

December 2024

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

THE ELECTRIC CURRENT



**A New Patented
Approach to
Diffusion Bonding
Offers Speed and
Improved Process
Control**



Upgrade Your Building Wire with Copper-Clad Aluminum (CCA).



Cost Stable

Reduce your exposure to volatile price fluctuations.



Code Compliant

NEC referenced since 1971, Copperweld is accepted by builders and inspectors.



Easy to Install

A similar metal to copper for electrical connections, CCA is light and easy to bend.



COPPERWELD®
BUILDING WIRE



Learn More

Copper where it counts™

Contact us for sales and info:

615-622-4662

buildingwire@copperweld.com

copperweld.com



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.

Rent

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

Repair

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

Purchase

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

1-800-270-2011

sales@maddoxtransformer.com

maddoxtransformer.com

PG 4	A New Patented Approach to Diffusion Bonding Offers Speed and Improved Process Control
PG 12	Klein Tools® Combines Four Essential Testing Tools into One Convenient Kit
PG 14	New Component Box from Klein Tools® Connects to MOD-box™ Tool Bag, Tote and Backpack
PG 18	Ad Index



Vol. 25 Issue 2

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

Made to order polymer composite
HOUSEKEEPING PADS

ZANITE PLUS POLYMER COMPOSITE
A base you can build on.

 Proudly made in the U.S.A.



Outperforms traditional concrete
Quick Installation no waiting for concrete to cure
Labor Saving no forms or pouring field materials
Mounting stainless steel inserts for equipment and floor anchors

Flexible Designs built to exact size specifications including conduit openings
Built to Last corrosion resistant and extremely durable (seismic ready)
Precast with limited colors available

basetek.com | info@basetek.com | 877.712.2273

BASETEK Built to last and outperform. We guarantee it.

©2024 BaseTek, LLC. Zanite Plus is a registered trademark of BaseTek LLC

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



The Electric Current™ is published twelve times a year on a monthly basis by Southern Digital Publishing, 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™ is distributed 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
Southern Digital Publishing, Inc. P.O. Box 1568
Pelham, AL 35124
PRINTED IN THE USA

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"



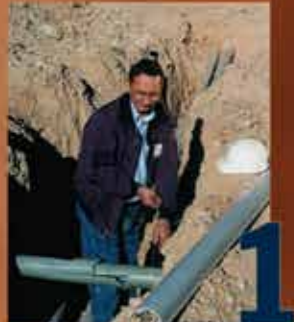
Conduit Repair Systems, Inc.

The World Leader In Split Conduit Products

800-670-1804

fax: 435-673-8724

email: crs@conduitrepair.com



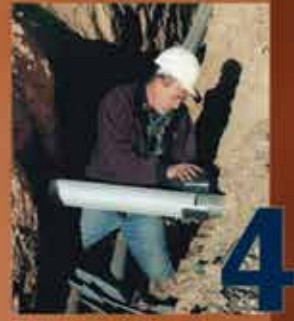
**Step 1: Remove
Damaged Conduit**



**Step 2: Cut Split
Duct Conduit to Fit**



**Step 3: Snap in
Place**



**Step 4: Attach
Adapters**



**Step 5: Finish Job
in Record Time**

Please Visit Our Website at WWW.CONDUITREPAIR.COM

A New Patented Approach to Diffusion Bonding Offers Speed and Improved Process Control





An innovative process is reducing diffusion bonding time of aluminum and aluminum alloys by up to 50%, energy use by 30%, and improving quality.

Contract manufacturers and design engineers in the aerospace, semiconductor, high-power electronics, and energy industries have been turning to diffusion bonded metals to produce new cutting-edge innovations.

Diffusion bonding is an essential joining method used to achieve a high-purity interface when two similar or dissimilar metals require superior structural integrity, and a traditional brazing approach fails to yield quality results. The process involves applying high temperature and pressure to metals mated together in a hot press, which causes the atoms on solid metallic surfaces to intersperse and bond.

Today, much of the innovation occurring in either high-demand or high-quality industrial sectors involves aluminum as one or more of the layers of metals that are bonded. Aluminum, and its broad family of alloys, is prized as a lightweight metal with strong structural integrity, high electrical and thermal conductivity, corrosion resistance, and a malleability that makes it easy to shape.

Aluminum's unique blend of lightness, strength, and purity makes it indispensable across various industries. In aerospace, its high strength-to-weight ratio is crucial for structural components. For semiconductor equipment, aluminum enables the fabrication of intricate, contamination-free channels essential for gas and fluid flow, avoiding the impurities inherent in traditional joining methods like brazing or welding. Furthermore, aluminum's compatibility with diffusion bonding allows for the creation of complex cooling channels in high-power electronics, injection molds, and specialized heat exchangers—designs often impossible to achieve through conventional machining.

Unfortunately, the characteristics of aluminum present a challenge for the traditional diffusion bonding process, which involves the application of radiant heat into the metal layers while in a vacuum furnace. Aluminum tends to reflect radiant heat and has a relatively low melt-

ing point in relation to the temperatures that must be achieved for proper diffusion bonding.

Engineers cleverly confronted the issue by developing a conductive heating method which more rapidly reaches bonding temperature. This new approach offers an alternative to traditional diffusion bonding by circumventing the slow process of radiant heating structural assemblies in a vacuum environment.

The c.BOND machine utilizes precisely controlled heat conduction, instead of radiation, to enable high speed production of aluminum-to-aluminum, or aluminum-to-dissimilar material parts. After several years of developmental research, the c.BOND tool can now reduce total diffusion bonding process time essentially in half, and thus reducing the energy required during processing by as much as 30%. This also improves the quality of the bond in certain instances.

Expediting Aluminum Diffusion Bonding

In the traditional diffusion bonding process, a vacuum furnace provides radiant heat to the surface of the part. Subsequently the heat is conducted through the assembly and transmitted to the faying surface where required. However, when radiation becomes the dominant form of heat transfer, particularly at relatively lower temperatures in vacuum, below 600°C, aluminum's thermal conductivity is time consuming.

Aluminum excels at conducting heat, particularly at lower temperatures, making it ideal for applications requiring efficient heat dissipation, such as in electronics and automotive components.

"Aluminum's high reflectivity poses a challenge in traditional diffusion bonding. It's like trying to heat a mirror with a spotlight – the energy is reflected away instead of being absorbed into the material [using the traditional diffusion bonding process]," says Horst-Gunter Leng, Product Manager, PVA TePla, a global manufacturer of industrial furnaces and PulsPlasma nitriding systems.

Horst-Gunter Leng adds that diffusion bonding of aluminum requires superior temperature control throughout the process. To prevent overheating of the load, slow heating rates traditionally are applied, leading to long process times.

In addition, aluminum alloys have a narrow processing temperature range for successful bonding. When temperatures fall outside that critical temperature band a poor bond is produced.

To overcome the existing challenges of bonding aluminum, PVA TePla and its partner initiated an extensive development program and came up with an innovative solution: integrating heating elements directly into the press platens, explains Horst-Gunter Leng. "This approach speeds up the bonding process, and significantly enhances efficiency by directly transferring heat to the aluminum components."

The culmination of extensive research and development is the c.BOND machine, features a unique combination of direct conduction heating through the top and bottom platens which are in contact with the assembly. This innovative design ensures bi-directional homogenous heating and more precise temperature at the bonding interface where it is required.

The c.BOND machine utilizes a hot-press tool with advanced software and feedback sensors to achieve micrometer-precise pressure control across the entire component surface. This ensures uniform bonding over large areas. Furthermore, the system allows for selective heating of specific areas, preventing unnecessary heat exposure to other parts of the component.

The high-vacuum atmosphere within the chamber eliminates contamination and prevents voids in the bonded joint.

"With the [c.BOND] the time to heat the part to the ideal temperature for bonding is cut in half compared to traditional radiant heating. With less processing time required, the energy requirements are reduced by up to 30% as well," says Horst-Gunter Leng. He notes that multilayer stacking is also possible, which can further increase productivity.

The c.BOND technology demonstrates significant quality improvement of bonded aluminum components. The technology improves temperature homogeneity in the load by 70%, which enhances bonding across the entire surface. The technology also improves the parallelism of parts by 50%, which enhances the accuracy of geometric dimensions, tolerances, and product specifications.

According to Horst-Gunter Leng, the c.BOND furnace technology by PVA TePla is commercially available today for high volume production. The innovative furnace technology incorporates another feature unique to the industry, utilizing PVA TePla's proprietary automatic bonding software (ABP).

"With the automatic bonding software, you place your

AMERICAN MADE. RONK SOLID.

RONK Electrical Industries not only designs and manufactures high-quality products and solutions that help lower costs, increase efficiency, and stabilize power usage, but also provides you and your customers with vast industry knowledge and unbeatable customer service and support.

RONK's Roto-Con® Rotary Phase Converter units manufacture three-phase current from a single-phase supply. This unit is built to allow the use of three-phase motors and equipment where installation of a commercial three-phase supply is impractical or too expensive. Available in Type P, Type D-1, and Type CP, these units are flexible in operating a range of different loads for multiple applications to meet your unique needs, making them easy to install and maintain.

RONK

Sales: 1-800-221-7665 | **Service:** 1-217-563-8333

www.ronkelectrical.com



RONK ROTO-CON® ROTARY PHASE CONVERTER



COMMON APPLICATIONS

- Metal and woodworking equipment
- Grain handling and milling
- Battery chargers
- Print shops
- Welders
- Food processing machinery
- Irrigation pumps

parts in the furnace, input a few parameters such as the size of the bonding area and the software calculates automatically the optimum processing parameters. No specific diffusion bonding knowledge from the operator is required,” says Horst-Gunter Leng.

He notes that the recipes can be modified according to the type of material being bonded, the thickness of the material, its surfaces, and other factors. During the process the software continuously monitors the process in real-time and adjusts parameters accordingly.

A c.BOND unit is installed at a national research facility in Germany, The Günter Köhler Institute for Joining Technology and Materials Testing (ifw Jena) an independent, non-university industrial research institution that conducts research in diffusion bonding, additive manufacturing, brazing, welding, laser processing, material science, and other forms of bonding.

The c.BOND system is compact, requires minimal maintenance, and enables high-volume production of aluminum components for diverse industries. Its benefits are being realized in aerospace, where it creates lightweight yet strong aircraft components. In the semiconductor industry, it provides a cleaner alternative to brazing,

eliminating the risk of solder contamination. There is also growing demand for diffusion-bonded aluminum heat sinks, crucial for cooling high-power silicon carbide (SiC) electronics.

Diffusion bonding also has applications for conformal cooling. The concept is to bond layers of sheet metal that contain machined channel/microchannel structures. When combined, the channels provide a path for heat dissipation. Current applications include power electronics for effective heat management and rapid cooling of molds utilized in injection and blow molding processes.

With the size of components continually getting smaller in sectors like semiconductors and electronics, controlling the amount of time, and by extension heat, introduced into the part becomes more critical.

“As the features [of the internal channels] become more miniaturized, it becomes even more important to control the heating during the diffusion bonding process to avoid any distortion in the part,” says Horst-Gunter Leng. “If you can shorten the cycle time, you introduce less heat into the part. This will facilitate creating parts with conformal cooling channels that have finer and finer features.” Diffusion bonding is increasingly valuable for joining



Don't get caught off guard when we deliver this FAST.

So fast you might not be ready for it.

LS Cable & System USA lead times are the best in the business.
Order today and get your product months ahead of the competition.

LS Delivering quality **3x faster!**

lscusa.com



THE SECRET TO

UNDERGROUND POWER TRANSMISSION



OUR WUNPEECE TRANSMISSION SPACERS REDEFINE THE INDUSTRY STANDARD
FOR UNDERGROUND POWER TRANSMISSION INSTALLATIONS.
WITH PRECISION ENGINEERING AND UNMATCHED QUALITY,

JOIN THE RANKS OF INDUSTRY LEADERS WHO TRUST
UNDERGROUND DEVICES FOR THEIR POWER TRANSMISSION NEEDS.



VISIT WWW.UDEVICES.COM

AND EXPERIENCE THE FUTURE OF UNDERGROUND POWER INSTALLATION

dissimilar metals, such as aluminum to steel or titanium. This allows engineers to design components and assemblies with the best properties of each metal. For example, one metal might offer superior corrosion resistance while the other provides greater strength. This 'packaging' of dissimilar metals opens up new possibilities in design, particularly for overall weight reduction of design and enhancing performance in challenging environments.

When joining dissimilar surfaces, a liquid-phase diffusion bonding process is utilized, particularly when the bonding interface extends beyond R&D sized samples. This often involves an interlayer of an alloy that typically melts at the faying surfaces. When the interlayer includes aluminum, the c.BOND can delivery controlled heat to increase the bonding speed.

Although the c.BOND technology is designed to improve the diffusion bonding of aluminum, PVA TePla can design the machine around the specific needs of the customer customized for the alloy, including copper, which has many applications in specialized heat exchanger or for products used in the microelectronics industry. The company is exploring options to modify the c.BOND to achieve even higher temperatures above the current

maximum of 800°C, according to Horst-Gunter Leng.

As diffusion bonding of aluminum gains importance across industries, contract manufacturers and design engineers must embrace the latest advancements to remain competitive. By adopting fast, energy-efficient diffusion bonding technologies for aluminum and other materials, they can unlock higher production volumes, reduce costs, improve or achieve global sustainability targets, and realize increased profitability.

For more information, contact PVA TePla America at 951-371-2500 or 800-527-5667 or visit www.pvateplaamerica.com •



The test tools you need - for the information you require.



From monitoring equipment, tools and test instruments to the need for on-going calibration requirements and the training to understand everything - there is no wonder the maintenance professional is overwhelmed. With the availability of new and upcoming technology, information overload can quickly set in when trying to put together the best maintenance solution. **That's where we come in.** EDE can demystify electrical testing programs, offer support, training programs and the high tech equipment to make your maintenance activities straight forward and motors and generators doing what they are supposed to do - run. We will help you **Find the Way.**

• 970/292-8207 • www.edeinst.com •

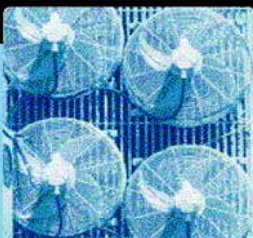


Get Cool!

**Extend
transformer
life!**

**Increase
transformer
capacity up
to 166%!**

- expert technical assistance
- large inventory
- low sound levels
- one-piece cast aluminum blades
- energy-efficient motors
- galvanized or stainless steel guards



p.o. box 187 germantown, wisconsin 53022

262.255.2318

www.krenzvent.com



STRUCTURAL STEEL CO., INC.

Pre-Engineered Buildings Built to Withstand The Rugged Northeast Winters

- Commercial, Industrial and Agricultural Buildings Built to Satisfy Your Building Needs
 - Pre-Engineered Steel Packages
 - Pre-Engineered Post Frame Packages
 - Mini Storage Buildings



*Call For a Quote On
Your Next Project*

***We Manufacture 26 & 29 ga.
Steel Roofing & Siding***



STRUCTURAL STEEL CO., INC.



607 Rt. 13 S, Cortland, NY 13045

National: 1-800-323-7739



(607) 753-9384 • Fax: (607) 753-6272 • www.essexsteel.com

Klein Tools® Combines Four Essential Testing Tools into One Convenient Kit

Klein Tools, for professionals since 1857, introduces the Premium Meter Electrical Test Kit, featuring four best selling testing tools in one convenient kit.

Premium Meter Electrical Test Kit (Cat. No. CL220VP)

- CL220 Clamp Meter measures AC current and AC/DC voltage, resistance, and continuity via test leads, and temperature with thermocouple
- Auto-ranging TRMS meter has a backlit LCD on clamp to provide better viewing in low light and is CAT III 600V, Class 2 Double Insulated
- NCVT3P has dual-range capabilities to detect from 12 to 1000V AC or 70 to 1000V AC for a broad variety of low-voltage or standard voltage applications
- Bright flashlight illuminates work area and may be used independent of NCVT-3P voltage detection function
- ET40 tests AC voltages from 12V to 240V and DC voltages from 1.5V to >17V to 24V at four useful levels aligned with commonly used residential voltages
- ET40 also has built-in test lead holders spaced for testing tamper-resistant US-style outlets and convenient for storage
- RT210 detects common wiring problems in standard and GFCI receptacles: open ground, reverse polarity, open hot, open neutral, and hot/ground reversed



“Putting multiple tools that are often used together into a kit is something Klein Tools does regularly,” says Amy Hart, associate director of product management at Klein Tools. “Combining these four testing tools into this Premium Meter Electrical Test Kit gives electricians, maintenance professionals and homeowners a convenient testing solution that is designed with optimum reliability and safety in mind.”

For more information on Klein Tools safety products, visit www.kleintools.com/safety or search for #NewKleins on social media.

About Klein Tools

Known by trade professionals worldwide as a premier manufacturer of hand tools, Klein Tools is a family-owned and operated company. Since 1857, Klein Tools has prided itself on designing, developing and manufacturing a wide variety of best-in-class, precision Made in the USA products including pliers, wire strippers, screwdrivers, cutting, crimping tools, and more. Klein Tools remains the number one choice among electricians, ironworkers, HVAC Technicians, and other trade professionals. For more information, visit www.kleintools.com

Klein is a registered trademark of Klein Tools, Inc.

www.kleintools.com •

*"As a safety professional, you always want your workers to have access to leading edge safety tools that improve safety and focus. Working with **COOLSHIRT SYSTEMS** over the past two years allowed me to help design a tool by lineman for lineman."*

*The **A.R.C. Hybrid Cooling System** by **COOLSHIRT SYSTEMS** allows lineman to remain more focused and less fatigued by reducing their core body temperature in extreme environments, therefore reducing the possibility of unintended accidents."*

-James "Jim" Bonner
Compliance Coordinator- Retired
Alabama Power



A.R.C. Hybrid Cooling System

Complete Arc Rated Portable Cooling Solution

Developed in conjunction with major power companies for use in extreme heat conditions, the **A.R.C. Hybrid Cooling System** uses liquid cooling to reduce fatigue, injury, and heat stress related illness.

Designed specifically for use by linemen, the **A.R.C. Hybrid Cooling System** features a compact design with a custom woven strap mounting system. The use of S-hooks offers the versatility of mounting inside or outside of the bucket. The system includes our mobile ice based cooler, a 7 hour lithium ion battery with charger and a **CAT 2, 12 CAL** rated Liquid Cooled Vest for **70E Arc Flash** protection.

Designed with portability in mind, measuring **6" x 6" x 20"** and weighing in at **less than 10 lbs dry**, the unit is entirely self-contained and built to last with a 20,000 hour pump.



A.R.C. Hybrid Cooling System
2002-0017



COOLSHIRT®
LIQUID COOLED GARMENTS

New Component Box from Klein Tools® Connects to MODbox™ Tool Bag, Tote and Backpack



Klein Tools, for professionals since 1857, introduces new MODbox™ Tool Bag, Tote and Backpack Component Box, with multiple configuration options to fit into your MODbox™ ecosystem and easily connect to your on-the-go tool bags.

MODbox™ Tool Bag, Tote, and Backpack Component Box (Cat. No. 54812MB)

- Designed to connect to the bottom of the Electrician's Backpack, Tool Tote or Tool Bag (Cat. Nos. 62201MB, 62202MB, 62203MB)
- Clear lid to easily view contents for enhanced efficiency and to allow quick assessment of inventory
- Stay-put lid design prevents contents from shifting



Reliable and Safe. The Power of Us.

40+ OFFICES
ACROSS THE U.S. & CANADA

- ⚡ Electrical Testing and Maintenance
- ⚡ Commissioning and Start-Up Testing
- ⚡ Power Quality Analysis
- ⚡ Cable Testing and Fault Location
- ⚡ Online and Offline Cable Partial Discharge Testing
- ⚡ Engineering Services
- ⚡ Electrical Safety Training
- ⚡ Renewable Energy Systems Testing
- ⚡ Power Distribution System Testing
- ⚡ Power System Troubleshooting and more...



SERVICES

TRANSFORMERS

SYSTEMS

COMPONENTS



resapower.com



Network with us on LinkedIn and follow us on social media as we routinely publish the most recent company news, share best practices, post open jobs, and more.



SCAN ME

GOT A TOUGH ONE?



800-576-RESA



sales@resapower.com

5,000 Lumen (50W) Rechargeable/AC Dual Head LED Tripod Work Light



- Tool-Free 360° Swivel Head Adjustment
- Extendable Tripod
- 16Ft 18/2 SJTW Charge/AC Cord
- Maximum Height 75"
- (1) On/Off Switch
(1) Light Setting Switch
- Run Time: Hi-2/
Med-4/Low-8hrs
- Charge Time: 6hrs
- Dual Function:
Plug In and Use
Continually On
**Medium Light
Mode Only**
- Reversible Ground
Spikes for Secured
Footing

- Comes with 3 removable dividers to organize small parts such as wire nuts, connectors and fasteners
- Made with impact resistant polymers and is IP65 rated for protection against debris and rain
- One handed system release mechanism for quick tool-box removal and reconfiguration

"The new MODbox™ Tool Bag, Tote and Backpack Component Box is designed to be a durable, portable storage solution for small parts and tools," says Scott Rabe product manager at Klein Tools. "This new Component Box works great for additional storage and portability when attached to the MODbox Backpack, Tote or Tool Bag, and is designed with tapered sides that match the backpack's curved bottom for wearer comfort."

For more information, visit www.kleintools.com/new-products or search for #NewKleins on social media.

About Klein Tools

Known by trade professionals worldwide as a premier manufacturer of hand tools, Klein Tools is a family-owned and operated company. Since 1857, Klein Tools has prided itself on designing, developing and manufacturing a wide variety of best-in-class, precision Made in the USA products including pliers, wire strippers, screwdrivers, cutting, crimping tools, and more. Klein Tools remains the number one choice among electricians, ironworkers, HVAC Technicians, and other trade professionals. For more information, visit www.kleintools.com.

Klein is a registered trademark of Klein Tools, Inc.

www.kleintools.com •



1-866-4VOLTEC (486-5832)



STRUCTURAL STEEL CO., INC.

Pre-Engineered Buildings Built to Withstand The Rugged Northeast Winters

- Commercial, Industrial and Agricultural Buildings Built to Satisfy Your Building Needs
 - Pre-Engineered Steel Packages
 - Pre-Engineered Post Frame Packages
 - Mini Storage Buildings



*Call For a Quote On
Your Next Project*

***We Manufacture 26 & 29 ga.
Steel Roofing & Siding***



STRUCTURAL STEEL CO., INC.



607 Rt. 13 S, Cortland, NY 13045

National: 1-800-323-7739



(607) 753-9384 • Fax: (607) 753-6272 • www.essexsteel.com

Ad Index

Company	Pg.	Website
Base Tek	2	www.basetek.com
Conduit Repair	3	www.conduitrepair.com
Cool Shirt	13	www.coolshirt.com
CopperWeld	IFC	www.copperweld.com
EDE	10	www.edeinst.com
Emsco	IBC	www.emscomn.com
Essex Steel	11	www.essexsteel.com
Grace Industries	BC	www.graceconnectedsafety.com
Krenz Vent	10	www.krenzvent.com
LS Cables	8	www.lscusa.com
Maddox	1	www.maddox.com
Resa Power	15	www.resapower.com
Ronk Electrical	7	www.ronkelectrical.com
Underground Devices	9	www.udevices.com
Voltec	16	www.voltecpowerlighting.com
Working Concepts	18	www.safeworker.com

Work shouldn't hurt.

SOFT KNEES® No-Strap Knee Pads



STOP a LADDER®

Another fine **ergoKNEEL** product
www.ergokneel.com



888-456-3372 • www.safeworker.com • info@safeworker.com

Find. Fix. Fast.



EMSCO

ELECTRIC MOTOR SUPPLY COMPANY

- ✓ Busway & Plugs
- ✓ Circuit Breakers
- ✓ Fuses
- ✓ Motor Control Centers
- ✓ Panelboards
- ✓ Safety Switches
- ✓ Switchgear
- ✓ Transformers

If we don't have what
you're looking for,
we find it.

GET 10% OFF
YOUR FIRST ONLINE ORDER

With code

ELECUR10

**Home of Thousands of Transformers,
Breakers, Switches, Bus Plugs,
Circuit Breakers and Motor Controls.**



250,000st of
inventory



Every product
certified



Quick Ship
Fast lead-time

EMSCO stocks obsolete, reclaimed, and
hard to find electrical components.

www.EMSCOMN.com



**24-HOUR
HOTLINE**

Get what you need, when
you need it.

CONTACT US

800.328.1842

24-Hour Emergency Line

LONE WORKER PROTECTION
FALL PROTECTION
SUSPENSION TRAUMA PREVENTION

SECURE 1/2 MILE
LINE-OF-SIGHT



ASSIGNED MONITORING ATTENDANTS



Grace Web Portal Dashboard



Custom Check-In Schedule



TEXT/Email Notification

Receive a GPS Map Link

Check-In System



LEARN MORE

GRACE GATEWAYS

Iridium Satellite/Cellular

Mobile or Portable Worksite Models

SALT™ System Loop Test Indicator

Supports up to 20 Grace Pendants



WORKFORCE® LONE WORKER PENDANT

Fall Detection

Manual Panic Button

Motion Detection

GPS Location

