



**PANDUIT®**  
**Wind Energy Solutions**



## Infrastructure Has Answers For An Industry In The Cross Roads

Once considered an emerging technology, the installed capacity of wind energy has grown by tenfold over the past decade, and is now a major force in renewable energy initiatives.

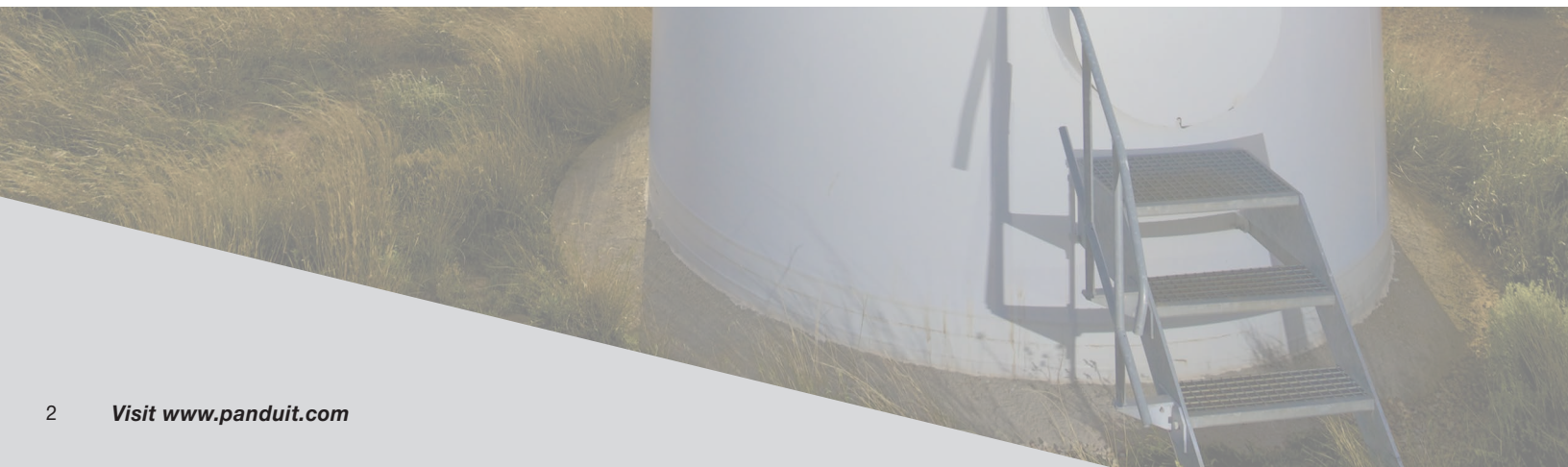
Recent growth has been driven by a combination of public policy and technological advances that have significantly reduced cost per megawatt. Wind power's future is now challenged by uncertain regulatory environments around the globe, trends toward the use of larger and larger turbines to optimize performance in low wind locations, and the desire to build capital-intensive offshore farms. As a result, wind energy producers are looking for partners who can help them maximize output at the lowest total cost.

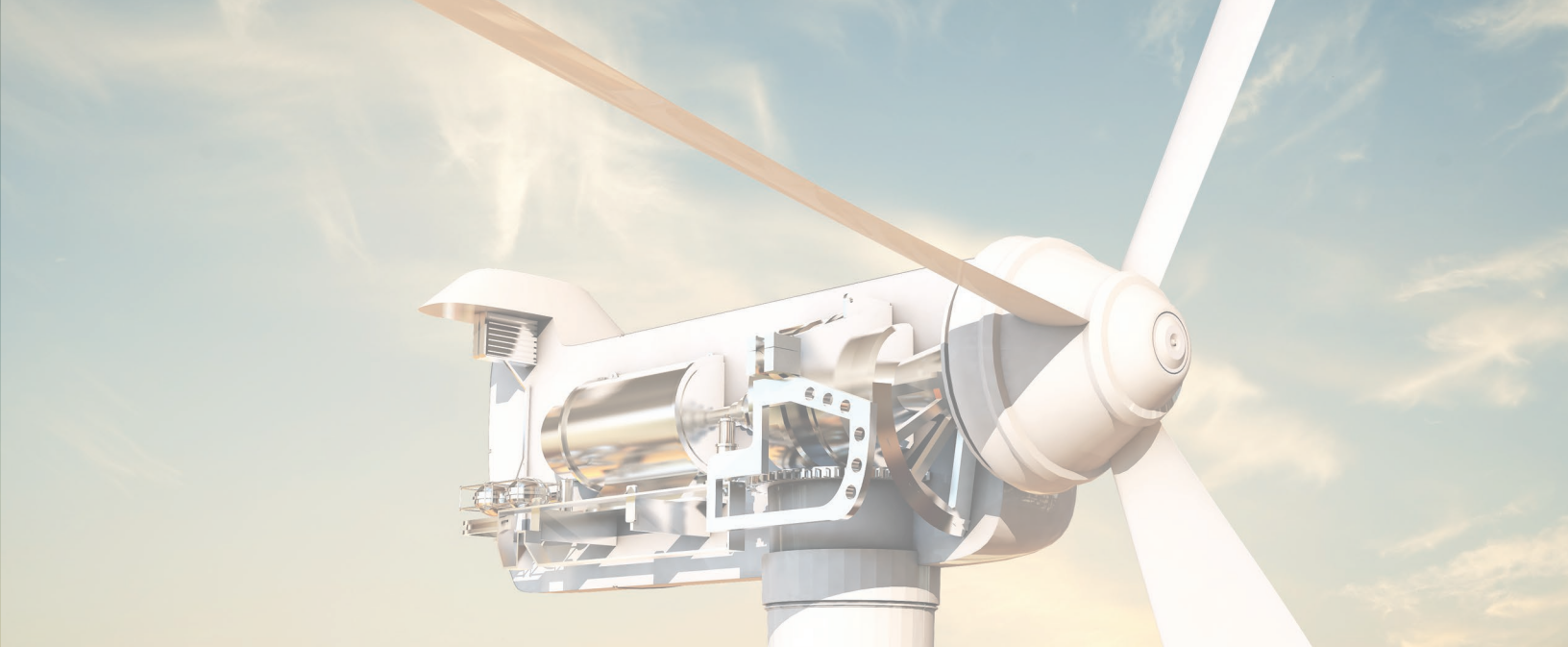
Panduit plays an important role in the energy value chain. As a global innovator of solutions for connecting, grounding, securing, protecting, identification labeling, and copper and fiber communication systems, our solutions help reduce operating and capital costs.

### Driving Costs Down

Reaching financial parity (\$/KW) with conventional power will require cost reductions across the entire lifecycle of the wind farm — from initial capital outlays to installation costs to maintenance and replacement expenditures.

Panduit solutions can have a major impact on reducing installation times, and are known for time-savings features that require fewer installation steps while maintaining or exceeding performance. For example, Panduit's direct burial grounding compression connectors can be installed four times faster than traditional exothermic products. The use of Panduit tooling can further reduce installation times, helping to manage labor costs.





## Reliability Is The Top Priority

Product reliability is paramount to the financial success of a project. For example, every component of the turbine is evaluated for increased performance — from turbine design to the drives and the components that connect, ground, and identify them. Also, wind energy installations are frequently located in remote locations, exposed to harsh climatic conditions.

To achieve higher reliability standards Panduit conducts extensive testing to measure product performance in extreme operating environments. Our products meet — and many exceed — the performance standards set by various regulatory agencies worldwide. Panduit also offers solutions that decrease downtime by making maintenance easier.

In addition, making repairs in remote locations is very costly; superior reliability helps avoid major maintenance or premature replacement expenses.

## Meeting Global Standards

The technology for wind generation was developed in Europe and the United States with wind turbine manufacturing recently shifting to Asia. This technology has grown rapidly across the globe with major players located in United States, Spain, China, and India. Lack of globally accepted standards creates a challenging situation where every country follows its own set of standards, making global integration difficult, costly, and time-consuming.

With decades of engineering and manufacturing experience, Panduit understands global requirements and offers products that meet global standards. Supported by a worldwide network of manufacturing and warehousing facilities, Panduit is uniquely capable to deliver products anywhere and everywhere they are needed.

If You Route It, Ground It, Connect It,  
Protect It or Identify It...

Panduit Can Help You Manage It

1

Wiring Duct



2

Terminals



3

Identification  
and Labeling



4

Cable Ties



5

Abrasion  
Protection and  
Heat Shrink





Substation and Control Room

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 9
- 10

Substation and Control Room

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 9
- 11



6

Cable Accessories



7

Lockout/Tagout



8

Stainless Steel, Permanent ID, and Tools



9

Panel Systems



10

Micro Data Centers



11

Grounding Connectors



## Industry-Leading Solutions

Panduit products have distinct engineering and performance advantages for wind energy environments. With Panduit as a primary source partner, customers can maximize uptime, enhance safety, increase reliability, and have a single point of contact forgetting quick answers regarding product usage, installation, and availability.

### Direct Burial Compression Grounding System

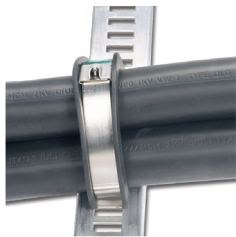


Panduit's unique design offers an alternative to exothermic grounding systems, meeting the higher survivability benchmarks of IEEE 837™-2002 standard. Because there is no open flame involved in the installation process, installations can continue in any weather condition and open-burn permits are not required. Bonds can be visually inspected on the spot. Field tests show installation speeds are up to four times faster than exothermic equivalents.



### Power Connectors for Code, Flex, and Metric Cable

Panduit power connectors feature generously beveled entry ports to prevent wire strands from bending back during the wire insertion process. An inspection window allows installers to confirm full conductor insertion has occurred. Tin plating inhibits corrosion. UL Listed and CSA Certified to 35kV and temperatures to 90° C. Meet stringent American Bureau of Shipping standards.



### Pan-Steel® Self-Locking Stainless Steel Cable Ties

The Pan-Steel® Super Heavy Cross Section Self-Locking Stainless Steel Cable Tie is a lightweight, flexible alternative to cable cleats for fastening cables to cable tray. The self-locking design speeds installation because no tray modification is required. Total installation costs can be as much as 25% less vs. traditional cleats. The smooth, rounded edge of Pan-Steel® Cable Ties is considerably safer for installers to handle, and protect against abrasion of the cable jacket/insulation.



### Control Panel Solutions

Panduit control panel solutions are designed to accommodate the space limitations inside the nacelle or base and minimize the adverse effects of electromagnetic interference. Panels utilize innovative Panduit wiring duct that can reduce the panel footprint by 30%. Separate pathways for electrical and communications cabling are provided along with products for segregating and shielding all wiring.



### Terminals/Ferrules

Panduit ferrule wire end sleeves in 16 and 18 AWG reduce the potential for shorts or intermittent system faults. They install quickly and create safe, homogeneous connection points. Brightly colored insulation sleeves simplify troubleshooting. Excellent containment characteristics make these terminals ideal for use with fine or high strand cables.



### Tooling

Panduit offers a wide variety of lithium-ion battery-powered terminal and power connector installation tools that are easy to use and create reliable, high-grade terminations. Payback comes quickly through improved productivity. Installers can complete up to 135% more crimps per battery charge than traditional NiCd or NiMH tools.



## Data Center Solutions

Panduit Data Center Solutions encompass data center advisory services, intelligent software and hardware, energy efficient cabinets, converged infrastructures, physical infrastructure foundation, and high-speed data transport (HSDT) copper and fiber optic cabling. Our solutions are modular, scalable, and agile, fully supporting state-of-the-art network architectures today and into the future.

### **Best practice methodologies are supported in four key areas:**

- Visibility and control for managing and automating real-time data processes and documentation
- Convergence of new technologies and high-speed data applications
- Operational efficiencies through process improvement and IT initiatives, such as reduced cooling requirements through the use of energy efficient data cabinets
- Capacity management for greater real estate utilization

## Industrial Automation Solutions

Panduit is uniquely qualified to understand the complexities of plant-level networks and controls, from monitoring production processes to optimizing pathway design. Panduit's Industrial Automation Solutions ease the deployment of industrial networks and automation control systems. Integrated and optimized architectures, solutions, and services help customers achieve business objectives such as accelerated convergence of IT and the factory floor, quicker deployment times, and broader risk management.



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