May 2022

THE MOST UNIQUE AND RELIABLE RESOURCE FOR TODAY'S ELECTRICAL CONTRACTOR

## Custom Conduit Cutting & Packaging



#### Call: 802.674.6555

31 National Road • Edison, NJ 08817 www.windsorwireco.com

## 

#### LET RAPID PULLS SAVE YOU TIME!

- Setup one reel per home run pull.
- Pre-measured per home run.
- No balance material to manage after job.
- True color conductors.
- Reel is pre-marked with panel and box ID.
- No ringing out and tagging.
- LABOR SAVER!

## Redefine roadway performance

#### Introducing RoadMax

Evluma's next generation roadway luminaires deliver uncompromising performance and industry leading glare control. Because essential roads deserve exceptional light.

#### Lightfair, Las Vegas June 21-23, 2022, Booth #2546



evluma.com | sales@evluma.com

#### TEC Contents · May 2022

PG 4	Custom Conduit Cutting & Packaging

- PG 8 The Importance of Oil Resistant Cables
- PG 24 Ad Index





Vol. 22 Issue 5

PRESIDENT

Glen Hobson 205-441-5591 glen@handfmedia.net

#### ASSOCIATE PUBLISHER

Steven Goodwin 205-624-2181 steve@handfmedia.net

ADMINISTRATIVE DIRECTOR

Steven Hobson steven@handfmedia.net

EDITOR

Brandon Greenhill brandon@handfmedia.net

**CREATIVE/ WEB DIRECTOR** 

Jacklyn Greenhill jacklyn@handfmedia.net

#### t Cool! 2



Extend transformer life!

Increase transformer capacity up to 166%!

- expert technical assistance
   large inventory
- Iow sound levels
- energy-efficient motors



· galvanized or stainless steel guards



P.O. Box 1568 · Pelham, AL 35124 Phone: 205-441-5591 · Fax: 205-624-2181 www.theelectriccurrent.com info@theelectriccurrent.com



The Electric Current<sup>™</sup> is published twelve times a year on a monthly basis by H & F Media, Inc. *The Electric Current™* is distributed free to qualified subscribers. Non-qualified subscription rates are \$57.00 per year in the U.S. and Canada and \$84.00 per year for foreign subscribers (surface mail). U.S. Postage paid at Birmingham, Alabama and additional mailing offices.

The Electric Current<sup>™</sup> is distributed to to qualified owners and managers in the electrical industry. Publisher is not liable for all content (including editorial and illustrations provided by advertisers) of advertisements published and does not accept responsibility for any claims made against the publisher. It is the advertiser's or agency's responsibility to obtain appropriate releases on any item or individuals pictured in an advertisement. Reproduction of this magazine in whole or in part is prohibited without prior written permission from the publisher.

> **POSTMASTER:** Send address changes to H & F Media, Inc. P.O. Box 1568 Pelham, AL 35124 PRINTED IN THE USA



#### First there was 4 square... and now the **REVOLUTIONARY** 5 Square<sup>®</sup> Box!!

You've struggled with 4 Square boxes for years - you know how small, cramped and time consuming they are. Finally, there is a solution that allows you the space you have always needed.

The **5 Square**<sup>®</sup> Boxes (5" x 5" x 2-7/8") provide up to 88 in<sup>3</sup> of interior volume which more than doubles that of most existing boxes on the market.

Create a robust and unrivaled infrastructure for the life of your facility with the **5 Square**® Products!





## **Custom Conduit Cutting & Packaging**

ELECTRI-FLEX COMPANY now offers custom conduit cutting and packaging options to product orders. Customers requiring cut lengths of flexible electrical conduit can now have them cut to their required length and have the ends cleaned and deburred. Orders are then packaged and shipped direct to the jobsite. Custom conduit cutting provides the following benefits:

- Saves time on installations.
- Reduces labor and tools required.
- Reduces or eliminates conduit scrap.
- Decreases jobsite accidents that could result from improper cutting.
- 4 TEC Magazine May 2022



Time

### Unitrex XS<sup>™</sup> Max Wear. Unmatched performance in the field and in the boardroom.

Electric line stringing is easier and more economical with Unitrex<sup>™</sup>. Made with a core of Honeywell Spectra<sup>®</sup>, it is up to 10 times lighter than steel, while delivering comparable strength. The urethane-coated polyester jacket provides excellent abrasion resistance for great productivity that lasts.

To learn more, visit www.yalecordage.com



## WE HAVE THE ROPE TO GET THE JOB DONE.

Distributor partners agree, "We took standard conduit that many sources can supply and turned this business into a customized solution for my customer. It saves time and money for them by cutting and packaging specifically to their needs. In the process, this item is now viewed as a cost savings item to both my company and my customer. This is truly a partnership."

The Electri-Flex cutting division is located at its manufacturing facility in Roselle, IL. The highly trained staff and professional in-house equipment make processing custom orders fast and easy. Most orders ship out in as little as two weeks, depending on the type or size of the product, or quantity. Factory cut conduit is cut to a 90-degree angle, packaged and shipped. Customers can also choose to have the ends cleaned and deburred, leaving no jagged edges for safe handling and making pieces connector ready. Customers can request a quote through an authorized supplier or Electri-Flex representative. To learn more, visit https:// www.electriflex.com/engineering-data/cuttinghandling-conduits/.

Electri-Flex Company, a leader in electrical conduit design and manufacture for nearly 65 years, produces Liquatite®, the most diverse line of liquidtight flexible electrical conduit in the industry. The company offers custom design, engineering, quality assurance and testing capabilities. For more information on Electri-Flex Company, call (630) 529-2920 or (800) 323-6174; fax: (630) 529-0482; e-mail: mktg@electriflex. com; visit: www.electriflex.com; or write: 222 West Central Avenue, Roselle, IL, 60172-1994.

www.electriflex.com/engineering-data/cuttinghandling-conduits/ •



800-358-7673

www.bucrope.com



Step 1: Remove Damaged Conduit



Step 2: Cut Split Duct Conduit to Fit



Step 3: Snap in Place



Step 4: Attach Adapters



Step 5: Finish Job in Record Time

## **REPAIR CONDUIT** IN A SNAP!

No Tape
No Plastic Straps,

No Metallic Straps

NO KIDDING! Designed especially for power, communications, and fiber optics



"The World Leader In Split Conduit Products"



800-670-1804 fax: 435-673-8724 email: crs@conduitrepair.com

Please Visit Our Website at WWW.CONDUITREPAIR.COM

# LAPPKABEL STUTIGART O

## The Importance of Oil Resistant Cables

#### Original Content Written By: John Gavilanes, Director of Engineering for LAPP

The demands of the industrial environment are ongoing, with ever-changing trends. Cables, which were once able to sustain functional and operational integrity a decade ago, would not be adequate to survive in the environment of a present-day manufacturing site.

Everywhere, from the Renewable Energy Industry, Automotive Assembly Plants, to the factories that manufacture small office machines and even in some commercial buildings, the oil resistance of cables has become increasingly important.

Oils serve a dual-purpose role in industrial applications, both as a coolant and lubricant, depending upon the requirements mandated by the end-use application.

Sustaining trouble-free cable operation under harsh chemical and environmental conditions reduces costly manufacturing downtime and helps to eliminate or minimize periodic maintenance and costly cable replacement.

All of these factors mentioned play a major role that is critical to a consistent, smoothly run manufacturing operation, which in the end, results in higher profit margins.

#### Regulatory and Code Changes

With the changes to the National Electrical Code (NEC) in the past 20 years, a protective conduit or raceway is no longer required when running an exposed run (-ER) cable from the tray to the equipment or device. Previously, when the cable was extended from tray to machine, a conduit or raceway was used primarily as a protection mechanism in helping to prevent cable damage.

Originally TC-ER cable (previously printed "open wiring") had a length limitation of 50 ft. from the tray to the equipment. The 50 ft. allowances resolved a large "grey" area in the industrial environment and were initially a well-received solution by the industry.

Due to the overwhelming acceptance of the 50 ft. length allowance, the NEC committee enacted further changes shortly thereafter, permitting unlimited length of TC-ER under Article 336. With the advent of unlimited length, Article 336 also brought other issues, like a greater area of cable exposure and susceptibility to

## 🕅 Maddox

## Maddox is the one-stop shop for your transformer needs

Founded by a team of industry veterans focused exclusively on the transformer and transformer-related needs of industrial and commercial clients.



#### Sell

Maddox stocks and sells the highest quality transformers from dry types and padmounts to substations.

#### Repair

With shops on both coasts Maddox inspects, tests, and repairs transformers to ensure that they are in top working condition.

#### Rent

With thousands of units in stock, Maddox rents out transformers for the temporary power needs of customers across North America.

#### Purchase

We offer a great price that includes handling all the transportation and environmental issue.



the surrounding industrial environment.

Under the typical conditions of operation, consideration for factors such as ambient temperature, a cable's mechanical strength, unintended movement and constant exposure to industrial lubricating and coolant oils must be taken into account.

When exposed to these conditions, the cable inevitably will begin to deteriorate; the overall jacket

<image>

Wizard & AI Tools Save Time and Eliminate Errors Renewable Warranties that Include Calibrations 1-2 Day Shipping on Most Orders



may swell and/or crack, creating a potentially hazardous condition, along with machine and production downtime. These possible problems are undesirable and necessitate the need to implement cable protection measures.

When referring to NFPA 79, the electrical standard for industrial machinery, Machine Tool Wire (MTW) is one type of cable permitted. Under the standard for machine tool wire, UL 1063, passing the Oil Res I test is required and further severe testing such as the Oil Res II is optional.

Environmental resistance tests, such as those per UL Standards were implemented in response to the globalization of industry with the goal of standardizing the oil resistance requirements of cables used in manufacturing industrial machinery throughout the world.

#### Purpose and Application

Why does oil cause such excessive damage to certain types of insulations and jackets and how does this occur?

All compounds are not the same, for example, certain types of PVC have a higher degree of flame re-



#### Custom Insurance for the Construction Industry

#### With XINSURANCE, You Get...

- > All-In-One Approach
- > Agent Friendly
- > Limits up to \$10MM
- > Property & Casualty
- > Professional Liability
- Commercial Auto Liability (available in most states)
- Products Liability
- Exclusions/Gaps in Current Coverage & More

XINSURANCE is powered by Evolution Insurance Brokers, LC ("EIB"), an excess and surplus lines insurance brokerage. XINSURANCE is a DBA of EIB, which is domiciled in and has its principal place of business in Sandy, Utah. This insurance product is offered by an unlicensed surplus lines insurer. The NPN for EIB is 5464658 and CA license number is 0H93938. Ask us about our new coverage option – Communicable Disease Liability

To get your free custom insurance quote for the construction industry, visit www.xinsurance.com

You can also contact Logan Fitzgerald directly at 801.304.5562 or loganf@xinsurance.com

XINSURANCE



sistance, while others have better oil resistance, and some demonstrate improved flexibility characteristics. PVC formulations vary greatly, depending on the desired properties and applications.

These properties can be achieved by adjusting the formulations of a particular PVC compound. The modification or addition of flame-retardants (iodine), stabilizers, and fillers allow the compound to exhibit these types of enhanced characteristics.

However, when certain PVC characteristics are improved, the enhancement sometimes comes at a cost, the cost being that other performance traits are affected or completely lost.

The specific application will determine if oil is used as a lubricant and/or coolant. Acting as a lubricant, oil would be applied to a gear system driven by motors to prevent premature wear down and ensure smooth operation. Acting as a coolant, oil is applied during the machine lathing process to keep metal from becoming too hot.

In the field, cables can be exposed to oil in a wind turbine nacelle, (the nacelle is the area located on the top of the turbine) where oil is used in the gearbox. Cables that lay on the floor of the nacelle are subjected to oil that is unavoidably spilled. These cables are then exposed to oil for very long periods of time, along with other extreme high and low temperatures causing the lower quality jacket compounds of a cable to crack.

There are many factors involved regarding how oil will attack wire and cable, such as exposure, ambient temperature, and also possible continued immersion. In general, increases in the amount of exposure, the frequency, and the ambient temperature, the faster oil will start the deterioration process.

In short, oil attacks the insulating compound, where it will become virtually ineffective in its primary role as an effective insulator. This action can create a possibly very hazardous situation, not only to human life but also to the overall function of the industrial machinery to which it is connected.

This results in very expensive downtime, costly repair, and in the worst-case scenario, entire replacement of the machine.

Step 1: When process oils come in contact with PVC & Polyolefin compounds, the process oils are attracted to the plasticizers in the cable.

Step 2: The oils can be absorbed by a Polyolefin material resulting in swelling and weakening of the cable jacket.

Step 3: The oils can extract the plasticizers from PVC materials making the cable jacket hard and lead to failures.

#### What Happens

All wire and cable insulation are not created equal. Electrical, environmental, mechanical, and chemical attributes will vary depending upon the individual compound formulations. Insulating compounds contain a specific amount of plasticizers in their individual formulations, which help promote flexibility and resistance to fatigue.

When compounds are exposed to lubricating and coolant processing oils the material either absorbs



#### The Future of Precast Light Pole Bases.

.

### **Universal Features**

Can easily accommodate light poles up to 25' high - taller depending on the conditions.

Adjustable anchoring system can accommodate bolt circle diameters from 7 1/2" up to 13 1/2".

Able to accommodate multiple conduits from all directions.

 Large side openings leading to a central vertical pathway.

#### 6' OPTION

For exposed heights up to 12" Approx. Wt: 2,600 lbs Diameter: 24"

#### 8' OPTION

For exposed heights up to 36" Approx. Wt: 3,500 lbs Diameter: 24"



Scan Here!

18.

LightPoleBase.com

the oil or the plasticizer will diffuse from the compound.

When oil is absorbed, it causes severe swelling and softening of the compound resulting in degradation of tensile properties. When the oil causes diffusion of the compound plasticizer, hardening will result and all flexibility and elongation properties are lost. The following images illustrate the effects that oil can inflict on cable jackets and insulation.

Cracking – Caused during exposure of the PVC to oil or other chemicals due to the complete removal of plasticizers, resulting in hardening and eventual cracking of the insulation and jacket.

Melting – Caused during exposure of the PVC to oil or other chemicals due to the absorption and combination with the plasticizer, resulting in softening and the high elasticity noted in the compound.

Swelling – Caused during exposure of the PVC to oil

or other chemicals due to the migration of the oils into the plasticizer, resulting in noticeable increases in insulation and jacket diameter.

Discoloring – Caused during the exposure of the PVC to oil or other chemicals due to the diffusion of the plasticizers along with colorant from the insulation and jacket.

These pictures verify the damage caused by oil exposure is irreversible and creates hazardous conditions. Now, in addition to cable replacement costs, there is also the expense of reinstallation to be taken into account.

To avoid these types of unwanted scenarios, the customer must review the properties of the cables they are about to consider for their application and determine suitability for the oil environment.

There are UL tests, which help determine how a cable will react in the industrial oil environment. These tests are more commonly referred to as the Oil Res I





## The New Standard for Linemen

At Tallman Equipment, our priority is to set the standard in the electric transmission and distribution industry with an all-inclusive approach to serving our customers. Our vision to deliver a trio of quality, convenience, and reliability is driven by listening and adapting to the needs of our customers. As the industry changes, so does Tallman. As a result, Tallman Equipment has become a unique company within our industry offering a full range of professional services including tool sales, product distribution, rentals, and repair. Tallman is already a trusted name in stringing blocks, cable assemblies, fiberglass, and rope products – and we are excited to announce the addition of our new Rubber Goods Testing Lab.

### Dur Services Include:

Groundset & Jumperset Manufacturing, Repair & Refurbishing

Transformer Sling Manufacturing & Rope Repair

**Battery Power Tool & Equipment Repair** 

Fiberglass Tool Testing, Repair & Refinishing

Tool & Equipment Rental

**Rubber Goods Testing & Refurbishment** 





www.tallmanequipment.com

Call Toll Free: 877-860-5666 International: 630-860-5666



and Oil Res II tests, which involve continuous immersion of the cable samples in IRM 902 at elevated temperatures for a specified period of time.

Passing results are determined by the evaluation of mechanical properties and observations of physical damage caused by oil exposure. In 2000, LAPP as an innovator and leader approached UL about creating tougher standards which resulted in the creation of AWM style 21098.

The table below indicates the industry standard tests that are used to evaluate wire and cable oil exposure performance.

Name	Method	UL Requirement
UL 62	Oil Immersion for 7 Days @ 60°C	75% retention of unaged tensile and elongation
UL Oil Res I	Oil Immersion for 4 Days @ 100°C	50% retention of unaged tensile and elongation
UL Oil Res II	Oil Immersion for 60 Days @ 75°C	65% retention of unaged tensile and elongation
UL AWM 21098	Oil Immersion for 60 Days @ 80°C	65% retention of unaged tensile and elongation

#### Industry Oil Exposure Tests

#### Example of Tensile and Elongation Test Methods

Let us assume, for example, that the cable jacket of your product is going to be tested for compliance to UL

## INNOVATIONS

#### **Faster Safer Workspace**





#### ALL JACK™

Increase productivity and decrease fatigue using iTOOLco's All Jack<sup>IM</sup>. Install pipe, lights, cabinets, drywall, temporary dust barriers and much more with this innovative jack designed to lift and support the weight of your workpiece while you anchor it into position.

High ceilings and ladder work are not a problem for this dynamic tool. Reach from 58" to a staggering height of 13'6". The industrial gas shock ensures a snug, stable support that stays in place while you complete the installation. Once your workpiece is secured into place, simply remove the All Jack™ by releasing the shock. More powerful than a typical support pole, the All Jack's gas shock can handle your most challenging jobs.



#### CORDLESS CANNON 3K

Speed, Versatility, and performance are all yours with iTOOLco's Cordless Cannon 3K™. This portable 3,000 lb. puller is intuitively designed to handle all of your day-to-day wire pulls.

The built-in capstan switch automatically turns the puller on and off. Simply tug on the rope to start the pull and slack off the rope to shut it down.

Delivers dynamic performance in remote locations or areas where power is not yet available. The high-capacity rechargeable battery is long-lasting and delivers maximum power. The Cannon 3K<sup>™</sup> will even chew through a medium size run of 4 - 350 in 3" conduit with 4 - 90s 220' long in record time and still have half the battery life for your next pull.







Oil Res II. Tensile and Elongation tests must be performed both on the original (unaged) and oil immersed (aged) test samples and must be prepared as defined under UL Standard 2556. Die cut dumbbell specimens are taken from the jacket and are then tested for tensile strength and elongation.

As for sample preparation, two marks are applied approximately 1.3 inches apart from each other and equidistant from the center of the dumbbell sample. These marks are applied at right angles to the direction of the pull in the testing apparatus.

The sample is then clamped on the tester with one-inch marks outside of and between the grips. The grips are then separated at the rate of 20 inches per minute until the sample breaks.

Results are then recorded for elongation and pound-force breakage; tensile strength is calculated by dividing the pound-force by the cross-sectional area of the specimen.

Untested die cut samples are aged under the UL Oil Res II requirement of 75°C for 60 days. After 60 days, the samples are removed from the oil for a minimum of 16 hours. They are then tested for tensile and elongation, which must retain 65% of the unaged values. The following is an example for an Oil Res II test results:

Sample	Tensile Strength (PSI)	Elongation (%)	Tensile Retention(%) Pass/Fail	Elongation Retention (%) Pass/Fail
Original	3698	167	-	-
Aged	3625	129	98 / Pass	77 / Pass

#### Oil Res II Test Requirement:

65% of the original tensile and elongation values 65% (3698 Psi) = 2404 Psi, min. 65% (167%) = 109%, min.

Unaged Tensile Strength:	3698 Psi
Aged Tensile Strength:	3625 Psi
Percent Retention:	<u>3625 Psi</u> X 100 = <u>98%</u>
	3698 Psi
Unaged Elongation:	167%
Aged Elongation:	129%
Percent Retention:	<u>129%</u> X 100 = <u>77%</u>
	167%

## BOO.557.0098 | golight.com

## DURABLE VERSATILE

5

HI

#### Conclusion

The oil resistance of cables has now become a critical performance parameter when electrical contractors, engineers, and installers specify cables for end-use application designs.

The continued growing popularity of oil resistance requirements is due to changes in standard regulations and the increased performance characteristics that are mandated by certain industries: Renewable Energy, Automotive Assem-



bly Plants, and other production facilities.

As time moves forward, superior oil-resistant cables will become standard, rather than the exception and the demand for this type of operating performance will only continue to grow.

#### Oil Resistant Wire and Cable Products by LAPP

LAPP has been providing oil resistant wire and cable products for the past 60 years and will continue being the industry leader in the future. LAPP is ahead of the pack and has already made the commitment to service industries that are directly affected by these oil-resistant requirements.

The numerous cable designs within the LAPP product family groups offer varying degrees of oil resistance combined with other premium characteristics to better serve the needs of industries today and in the future. To learn more about these cables, visit the LAPP Wire and Cable page or browse some of our popular oil-resistant products below.

#### ÖLFLEX® 190

ÖLFLEX® 190 is a multi-conductor cable with a highly oil-, coolant-, and solvent-resistant thermoplastic polymer jacket for control and power applications in an industrial environment. It is designed for use in all electrical equipment under dry, damp, and wet conditions

#### ÖLFLEX® TRAY II

ÖLFLEX® TRAY II is an industrial-grade tray cable with superior oil performance for long cable life. It has a pressure-extruded jacket and fine copper stranding for excellent flexibility, making it much easier to pull through trays.

#### ÖLFLEX® 890

ÖLFLEX® 890 is a time-tested, performance-proven multi-conductor cable designed for continuous flex applications. Fine stranding and specially formulate compounds optimize flexing life and provide excellent

## BUDGE DE DE MACHINE WE BUILD

Hogg & Davis has been proudly manufacturing utility line equipment for more than half a century.

Our trusted products are part of the fleets and tool cribs of nearly every investor- owned power and communications company in the United States and Beyond.



HOGG & DAVIS, INC. 3800 EAGLE LOOP • ODELL, OR 97044 TEL 541.354.1001 • FAX 541.354.1080 WWW.HOGGDAVIS.COM



resistance to mineral oils, synthetic oils, and water-based coolants.

#### About Lapp Tannehill - Wire, Cable & Wire Management Distributor

Lapp Tannehill supplies and distributes wire, cable, tubing, connectors, and other related products and materials. Serving domestic and international customers, we are headquartered out of Savage, Minnesota, with sales teams across the country, and additional distribution centers in Nevada and Texas.

Our excellent customer service and value-added services are what sets us apart. We provide additional services to accommodate special requirements or specifications, including wire striping, dying, twisting, cut pieces, re-spooling to specific put-ups.

### DIAGNOSE YOUR OWN EQUIPMENT.



HV Pro is our answer to folks needing a stand alone, full featured scan tool for working on Agricultural, Construction, The Mining and other Off-highway applications. Brands such as John Deere, Volvo, Caterpillar and CASE are covered. Perform bi-directional controls on hydraulics and special functions, such as injector coding, DPF regens and VGT calibrations.

8" Android Tablet | IP65 Rated | Bluetooth® Wireless | Easy Updates | Remote Technician

WWW.CANDOINTL.COM



909/CANDO-11(226-3611)

## The Evolution in Electrical Construction is Happening Now



Electrical contractors' scope of work is expanding. The place to find the tools you need to stay competitive is at The NECA Show. It's the industry's largest display of next generation solutions. The future is bright, and we'll prepare you to seize new business opportunities.

#### REGISTRATION IS OPEN. Use Code 22UTSC for FREE Trade Show Admission.



NECA 2022 Austin • Oct. 15-18, 2022



#### Ad Index

Company	Pg.	Website
Buccaneer Rope	6	www.bucrope.com
Can Do	22	www.candointl.com
Conduit Repair	7	www.conduitrepair.com
Emars	24, IBC	www.emarsinc.com
EvLuma	1	www.evluma.com
GoLight	19	www.golight.com
Greaves	BC	www.greaves-usa.com
Hogg Davis	21	www.hoggdavis.com
iToolCo	17	www.itoolco.com
Krenz Vent	2	www.krenzvent.com
Light Pole Base	13	www.lightpolebase.com
Maddox	9	www.maddoxtransformer.com
NECA	23	www.necaconvention.org
Powersight	10	www.powersight.com
Randl Inc	3	www.randl-inc.com
Tallman	15	www.tallmanequipment.com
Windsor Wire	IFC	www.windsorwireco.com
X Insurance	11	www.xinsurance.com
Yale Cordage	5	www.yalecordage.com

### Relax On Payroll Fridays

eMarsinc.com Ph: 480-595-0466



• 5 Minute Friday Payroll

- Internet based
- 58,000+ Construction Clients
- Avoid Jail Time and Costly Fines

Encrypted

 Identifies All Davis Bacon Compliance Errors
 80% Savings of Time and Money Compared to Manual Payroll Preparation

## Relax On Payroll Fridays

- 5 Minute Friday Payroll
- Internet Based Encrypted
- Avoid Jail Time and Costly Fines
- Identifies All Davis Bacon Compliance Errors
- 80% Savings of Time and Money Compared to

**Manual Payroll Preparation** 



eMarsinc.com Ph: 480-595-0466

## Making perfect connections has never been simpler. In fact, now it's a SAAP!

**NEW SNAP Connectors** from Greaves. A revolutionary compression connector concept that gets the job done with just a few turns of a standard wrench!

Time-saving, easy installation

- Superior pull-out strength and conductivity
- No bulky and costly tools and dies



860-664-4505 | 800-243-1130 | www.greaves-usa.com | info@greaves-usa.com