version 3.0. As HellermannTyton's identification product category manager, I regularly ask customers and non-customers about their biggest operational challenges. Naturally, so do our salespeople.

Most of the responses, not surprisingly, are the scenarios presented at the beginning of this article. Opening and printing the wrong files, operator errors ... these issues can be costly and time consuming.

They can also threaten your customer relationships. Your wire harness customers count on proper labeling for identification, safety, compliance and of course, quality. Delivering a bad batch of product can set them behind schedule. And nobody wants to be responsible for that.

Print automation is a technological approach to solving these issues. Since it is intended to alleviate problems for those who print labels, it needs to be more than powerful technology. It must be easy to implement and even easier to use.

Let's break down the steps to create and print a batch of labels, both the traditional way and with print automation.

We'll assume the label files were created previously and saved. Typically, the operator receives a work order that lists the necessary labels for a particular job. It also identifies the label stock for each label, print quantities and other data. The average shop not using print automation has



With print automation, the file can be accessed using a bar code wand and scanning a barcode on the work order.

one or more printers on site.

Open the file. In a traditional workflow, the operator reads the work order and must open the correct file. Searching takes some time to navigate to a folder and find the right saved file. Will the correct file be selected? Usually, but there's the first potential for user error. For example, is it the latest revision?

With print automation, the file can be accessed using a bar code wand and scanning a barcode on the work order. No wasted time, and no chance of opening the wrong file. Some shops don't want to invest in a scanner. In that case, the job number can be entered - not as efficient or error proof, of course.

Make any edits. If the process is manual, data entry invites further mistakes, of course. The less an operator needs to touch the keyboard, the better. This step is also where operators may look at the label design and believe the margins need to be adjusted. If they do this without it being required for the given label, well, you know what happens. And, it happens as we've seen time and again.

The print automation method works best when edits are made to the file by a senior-level employee and stored ahead of time. Alternatively, a pop-up can be programmed into the automated job to prompt the ready to go, the operator must find operator for the new data without ac- and open each one. If the shop uses

tually opening the saved label design. In this scenario, the operator doesn't have to worry about font sizes or text placement. There is no opportunity to play with print margins, either. A prompt can even direct the operator to load a particular label into a specific printer.

Print the labels. The operator selects the print option and, if there are multiple printers, chooses the print destination. Was it the right printer? Was it loaded with the label stock from a previous job? It's easy to forget that detail. Was the correct quantity entered, or was 100 selected instead of 10?

In an ideal automated workflow, the file is sent to the correct printer as soon as the barcode is scanned. How does this happen?

Using TagPrint Pro 4.0 as our example, when the label is first created, other job-specific options are saved with the file, including printer, label type, print quantity, variable data and date codes if desired. Having all the pertinent info predetermined, the system doesn't need to wait for the user to enter parameters or even to click print.

Wait for labels to print. This may sound trivial; however, this is another factor where significant time is lost. Even when labels are pre-saved and



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HellermannTyton's TagPrint Pro 4.0

one printer, the label roll may need to be changed once or several times for one print job. Not to sound like a broken record, but here's another opportunity to make mistakes.

Many of our print automation customers like to run multiple printers. Since the software can print to as many printers as a customer wants to deploy, having five printers preloaded with five different labels not only makes sense from an automation standpoint, this scenario quickly pays for itself.

In fact, one of the most exciting features we built into the software is the ability to package individual label jobs together. That way, one barcode on the work order launches every

label in the job, with all the print parameters for each label included. The five printers receive the instructions at the same time and print simultaneously. It's easy to appreciate the boost in productivity.

One incidental advantage to deploying print automation is less chance for down time. Some shops have one operator assigned to printing labels. If the person calls in sick, who can be trusted to take over? In a fully optimized automated workflow, anyone should be able to step in to print labels.

We're hearing amazing feedback, like customers no longer must work extra hours and weekends to tackle their labels. Reworks are down or eliminated completely, and operators

are less stressed (a lot of these folks are intimidated by computers).

Hopefully, I've made the case for this incredible technology. With your label printing woes behind you, you'll be able to better focus on your actual product.

#### About Todd Fries

Todd Fries is the Product Category Manager - Identification, HellermannTyton. Todd has led the innovation of HellermannTyton's identification products and programs

for over 30 years. He is a member of Code Making Panel 4 of NEC 2014, 2017 and 2020, and serves on other standards committees. He has been instrumental in driving the development of our labeling software, printing systems and labeling solutions. For more information, contact Todd at tfries@htamericas.com or 800-537-1512 ext. 8469. See more information on the technical aspects of this story at www.hellermann.tyton.com/printautomation

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# **Recent Trade Event Showcases Opportunities**

The Battery Show recently held in Novi, MI, showcased many opportunities for the industry in the expanding EV market, and WHN was there as an exhibitor. The shows total attendance was 5,591. There were also 2,919 total exhibitors, including many suppliers to the wire processing industry, as well as harness producers serving the EV and Critical Power industries. A

powerful, end-to-end showcase, this industry event covered advanced battery, and battery interconnect technology for the automotive, portable electronics, medical technology, military, telecommunications, and utility/ renewable energy industries. Following are just a few observations that will help you understand the market, and identify possible opportunities:

**Plug-in Electric Vehicles (PEVs)** 

US sales for PEVs continue to be limited to early-adopters with only 2% market penetration. Still, forecasted sales for 2018 represent a 75% increase over last year with over 350,000 units projected in the US. The US market for these vehicles is projected to grow 14-fold by 2020. Global auto manufacturers have announced plans for over 200 PEV models between now and 2025.

The early adopters seem less

prone to range anxiety, but as vehicles exceed the 200-mile range, market penetration will expand beyond the heretofore cult following, and into the general consumer ranks.

#### But all is not rosy...

Although there have been many enabling forces to EV adoption (cost, range, and availability) one hindrance to growth is the still limited public charging infrastructure. There just has not been the same investment





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TECH-SONIC crew (from left to right) David Locke, Frank Myers, Byoung Ou (President).

here as with other aspects of the EV market. It is still seen as a marketing expense for OEMs like Tesla, and as a pilot programs for utilities. Overcoming this challenge will likely see the market explode (more on this later).

Battery cost reduction is slowing and could bottom out at a higher than expected level as raw material costs weaken the link between manufacturing scale and cost. In 2017, lithium ion cell costs declined by only 5% despite manufacturing scale rising by 26%.

#### **Commercial EV Market** Opportunity

Electric cars get all the media attention, but the electrification of commercial transportation is another huge market potential. Economies of usage are improving with enhanced range, charging technology standardization, and a decrease in battery cost for this sector. Commercial electric vehicles are also proving themselves to be service proven performers.

The electric bus market alone is projected to be a \$60 B market by 2020, representing four-fold growth. China and Europe lead the charge, but as metropolitan areas push for low emission zones, the trend is expected to be emulated in the US.

Heavy duty truck OEMs are also transitioning to EV as most traditional heavy duty diesel truck manufacturers now offer some sort of battery-electric version.

#### Chicken or the Egg -**Opportunities with Charging Stations**

previously As mentioned, the limited charging infrastructure can be a problem that prohibits growth in the EV market. Until now, EV owners have not been concerned about this issue. Their zeal for the technology has trumped the convenience and availability of public or commercial charging stations. There is currently no correlation between charging infrastructure and EV sales. Commercial charging stations are highly unprofitable at the current utilization rate of 5%, but this is expected to change. The next 5 years should be an era of expanding margins and returns for charging infrastructure owners /operators. As charging speeds

triple and the number of PEVs dramatically increases over that time frame, utilization rates should increase to 15% by 2022. If station utilization rates jump to this level, station owners should be generating an EBITDA of 40%. It seems reasonable there should be some opportunities in this end of the business.

Look for WHN in attendance at next year's event as we continue to closely monitor these sectors. For more information on the 2019 event, go to thebatteryshow.com.



Display showing interconnect products for electric and hybrid vehicles offered by TE Connectivity.

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# **CURTI Opens US Office**

URTI, a manufacturer of wire processing equipment, has announced the opening of a corporate sales office in West Chicago, Illinois. CURTI produces high speed wire and cable processing transfer lines for high volume cut, strip and crimp applications, as well as smaller stand-alone equipment to cut and strip wire. Carlo Accorsi, Sales and Marketing Manager, heads the new US location. He recently spoke about CURTI's history, and plans for the future.

For over 60 years, CURTI, an Italian company, has been producing automatic machines to produce complex subassemblies for various industrial applications. With significant expertise in mechanical engineering, the company is divided into several divisions. Among those are packaging, energy, aerospace, and of course wire processing equipment.

The Wire Processing Division began in 1994 when CURTI acquired another Italian company that was making automatic equipment for processing electrical cables. They began to segment the market for this equipment with specially designed production lines to meet defined customer needs in automotive, appliance, and other high-volume harness applications (figures 1 and 2). CURTI has amassed a great proficiency in developing automated lines for automotive coax, data cables, and power cords.

Continued on page 54



Figure 1. WWP: Wire Working Platform



Figure 2. CAWP: transfer line for airbag connectors



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# **CURTI** Wire Processing Equipment Opens US Office

Continued from page 53

In 2010, CURTI rounded their product offering in the harness arena by purchasing Makfil Systems that was making semi-automatic equipment for cutting, cutting/stripping and winding/unwinding of electrical cable (figures 3 and 4).



Figure 3. ECS-35: Cut & Strip Machine

CURTI has attended the past six Electrical Wire Processing Technology Expos in Milwaukee, and Carlo says the response has been very good."But it was tough because there are many potential customers here who want us to have a physical presence in the US." CURTI already has many customers in the US, but Carlo is confident the addition of the new office will enable them to better understand the market, bring new business on board, and respond to the overall needs.



Figure 4. SP-200: Cutting Machine

As a company, CURTI plays to its strength in building mechanical reliability in everything they do. As such, you may not notice as many software features seen on many of their competitors equipment. "CURTI is really a mechanical engineering company so you will find our machines more robust from a mechanical point of view," Carlo explained. He did mention that as they gain more understanding of the market, they plan to enlarge the product portfolio. He was clear in saying this expansion would occur outside the solutions their competitors currently have. "We have a team of people who have been in the wire processing business a lot of years, and they are more focused on developing something that is currently not on the market."

CURTI has recently joined WHMA and plans to become even more visible at industry trade events as they expand personnel at the US office. You can contact Carlo Accorsi directly at c.accorsi@curti.com, and you can see the product offering by going to CURTI.com and following the Divisions tab to the Wire Processing Division.





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# **NEWS PLUGS** continued

#### **CAMI Celebrates 25 Years Developing Automation-Ready Cable and Harness Testers**

CAMI Research Inc. (Acton, MA), manufacturer of the CableEye automation-ready cable and harness test system, is marking 25 years since its first sale and of innovating highly configurable test solutions for simple and complex multiconductor cables and harnesses. Trusted by industry leaders such as CERN, Ford, GE, Hitachi, NASA, Abbott, TESLA, Lockheed Martin, Raytheon, Airborn, Furukawa, TE Connectivity, and the Nobel prize-winning group, LIGO, thousands of test systems have shipped globally over the years.

Founder Christopher E. Strangio's vision for CAMI Research involved developing a suite of pc-based cable testing products powered by the same intuitive software that, with the help of easy-to-interpret color-coded graphics, instantly identifies not only when there is a fault, but what type of fault and where (Fig. 1). CableEye's highly configurable nature and automationreadiness is directly attributable to this advanced software.

switched to an industry-standard 64pin header interface and developed easily-interchangeable, auto-detected, test interface fixtures known as connector boards. The software automatically displays a clear graphic of the connectors and wiring under test and the tester can be readily programmed to do the same for custom boards and fixtures using the PinMap™ option that was released in 1993. Connector Designer™ (2000) is an option that allows creation of custom graphics for unusual connectors (e.g. connectorized catheters) not found in the graphics library. With a single click, the wiring schematic (see photo) can be switched to a customizable netlist view. In both views, a large PASS/FAIL indicator is clearly visible. The stackable CB35 relay board, with 10 digital outputs per board, is a popular choice for those who need to manage external devices for full control and automation of the test station.

CAMI Research released its first Hi-Pot tester, the HVX, in 2009. In 2015, the HVX-21 was launched that increased the maximum test voltage from 1500Vdc to 2100Vdc. There are now seven tester models covering low voltage and HiPot requirements, the most recent of which was released this year adding the capability of checking twist pair relationships. Guided connector



Figure 1: CableEye Production Screen

assembly is a software option that was released as Autobuild™ in 2006 and which was augmented in 2008 by the release of the LightDirector<sup>™</sup> - an accessory enabling light-guided connector assembly.

The CableEye PC-based Continuity and HiPot test system is a professional test instrument used to pass/fail check and diagnose multiconductor cables found in countless applications in Transportation, Aerospace, Energy,

APPLICATORS / CRIMPING PRESSES / TOOLING

Appliances, Medical Devices, Defense, Robotics, Telecommunications, Scientific R&D and more. CableEye takes full advantage of the PC's color graphic display, high-speed computation, and mass storage to provide a complete cable and wire harness management system.

Contact sales@camiresearch.com or (978) 266-2655 for a quote. Systems start at \$1,295.

Figure 1: The Production

Initially released for DOS in 1993 and updated regularly to work with the latest



# **ODYSSEY** TOOL Mini Left to Right Mini (Power Drive II) Mini (2 Post) Air





1 Applicator Base, Many Terminals

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Mini End Feed



Med. Duty Air End Feed **Quick Change Tool Pack** 



operating systems, CableEye is currently compatible with computers running all modern Windows™ operating systems. Test engineers and managers are free to choose any size monitor they require, including Touch Screens and all-in-one computers.

Of course, development of robust and modular hardware has taken major effort too, all leading towards a system that can be used automated or not, as a pass/fail check tester, or a diagnostic system at the whim of the owner.

Following release of their first product, which was a low voltage tester with fixed test connectors, CAMI



Left to Right

Heavy Duty Slide **Quick Change Tool Pack** 

Quick Change Tool Packs Change Over in 5 Minutes or Less! **Reduced Cost and Down Time!** 

Med. Duty Slide **Quick Change Tool Pack** 

### ODYSSEY CRIMPING PRESSES



# **NEWS PLUGS** continued

#### Welcome New Cirris Systems CEO, **Craig Taylor**

As of April 2018, Craig Taylor became the President & CEO of Cirris Systems Corp. Craig brings years of experience leading companies to success. We are excited to have him as part of the Cirris family. As Craig puts it, "It is a tremendous honor to serve as the CEO of Cirris Systems. I am humbled to be part of such a great team."

Craig's past experiences serving as a CEO has given him insight into how he can better lead Cirris. At Blendtec, he helped shape the company into a global business. Shortly after, he established a company culture at Molen that allowed them to plan for future growth. Craig is already implementing plans to build the future of Cirris. Part of this is by ensuring that we meet the needs of everyone with whom we in-



**Craig Taylor Cirris Systems** 

teract. He says, "Our mission of creating the best ownership experience not only extends to our shareholders, as an ESOP company, but also to our valued partners and customers."

One of Craig's strongest beliefs for a successful company is to develop a strong company culture. Not only will a good culture have a positive influence on employees, but it will translate to the customers, providing them a good experience as well. Craig's presence at Cirris has already begun to create an uplifting culture through his attitude and example. In his own words, he states, "I am incredibly excited to assume this new role and for the future of Cirris Systems. We have an exceptionally talented team that is focused on taking decisive actions to transform the business, continuing to innovate our product in new and diverse ways, and

unlocking future growth opportunities. We remain confident in our business plan and I believe we are taking the right steps to move the business forward."

As Cirris moves forward, we can't think of anyone better to guide us toward success.

Cirris Systems manufactures wire/ harness test equipment. We create test systems that are easy-to-use and affordable. Along with quality testers, we provide support to help at any point in the test process. To learn more about Cirris, visit www.cirris.com

#### **Heilind Electronics Stocking 3M's** Wiremount Socket, 3000 Series

The 3000 Series wiremount socket connectors are RoHS-compliant and feature industry-standard IDC socket.

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Authorized Distributor Interconnect Products ers, plugs and pin strips for quick connect/disconnect capability. They are available with a pull tab to facilitate proper unplugging, and offer two types of strain relief to isolate the IDC interface. 3M's wiremount sockets are RoHS-compliant and set the standard for MIL-SPEC and IEC standardization.

Additionally,

Visit Heilind's website for more information about 3M's Wiremount Socket, 3000 Series.



**Artos LTC-3 Loose Terminal Crimper** 

# **Loose Terminal Crimper**

Artos Engineering Company, a Brookfield-based manufacturer of wire processing equipment, has introduced the Artos LTC-3 loose terminal crimper for use on the Cr.22 wire processor, adding pin-and-socket processing capabilities to the small-footprint unit.

The LTC-3 features a dual bowl design, allowing two different pins or sockets to be run in one station. The unit can be tooled to handle wires from 24-12 AWG (0.25mm2 to 4.0mm<sup>2</sup>), with each unit capable of processing a two-wire size range. By adding two LTC-3 units, the Cr.22 can process any combination of pins and sockets on both sides of a wire, in addition to processing standard reel feed terminals without any change over. This capability has previously only been

Artos Engineering Introduces LTC-3 available on larger-platform, more expensive wire processors.

> "We've had numerous requests from customers to automate pin-and-socket processing to expand production options and throughput," says John Olsen II, Artos Engineering Company president. "We've responded by making the LTC-3 available as a station on the Cr.22 wire processor, which not only increases production flexibility but also eliminates the need for a separate unit and additional floor space."

Founded in 1911 and based in Brookfield, Wis., Artos Engineering Corporation is an independentlyowned manufacturer of wire processing equipment serving the aerospace, automotive and manufacturing industries. For more information, visit www. artosengineering.com



#### Heilind Electronics to Exhibit at force, torque, torsion, stress, pressure, Electronica in Mullnich, Germany

Heilind is amongst the world's leading electronic supply chain companies at this international event

temperature and CO2 sensors, as well as customized solutions.

Heilind's interconnect offerings span a broad range of markets, includ-

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- Unlimited font selection Full graphics capabilities
- Portable Easy to move around shop/job site
- Expands the Tri-Star product family

TEGHNOLOBIES



Heilind Electronics, a leading global distributor of electronic components, will be exhibiting in Munich, Germany this November at Electronica - the world's largest trade fair and conference for electronics.

At the event, Heilind will be showcasing its franchised lines of commercial and MIL-SPEC interconnect, electromechanical and sensor products from over 170 leading suppliers. A wide array of interconnect solutions will be highlighted, including military and commercial connectors, fiber optic connectors and connector accessories. Featured sensor products include

ing automation, aerospace, defense, green energy, industrial, marine, medical, smart & small home, space and transportation.

A biennial event featuring the "who's who" in the electronics industry, Electronica attracts over 70,000 visitors from 84 countries. The exhibition will be held at Messe München in Munich, Germany from November 13 through 16, 2018. Heilind will be located in Hall B2 at Stand 319 for the duration of the show, where attendees can meet representatives from its Europe, North America and Asia offices.

# **NEWS PLUGS** continued

#### **Pasternack Launches New Military-Grade RF Cable** Assemblies with

#### Same Day Shipping

Commercial Off-the-Shelf MIL-DTL-17 Cable Assemblies Feature Operating Frequencies of up to 12.4 GHz

Pasternack, a leading provider of RF, microwave and millimeter wave products, has introduced a new line of military-grade MIL-DTL-17 RF cable assemblies that are ideal for avionics, military electronics, satellite ground stations and autonomous vehicles.

Pasternack's new series of militarygrade cable assemblies consist of 124 basic configurations from six different cable types for a total of more than 700 part numbers that are all available for same-day shipment. These cables provide operating frequencies of up to 12.4 GHz and VSWR as low as 1.3:1 per connector. They are made from MIL-DTL-17 gualified cable, MIL-PRF-39012 qualified connectors, AS23053 heat shrink and J-STD soldering. The final commercial off-the-shelf (COTS) cable assemblies are 100% tested and include a test report, as well as material lot traceability. They are ideal for defense, aerospace and transportation industries or any place where the costof-failure is high.

"We are excited to offer this new



**MIL-DTL-17 Cable Assemblies** 

line of cable assemblies with such a high service level. In the past, customers would wait weeks or months for cables built to these specifications and with traceability. Now, they can select from hundreds of different COTS solutions and have the cables shipped same-day with test reports," said Dan Birch, Product Manager.

Pasternack's new military-grade MIL-DTL-17 cable assemblies are in stock and ready for immediate shipment with no minimum order quantity. For detailed information on these products, please visit www.pasternack. com, or call 949-261-1920.

About Pasternack:

A leader in RF products since 1972, Pasternack is an ISO 9001:2008 certified manufacturer and supplier offering the industry's largest selection of active and passive RF, microwave and millimeter wave products available for same-day shipping. Pasternack is an Infinite Electronics brand.

Electron-

Infinite ics is a leading global supplier of electronic components serving the urgent needs of engineers through a family of highly recognized and trusted brands. Our portfolio brands are specialists within their respective product set, offering broad inventories of engineering-grade product, paired with expert technical support and same day shipping. Over 100,000 customers across a diverse set of markets rely upon Infinite Electronics to stock and reliably ship urgently needed products every day.

#### Pelican Wire Completes Acquisition of Watlow **High-Temp Wire Product Line**

Pelican Wire has completed the purchase of a portion of the SERV-RITE insulated thermocouple manufacturing business from Watlow Electric. The agreement, which includes machinery, design & manufacturing process information and customer account data, specifically affects the High Temperature Ceramic & Vitreous Silica constructions. Pelican Wire President, Ted Bill, states "I'm excited to work with our long-time partner, Watlow Electric, to provide their customers continued superior service for these high-temperature thermocouple products. This is a great example of Pelican Wire's ongoing commitment



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to the Thermocouple Wire industry."

Watlow's Chief System Designer Randy Brown stated "This is a very natural transition for both companies. Watlow and Pelican Wire have a long history of cooperation to ensure customers can leverage the core capabilities of both to get the best solution."

As quoted from the August 31, 2018 'End of Life' (EOL) statement, "Pelican Wire will begin quoting and accepting orders on new and existing wire designs on September 17, 2018 and will begin manufacturing operations on or before October 15, 2018." Since Pelican Wire already produces these wire constructions, Watlow customers can expect a seamless transition and continued access to a talented and experienced team of Design and Production Engineers on every project. Current Pelican Wire customers may benefit from the additional capacity, both at our Naples, Florida location and with our sister company, Rubadue Wire, in Loveland, Colorado.

#### **Push-button Terminal Blocks with Positive Operating Feedback**

WAGO has expanded its TOPJOB®S line of DIN rail mount terminal blocks to include push-button actuation. Orange push-buttons on both sides of the terminal block clearly identify where the operating tool must be applied - simply press down on push-button with the operating tool, insert the conductor and remove the operating tool from the push-button, and its done. They are suitable for all copper conductor types (solid, stranded and fine-stranded) size 22-4 AWG. Highlighted features include:



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• Push-in CAGE CLAMP® allows direct insertion of ferruled or solid conductors

The new push-button terminal blocks offer the same profile as the original open tool slot and the recently released lever versions of the TOPJOB®S family. This allows all three operating versions to be mixed and matched on the same DIN rail, as well as share accessories such as jumpers, marking strips and test adapters. For more information, visit the website at: https://www.wago.com/us/discoverterminal-blocks/topjob-s-variants.

Innovation is at the heart of everything we do at WAGO. From our pioneering CAGE CLAMP® spring pressure connection technology to our extensive range of Interconnect, Interface

and Automation solutions, such as the fieldbus independent WAGO-I/O-SYS-TEM, our customers count on the unconditional performance and reliability of our products to ensure the safe, efficient operation of their systems every time.

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

#### **Fast Curing Thermal Epoxy Adhesive**

Managing heat in electronic assemblies is a challenge for countless manufacturers. Many assemblies require the use of thermally conductive adhesives. However, finding a thermal epoxy that is easy to use and does not slow down production due to long cure times is difficult. The 50-3112 Thermally Conductive Epoxy has been developed to assist manufacturers with thermal management issues while offering a quick cure, and easy application solution.

50-3112 is packaged in the convenient TriggerBond® dual barrel cartridge system. This allows users to easily apply the epoxy with accuracy. Perhaps the most impressive feature of the 50-3112 is the development of the adhesive strength within four hours at room temperature. After just four hours the lap shear strength is 1,400 psi and after twenty-four hours reaches strength of over 2,200 psi.

The 50-3112 is electrically insulating and thermally conductive so it may be used in many electronic devices. It is a good choice for bonding heat sinks



50-3112 Thermally Conductive Epoxy

or anywhere a strong bond with good heat transfer is required.

A Technical Bulletin that provides more information about the 50-3112 Thermally Conductive Epoxy Adhesive is available.

Samples are readily available and ship within three days.

Epoxies, Etc. has been formulating solutions for electronic circuitry and assemblies for over 30 years. Our chemists and engineers are able to provide specific application support. Technical Support can be reached by phone 401-946-5564 or sales@epoxies.com.

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# Successful Schleuniger Oktoberfest Celebration!



Schleuniger hosts (from left to right) Melissa Bedard, Rob Boyd, and Lori Wilkins.

n September 21, 2018, Schleuniger, Inc., a leading international manufacturer of high-precision wire processing machines, hosted an Oktoberfest themed open house at its headquarters in Manchester, NH. Gem Gravure, Panduit and Telsonic Ultrasonics also exhibited at the event.

Guests were greeted by enthusiastic Schleuniger employees dressed in Oktoberfest themed attire and were given a special Oktoberfest t-shirt and glass liter beer stein to commemorate the event and to help them get into the spirit! We kicked off the celebration by tapping two kegs, each with a different style of German beer, in our very own "Biergarten." Guests enjoyed dining on a buffet of pretzels, brats and more, while listening to a live Oompah band! Many also participated in outdoor games, "Masskrugstemmen" (beer stein holding contests) and several raffles and giveaways throughout the day.

Representatives from each of the exhibiting companies were on hand in Schleuniger's large demo room to discuss applications, provide machine demonstrations, and explore the best solution for each visitor's needs. Scheduled presentations by each company were held throughout the morning and early afternoon with an emphasis on achieving maximum performance and overall equipment effectiveness (OEE).

The presentations included:

• "Productivity Enhancing Solutions-Organize, Connect and Protect" presented by Panduit

• "GEM's Inkjet Printing and Inks" presented by Gem Gravure

• "Ultrasonic Metal Welding Applications and Equipment Capabilities" presented by Telsonic Ultrasonics • "Latest Innovations in Wire Processing to Maximize Performance" presented by Schleuniger

Building tours were also conducted in between each of the presentations.

All who attended had a great time and were impressed with the level of information and education available to them during the event. Schleuniger would like to thank all attendees and partners who participated in the event and made it a huge success!

Should you have any questions, please e-mail sales@schleuniger.com or call (603) 668-8117.



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6

# RAZOR-SHARP PRECISION



MIRA 340 wire stripper

The programmable Mira 340 is designed for universal use while maintaining maximum precision. It is perfect for processing wires and insulation material with demanding requirements. The Mira 340 is fitted with a rotary head with 4X-blades and offers unique functions designed to reduce production time and increase quality. Thanks to sequential processing, multi-conductor cables and multi-layer insulation material can be processed quickly, thereby saving time and increasing productivity.

