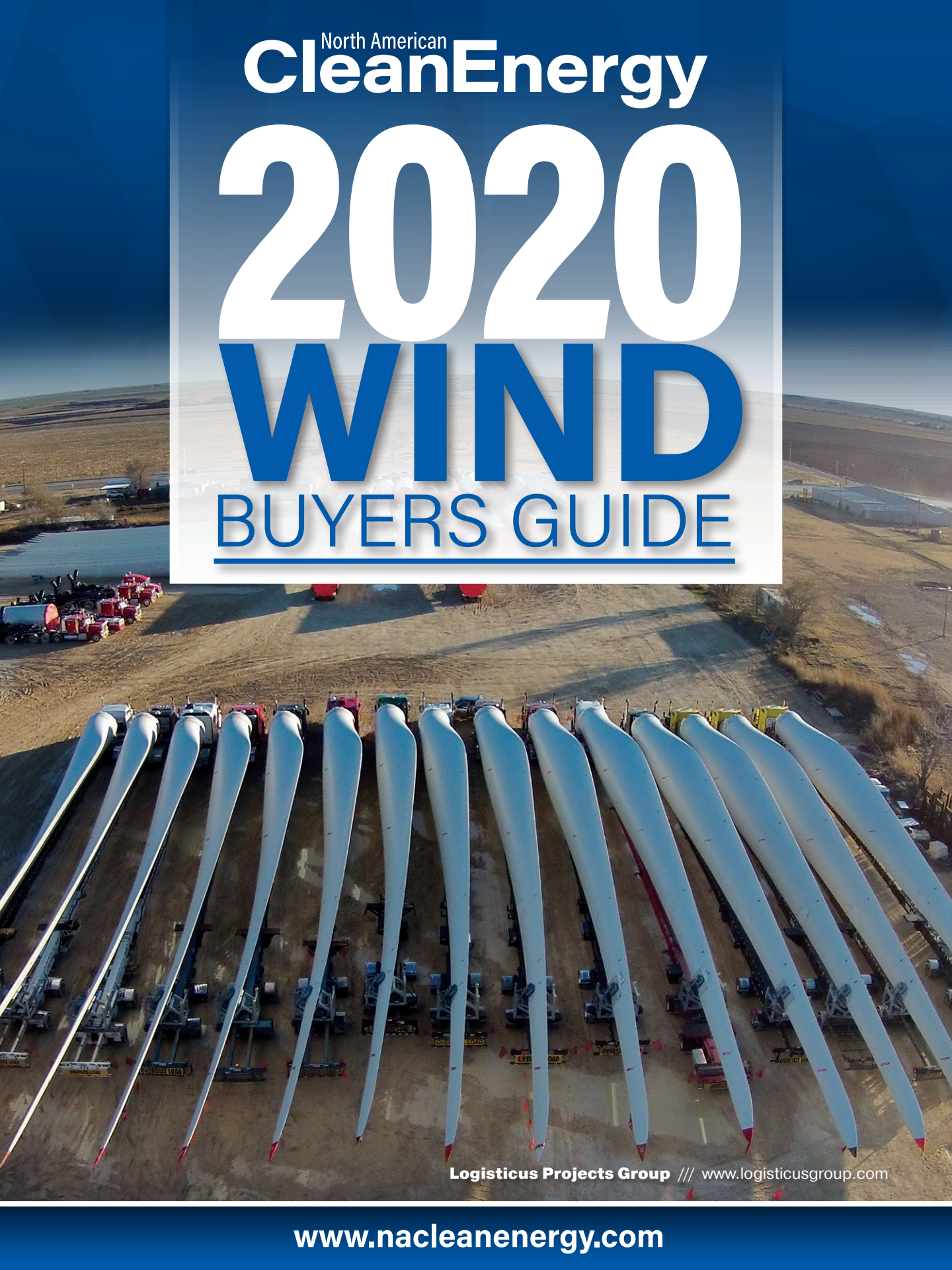


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**CleanEnergy**

**2020**

**WIND**

**BUYERS GUIDE**



Logisticus Projects Group /// [www.logisticusgroup.com](http://www.logisticusgroup.com)

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

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  - Sectionalizing cabinets
  - Telecommunications Provider

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## Adhesives, Sealants & Surface Treatment



### Mankiewicz Coatings

Mankiewicz's two new advanced coatings products maintain turbine blade surfaces for optimal performance and efficiency. BladeRep5 is a fast setting putty that dries in one hour with the same profile-building and sandability traits of other Mankiewicz surfacing putties. And Mankiewicz's new ALEXIT Leading Edge Protection single-coat only requires one-coat application and provides substantial cost savings thanks to less application time. Field testing has proved significantly longer product performance. Mankiewicz's coatings also meet the requirements of the cosmetic blade maintenance market.

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

BUILDING TRUST



### Sika Corporation

Sika Wind Repair solutions help turbines get back on line quickly and efficiently. SikaForce-7800 series fast-sanding surface fillers can be applied in a broad range of temperatures between 40°F to 90°F effectively extending the repair season. The fast 30 minute curing time allows for quick sanding time characteristics and finishing. Sikadur Blade Repair Kits are fast curing epoxy resin systems for structural laminating repairs. Sikadur Blade Repair Kits are GL approved and can reach OEM specified performance as little as 30 minutes. There is no special equipment required. Sika Wind Repair products are available in easy, ready-to-use packaging so there is no field mixing required.

[www.sikaindustry.com/wind](http://www.sikaindustry.com/wind)

## Aluminum Extrusion & Metal Fabrication



### Sotek

With 35 years of experience, Sotek manufactures precision stators and rotors for demanding highly specified applications in wind power generators. Sotek stamps and laser cuts electrical steel laminations using in-house equipment and tooling. They manufacture vent plates, end plates, stator bars, and related components to meet the increasing specifications of the wind industry serving all of North America and beyond from their Buffalo, NY facility. Sotek's skilled team of manufacturing and assembly technicians effectively utilize stamping, notching, stacking, pressing, welding, thermal shaft insertion, robotics, manual and CNC machining, and a variety of value added services to increase efficiency and streamline the process. Additionally, Sotek's supply chain partners provide value to suit the unique demands of each project.

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

## Anchor Bolts | Fastening Systems



### Cooper & Turner

Cooper & Turner is a manufacturer of high quality, high strength, safety critical, large diameter (M16 to M100) hex bolts, double ended studs, and thread rod. Employing automation (including in process NDT inspection) and robotics results in high quality and consistent products, having full lot traceability, for supplying the global wind turbine market, OEM's, and major tiers as well. Recently opening an anchor bolt manufacturing plant in Pueblo, CO., they use 100% USA material and manufacturing, producing anchor bolts to ASTM A615 Grade 75 and Grade 90, plus ASTM A722 Grade 150, with all accessories (nuts, washers, and PVC sleeves), with bolt caps and grease optional. All assemblies are tested in a USA independent lab.

[www.cooperandturner-usa.com](http://www.cooperandturner-usa.com)

# Type 947D

## High Density, DC Link Capacitors



### DC link power film capacitors

Next generation inverter designs for renewable energy demand reliable DC link capacitors with higher capacitance values, voltage, and current ratings. Available in new case sizes and ratings, Cornell Dubilier's Type 947D power film capacitors offer the highest bulk energy storage, ripple filtering and life expectancy for wind and solar power inverter designs, as well as electric vehicle applications. Select from hundreds of standard catalog listings, or connect with CDE engineers to develop special designs to your requirements.



**TYPE 947D POWER FILM CAPACITORS**  
85, 90, 100 & 116 mm CASE SIZES  
CAPACITANCE VALUES TO 3600  $\mu\text{F}$   
APPLIED VOLTAGE TO 1500 Vdc  
RIPPLE CURRENT RATINGS  $>100 \text{ A}_{\text{rms}}$

For technical information, visit [cde.com/solutions/inverters](http://cde.com/solutions/inverters)



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ENERGIZING IDEAS





**Fastenal**

Fastenal Manufacturing services customers in the wind energy industry by providing MRO fasteners as well as OEM parts to the original equipment/parts manufacturers, construction sites, and operating wind farms. Fastenal Manufacturing meets wind-specific material specifications of A615 Grade 75 and A722 Grade 150, available in 1-1/4 – 4.0 and 13/8 – 3.0 thread sizes in both stud and nut.

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



**Heico Lock**

The HEICO Group offers a wide array of products. HEICO-LOCK WEDGE-LOCK WASHERS are a reliable locking system for demanding bolted joint applications including those under extremes of vibration or dynamic loads. The HEICO Group continues to expand its product portfolio with the addition of the HEICO-TEC TENSION NUT, which provides easy, fast, and reliable assembly of large bolted joints. HEICO-TEC TENSION NUT eliminates the need for complex, bulky, or heavy tools, and makes securing large bolted joints convenient and easy.

[www.heico-group.com](http://www.heico-group.com)



**HellermannTyton**

The UL Listed Ratchet P-Clamp delivers cable management performance in a wide range of environments. Wind farm operators are sensitive to the costs associated with repairs and routine maintenance, especially in tight spaces and under challenging conditions. Ratchet P-Clamp is a flexible cable management solution that can be opened and closed again without removal from the mount. It can self-adjust to bundles, with just four sizes covering diameters from 1/4" to 2". The mounting plates are available in different lengths and angled orientations for a more customized fit. They are offered in zinc plated and stainless-steel options to enhance corrosion resistance.

[www.hellermann.tyton.com](http://www.hellermann.tyton.com)



**Nord-Lock Group**

Nord-Lock Group provides secure bolting solutions, creating a safer world by focusing on the integrity of mechanical solutions that are critical to our way of life. The Group offers four key technologies: Nord-Lock original wedge-locking washers with wedge locking technology that makes unintentional loosening impossible, even when exposed to severe vibration and dynamic loads. Superbolt mechanical tensioners that can accurately and safely achieve high preloads while using only hand tools. Expander System pivot pin replacements that provide a permanent solution to lug wear eliminating the need for expensive welding and line boring, and Boltight hydraulic tensioning tools which can provide a low profile solution for space-restricted applications demanding high and accurate preloads, such as wind turbines. Together Nord-Lock Group is providing safe and innovative solutions to safeguard human lives and customer investments.

[www.nord-lock.com](http://www.nord-lock.com)



**NTC Wind Energy**

NTC Wind Energy's patented IronClad bolt caps for the wind industry are made of UV resistant HDPE, manufactured specifically for the make and size of foundation anchor bolts. Bolt caps are intended to prevent water from intruding into the bolt sleeves, prevent the grease applied to the rod from dissipating by sealing it from air and water, and to mitigate the safety hazard of exposed bolts. All of NTC Wind Energy's caps are precisely sized to assure a good fit on the flats of the nut, thereby maintaining a positive seal against the tower flange at the flexible bottom "skirt" of the cap. IronClad foundation anchor bolt caps can be purchased in Standard Duty or Extreme Duty, and in multiple lengths.

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



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[Tderosa@korepower.com](mailto:Tderosa@korepower.com)

 **KOREPOWER**.com

## Blade | Tower Manufacturer & Repair



### LM Wind Power

LM Wind Power is a designer and manufacturer of blades for wind turbines, with 15 factories on four continents. LM Wind Power produced the LM 88.4 P, for an 8MW offshore turbine, and produced the first wind turbine blade beyond 100m in length, the LM 107.0 P, to power GE's Haliade-X 12MW. Their unique technical know-how and manufacturing expertise, enables today's offshore wind turbines to capture more energy from the wind, and reduce the cost of energy.

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



we keep it turning



### Rope Partner

Rope Partner is a provider of quality at-height tower and blade maintenance services domestically and internationally. By combining a highly trained work force and utilizing rope access, suspended platforms, and Bronto skylifts, they deliver a cost effective approach to their clients. They are committed to building safe, long lasting, mutually beneficial working relationships resulting in extending asset life.

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



### TPI Composites

TPI is a U.S.-based independent manufacturer of composite wind blades for the high-growth wind energy market supporting global wind turbine manufacturers. TPI operates composite products manufacturing facilities in North America, Europe, and Asia. Their products provide high strength, light weight, and durability. TPI has over five decades of innovation and expertise in manufacturing large-scale composite structures of high quality at a competitive total delivered cost to their customers.

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

## Cable, Wire, & Conduit



### AerosUSA, Inc.

AerosUSA offers a wide range of flexible polyamide non-metallic corrugated conduits, galvanized steel and stainless steel metallic conduits, metal and nylon fittings, and cable gland strain relief cable glands. Their products are designed for numerous applications within the wind and renewable energy, transit, robotic, automation, marine, offshore, mining, industrial applications, and especially where power and data cables require dependable protection.

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



### American Wire Group (AWG)

American Wire Group (AWG) is a single solution for all types of electrical conductors and hardware required to construct and maintain wind and renewable generation projects—for low, medium, and high-voltage applications. Save schedule time and costs with AWG's ability to supply an entire project's cable requirements from stock. AWG inventories 35-kV UL MV-90 and UL MV-105 Collection System Cables in aluminum conductor in all standard sizes, including 1/0, 4/0, 500, 750, 1000, and 1250 (available in both CN or CTS). All of AWG's Collection System Cables carry a 20-year factory warranty, ensuring protection for the longevity of projects. AWG also inventories the following: fiber optic; copperclad steel grounding; bare copper; transmission cables; OPGW; static wire; low-voltage cables; control cables; and associated hardware.

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





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## Cameron Wire & Cable, Inc.

Cameron Wire & Cable provides LV, MV, and HV (Aluminum and Copper) wind tower, nacelle, and site cables. Cameron offers cost-effective pricing and high performance cables for all applications, and will customize the cable package, offering cut-to-length or bulk cables, accessories, labels, and lugs supplied in kits. They also offer inventory management and will warehouse planned goods at no charge, shipping the same day to satisfy tight job deadlines.

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



## CTC GLOBAL

### CTC Global

CTC Global, in association with 30 international manufacturing partners, produces the High-Capacity, Low-Sag ACCC Conductor. The ACCC conductor carries twice the current of other bare, overhead conductors with 25% to 40% less line losses. The use of ACCC can help reduce upfront capital costs for the tie line, and improve the overall economics of the generation project—reduced line losses translate into more power delivered for any wind energy investment.

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



## HELUKABEL USA

HELUKABEL provides wind power system expertise for the entire turbine, rotor tip to base. In the nacelle they provide control cables that are both oil (Oil Res I & II) and heat-resistant. Cables for the loop have been torsion tested in-house for up to 18,000 cycles. Finally, they manufacture flexible aluminum, copper, and fiber-optic cables for the tower section. Their wind cable products provide quality performance in climate conditions from -67°F up to 293°F (-55°C up to 145°C) for CCV and offshore applications. They have been internationally approved by UL (WTTTC), CSA, CE, and VDE, and have passed the FT4 flame test.

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



## Petroflex N.A., Ltd

Petroflex is an extruder of HDPE (high-density polyethylene) duct and accessories. PNA CableGuard is a solution for both domestic and international clean energy initiatives. They provide cable-in-conduit for control and cabling at both wind and solar farms. Long continuous run lengths of fiber optic cable duct, up to 14000' on 1" IPS, minimize splicing. Cable or fiber installed in conduit at the factory ensures additional protection before, during, and after installation.

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



## Prysmian Group

Prysmian Group offers an array of cables needed for wind turbines to generate, distribute and transmit energy from fiber optic and bare overhead conductors to EmPowr Link CL Advantage underground URD and wind-specific low-voltage power cable. Prysmian is positioned to rapidly respond to the needs of the evolving wind farm market with next-generation cabling systems. EmPowr Link CL Advantage is a cable for today's solar and wind farm collection systems. Featuring enhanced, ruggedized installation protection, this cable has a reduced weight and diameter and XLPE jacket technology. Its efficient fault current protection provides reliability and performance.

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

## Component Supplier



## American Roller Bearing Company

American Roller Bearing Company manufactures large bore (200mm to 2400mm) anti friction bearings, including tapers, cylindrical, spherical, and balls. They offer complete engineering services and expert repair on all types and brands.

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

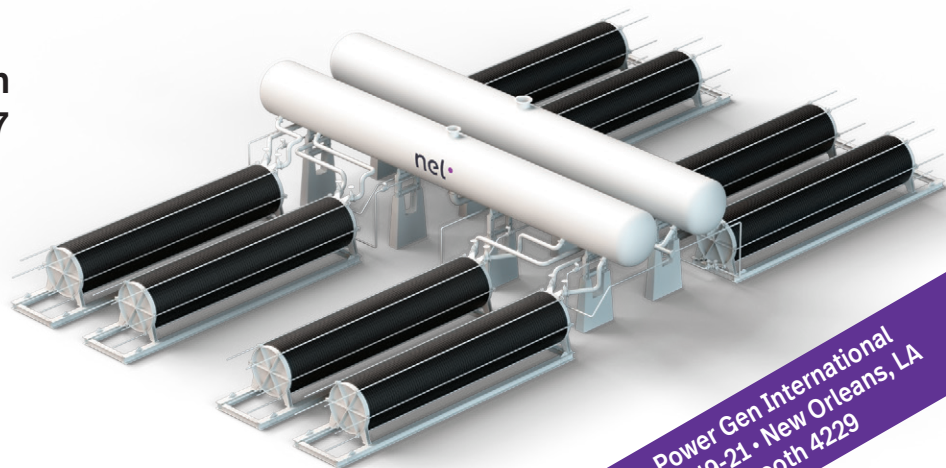
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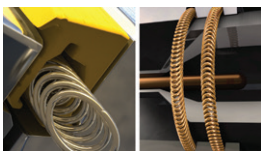
An IDEAL Company



### Anderson Power Products

Anderson Power Products SPEC Pak Connector Series are rugged and environmentally sealed (IP68) certified connectors made from PC, PC/PBT material that is UL94 V-0 flame resistant. Available in wire-to-wire or wire-to-panel configurations that include either pin and socket or flat wiping contact technology. SPEC Pak connectors are intended for applications that demand a waterproof high-power interconnect solution for power, ground, and signaling capabilities such as for use in wind power, solar, lighting, marine, agricultural, or off-road equipment applications.

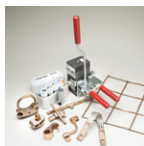
[www.andersonpower.com](http://www.andersonpower.com)



### Bal Seal Engineering, Inc.

Bal Seal Engineering, Inc. designs and produces sealing, connecting, conducting, and EMI shielding solutions that improve the performance and reliability of equipment used in wind, solar power, and other alternative energy production. Their solutions enable engineers to prolong service life, reduce maintenance, protect precision components, design more compact, efficient electrical connectors, and ensure consistent current/signal transmission. Their consultative engineering services streamline the design process, improving speed to market. Their products include the Bal Seal spring-energized seal, the Bal Spring canted coil spring, and the Bal Contact electrical contact.

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



### BURNDY

BURNDY offers a comprehensive selection of grounding products. BURNDY's grounding connectors are systems-engineered to provide system integrity as well as to withstand harsh environments. The BURNDY HYGROUND irreversible compression system meets stringent safety and performance requirements. The BURNDYWeld connection process is a simple, efficient method of welding copper to copper or copper to steel. All BURNDY mechanical grounding connectors have been designed for easy installation and for lasting durability.

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



### Continental Fan Manufacturing, Inc.

Continental Fan provides fans and blowers for nacelle ventilation, GCU (generator control unit) cooling, and tower ventilation. Whether axial fans for high air volumes and low pressures, centrifugal blowers for higher pressure applications, or TMK motorized impellers for ventilating electrical cabinets, Continental Fan has solutions for many applications.

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



### Cornell Dubilier Electronics

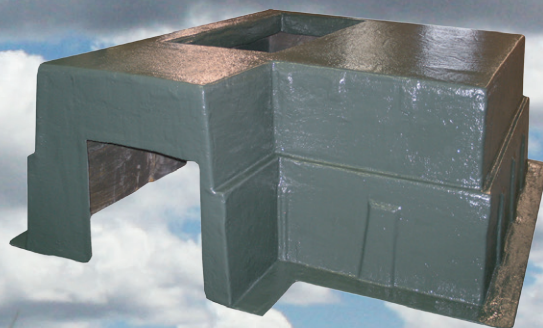
100% of Cornell Dubilier Electronics' 947D DC Link capacitors are conditioned at accelerated temperature and voltage before they leave the factory. They've demonstrated this process eliminates infant mortal failures and produces thermally and electrically stable DC Link Capacitors.

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

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### Eisele Connectors, Inc.

Eisele Connectors Inc. is a manufacturer of robust, all-metal push-to-connect fittings, multi-couplers, and tubing/hose for pneumatics, vacuum, gases, liquids, cooling water, paint, and electronics.

[www.eisele-connectors.com](http://www.eisele-connectors.com)



### EMA Electromechanics, Inc.

EMA Electromechanics is the designer and manufacturer of the VDH/GSMI combined outdoor vacuum circuit breaker and high speed, mechanically interlocked grounding switch. 38kV class, 200kV BIL, 1200A continuous current and 25, 31.5, and 40kA interrupting capability ratings, VDH/GSMI is a patented system specifically designed for switching and grounding of wind and solar energy collection circuits and replaces oil insulated grounding transformers combined with conventional circuit breakers in every feeder of a wind or solar power substation, improving overvoltage mitigation and reducing costs.

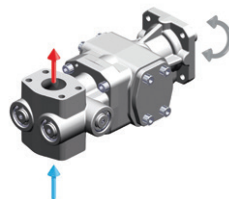
[www.emaelectromechanics.com](http://www.emaelectromechanics.com)



### Ingeteam, Inc.

Ingeteam offers solutions for wind turbines of up to 15MW, including power converters, Indar generators, turbine controllers, CMS, SCADAs, and O&M services for wind applications. Low and medium voltage power converters, optimized for DFIG and FC topologies. The power converters are specifically designed to increase reliability, boost efficiency, reduce maintenance costs, and fulfill strict grid codes. Air cooled, air/water cooled, and full water cooled solutions for harsh environments. Based on IGBT power semiconductors and are equipped with a web application service tool that allows monitoring and remote control.

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



# KRACHT®

### KRACHT CORP.

KRACHT CORP. is a subsidiary of KRACHT GmbH in Germany. KRACHT, is a medium-sized, family-run business with 370 employees. KRACHT is a manufacturer of transfer pumps (e.g. noise optimized for air containing oils), hydraulic motors, high pressure gear pumps, valves, pump units, gear type flow meters, and electronics. KRACHT CORP. is located in Maumee, OH.

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



### Kuma Brake Pads

KUMA Brake Pads is a manufacturer of sintered friction material for wind turbine applications. The products are used on the hydraulic brake Galiper on the high-speed rotor. Designed according to OEM specifications for GE, Vestas, Gamesa, Siemens, Nordtank, Senvion, and most turbines, KUMA sintered brakes pads and products are submitted to extreme conditions tests to ensure high quality. The product is manufactured in North America based on ISO 9001-2015 standards and is also approved by GE for its 1X and 2X turbine platforms.

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



### Lighthouse Global Energy, LLC

Lighthouse Global Energy is a spareparts distributor specializing in OEM parts. With strong distribution partnerships, Lighthouse supplies across multiple turbine platforms. From mechanical yaw systems, hydraulic solutions, or specialized kits, Lighthouse is dedicated to providing solutions.

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

# Type 947D

## High Density, DC Link Capacitors



### DC link power film capacitors

Next generation inverter designs for renewable energy demand reliable DC link capacitors with higher capacitance values, voltage, and current ratings. Available in new case sizes and ratings, Cornell Dubilier's Type 947D power film capacitors offer the highest bulk energy storage, ripple filtering and life expectancy for wind and solar power inverter designs, as well as electric vehicle applications. Select from hundreds of standard catalog listings, or connect with CDE engineers to develop special designs to your requirements.

For technical information, visit [cde.com/solutions/inverters](http://cde.com/solutions/inverters)

#### TYPE 947D POWER FILM CAPACITORS

85, 90, 100 & 116 mm CASE SIZES

CAPACITANCE VALUES TO 3600  $\mu\text{F}$

APPLIED VOLTAGE TO 1500 Vdc

RIPPLE CURRENT RATINGS >100 A<sub>rms</sub>



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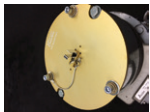
**MERSEN**



**Mersen**

Mersen has made advances in the domain of generator slip-ring and carbon brush technology resulting in improved performance and reduced operating costs. The increased demand for additional power output or turbine up-ratings requires a deep technical understanding of the generator's dynamic behavior and rotor loads in Double Fed Induction turbines. The SR13-15 is an upgrade to one of the most common wind turbine generators in North America. Its robust and enhanced design accommodates high operating loads and boosts up the initial limitations of the turbine. It has proven to run cooler, improve brush life, and increase turbine availability in high winds.

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



**Morgan Advanced Materials**

Bearing fluting from electrical current is a major cause of costly pitch motor failures. To protect these motors, Morgan offers grounding solutions which are fast and easy to install, even up-tower, and without the removing or disassembly of brakes. By shunting electrical current around the bearings, they maximize protection of this valuable equipment. Morgan designs are lightweight, compact, and can retrofit existing motors. Morgan pitch motor grounding solutions come equipped with a constant force spring resulting in consistent brush pressure and a silver/graphite brush for low contact drop insuring this is the path of least resistance for current flow.

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



**Motion Industries, Inc.**

Motion Industries distributes industrial replacement parts and supplies such as bearings, mechanical and electrical power transmission, industrial automation, hose, hydraulic and pneumatic components, safety/industrial supplies, and material handling products to MRO and OEM customers throughout North America. Services provided to renewable energy facilities include repairs of hydraulic and electrical components, OEM parts conversion, committed inventory to reduce lead times, and field expertise in the areas of fluid power, electrical, hose and rubber, and pumps.

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

**NI**

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**Niagara Transformer Corporation**

Since 1933 Niagara Transformer Corporation has been designing and manufacturing transformers in Buffalo, New York. They have shipped over 75,000 transformers to 90 different countries in their 85+ year history. Their products comply with IEEE Standards and government standards practiced throughout the world. Their customers include OEM and engineering, procuring and construction (EPC) firms, as well as end-users in private industry, government, utilities, universities, and others. Their diverse product line includes inverter duty transformers, substation collector transformers, step-up collector transformers, grounding transformers, and load tap changing transformers. Base ratings up to 50MVA, 138kV, and 650kV BIL.

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



**SFP Hydraulics, Inc.**

SFP provides design, assembly, and service of hydraulic accumulators used in various industries including the wind power industry. In collaboration with their customers, they provide value added solutions reducing costs, ensuring safety, and improving performance for all integrated hydraulic systems. SFP offers full service and repair of bladder accumulators both on-site and at their plant in Katy, TX. Their products are offered with wide range of approvals to suit the global requirements including ASME, CE, AS1210, CRN, and TR-CU.

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





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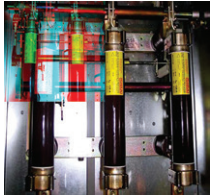
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**FUSES**



**SIBA Fuses**

SIBA Fuses is a source for circuit protection applications, from solar power to wind power, and energy storage. They have been working for over 75 years in semiconductor fuses, including ULTRA RAPID, medium and high voltage, standard European, miniatures, electronic fuses, and a wide range of DC rated fuses (24VDC - 6000VDC) for all types of applications, including Power Conversion, Rectifiers, Inverters, Converters, Drives, UPS, and Traction Applications.

[www.siballc.net](http://www.siballc.net)



**STEGO, Inc.**

STEGO develops products that heat, cool, ventilate, illuminate, and control temperature and humidity for enclosed electronic control systems. For over 35 years, they have offered Thermal Management solutions, which ensure the electronics in their customers' installations are safe from extreme climatic conditions.

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



**United Equipment Accessories, Inc.**

United Equipment Accessories manufactures low-maintenance, high-quality slip rings for OEM and aftermarket clients. These slip rings feature new brush technology designed to provide long life in harsh environments. UEA's design engineers work with their customers to custom build slip rings that meet their wind turbines' specifications. UEA can take current slip ring specs to design an interchangeable slip ring for the wind turbine. Single brushes can be replaced at any time, removing the need to replace entire units or sets of brushes. UEA products maintain superb functionality in a wide range of electrical/electronic circuits, environmental conditions, and rotational speeds.

[www.uea-inc.com](http://www.uea-inc.com)

**Condition Monitoring**



**Dynamic Ratings**

Dynamic Ratings' E3 and C50 units can be deployed to handle condition-based monitoring in wind and solar assets and station service batteries subject to NERC PRC compliance and reporting. DR's visualization software, DynamicMetrix, provides an asset health index and integrates monitored information. Customers have web access to view real-time information and to download historical data. Dynamic Ratings can also monitor the information and notify their customers when conditions fall outside normal parameters.

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



**Fluid Life**

Using current technology and proven testing methodologies, Fluid life helps their customers reduce maintenance costs and improve equipment reliability. Offering a wide range of condition monitoring and reliability services backed by in-house labs, they deliver fluid analysis and reliability solutions accurately and on-time. At Fluid Life, their flexible approach is designed with their customers' individual needs in mind.

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

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**Construction Products & Services | EPC Contractor**



**Blattner Energy, Inc.**

Blattner Energy is an EPC contractor in renewable energy construction with more than 35,000 megawatts installed across North America. Blattner provides complete EPC services for utility-scale wind projects, including post-tension concrete tower supply and installation. Blattner also serves utility-scale solar, energy storage, and high voltage transmission and substation projects. Blattner has a history for responding to client needs, delivering on aggressive project schedules, and self-performance on all major work activities to ensure high levels of safety, quality, and overall client satisfaction.

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



**CONSERTEK LM Group, Inc.**

CONSERTEK is involved in engineering, procurement, construction and sensors, and instrumentation/equipment commissioning, as well as maintenance as needed. Consertek LM Group also designs, fabricates, and supplies high-quality anemometric instrument supports and accessories. All of their supports can be fabricated to suit any type of towers and can accommodate all common instruments. Their supports and accessories are compliant to the latest edition IEC 61400.

[www.consertek.ca](http://www.consertek.ca)



**Contract Land Staff**

Contract Land Staff (CLS) provides Right of Way land solutions for wind and solar, electric transmission, and distribution utility clients across the U.S. CLS services include easement acquisition, mineral and surface title, site scouting, crossing permissions, permitting services, land data records management, GIS and mapping, and construction support.

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



**Pennecon**

From the initial stages of project engineering to the final steps involved with commissioning, the Pennecon team maintains a strong portfolio of wind energy projects that not only showcase their depth of services but also their ability to achieve project success in challenging environments. Capabilities include: engineering, site development (roads, etc.), concrete base construction, tower and turbine erection, substation construction, collector installation, and transmission line development.

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



**Presto Geosystems**

Presto Geosystems' 3D GEOWEB soil confinement system strengthens local fill, even sand, reducing cross section for building roads and pads for foundation construction, turbine component delivery and maintenance access. Over soft subgrades, one layer does the job compared to three layers typically required of geogrids. Confined infill remains stable under heavy loading. With 50% less cross section, use of onsite fill, and virtually no maintenance requirements, the system is a fast-built, low-cost road solution for stable access into the most challenging sites.

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



**RES**

RES (Renewable Energy Systems) is an international renewable energy company with experience in innovating and reducing costs for continued growth without subsidies. In the past 35 years, RES delivered 10GW of renewable energy projects in North America, including over 9GW wind, and a total of more than 16GW across the globe. They leverage their experience as both a developer and self-perform EPC contractor to deliver unique, value-added solutions to lower the levelized cost of energy (LCOE) for their customers. The RES team has domain expertise in wind, solar, energy storage, and transmission with a strong portfolio of EPC projects.

[www.res-group.com/wind](http://www.res-group.com/wind)

# Dialing up the power of your wind turbines?

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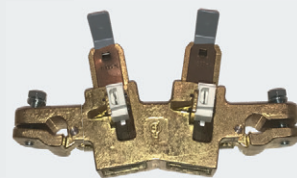
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SR13-15  
BRONZE SLIP RING



HCH-30X  
CG677 BRUSHES



BR09-13  
BRUSH-HOLDERS



## Samson

For more than 140 years, Samson has been working with industry professionals to develop synthetic rope for energy operations. Samson has engineered products specific to the challenging conditions and demanding environments in energy applications.

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



## Signal Energy, LLC

Signal Energy has 8000MW of utility-scale renewable project experience and 1500MW of wind project experience. They support their customers with in-house capabilities including Preconstruction Solutions Group, foundation construction resources, and high voltage EPC capabilities. Signal Energy is active in new project construction and in the re-powering of existing wind projects.

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



**WANZEK**  
a MasTec company

## Wanzek Construction

Wanzek Construction provides high quality general construction, including a wide cross section of industries: Power, Renewable Energy, Oil & Gas, Infrastructure, and Agriculture. Wanzek focuses on leveraging their skilled crews to construct, expand, and maintain renewable energy facilities across North America. They work closely with owners to balance organic growth with client demands to meet market needs. Through their involvement with reputable associations, such as the American Wind Energy Association (AWEA) and Solar Energy Industries Association (SEIA) they stay apprised of industry-specific details that positively affect their project approach.

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

## Consulting Services



## DNV GL

DNV GL's energy experts support customers around the globe in delivering a safe, sustainable, and reliable energy supply. They deliver advisory, certification, and testing services to the energy value chain, including renewables, storage, and energy management. Their expertise spans onshore and offshore wind power, solar, storage, and energy management. DNV GL is recognized by developers, investors, and utilities for its integrity and technical rigor. With DNV GL projects run smoothly, from the initial design stage through project completion.

[www.dnvgl.com/energy](http://www.dnvgl.com/energy)



## Switch Power

As an Independent Power Producer (IPP), Switch focuses on capital deployment in long-term infrastructure assets through creative projects, creative financing, and creative commercial structures. Switch offers innovative and sustainable power generation solutions by meeting load customers needs by lowering electricity costs through physical supply with multiple technologies and filling grid capacity with low-cost electricity supply from sustainable sources. Switch provides resiliency and ancillary services to both physical customers and the grid with energy storage, as well as utilizes energy management and predictive market algorithm-based software systems.

[www.switchpower.ca](http://www.switchpower.ca)



## Terrapro Solutions

With over 10GW of renewable energy developed, TerraPro Solutions supports the development of renewable energy projects. Their services include real estate, title, and ALTA survey. They assist developers in preparing projects for title insurance. TerraPro can analyze and review title commitments and provide curative services to the title issues that arise. Because of proximity to title, their ALTA survey services allow them to work directly with surveyors to avoid common problems that occur between title and survey. They have wind and solar experience in nearly every US state.

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

# ONE SHOCK ABSORBING LANYARD THAT COMPLIES WITH THE ANSI, CSA AND EN 6' & 12' PERFORMANCE REQUIREMENTS

Most shock absorbing lanyards only comply with 6' or 12' performance requirements. SKYLOTEC eliminates this confusion by offering the Skysafe Pro shock absorbing lanyard which covers both performance requirements in one product. This increases safety, eliminates the need for two different shock absorbing lanyards, simplifies employee training, and improves your bottom line.

### CARABINER

Aluminium. Robust & lightweight 16kN / 3600 lbs steel gate. The Grey & Orange hardware assists in identifying left & right sides while in use and prevents twisting of lanyard legs.

### RESCUE LOOPS

On both legs. Easy attachment of the rescue device. Ensures safe & fast rescue operations.

### FLEX FUNCTION

No slack rope, reduces risk of tripping. Great handling. Flex length is 4 ft.



L-0558-1,8

**SHOCK ABSORBING SYSTEM** Reduces the impact force to below 1349 lbf. (6kN) in the range from 110 - 340 lbs with a deceleration distance of max 48" according to ANSI Z359.13 when at a 6' free fall and max 60" according to ANSI Z359.13 when at a 12' free fall.

### FALL INDICATOR

On both legs. Easy fall detection, Easy inspection.

### PROTECTIVE COVER

Removable and replaceable protective cover. Enables 100% inspection of the entire device (ACS-0216).

Works without limitation for user weights from 110 up to 340 lbs!\* Meets ANSI Z359.13 for 6' & 12' free fall & CSA Z259.11-E6



L-0562-1,8



L-0623-1,8



L-0533-1,8

### IGNITE PROTON WIND



### RESCUE PRO 2.0



### NEW CLAW

### CLAW



### LORY PRO



### NEW ACX POWER ASCENDER



SKYLOTEC offers you a highly innovative and functional range of fall protection, rope access and rescue equipment. The **IGNITE PROTON WIND** and **RESCUE PRO 2.0** Harnesses feature light-weight designs built for durability and comfort. The smooth running **CLAW** Vertical Cable Sleeve for 3/8 & 5/16 inch diameter wire ropes. The **LORYPRO** positioning lanyards allow you to work hands free with complete adjust-ability. The **ACX** power ascender allows for battery operated portable ascent and descent. These products are ideal for work at height in the wind energy, telecommunications, and electrical utilities industries. For more information please email us at:

info-us@skylotec.de. [skylotec.com](http://skylotec.com)

SKYLOTEC North America LP | Denver, CO USA | Tel 1-303-544-2120



## **Vertex Resource Group, Ltd.**

Since 1962 Vertex has been a North American Environmental Services company providing: Regulatory Compliance Monitoring & Site Assessments, Right of Way & Land Acquisition, Biophysical Assessments (Wildlife, Vegetation, and Aquatic), Soil Survey & Acquisition, and Phase I, II & III Environmental Site Assessments.

[www.vertex.ca](http://www.vertex.ca)



## **Westlake Consultants, Inc.**

WCI has provided civil engineering and surveying consulting for over 2 dozen wind and energy developments throughout the U.S. Services include feasibility review, land surveying, land use planning approval, permitting assistance, roadway and grading design, and construction phase services.

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



## **Westwood Professional Services**

Westwood is a multi-disciplined engineering and surveying firm with experience gained from supporting more than 50GW of wind projects across the U.S. since 1997. Their services include environmental studies, permitting, civil engineering, electrical engineering, geotechnical engineering, HV transmission line engineering, land surveying, aerial mapping, and construction support. They have offices across the country and are licensed in nearly every state.

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

## **Contractors**



## **Caldwell Marine International, LLC**

Caldwell Marine International, LLC is a marine construction contractor specializing in submarine cable installation and heavy civil marine construction. In operation for over 65 years, CMI has carried out the installation and repair of hundreds of submarine power and telecommunications cables worldwide, and have successfully built and rehabilitated many piers and docks, as well as unique marine structures that required advanced installation techniques. Caldwell has a wide range of specialized marine construction equipment, an Atlantic waterfront yard, and over 150 years of marine construction experience on staff.

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



## **Rosendin Electric**

Rosendin is a U.S. electrical contractor and works in constructing underground and overhead collection systems, fiber optic SCADA systems, turbine and tower wiring, as well as substations and overhead transmission lines connecting generating power plants to utility grids. Over the last decade Rosendin has installed more than 20GW of clean, renewable energy, including more than 100 wind energy projects ranging in size from 1MW to more than 900MW, throughout the U.S. and Canada, with their commitment to safety, quality, and on-time performance.

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



## **Sentry Electrical Group, Inc.**

Sentry Electrical Group, Inc. constructs projects across the United States. They provide high and medium voltage construction of electrical infrastructure for private companies who require HV and MV solutions and electric utilities improving their electrical facilities. They also serve private companies in the growing renewable generation industry. Their offered services include engineering, procurement, or construction of HV and MV facilities. They offer complete turn-key solutions where all aspects of projects from planning to commissioning are required.

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

## **Cranes | Hydraulic Equipment | Aerial Devices**



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







## **Bishop Lifting Products, Inc.**

Bishop Lifting Products designs and fabricates below-the-hook lifting devices for wind energy components including universal nacelle lifting beams, J-hooks for lifting tower sections, counter balanced lifting beams, blade lifters and cradles, twin-path extra CoverMax slings, swivel hoist rings, and Crosby rigging hardware for wire rope and chain.

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



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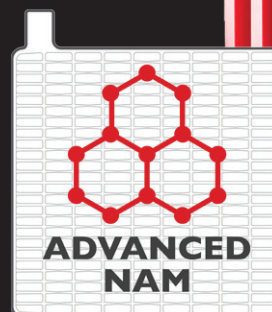
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ROLLSBATTERY.COM





### **Kardie Equipment (a TGM Wind Company)**

Kardie Equipment, a North American distributor for Bronto Skylift aerial work platforms, has a fleet of Bronto AWP's ranging from 150' to 295' in working height. Features of their units include: 360° turntable rotation, working platforms of at least 3' x 7' (with some models reaching to 3' x 10'), integrated wind speed indicators, automatic outrigger leveling, remote diagnostic systems, and more. They also have a 24/7 dedicated parts and service hotline, and a North American maintenance facility with a large Bronto parts inventory.

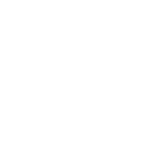
[www.kardieequipment.com](http://www.kardieequipment.com)



### **Leavitt Cranes**

Krøll provides large capacity, free standing tower cranes which are an effective solution for wind turbine erection. Where there is restricted and limited access, small hardstands, high erection height levels, and large nacelle weights Krøll cranes have provided effective alternate solutions in conditions where crawler and mobile crane could not be applied. Leavitt Cranes is the North American Agent for Krøll Cranes A/S and is capable of working with wind turbine manufacturers, developers, owners, and erectors.

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



## **LIEBHERR**

### **Liebherr**

Liebherr offers optimized crane concepts for diverse situations and requirements for the erection of wind power generators for highest efficiency and economy. Their cranes provide high capacities over the complete working range, variable boom systems for diverse requirements, efficient application due to optimized transportation components, comprehensive comfort and safety features, worldwide customer support by manufacturer, and optimized dimensions and weights for transportation.

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



### **Mammoet**

Mammoet's heavy lifting and transport expertise optimizes wind projects, specifically addressing O&M and repower requirements, and working with manufacturers and contractors on new construction projects. Their wind equipment services team brings projects to a safe completion and improves project efficiency by utilizing their experience and large fleet of equipment. With offices across North America, Mammoet is well positioned to provide the assistance where it is needed.

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



### **Maxim Crane Works, LP**

Maxim Crane provides lifting services for wind power projects on both grass root and maintenance projects throughout the United States. Crane lifting services range from 60 to 900 ton, All Terrain and Crawler Cranes, and 15 to 150 ton Rough Terrain Cranes support cranes.

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

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## Economic Wind Development Region



### Black & McDonald

Black & McDonald Inc. is an integrated, multi-trade service provider that safely delivers high quality construction, facilities management, and technical solutions. They are a family owned and operated company with over 5,500 employees working out of more than 30 offices across North America. With nearly 100 years of diverse market experience, they are a forward thinking organization with a strong track record of delivering operational excellence and customer-focused solutions that stand the test of time.

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



### Kansas Department of Commerce

Kansas is among the top states for operating wind farms, recently crossing the 6,000 MW threshold, and ranking 1st in wind as a percent of total energy. Cost effective Kansas wind is attractive to corporate off-takers, which are purchasing a significant percentage of wind energy produced in Kansas. Centrally located in the heart of the wind corridor, Kansas offers an advantageous operating environment for developers, wind turbine component manufacturers, logistics, and other service providers. The Kansas Department of Commerce is the primary point of contact to assist companies in learning about the state's wind industry and finding the ideal site for their operations.

[www.kansascommerce.gov](http://www.kansascommerce.gov)

## Education | Research Development



### Abaris Training Resources, Inc.

Abaris offers windblade repair training at both basic and advanced levels. Their courses are designed to provide skills to the engineer or technician looking to become proficient in structural repairs to skins, tips, spars, and leading and trailing edges. They have over 35 years experience in teaching advanced composite repairs and provide quality training resources to wind industry professionals.

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



### Appalachian Energy Center

Appalachian Energy Center hosts a Hands-on Distributed Wind Energy Workshop annually at their Small Wind Research and Demonstration Site located on Beech Mountain, NC. Participants will experience a crash course in distributed wind energy, learn how to determine if wind is right for them (and others), and install a small wind turbine. The workshop includes continuing education credits for engineers and architects.

[www.energy.appstate.edu](http://www.energy.appstate.edu)



### Iowa Lakes Community College

Providing wind energy education and training since 2004, Iowa Lakes Community College offers the AAS in Wind Energy & Turbine Technology and continues to adapt to the changing wind industry landscape. Competencies that enhance their student's resumes through advanced safety, realism, challenge, and mentorship, the team at Iowa Lakes Community College invests in student's development, providing a positive impact on America's energy and environmental future.

[www.iowalakes.edu](http://www.iowalakes.edu)



### Nergica

Nergica owns and operates a research site that comprises two Senvion MM92 CCV wind turbines, 16kW of solar PV panels, a microgrid comprising small wind turbines, diesel generators, and energy storage systems, two 413ft (126m) met masts, and two lidars. Their services are tailored to their clients needs, including technology development and assessment, operation and maintenance, applied meteorology and energy resources, energy storage and grid management, commercialization of innovations and cold climate suitability, and microgrids.

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



### Safety Technology USA, LLC

Safety Technology USA specializes in the delivery of GWO accredited training for technicians in the wind sector. Training modules include both the GWO Basic Safety Training and GWO Basic Technical Training. Training courses are delivered from facilities in Texas, Iowa, and Kansas as well as onsite, subject to risk assessments, at operators locations.

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



### University of British Columbia

The Master of Engineering Leadership (MEL) in Clean Energy Engineering is a professional degree for engineers who want to excel and drive innovation in the field of clean energy. This hybrid master's program combines graduate-level engineering courses with UBC Sauder's Robert H. Lee Graduate School courses, giving students and professionals the skills and confidence to take their career in new directions.

[www.apscpp.ubc.ca/programs/mel/clean-energy-engineering/](http://www.apscpp.ubc.ca/programs/mel/clean-energy-engineering/)

### Electrical Equipment & Services | Power Generation



### Alencon Systems

Alencon Systems builds a variety of power conversion products that can be applied to wind. The Alencon BOSS can be used to couple storage with wind projects in order to capture otherwise clipped energy and firm wind energy production. The Alencon SPOT can be used to collocate PV and wind.

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



### Electrical Consultants, Inc. (ECI)

Electrical Consultants Inc. (ECI) was incorporated in 1985. For over 34 years, their in-house portfolio of services, including overhead and underground transmission engineering, substation and switchyard design, industrial power systems design, land survey and construction staking, right-of-way services, environmental planning, project management, construction management, and procurement services have provided a key resource for hundreds of utilities. ECI brings extensive experience in power delivery services through 500kV to their clients.

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



### Maclean Highline

Maclean Highline manufactures fiberglass box pads and sectionalizing cabinets used on collection systems. They also have a complete line of polymer concrete pull boxes and splice boxes for running fiber optic cable.

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



### SPX Transformer Solutions

SPX Transformer Solutions provides medium and large power transformers up to 1200MVA, 345kV as well as power transformer, LTC, and circuit breaker components, including a line of Transformer Health Products. SPX Transformer Solutions also offers a variety of substation-applicable training classes for all skill levels and provides complete transformer service solutions for almost any manufacturer's units, including installation, maintenance, relocation, testing and engineering assessments, oil processing, dryouts and retrofits, corrective and preventative maintenance, load tap changer field retrofits, and repairs.

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

### Virginia-Georgia Transformer

Virginia-Georgia Transformer designs, manufactures, and markets products related to power generation, transmission, and distribution. A US based company manufacturing core form power transformer up to 1400MVA, 500kV, serving a range of markets including utility, commercial, industrial, mining, oil & gas, renewable, transit, and specialty Data Centers. They have been in the transformer industry since 1971 and produce both liquid and dry type power transformers manufactured from their four (4) facilities in North America. Their service division offers a full range of services and spare parts and provides lifetime extension programs for transformer assets.

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

Enclosures



**Fibox Enclosures**

Fibox Enclosures specializes in corrosion-resistant polycarbonate enclosures for the electrical power generation industry. Their NEMA 4X enclosures protect products from hostile environments and resist impacts and UV damage, making them ideal for wind energy farms. Fibox can also customize their products to meet exact project requirements.

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



**EnerSys**

PowerSafe ESG batteries by EnerSys are designed to provide 187-935 amp-hours (Ah) of capacity range to handle the challenging load profiles and service conditions of utility applications, including substations that support wind farms. The configuration of five multi-cell 4-volt units (185, 234, 281, 354, and 418Ah) reduces the footprint of the PowerSafe ESG battery to enable minimal occupation of floor space. Individual terminal posts on each cell facilitate integration of battery monitoring and test equipment used in routine maintenance and inspection. The Slide-Lock post seal accommodates natural plate growth over time for maximum reliability and reduced maintenance.

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

Energy Storage | Grid Connection



**Crown Battery Manufacturing Company**

Crown Renewable Batteries are heavy weights with dense plates that use more active lead material, increasing battery performance and longevity. Crown currently leads the industry in lead content per ampere-hour of rated capacity. Their two-volt 2CRP3690 Power Module combines ampere-hour capacity availability to renewable energy system users. The battery delivers application flexibility, while providing an ideal solution for temperature management and electrical isolation.

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



**e-On Batteries, Inc.**

e-On Batteries, a Fort Worth, Texas area supplier with national scope, is developer of lithium iron phosphate (LiFePO4) based energy storage systems with a focus on product safety. The company's UL 1973 listed and CEC approved and listed modules are engineered as scalable building blocks to enable larger systems, and its 19" rack-mounted modular systems are easily configured from 12.8kWh residential systems to 4.8MWh container-based systems and more. With over 20 million deployed calls and zero catastrophic failures, combined with cell-level BMS monitoring and control systems, expert engineering liaison and certified installers, e-On Batteries provides full value to their customers.

[www.e-onbatteries.com](http://www.e-onbatteries.com)

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**The Power Behind**

**You bring us your technology, unrivaled technical expertise, and manufacturing capabilities. We bring you the power on with innovation.**

[timken.com/wind-energy](http://timken.com/wind-energy)



### ESS Inc.

Energy Warehouse and Energy Center, ESS Inc's long-duration batteries utilize a non-toxic, non-hazardous, and completely recyclable iron-based electrolyte that provides over 20,000 cycles of power with little or no maintenance. A flow battery offers significantly more storage capacity, so users have the flexibility to shift both their energy flow and rate of storage as needed for more efficient energy management.

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

## KORE POWER



### KORE Power

The KORE Power Mark 1 Energy Storage System delivers 110.7kWh in a standard 19-inch rack. Designed to lower energy storage installation and operation costs while optimizing performance, the Mark 1 system includes their propriety NMC cells, added safety features, and innovative modules, fully integrated with the Mark 1 BMS. Operating in the 1500V class, the Mark 1 has 6GWh of 2020 production capacity with deliveries available as early as Q1 2020. The Mark 1 is well-suited for pairing with wind systems.

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



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**Nel Hydrogen**

Nel Hydrogen provides Alkaline and Proton Exchange Membrane (PEM) electrolysers and electrolyser plants, built-to-scale to store excess electricity from renewable energy sources as hydrogen. This technology allows energy suppliers stable and flexible delivery of electricity. When required, New Hydrogen also integrates equipment components from other global suppliers into a customized Nel solution.

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

**Engineering**



**Commonwealth Associates, Inc.**

Commonwealth can provide assistance with owner's engineering, program management, power generation and energy services, interconnection, electrical system studies, routing/siting, land and right of way, environmental services, transmission and distribution line engineering, and substation engineering.

[www.cai-engr.com](http://www.cai-engr.com)



**Metro Consulting Associates**

MCA supports renewable energy projects (mainly wind and solar farm development) through their core consulting services: Land Acquisition & Title, Land Surveying, Ecological, Civil Engineering, and GIS. These services allow them to provide turn-key solutions to their client's development needs. MCA has the ability to support projects at very early stages with developers and utilities, but also through EPC's during mid to late stage development through ALTA surveys, design services, permitting, BOP design, environmental solutions, construction staking, and as-built surveys. MCA is headquartered in Plymouth, Michigan with 3 more full service offices in Traverse City, Michigan; Chicago, Illinois; and Cincinnati, Ohio.

[www.metroca.net](http://www.metroca.net)



**Mott MacDonald**

Mott MacDonald has participated in over 65 offshore wind projects over the last 15 years. They have worked on around 37GW of wind power production worldwide; roughly 10% of the world's capacity. Mott MacDonald's clients include owners, EPC contractors, power delivery utility companies, industrial facility owners, and independent power producers. As a multidisciplinary engineering and development firm, they have specific and recent experience providing design services for HV substations, transmission lines, and collector systems for key offshore clients.

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



**POWER Engineers, Inc.**

POWER Engineers, Inc. provides owner's engineering, environmental, and engineering design services for medium voltage collection systems, BESS, site civil, communication networks, SCADA, and associated substations and transmission interconnect lines. They also perform up-front interconnection support and complete electrical system studies for developmental projects, as well as construction management, inspection services, and testing and commissioning for wind farm constructors and owner/operators.

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



**Sargent & Lundy**

Founded in 1891, Sargent & Lundy is a global company in power and energy with expertise in all forms of electric power generation including wind power, power transmission and distribution; grid modernization; energy storage; fuel infrastructure; energy consulting; and physical and cyber-security. Sargent & Lundy delivers comprehensive wind project services, from consulting, design, permitting, interconnection, construction management, commissioning, repowering, and operations/maintenance support, with an emphasis on quality and safety. Sargent & Lundy performs many roles on wind power projects, including full design architect-engineer, owner's engineer, lender's independent engineer/technical advisor, and consultant.

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



## Filtration Systems



### Wahne Filtration

Wahne Filtration's low cost and high performance gearbox and hydraulic filters exceed OEM requirements.

Veteran owned and operated.

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

## Financial Services



### CleanView Capital

CleanView Capital's Clean Energy Ownership Program, uses a 3-page traditional operating lease to provide C&I customers with a low-cost path to ownership at an affordable price. The program appeals to companies which cannot benefit from a federal income tax credit within the company, as well as companies seeking to optimize value within budget and cash flow constraints. CleanView Capital's Government Finance Program uses a tax-exempt lease purchase agreement to provide municipal, county, and state governmental entities and their political subdivisions, such as schools and municipal electric companies, with financing at below commercial rates.

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

## Gearbox Manufacturing, Services & Repairs



### Bonfiglioli

Bonfiglioli's new condition monitoring system ensures a drastic reduction of down time with optimized maintenance intervals and electronic controls to reduce overloads. Their torque limiters monitor and measure gearbox performance, troubleshoot maintenance issues, and control and manage power for higher ROI and longer LTV. They design and manufacture an extensive range of wind energy products, including yaw and pitch drives, as well as a complete range of AC and permanent magnet electric motors with inverters. Bonfiglioli products are compact, lightweight, and versatile to help improve performance and minimize maintenance costs of 1MW to 12MW turbines in on- and off-shore installations.

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

# Because it's a long way down.



### PDQ2™ System

The PDQ2 is Sterling's lightweight evacuation system for use in all work-at-height environments. The PDQ2 descent-control device and the 6 mm XTEC™ heat-resistant Technora® rope form the core of this system whose total weight is under 10 lb. Rated for a user-load of 310 lb, the fully-assembled kit comes ready for deployment and its slim profile means it can be stored compactly and carried by each technician until needed.

For Sterling gear, talk to your employer or visit [SterlingRope.com/Work](http://SterlingRope.com/Work)





### Ernst Schäd GmbH

Ernst Schäd GmbH, gear producer in Dortmund, Germany, is an independent producer of gear components for the main wind turbine gearbox. They have more than 20 years experience in the production of gears for the original gearbox makers, as well as to service companies. They can produce gears according to customer drawings or reverse engineer according to their customer's sample. Producing planetary as well as helical stage, and up to module 45 and 8000 ton single item weight.

[www.ernst-schad.com](http://www.ernst-schad.com)

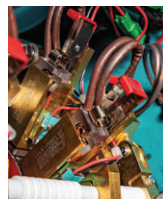


### Milwaukee Machine Works

Milwaukee Machine Works is a North American manufacturer of wind turbine parts including, housings, torque arms, and gearboxes. MMW's machining of wind turbine gear boxes, torque arms, armature housings, and components spans close to two decades. They have the solution, technology, and machining expertise to satisfy their customer's stringent requirements. Their Leitz CMM also provides quality inspection capabilities for complex and large parts.

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

## Generators | Maintenance & Repair Services



### Helwig Carbon Products, Inc.

Helwig Carbon is a manufacturer of carbon brushes, brush holders, and quick disconnect fittings for wind turbine generators. They offer complete wind generator upgrades for longer service life. They also make a wind pitch motor bearing protection kit designed to protect pitch motors from premature bearing failure.

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



### SGL Gelter

SGL Gelter is a worldwide manufacturer and provider of carbon brushes for wind power. Their brushes for wind are now installed around the world in generators, pitch control, lighting protection, and protection of main shaft and bearing. RC 54 is a specific grade for the extreme environments found in wind turbines and has been designed to increase the lifetime of the brush.

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

## Large Wind Turbine Manufacturer (Over 100kW)



### Goldwind Americas

Goldwind's latest GW 4S MW Permanent Magnet Direct-Drive (PMDD) series of turbines now features a 4.5MW rated capacity with a 155-meter rotor. The smart wind turbine designed for international markets and IEC wind classes IIC / IIB. The 4.5MW turbine is a direct evolution of Goldwind's portfolio of wind turbine generators that offer high energy production, smart controls, and availability.

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



### Suzlon Wind Energy Corporation

Suzlon offers wind turbines from 2MW to +4MW class, with tower hub heights of 90m to 120m. Suzlon is a full service provider on all OEM platforms throughout North America and offers extensive training programs at their training facility in Elgin, IL, to cover all aspects of wind technician certification and they have the ability to customize programs to fit their customer's needs.

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



### Vestas

Vestas provides sustainable energy solutions. They design, manufacture, install, and service wind turbines across the globe. They have installed 105GW of wind turbines and have over 85GW under service. They use data to interpret, forecast, and exploit wind resources and deliver quality wind power solutions.

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

## Lighting



### DeTect, Inc.

DeTect developed the HARRIER Aircraft Detection Lighting Systems (ADLS) for automatic lighting activation of aviation obstructions such as wind farm turbines, high voltage transmission lines, and communication towers. The HARRIER ADLS provides continuous 360° radar surveillance of the airspace, automatically issuing signals to activate obstruction lighting when aircraft are detected at a defined outer perimeter. The FAA Performance Assessment Report on HARRIER ADLS states that the system met the performance requirements identified in Chapter 14 of AC 70/7460-1L and is published on the FAA Website. HARRIER is also fully compatible with all SCADA systems and turbines and is a widely deployed system with installations the US, Canada, and Europe.

[www.detect-inc.com](http://www.detect-inc.com)



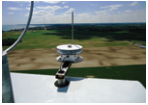
# WANZEK

a MasTec company 

BE THE BEST... DELIVER EXCELLENCE.

## RENEWABLE ENERGY CONSTRUCTION & SERVICES

We deliver excellence through our commitment to safety, expertise in construction planning, exceptional services and outstanding teams.



## Flash Technology

From their Franklin, TN headquarters, Flash Technology offers innovative traditional and solar MET tower and wind turbine obstruction lighting solutions and the remote asset monitoring systems that support them. An OEM since 1970, they help clients mitigate risk and meet the day-to-day challenges of obstruction lighting operations. Their ETL-certified and FAA-approved LED products serve airport, broadcast, telecom, utilities, and wind energy markets. Their support services include component-level training, installation, troubleshooting, and maintenance.

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



## Hughey & Phillips

The H&P HORIZON L-864 Red LED beacon has design features specifically for wind turbine applications. Light weight, compact, easy wiring, dry contact, field repairable, and integrated GPS/PCELL allows the fixture to be quickly installed on new or existing turbines. At 17lbs and 9" tall, the fixture can easily replace larger and heavier fixtures while typically using the same system wiring. Being field repairable, it reduces maintenance costs. The integrated GPS/PCELL provides sync and mode control without the need for additional controls. All HORIZON systems come with a full 4-year warranty.

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



## International Tower Lighting

International Tower Lighting (ITL, LLC) provides LED technology, advanced optics, and wireless GPS-based flash synchronization for wind turbine obstruction lighting. ITL provides obstruction lighting, management of installations and repairs, live technical support, and a 24/7 NOCC center.

[www.itl-llc.com](http://www.itl-llc.com)



## Moltec Windpower Products

Moltec now offers brighter ways to illuminate critical areas in wind towers and nacelles. Their new LED lighting systems deliver high performance and are a cost-effective solution for wind tower lighting. All of their engineered lighting and electrical systems are pre-assembled, pre-tested, and ready to install per user specifications. The compact and lightweight Moltec LED Sabre Light achieves industry photo-metric requirements. This allows for easy handling and installation within limited space without sacrificing lumen output. The Moltec UFO Light utilizes high-powered, high efficiency LED technology to deliver optimal directional lighting. As a result, the desired lux values are achieved with fewer fixtures. This system is a solution for down-tower lighting or large workspace task lighting.

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



## Technostrobe

Technostrobe manufactures obstruction lights for tall towers. Their mission is to help pilots fly safely by providing innovative, robust, and energy efficient lighting technologies. The LED lighting systems can be combined with their LIDS (Lighting Intensity Dimming Solution) Technology to ensure the intensity of the lights on a wind farm are adapted to the surrounding visibility, thereby helping the site become more community friendly. They serve customers in the broadcasting, telecommunications, and wind farm industries.

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



## TWR Lighting

TWR is a manufacturer of obstruction lighting, visibility sensor, and radar detection systems for wind turbines and tall structures that present a hazard to aviation. With thousands of systems installed around the globe, TWR provides FAA and ICAO compliant systems. TWR showcases their latest FAA L-810 temporary light, as well as their standard L-864 lighting system, visibility sensor and controller, and can provide information about their system compatibility with radar technology.

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

## Lightning & Surge Protection

# Raycap



### Raycap

Raycap offers the wind industry a variety of Surge Protective Device (SPD) technologies for the protection of wind turbines. Their solutions are suited for remote and mission critical installations. Strikesorb, Raycap's premium protection technology carries a 10-year warranty and is available to protect various applications inside the turbine. Also available are SafeTec and ProTec products, reliable solutions for temporary overvoltages, surges, and transients. RayDat products are a recommended solution for surge protection on the signal or data lines that run throughout the wind turbine.

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

## Lubricants

# AMSOIL

DEVOTED TO PROTECTION™



### AMSOIL, Inc.

AMSOIL synthetic lubricants use sophisticated additives to provide cost-effective choices for prolonging equipment life, reducing maintenance, and increasing performance. AMSOIL PTN 320 is approved with all gearbox manufacturers, including Winergy/Flender, NGC, Gearbox Express, Moventas, and ZF, and their lubricants are used as a global factory run-in for Winergy, NGC, and ZF.

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



# SIBA

## FUSES

29 Fairfield Place  
West Caldwell, NJ  
(973) 575-7422  
[info@sibafuse.com](mailto:info@sibafuse.com)



SIBA Fuses is proud to introduce NEW True Full-Range HV Fuse Technology. Our 7.2kV & 12kV fuses are capable of operating at 100% full range tested voltage and rated currents. The 7.2kV fuses are available up to 180A in a single body and 12kV fuses up to 160A. For the increased levels of power used, such as in Wind Applications, SIBA developed NEW high-voltage SSK type fuse-links that extend the range of usage for switch-fuse combinations up to larger transformers.

For ALL your Wind, ES (Energy Storage), PV, Traction, Transformers and MCC circuit protection needs, SIBA Fuses offers the most comprehensive and innovative fuses. We're very confident you will appreciate our efficiency, product knowledge, superior technology, and the imaginative solutions that we can offer.



Call or email us for more information on our products and services!



**Fuchs Lubricants**

Fuchs is a full line global lubricant supplier to the wind industry. Fuchs has numerous OEM approved greases for bearing application and oil for gearbox usage. Fuchs has a full line of solutions for all wind related lubrication needs. Gleitmo 585K is a top performing pitch grease, and is widely used across turbine platforms.

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



**Hydrotex**

SYN-Nth Gear Oil is designed to reduce wear in wind turbine gearboxes for maximum equipment life and reliability. SYN-Nth Gear Oil's protection against gear scuffing and micropitting has been documented with FZG testing and field-proven in wind turbines. SYN-Nth Gear Oil has a high viscosity index to maintain an ideal lubricant film thickness year-round. Its high oxidation stability extends drain intervals. Guaranteed ISO 4406 cleanliness: 16/14/11.

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

**KLÜBER**  
LUBRICATION



**Klüber Lubrication NA LP**

Speciality lubricants made by Klüber Lubrication help increase the reliability of wind turbines. Experts in tribology and development cooperate closely with original equipment manufacturers to push the limits of what can be technically achieved. Klüber Lubrication offers a full portfolio of lubricants for wind turbines and components: fully formulated gear and hydraulic oil, synthetic assembly pastes, grease for new and used bearings under extreme conditions, and services for removing aged lubricants and refreshing components.

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



**Shell Lubricants**

Shell Omala S5 Wind fully synthetic gear oil offers lubrication performance even under severe operating conditions. The formulation is developed to protect a wind turbine's gears and bearings by minimizing wear, protecting against micro-pitting, maintaining effective fluidity at extremes of low temperature, and minimizing foam formation. Shell Omala S5 Wind is designed to meet or exceed OEM requirements of Siemens Wind Power, ZF Wind, Vestas, and Gamesa. It also meets or exceeds following OEM component requirements of Winergy, NGC, Bosch-Rexroth, Eickhoff, Moventas, SKF, Timken, Schaefflet, Hydac, CC Jensen, Mintai and Fredenburg.

[www.shell.us](http://www.shell.us)

**Operations & Maintenance (O&M)**

**bachmann.**



**Bachmann electronic GmbH**

Condition monitoring, SCADA, grid measurement, and data portals are crucial to bring down the cost of energy by 30%. Bachmann's smart automation not only increases turbine efficiency, but helps structure and connect the ever-increasing masses of data. This saves valuable time. The controller no longer just processes individual standardized signals for the operational management of the turbine but is becoming more of an intelligent control center. Bachmann's solutions can turn 100 monitoring variables into 20 with ISO 10816-21.

[www.bachmann.info](http://www.bachmann.info)



### Cortland Company

To meet the technical lift specifications of larger and more challenging lifts, synthetic lifting solutions provide strength, weight, handling, and storage efficiencies. As an originator of fiber braiding and rope sling technology, Cortland Company has more than 25 years of experience engineering certified synthetic lifting sling solutions. They offer the combination of high tenacity: 1) Selantic round slings, and 2) Plasma braided rope slings. All Cortland synthetic fiber lifting slings are compliant with DNV, EN, or ASME listing standards and are tug-certified with appropriate product and lifting capacities.

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



### HYTORC

From the foundation bolts to the blades, HYTORC has developed solutions for nearly every bolting application in the wind turbine industry. For custom projects, their experienced engineering team is available to custom design the most efficient solution, with simple operation and economical pricing in mind. HYTORC's mission is to ensure customers' jobs as safe and efficient as possible. All of their products are covered by a worldwide, one-year, no-questions-asked warranty, which includes free parts and labor. With authorized repair facilities located globally, fast and professional service is always available.

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



### EDF Renewables

EDF Renewables North America is an independent power producer and service provider with over 30 years of expertise in renewable energy. The Company delivers grid-scale power: wind (onshore and offshore), solar photovoltaic, and storage projects; distributed solutions: solar, solar+storage, EV charging, and energy management; and asset optimization: technical, operational, and commercial skills to maximize performance of generating projects. EDF Renewables' North American portfolio consists of 16GW of developed projects and 11GW under service contracts. EDF Renewables North America is a subsidiary of EDF Renewables, the dedicated renewable energy affiliate of the EDF Group

[www.edf-re.com](http://www.edf-re.com)



### Indji Systems

The Indji Watch solution partners with and delivers data from trusted and reliable sources to provide users with accurate real-time weather, and hourly-updating forecasts. Their Plan of Day dashboard will help users quickly identify rapidly changing weather at-a-glance, allowing them to be more proactive in mitigating potential impacts to their operation and employee safety. From a system-wide overview right down to an individual asset, Indji Watch will ensure that the team has the best possible picture of what the weather will be doing in the near future, as well as analytic capabilities to what happened in the past.

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

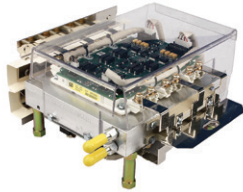
# LIGHTS ONLY WHEN NEEDED

# TWR

*Enlightened Technology*

TWR's ADLS (Aircraft Detection Lighting System) is a community-friendly solution that only activates turbine obstruction lighting when a radar detects an aircraft in the area.

More Info: 1 800 679 8724 | [www.twrlighting.com](http://www.twrlighting.com)



### Ludlum Wind

Ludlum IGBT assemblies are built to last. Assemblies utilize IGBTs with high ratings and enhanced internal construction, new buses, new insulators, new stand-offs, new mounting brackets, new fasteners, and an upgraded new AEBM driver board with surface mount parts. Parts are kept in stock so customers can quickly get the parts they need. All assemblies are shipped with custom steel shipping plates and custom reusable packaging so the parts always arrive safely. Ludlum IGBT assemblies are manufactured and assembled in the USA.

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



### Nearthlab, Inc.

Nearthlab provides AI solution for operations and maintenance of industrial facilities using autonomous drones. The company's autonomous drone software gathers and analyzes inspection data in various industries. Nearthlab offers efficient and reliable inspection service for renewable energy facilities such as wind turbines and works with governments and private companies in the U.S., Europe, and Asia. With capabilities in stable flight control in harsh conditions, autonomous flight based on artificial intelligence, and inspection data analysis through image processing and deep learning, Nearthlab provides fast and accurate decision making in industrial sites.

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



### Northwind

Established in 2004, Northwind, a Spark Power Company since 2013, has provided wind and solar operations and maintenance (O&M) services for over 75 wind farms, over 1200 sites, and 650+MW of solar assets. Across Canada and the United States, they've partnered with Original Equipment Manufacturers (OEMs), Developers, Owners, and O&M Managers to minimize downtime, maximize asset performance, and deliver solutions that keep customer's operations up and running today and equipped for tomorrow.

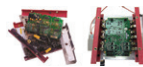
[www.sparkpowercorp.com](http://www.sparkpowercorp.com)



### Power Climber Wind

Power Climber Wind helps wind turbine OEMs, owners, and service providers around the globe manage their operation and maintenance costs by providing reliable access equipment and expertise to improve employee safety, productivity, and retention. With 70 years of experience performing productively at elevation, they offer a range of solutions including IBEX climb assists, turbine service lifts, tower access platforms, blade access solutions, safety equipment, and training.

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



### PSI Repair Services, Inc.

As an independent service provider (ISP) serving the wind energy industry, PSI Repair Services offers wind turbine component repair and upgrade services for GE, Vestas, Gamesa, Siemens, RePower, and Clipper turbines. They cover the critical electronic, hydraulic and precision mechanical components that drive a turbine's pitch and yaw systems and down-tower electronics. Commonly repaired components include printed circuit boards, pitch drive systems, inverters, IGBTs, PLCs, VRCC units, AEBIs, proportional valves, hydraulic pumps, pitch and yaw motors, encoders, slip rings, transducers, yaw modules, 3-phase bridge rectifiers, and more.

[www.psi-repair.com](http://www.psi-repair.com)





### RM Wilson Company

RM Wilson Company, founded in 1966, is a product specialist supplying numerous European manufactured components and parts. RM Wilson can provide a variety of solutions and services to owners and operators of the wind energy sector. They can provide current technology in gear manufacturing as well as upgrade solutions for older gearboxes in the field. Headquartered in Wheeling, West Virginia, with locations throughout the United States, RM Wilson is able to provide services to the end user. Along with power transmission solutions, RM Wilson also represents Svendborg Brake, a global supplier in both yaw and rotor brake systems, and Thiele Chain, GmbH, a supplier of round steel chains and accessories for lifting, moving, and securing loads.

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



### TECHEOL Renewable Energy Technical Services

TECHEOL is a company specializing in wind turbine O&M services, providing preventive and corrective maintenance, major component replacements, up-tower drive train repair, and blade repair as well as performance optimization. Since 2007, its management team had established solid business relationships with wind farm owners in Canada, USA, and Mexico.

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

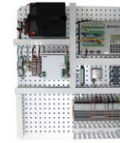


### WECS Renewables

WECS Renewables provides wind energy, commercial solar, and storage products for new construction and for long term O&M. Electrical, mechanical, and hydraulic solutions. For 35-years, WECS has been providing components exclusively in the North American renewable energy industry from conception to repower.

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

### Remote Monitoring



### Campbell Scientific

The WMS100 provides precision measurement capabilities in a rugged, battery-operated package. It consists of a measurement and control data logger, communications hardware, and power supply. Standard operating range is -13°F to 122°F (-25°C to 50°C); an optional extended range of -67°F to 185°F (-55°C to 85°C) is available. Building on a Campbell Scientific data logger platform yields a versatile, robust, and accurate MET system. The WMS100 supports nearly all sensors used in the industry. The WMS100 supports sensors at any height, junction boxes, down-tower cabling, and many other customer-specific measurement configurations.

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



### SkySpecs

SkySpecs offers a suite of Operations & Maintenance solutions including fully automated wind turbine blade inspections that are repeatable, precise, and take less than 15 minutes. Horizon is their asset management platform, allowing multiple stakeholders to collaborate and make the best decision about their assets every time. Their engineering services include risk assessment and auditing, root cause analysis, and blade services, and are run by a team of expert blade analysts and engineers ready to tailor projects to their customers' specific needs.

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

## HEICO FASTENING SYSTEMS



The best value to secure bolts.

### HEICO-LOCK® WEDGE LOCKING SYSTEMS

The HEICO-LOCK® wedge locking system is the reliable solution to the problem of securing bolted joints in high vibration assemblies against self-loosening by rotation!



MADE IN GERMANY!

[WWW.HEICO-GROUP.COM](http://WWW.HEICO-GROUP.COM)





### Leosphere, a Vaisala Company

Leosphere lidars measure and assess wind in both the development and operational phases of a wind farm, onshore and offshore. The Windcube is a reference remote sensor in the wind industry, providing accurate wind measurements up to 656ft (200m). Scanning Windcube systems are versatile, high-precision instruments offering a range from 328ft to 2.17 miles, 3.7 miles, or 6.2 miles (100m to 3.5km, 6km, or 10km) as well as multiple scanning pattern choices. The Wind Iris is a nacelle-mounted lidar for turbine performance verification. The Wind Iris Turbine Control delivers reliable wind data hundreds of meters in front of the rotor plane enabling increases in capacity and opportunities to reduce wind energy LCOE.

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



### Olympus America, Inc.

Olympus provides a portfolio of innovative test, measurement, and imaging instruments. Technologies include remote visual inspection, ultrasound, phased array, eddy current array, x-ray fluorescence, industrial microscopy, and optical metrology. Their products include ultrasonic flaw detectors and thickness gages, videoscopes, borescopes, microscopes, XRF analyzers, advanced nondestructive testing systems, and a large selection of industrial scanners, probes, software programs, and instrument accessories.

[www.olympus-ims.com](http://www.olympus-ims.com)



### Phoenix Contact

Phoenix Contact's new wind turbine ice-detection system reduces power production loss and increases safety. The self-powered sensors used in this system transmit ice thickness and temperature information wirelessly from blade surfaces, without drilling or wires. A single receiving unit is installed in the turbine and receives information from sensing units, which are distributed over the surface of each blade. These sensing units are easy to install during regular blade inspections. Detection in a stopped rotor state allows automatic restart to minimize power production loss. The system also measures the direct surface temperature for precise heating control with blade de-icing systems.

[www.phoenixcontact.com/wind](http://www.phoenixcontact.com/wind)

### Restoration



### AmePower

AmePower is an ISO9001 certified engineering company specialized on delivering customized solutions to improve the efficiency and reliability of high-power electronics systems found in wind turbines, PV inverters, EVs, marine propulsion, and many other applications. Their area of expertise includes GTO to IGBT technology conversion, IGBT system upgrades, and form/fit/function custom converters. Their equipment is manufactured in USA, complying with buy America. Their services include repair and overhaul of old/obsolete high-power converters, contract manufacturing, retrofit/technology upgrade, pre-designed inverters, in-house testing, and engineering capabilities.

[www.amepower.com/wind-power](http://www.amepower.com/wind-power)



### AREPA

AREPA provides technical equipment restoration and reinstatement solutions. They strategically restore and reinstate damaged equipment to help prevent business interruption, lost productivity, and decreased revenue potential.

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

### Safety Equipment | Fall Protection



### 3S Lift

The Climb Auto System is wind's new climb assist, improving health and safety, and reducing the cost of ownership. The Climb Auto System is a single technician (rated at 310lbs) ladder-mounted lift that completely eliminates the physical and mental strain of climbing. It features safety control switches on both handles, a remote mode for the easy transport of tools, and collapsible pedals for rapid evacuations in the event of an emergency. It offers an independent fall arrest systems for personnel and the Climb Auto System. The Climb Auto System can be easily retrofitted to any new or existing wind turbine ladder, often in only 8 hours. It has certifications from CE, UL, ANSI, OSHA, and more and has been installed in over 30,000 towers worldwide. The Climb Auto System is a safe and cost-effective way to ascend a tower and lets technicians keep their minds on the job and not on the climb.

[www.3SLift.com](http://www.3SLift.com)



### Dakota Riggers

From tool lanyards and tie-off points to holsters and pouches, Dakota Riggers stocks a full selection of 3M tool tethering products 3M. With the recent publication of the ANSI/SEA 121-2018 Dropped Objects Standard, fall protection for tools is quickly becoming a necessity in the wind industry in order to protect those working below.

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



### Petzl America

Petzl helmets focus on all-day comfort for technicians and at-height workers. The STRATO is a lightweight and comfortable helmet due to the dual inner foam construction. The liner incorporates an EPP (expanded polypropylene) and EPS (expanded polystyrene) foam to reduce weight and achieve superb shock absorption. The helmet comes in vented and unvented versions, as well as hi-viz yellow and orange for increased visibility. The STRATO is an ANSI Z89.1 and Type I Class E rated helmet. Multiple accessories are compatible with the STRATO helmets; eye shields, headlamps, nape protector, hearing protection, and name tag holder for personalization.

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



### Firetrace International

The Firetrace automatic fire suppression system is a solution for the unique environment in a wind turbine unaffected by vibration, dust, airflow, and temperature. Their systems can protect the control panels, capacitor cabinets, braking system, transformer, and other at risk areas of the turbine, without requiring power or excessive space usage.

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



### Ropes Park Equipment

Ropes Park Equipment provides safety and rescue equipment for work at heights, fall arrest, and rescues/evacuation needs. Products include Mark Save-a-Life Hero and Phoenix; 3-person rescue devices featuring redundant braking and fire resistance. These items can last up to 10-years maintenance free when stored in Seal-Pack.

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

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### SKYLOTEC

The new SKYLOTEC CLAW Vertical Fall Arrest Cable Sleeve is designed to fit a wide variety of wire ropes and travel along the vertical system while providing fall arrest when needed. Engineered to fit 3/8 and 5/16-inch wire rope, this high quality, lightweight stainless-steel device travels smoothly up and down the vertical system without hanging up. The redundant safety features reduce the risk of improper installation and unsafe situations. The CLAW is independently tested to meet ANSI A14.3-08, CSA Z259.2.5-17 and OSHA requirements.

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



### Sterling Rope Company

The PDD2 is Sterling's lightweight evacuation and rescue system for use in all work-at-height environments. The PDD2 descent-control device and the 6mm XTEC heat-resistant Technora rope form the core of this system whose total weight is under 10lbs (for a 100M system). The fully-assembled kit comes ready for deployment, in a durable, weather-resistant carrying bag that can be comfortably carried by the technician until needed. Custom lengths and configurations available upon request. It is a lightweight, easily deployable rescue system and can be customizable based on rope length needs. The weather resistant bag keeps kit protected and carried comfortably. Certified to meet ANSI Z359.4

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



### Skysaver Rescue, Ltd.

Skysaver offers a professional line of products for immediate evacuation for wind turbine, construction, cranes, hotels, and cell towers. Using SkySaver's military-grade Controlled Descent Device [CDD], an entire rescue operation will take only a matter of minutes and eliminates the need for rescue professionals. Their CDD has passed all necessary outdoor tests (heat, fire, extreme cold, water, salt) and can be pre-installed on site. They also offer an injured evacuation kit for incapacitated workers which provides an immediate solution facilitated by only one rescuer.

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



TeSuCon  
Technical Support & Consultancy



### TeSuCon Technical Support & Consultancy

Designed to save the lives of those working at altitudes ranging up to 984ft (300m), the Evacuator is a fast, simple, and easy-to-use (click and go) fireproof collective escape and emergency descent solution. Fireproof units, 3182°F (1750°C) for 30 minutes or 2192°F (1200°C) for 90 minutes, are customized for each turbine model and can be installed inside or outside of the nacelle, onshore or offshore. Emergency descent is fully-automatic and mechanically controlled at a speed of 3.2ft/sec (1m/sec), without use of electricity. Units are compact and easy to maintain. The Evacuator is certified in compliance with ANSI Z359, CSA Z259.

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

### Safety Work Apparel



### Blaklader

Blaklader, a Swedish Company, manufactures functional workwear for all workers' needs. Within the clean energy segment, their FR styles 1636, and now 1676, are tested and compliant with NFPA 70E. 1636 and 1676 work pants are HRC compliant, with an 11 calories/cm<sup>2</sup> arc rating.

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



### Thrive Workwear

Thrive Workwear's protective work apparel has been providing solutions to the wind industry for nearly 10 years. Their line-up of clothing includes Flame Resistant work pants, FR work shirts, FR base layers, and FR outerwear designed specifically for wind technicians and construction workers. Their work pants feature full-time knee protection built-in with patented SQUISH pad technology.

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

### Small Wind Turbine Mfg (Under 100kW)



### Flower Turbine

Flower Turbine's aerodynamically advanced small vertical axis drag type turbines are efficient due to innovations in the turbines and how they are placed; they actually make their neighbors perform better. They are a solution for customers with a large flat roof or parking lot structure to build a small farm of 10 or more turbines. Each has a choice of 2, 3, or 5kw electronics. Residential Flower Turbines will be available soon.

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



### SD Wind Energy (formerly Proven Wind Turbines)

SD Wind designs, manufactures, and supplies small wind turbines across the globe. With over 5,000 wind turbine installations in over 70 countries, they can deliver small scale renewable energy needs world-wide. The SD Wind Energy product range covers a wide array of applications and has a unique downwind design and ability to operate in all wind speeds without the need to shut-down. With over 30 years experience of installations in harsh environments, the SD Wind turbine is a reliable small scale turbine. SD Wind's 3KW and 6KW wind turbines are manufactured in Scotland and sold through dealers and installers.

[www.sd-windenergy.com](http://www.sd-windenergy.com)

### Software Supplier



### BladeEdge

BladeEdge offers a customized approach to blade inspection data and analytics through EDDIE, an artificial intelligence (AI) engine designed to process, identify, and manage inspection data automatically. Regardless of which method chosen for capturing data, or who is used for inspections, BladeEdge can leverage EDDIE to deliver a solution. EDDIE's valuable insights inform strategic initiatives and revenue-generating activities. BladeEdge helps users minimize efficiency loss, stop drowning in data, and maximize time.

[www.bladeedge.net](http://www.bladeedge.net)



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## Clir Renewables

Clir Renewables is a Software as a Service company in the renewable energy industry, providing a solution developed by engineers for engineers. The cloud-based AI platform provides asset managers and owners with tools to maximize annual energy production and provide clarity on portfolio performance. Their proprietary algorithm cleans and analyzes ingested data providing actionable insights. Founded in early 2017, the company now supports over 5GW of assets worldwide, with clients typically seeing increases of up to 5% in AEP in the first year.

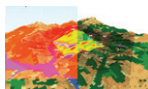
[www.clir.eco](http://www.clir.eco)



## JobNimbus

JobNimbus offers a fully mobile sales and production management software with features including interactive boards, customizable workflows, and photo uploads. Enter new leads and move them through the sales pipeline. Everything in JobNimbus is organized into job folders, including notes, emails, tasks, contracts, photos, estimates, and more. The entire pipeline can be viewed and interacted with in a digital whiteboard to see where everything is and what's up next. With a mobile app (iOS, Android), JobNimbus provides tools in the field to capture lead information, take and upload pictures to a job folder, and create estimates on the spot. The app works in offline mode to provide uninterrupted productivity anywhere. Featuring integrations for canvassing, QuickBooks, and EagleView, JobNimbus is a one-stop solution for managing business from the field or in the office.

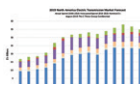
[www.jobnimbus.com](http://www.jobnimbus.com)



## Meteodyn

Meteodyn WT is a CFD software designed for wind resource assessment. It accurately estimates the wind resource, even on complex terrain (mountainous or forested) and allows users to design profitable wind farms. Meteodyn SPA is a SCADA data processing and analysis software for wind farm. Users can obtain the real production of the entire wind farm or for each individual turbine and compare it to the manufacturer's power curve. The software also detects the status of the wind turbine. Meteodyn Forecast is their service allowing customers to estimate the expected production of one or several turbines, from few hours to 14 days, to optimize plant maintenance. It uses CFD and machine learning, for higher accuracy.

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



## The C Three Group, LLC

The C Three Group offers subscriptions to cloud-based databases with up-to-date project-tracking for North American infrastructure projects in transmission, generation, oil and natural gas, and telecom. Add-on services include customer reporting, market forecasts, and a deep dive segment analysis.

[www.cthree.net](http://www.cthree.net)

## Steel Supplier



## Leeco Steel

Leeco Steel, headquartered in Lisle, IL, maintains a large inventory of carbon, HSLA, and alloy steel plate, including EN steels such as S355 J2, K2, and NL, and all ASTM grades suitable for wind tower applications. Leeco's extensive stock is housed in 11 strategically located distribution centers in North America so as to serve wind energy customers with their steel plate needs.

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

## Testing | Inspection Services



## Megger

The MIT410/2 is a handheld field rugged instrument that performs the fundamental test of electrical system reliability, insulation resistance. It also performs a regime of corollary tests which help the operator fine tune the final assessment. It offers preventive and predictive maintenance on generators and cables up to 200 gig ohms. The unit is rated CAT IV 600 volt protection from arc flash/arc blast. It also measures ac and dc voltage.

[us.megger.com](http://us.megger.com)



### MISTRAS Group, Inc.

MISTRAS Group is a global OneSource provider of asset protection solutions for the North American wind energy industry. They provide inspection, light mechanical services, and condition-monitoring for turbine blades, towers, gear boxes, and transformers in onshore and offshore assets. MISTRAS offers rope access and drone capabilities, enabling safe asset protection at any height. Their solutions include non-destructive testing (NDT) for internal and external inspection, laminate and coating repairs, blade installation and repair support, fleet-wide condition monitoring, lab materials testing, and root cause analysis.

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



### NTS

NTS provides lightning simulation and modeling services to wind turbine manufacturers at multiple labs throughout the nation. NTS facilities include a 20,000 square foot Lightning Center of Excellence in Pittsfield, Massachusetts, which boasts generators that can produce more than 200,000 amperes and 2.4 million volts. To meet individual customer needs, NTS provides a wide range of lightning services, which include direct effects testing, indirect effects testing, simulation and modeling, onsite engineering, custom wave shapes, electrostatic discharge, multiple burst, multiple stroke, near strikes, surge testing, and more. In addition, NTS subject matter experts are shaping industry standards, sitting on advisory boards, writing technical papers, and authoring textbooks used by NASA and the FAA. In short, NTS brings expertise to provide wind turbine manufacturers with a one-stop shop for robust design, analysis, and testing services.

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



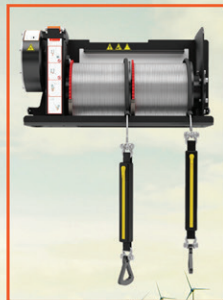
### Q-Lab Corporation

Q-Lab Corporation is a global provider of material durability testing products. Q-Lab designs and manufactures standard test substrates as well as weathering, light stability, and corrosion testers. In addition, contract test services which include accelerated laboratory testing are available at Q-Lab Florida, Q-Lab Arizona, Q-Lab Deutschland, and Q-Lab China. Outdoor exposure testing for weathering, lightfastness, and corrosion are available at Q-Lab Florida and Q-Lab Arizona. Nature's elements can take a huge toll on outdoor use products. Q-Lab offers various products, testing services, and locations to ensure their customers' products will stand the test of nature and time.

[www.q-lab.com](http://www.q-lab.com)

# How will YOU escape?

  
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519-885-9021  
[info@tesucon.com](mailto:info@tesucon.com)



## The EVACUATOR Key Features:

- Escape & emergency descent solution
- Designed to save the lives of those working at altitudes ranging up to 300m
- Evacuator is fast & simple (click & go)
- Fireproof units, 1750°C for 30 minutes or 1200°C for 90 minutes
- Fully mechanical descent at 1m/sec
- Installed inside or outside of the nacelle, onshore or offshore
- Each unit has 2 reels, each reel can carry multiple persons up to total weight of 282kg
- The Evacuator is certified in compliance with ANSI Z359, CSA Z259.



**Small Wind Certification Council**

The Small Wind Certification Council (ICC-SWCC), an independent ISO/IEC 17065 accredited certification body, certifies wind turbines that meet or exceed the requirements of specified standards. Designed to promote consumer confidence and mainstream acceptance of small and medium wind technology, ICC-SWCC certification standardizes North American reporting turbine energy and sound performance. ICC-SWCC certification also helps manufacturers to demonstrate compliance with certification requirements from numerous federal, state, and local incentive programs to qualify for rebates and tax credits.

[www.smallwindcertification.org](http://www.smallwindcertification.org)



**WindGuard North America, Inc.**

WindGuard's testing laboratory offers power performance measurements according to all established technical standards (for example IEC 61400-12-1). In addition, WindGuard has developed other methods to verify the power performance of wind turbines, implementing both ground-based and nacelle LiDAR technology. With the experience from hundreds of tests on turbine types from 30 kW to 7.6 MW, they are a reliable partner for verifying warranted power curves as well as prototype testing. WindGuard is committed to providing extensive scientific, technical, and operational services, which are unbiased and manufacturer-independent for onshore and offshore wind projects.

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

**Tools**



**AcraDyne**

AcraDyne's Gen IV Critical Bolting Platform is an advanced bolting/tool system. HT Series tools from AcraDyne are electric, high-torque bolting tools that provide accuracy, speed, and safety. The iEC controller/tool system measures traceable, dynamic torque directly at the square drive. The built-in transducer ensures accurate torque values. Combined with AcraDyne's Dual-Lever HT Nutrunners, the Gen IV platform provides an additional level of safety to protect the tool operator. AcraDyne's HT tools deliver high speeds in torque ranges 50 – 17,000Nm. The ergonomic, robust design includes five handle configurations. These tools are designed and made in the USA.

[www.aimco-global.com](http://www.aimco-global.com)



**Atlas Copco**

Atlas Copco offers products and solutions that increase productivity - the right solutions for all hydraulic torque, electric torque, pneumatic torque, manual torque, and hydraulic tension applications. Atlas Copco's SRB HA provides tightening with ergonomics and usability. It's durable, fast, and packed with smart features. Atlas Copco serves the wind power industry with assembly tools, equipment, calibration, repairs, and rentals.

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### Chicago Pneumatic

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



### Einpart, LLC

Einpart, LLC has 20 years of experience in parts, tools and special equipment. They supply and support the North and South American wind market from their headquarters located in Plano, TX. Their main product lines for the onshore and offshore wind industry are FAA approved obstruction lights, torque and tension tools with a wide range of hydraulic, electrical, and mechanical tools. Personal protection equipment, certified lifting bags, WTG components, offline oil filtration, heat products, sensors, hydraulic parts, and consumables.

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



### HD Electric

HD Electric's test, measurement, and safety products are a comprehensive range of products for testing electrical apparatus such as direct contact voltage detectors, voltmeters, phasers, underground cable fault tester, voltage indicators, proximity voltage detectors, handheld voltage detectors, voltage detection network, personal voltage detectors, insulator testers, arrester/leakage testers, ammeters, cable distance meters, phase rotation meter, cable identifiers, capacitor testers and transformer testers. Their controls and system monitoring products include local and communicating capacitor controls.

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



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### Hi-Line Utility Supply

With over 10,000 products in stock, Hi-Line Utility Supply is a “one-stop-shop” for tools, safety equipment, rubber goods, and services for wind farms, electrical utilities, and contractors since 1960. Hi-Line also custom grounds and jumpers, tool repair, fiberglass refinishing, and rubber goods testing at two NAIL-accredited test labs (IL and MA). Both warehouses house a large in-stock selection of rubber goods available for fast shipping. Hi-Line also provides the required certification documentation to meet the unique needs of wind farms.

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### ITH Bolting Technology



### ITH Engineering

ITH Bolting Technology manufactures bolting tools and systems for thread sizes as small as M16 up to M510 and larger, including standard products and custom designs engineered based on customer needs. The full scope of tools includes hydraulic bolt tensioners, hydraulic torque wrenches, and torque multipliers ranging from electric, pneumatic, and battery driven. ITH offers standard bolting system packages including tools and fasteners, and the maintenance-free bolting system which specifically includes ITH bolt tensioners and IHF tension fasteners.

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



### JANICKI INDUSTRIES

### Janicki Industries

Janicki Industries is a privately owned, full-service engineering and manufacturing company with facilities in Washington and Utah. Janicki specializes in manufacturing wind energy tooling, made of composite materials. Janicki is capable of large-scale projects, utilizing high-precision five-axis mills, curing ovens, autoclave, and large annealing oven. They have extensive experience using many composite systems, such as: 160°F (71°C) machined syntactic putty; 250°F (121°C) carbon/fiberglass hybrid molds; 350°F (177°C) carbon molds; and 350°F (177°C) invar and steel molds. This 100% in-house capability for the total tooling and parts solution enables a one-stop shop for customers.

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



### McCann Equipment, Ltd.

McCann Equipment Ltd. is a multi-branch Canadian industrial tool distributor, specializing in the sale, service, and rental of torque and tensioning products. Their services include the repair, calibration, and certification of torque tools (manual, electric, pneumatic, hydraulic), transducers, and testers. Additionally, they certify air pressure gauges and hydraulic gauges as well as tension calibration testers (Skidmore). Each of the company's branch offices is ISO 17025 accredited. The scope and accreditation for each is available on their website.

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



### Rad Torque Systems

The B-RAD Select battery series torque wrenches comes with two simple buttons to increase or decrease the value by 10ft. lbs. At the four-digit display, the set torque value is displayed. The B-RAD select remembers the last set torque value even after the battery has been removed. The B-RAD is suitable for pre-torque and service jobs where electricity or compressed air are not available. Torque ranges up to 3,000ft. lbs, equipped with the latest Lithium-ion Standard.

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



### Snap-on Industrial

Snap-on Industrial is a supplier of tools and protective equipment for professional technicians. Their Tools at Height tethered tool program includes more than 1,000 tools designed for work being performed at height or anywhere dropped or lost tools are a concern. All tools are designed with a tethered system to maintain or enhance the tool's functionality when used at height or near critical assemblies. Engineered, tested, and certified to improve safety and productivity for technicians working at elevated levels, Snap-on's Tools at Height use a retention system that is designed in conjunction with the tool so it doesn't inhibit the technician's ability to complete the job.

[www.snapon.com/industrial](http://www.snapon.com/industrial)



### Stahlwille Tools, LLC

SmartCheck is a newly launched, small sized, versatile, and easy-to-use torque tester that will find a home in any workshop and service vehicle. Due to its compact dimensions, the ability to mount it horizontally or vertically, and the rotatable display, it can be used virtually anywhere. Display and keypad are splash-proof and it can be operated through power supply or battery. SmartCheck quickly provides information on whether or not a torque wrench is still within the prescribed tolerances or whether it requires adjustment. The integrated visual and audible overload protection mechanism, and impact resistant plastic housing ensure the durability customers expect of STAHLWILLE.

[www.stahlwille-americas.com](http://www.stahlwille-americas.com)



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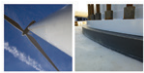


### Tech Products, Inc.

Tech Products, Inc. is a global source for quality identification products for the renewable energy industry including, cable tags, tower (aerial) markers, and signs. Their products range from adhesive transformer labels to long lasting substation signs following all of the latest ANSI, OSHA, and NESC standards.

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

### Tower Foundations



### E-Chem, LLC

E-Chem, LLC specializes in the design, manufacturing, marketing, and supply of epoxy polymer resin products, offering project specific solutions for a variety of industries. E-Chem's epoxy grouting products are designed for high-stress applications subject to intense dynamic and static loading (up to 21,000 psi), making them suitable for supporting the extreme loads placed on wind turbine towers. In addition, a high resistance to impact and vibration makes this 100% solids material a solution for safely transferring loads from the tower to the foundation, preventing damage that could limit the life and performance of the structure.

[www.e-chem.net](http://www.e-chem.net)

### Transportation | Logistics



### Anderson Trucking Services (ATS)

ATS is a worldwide transportation and project management resource and a manager of the logistical details of multifaceted and often multimodal energy projects. ATS also specializes in the physical transport of the oversized and over-dimensional components that come with them. Having safely moved more than 200,000 wind components since 2003, ATS currently provides transportation for approximately one-third of North America's wind projects annually. With nearly 65 years of experience in the transportation industry, ATS is a third generation family-owned company headquartered in St. Cloud, Minnesota.

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



### C.H. Robinson Project Logistics

C.H. Robinson Project Logistics has experience in developing and executing successful logistics plans for the transportation and management of heavy-lift and over-dimensional wind turbine equipment - from pick-up to final site. After a proactive analysis of all requirements, they help their clients develop solutions and contingency plans to help ensure shipping schedules are consistently met. They offer several services, including: detailed route planning; part/full charters; aircraft chartering and emergency rush air freight; accurate documentation; timely status reports; and consulting services for complex letters of credit and bid documents. Their experienced team of professionals is available onsite at global locations to manage the successful completion of technically demanding projects.

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



### CN

CN offers rail and transload services for dimensional loads and heavy equipment, supporting industries such as the wind industry, oil and gas, power generation, construction, and mining. Their network runs across North America from West to East, South from the Gulf coast into northern regions of Canada, and with direct access to strategic ports in the Great Lakes. They extend their reach by working with connecting carriers, partner shortlines, ports, and other parties to develop efficient routes, providing solutions for loading, offloading and marshalling their customers' freight.

[www.cn.ca](http://www.cn.ca)

# DOLECO USA



## Doleco USA, Inc.

Doleco USA provides a complete line of load securement and lifting slings and equipment for the wind industry. They are dedicated to providing a wide array of products including wire rope assemblies, web and chain slings, as well as all types of load securement. Doleco USA can also provide engineered solutions to any lifting and securement application needs.

[www.doleco-usa.com](http://www.doleco-usa.com)



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[www.drivingforce.ca](http://www.drivingforce.ca)

# LOGISTICUS GROUP



## Logisticus Projects Group

Logisticus Group is a supply chain partner specializing in project management, logistics, and fully-customized turnkey solutions for over-dimensional cargo, highly-complex projects, and operations. A wide range of solutions; off and on site civil engineering, route and feasibility assessments, standard and industrial warehousing, inventory management and GPS systems, lay-downs, staffing, and more. All LG service offerings are supported by Logisticus' proprietary advanced technology solutions, developed and 100% customized for each project.

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



## Metro Ports

Metro Ports is a contract stevedoring and marine terminal operator specializing in dry and liquid bulk cargoes, breakbulk and project cargoes, forest products, wind energy, and a variety of other marine cargoes.

Metro Ports operates in the U.S. states of Washington, California, Texas, Indiana, Georgia, North Carolina, and South Carolina.

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



## Miller Transfer

Miller Transfer is an asset based specialized carrier that has provided legal, over-sized, and heavy-weight transportation services to the power generation industry for over 50 years. They have a large, diversified fleet of equipment and a talented driver force that can handle anything from a legal flatbed to items weighing up to 400,000lbs. They service the US/CN/MX through a network of 18 strategically located terminals. In addition to transportation, they offer crating, wrapping, warehousing, and project management services.

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



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**Port Milwaukee**

Port Milwaukee handles a variety of breakbulk and non-containerized cargo, including wind turbine components, such as towers, nacelles, blades, and generators. Port Milwaukee's general cargo piers are paved with concrete and asphalt with connections to both Union Pacific (UP) and Canadian Pacific (CP) railways. Port Milwaukee's total general cargo capacity exceeds 20 acres (8.1 hectares); the Port can offer additional backup storage as requested. Federal Marine Terminals (FMT) is the Port's general cargo stevedore.

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



**Port of Corpus Christi**

Port of Corpus Christi, situated on the Texas Gulf Coast and located just 1 mile from Highway 37 and U.S. Highway 181, has 6 laydown yards, all highway accessible and most with rail capability, suitable for heavy lift cargo such as wind turbine components. The port provides a 47' deep ship channel (currently dredging to 54'); dockside rail; three class 1 rail carriers; an on-campus short line railroad; a knowledgeable labor force; heavy lift capabilities; Foreign Trade Zone #122, and open, covered, and dockside storages. The Port's Nueces River Rail Yard features 8 tracks each 8500' long. All of this provided with safety, security, and environmental management operations.

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



**Port of Olympia**

The Port of Olympia's 66 acre terminal is situated in Puget Sound in Washington State. ILWU #47 longshore labor is available 24/7 to discharge wind component vessels and to load out to truck and rail. Easy truck access is available, with access to Interstate 5 in less than one mile. On-dock rail is supported by both BNSF and UPRR with switching by OYLO, their shortline carrier. A wide variety of heavy lift equipment is on-site for operations including top picks and a 140-ton Gottwald mobile harbor crane.

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



**Port of Stockton**  
CALIFORNIA

**Port of Stockton**

The Port of Stockton is an inland facility located in the extended San Francisco Bay Area that has handled breakbulk cargo since 1933. They have around the clock security and uniquely offers customers 24/7 access to their freight. The Port has 2.5 miles of on-dock rail connecting to the UP and BNSF that offer service throughout the United States. It is adjacent to uncongested highways, I-5, CA-4, and CA-99, and is an hour from I-80. The Port of Stockton has handled numerous shipments of clean energy cargo of all shapes and sizes.

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



**Port of Longview**

The Port of Longview has more than 10 years experience handling wind cargo. In 2016, Port of Longview discharged blades direct-to-rail, decreasing handling costs and reducing the risk of damaged cargo. The Port is served by BNSF and UP, offers double tracked on-dock rail, and a 70 acre paved laydown yard. Their equipment consists of 2 heavy lift Liebherr mobile harbor cranes, reach stackers, and other equipment for their customers' handling needs. Located on the deep-draft Columbia River in Washington State, just 66 miles from the Pacific Ocean with direct access to Interstate 5 and BNSF mainline, the Port of Longview offers a full service transportation destination.

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



**Ports America**

Ports America is an independent marine terminal operator and stevedore company. The company operates in more than 42 ports and 80 locations in the United States. Ports America handles all types of cargo, including wind component projects, heavy-lifts, containers, bulk, breakbulk, automotive, military, and cruise. The company typically handles 10.1 million tons of general cargo annually.

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



### Stewart World Port Services, Ltd.

Stewart World Port is a deep sea multipurpose port located in Stewart BC. As Canada's most northerly ice-free port, Stewart is ideally located at the end of the Portland Canal and has paved access to British Columbia and Alberta. The location provides up to a full day advantage to Asian markets over southern ports and has favorable climate, low winds, and good anchorage.

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



### Transportation Partners and Logistics

Currently serving a variety of OEMs, project developers, and supply companies, TP&L provides logistics and transportation management for a variety of industries across the entire supply chain. Since 2012, TP&L's one-stop-shop for logistics and management solutions has assisted more than 75 wind farms, multiple oil/gas drilling projects, and agriculture throughout the United States, Canada, and Mexico. TP&L's team of in-house engineers are top-load certified and ready to take the lead when it comes to any logistical needs. From port to pad they deliver economically, safely, and on time.

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

### Wind Assessment | Forecasting



**EAPC**  
WIND ENERGY



### EAPC Wind Energy

EAPC Wind Energy is a wind consulting firm offering bankable wind resource and energy assessment, wind farm design, turbine site suitability analysis, project due diligence, noise and shadow flicker assessment, visual simulations, and met tower sales and installation. EAPC Wind Energy is the exclusive North and South American (excluding Mexico and Brazil) sales and support agent for WindPRO.

[www.eapc.net](http://www.eapc.net)



### RainWise

RainWise, an employee-owned company, celebrates 45 years as a global provider of meteorological measurement for commercial/utility PV solar monitoring solutions. Rainwise also delivers professional grade weather instruments for agriculture, commercial, fire/weather, storm/flood water, outdoor event and transportation applications, with seven PVmet weather stations including their new PVmet 500 Series. In 2019, they released their MK4 Weather Station. RainWise has obtained creation patents for the tipping rain bucket, digital weather station, and wireless weather station. RainWise is known for durability, quality, and high level of accuracy.

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



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### Remtech

Since 1982, Remtech has been refining wind profiling RSD's. Their standard warranty is 3 years with affordable extensions available. This is made possible by their software oriented design, thus minimizing the hardware. Their efficient software allows Remtech to offer a small and light RSD, the PA-XS, which can achieve a 400m AGL average altitude range.

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



### Sentrex Wind Services, Inc.

Sentrex Wind Services' core products and services include remote sensing, SoDAR and LiDAR Services, campaign management, installation and maintenance, data monitoring and more. Their SoDAR and LiDAR services include rental and Sales, SoDAR and LiDAR remote power supplies, Off Grid, SoDAR and LiDAR validation and verification. They also provide meteorological towers for wind developers, turbine manufacturers, or any other party with a need to characterize the wind.

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

## Yaw, Pitch & Blade Sensors



### Micronor, Inc.

Micronor MR200W series feedback units consist of user-defined single function and multi-functional yaw (nacelle) comprised of a position sensor and/or cable twist limit switches. Available position sensor options include both electronic and lightning-immune fiber optic absolute and incremental encoders, as well as potentiometric-based 4-20mA transducer. Feedback units are available with and without external pinion gear (for bull ring engagement). Custom gear ratios and external pinion gears are available upon request.

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



### POSITAL-FRABA

POSITAL-FRABA is an international supplier of innovative position and motion sensors with multiple applications in the wind energy industry. The company's rugged and reliable IXARC rotary encoders are suitable for monitoring rotor speed (incremental encoders) or controlling nacelle orientation and blade pitch (absolute encoders). POSITAL's magnetic encoders are designed for harsh conditions and are available with environmental protection up to IP69K. With over a million possible configurations and available analog, serial, CANopen, DeviceNet, or Industrial Ethernet interfaces, IXARC incremental and absolute encoders are a good fit for projects of any size or budget.

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

## Other Balance of Plant



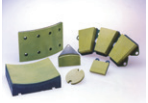
### Exo

With over 100 years of experience in structural inspection and remediation of T&D infrastructure, Exo offers asset management, inspection, and field repair services for utilities and renewable companies. Their engineering expertise and time-tested capabilities provide comprehensive in-facility inspections during manufacturing of towers, NDT field inspections for corrosion and welds on in service assets, and field repairs for coatings, welds and other structural issues.

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



## Brake Pads



### Tribco, Inc.

Tribco Inc. makes long lasting wind turbine brake pads lined with Braketex. Braketex is a 100% KEVLAR fibered textile composite friction lining. In addition to longer wear life, Braketex is nonabrasive and will not score or wear down brake rotors. Braketex also oxidizes as it wears so it does not create dust, thereby eliminating dust problems. Consequently, Braketex helps wind turbine operators reduce maintenance downtime and expense while increasing reliability and uptime.

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

## Control & Power Electronics Repair



# DEX

### DEX

Founded in 1980, DEX is a repair, parts, and manufacturing service provider for the control and power electronics components in wind turbines. With a team of highly trained electrical, electronic, mechanical, computer, quality, and process engineers, DEX provides a service solution for models that are older or where the manufacturer no longer supports the product, and gives OEMs the option to repair versus buying new parts. DEX uses a variety of functional simulators (testbeds) on all services to ensure the parts are in like-new condition and ready to work upon arrival. For ABB ACS 800, Delta Modules, IGBTs, power supplies, and other electronic and electromechanical components powering wind turbines, DEX guarantees high quality results with quick turnaround times.

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

## Electrical Insulation



PITTSBURGH ELECTRICAL INSULATION  
MANUFACTURER | CONVERTER | DISTRIBUTOR



### Pittsburgh Electrical Insulation

Pittsburgh Electrical Insulation is a manufacturer, converter, and distributor of electrical insulation materials focused on the OEM and service industries associated with motor, generator and transformer production and repair. With over 70 years of continuous operation, PEI remains a cost efficient, customer focused company dedicated to the supply of electrical insulation materials, IEEE and UL components, systems, and supplies for new power generation technology or for an unplanned outage on existing equipment. They maintain an inventory of high performance materials, both rigid and flexible, and are able to convert those products to customer requirements with short lead times. They represent manufacturers such as St. Gobain, 3M, and Kaneka, augmented with a global sourcing practice that gives their customers options for any application.

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

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[www.industrialrepair.net](http://www.industrialrepair.net)

## Elevators



### Elevator Industry Work Preservation Fund

Highly trained elevator mechanics from the International Union of Elevator Constructors not only keep elevators running, they keep them running efficiently, and above all, safely. They have over 28,000 trained professionals with over 8000 on-the-job hours and over 2500 classroom hours, with as many as 450+ companies ready to serve. Whether it's installation, repair, maintenance, or inspections, EIWPF can help, and provide compliance and safety inspections across the US as well. Their staff sits on the ASME A17.8 committee that write the codes for these elevators.

[www.eiwpf.org](http://www.eiwpf.org)

## Labor Trade Association



### Ironworker Management Progressive Action Cooperative Trust (IMPACT)

IMPACT is a labor management partnership designed to provide a forum for union ironworkers and their contractors to address mutual concerns and encourage reasonable, balanced solutions. Their members are committed to increasing the competitiveness and market share of the union ironworking industry. Their primary mission is to expand job opportunities through progressive and innovative labor management cooperative programs, providing expertise in ironworker and contractor training, construction certifications, safety, marketing, and construction project tracking and bidding.

[www.impact-net.org](http://www.impact-net.org)

## Legal services



### Nixon Peabody, LLP

With their Legally Green approach, Nixon Peabody understands the market forces, policies, and technological issues that affect the renewable energy industry. Collaborating across legal disciplines, they cover every aspect of renewable energy project development and finance, including property acquisition, project and portfolio M&A, debt, cash equity, or tax equity financing, transmission access, and storage. And, they're well versed in the approval and permitting processes that projects require at the local, state, and federal levels. Whether they're representing a large developer acquiring the rights to a community solar facility or helping a global investment firm with the siting and permitting of a large wind project, they work hard to remain the trusted legal advisor to clients shaping the future of renewable energy.

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

## Rescue and Safety Training



### **TEAM-1 Academy, Inc.**

TEAM-1 Academy, Inc. specializes in training for Working at Heights/Fall Protection, Confined Space, HazMat/Spill Response, many forms of Rescue, and much more. They provide Professional Safety and Rescue Training, Equipment Sales + Service + Inspections, and Consulting Services for the renewable energy sector, utilities, energy sector, Fortune 500 companies, industry, construction, health care, fire services, police, EMS, military, MOE, government, and numerous others.

[www.team1academy.com](http://www.team1academy.com)

## Sectionalizing cabinets



### **Nordic Fiberglass Inc.**

The ND-683054-MG-PA71-X-X is Nordic's "Workhorse" for three phase 3 and 4 pt. 35kV 600Amp deadbreak sectionalizing cabinets for Wind Farm Collection Systems. This cabinet is made of Rust free fiberglass construction and stainless-steel hardware. Nordic can supply and install up three, 3 or 4 pt. 35kV 600A junctions from various manufacturers with U-straps if requested by the customer. PA71 mounting plate has six movable above parking stands to park stand-offs or feed throughs. Nordic recommends the optional CSB-6830 cable support bracket system for holding cables in place and cable clamps. 18" or 36" high extensions available for cables requiring a greater cable bending radii.

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

## Telecommunications Provider



### **Skycasters**

Skycasters is a satellite telecommunications provider offering customizable, commercial grade satellite internet equipment and services. They can service the most remote locations in North America, Central America, and the Caribbean. Their fixed and mobile equipment allows users to manage, monitor, and respond to SCADA data about critical operations across hundreds of sites. Skycasters builds lasting relationships with their customers who appreciate customer service and tech support handled in-house by experts.

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

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