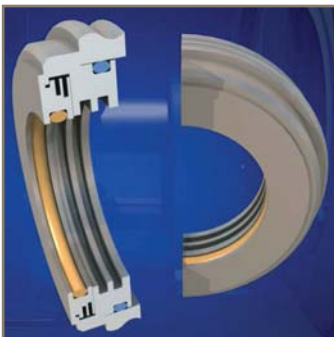




aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



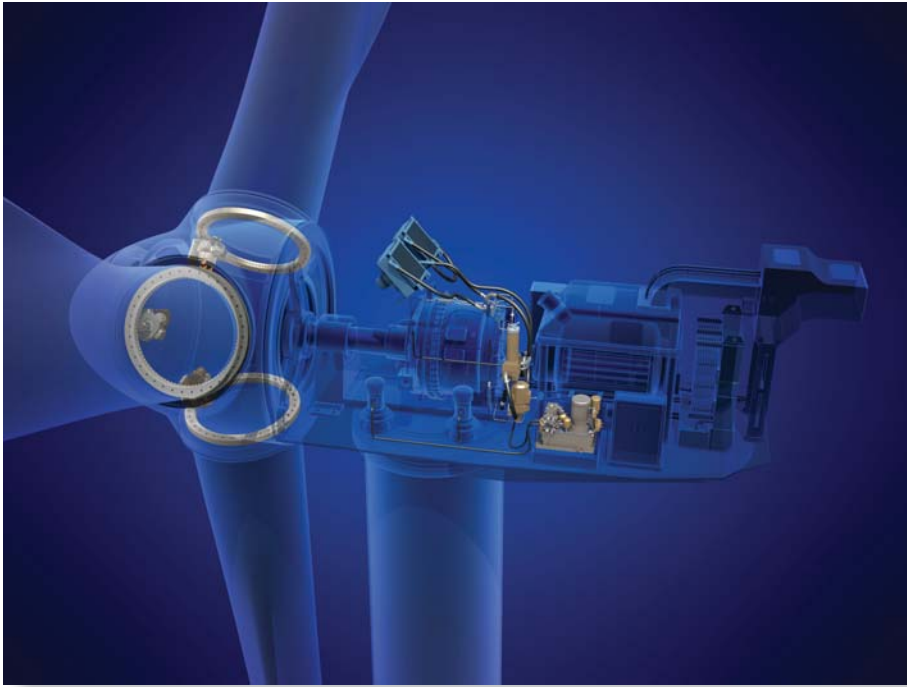
Wind Solutions

Improving wind turbine reliability and performance



ENGINEERING YOUR SUCCESS.

Together, we can improve wind turbine reliability and performance . . . one function at a time!



Parker wind solutions touch virtually every functional aspect of today's wind turbines. From integrated **Lube Oil Filtration Systems** that make drivetrains and gearboxes more reliable... to **compact blade actuation systems** that maximize rotor efficiency and minimize vibration,...to **sealing systems** that ensure bearings operate like new,... to **two-phase evaporative cooling technology** for power conversion systems, in scalable, lighter and more efficient designs, and more.

Parker has product and system solutions for wind turbine applications that impact the following functional application areas:

- Gearbox & Generator
- Blade & Rotor
- Nacelle Auxiliary Systems

Featuring:

- *Thermal Management two-phase evaporative cooling*
- *Integrated Filtration*
- *Hydraulic Power Units*
- *Hoses and Fittings*
- *EMI Shielding*
- *Conductive Coatings*
- *Advanced Diagnostic Tools*
- *Chomerics Thermal Sealing Solutions*

Experience Parker Renewable Energy Solutions today!



www.parker.com/windpower

Hydraulic Solutions

For Pitch Control & Brake Systems



◀ Hydraulic Pitch Systems

utilize heavy duty cylinders combined with integrated valve blocks and position transducers. An integrated package ensures maximum pitch control accuracy, reduced leak points and ease of service.

Specially designed cylinders, Parker's hydraulic cylinders for wind turbine applications deliver reliable performance under tough operating conditions. Typically, cylinders incorporate a manifold with control valves and feature a built-in position sensor. The system maintains selected rotor pitch during normal operation. In the event of e.g. grid loss, the rotor blades are quickly feathered.

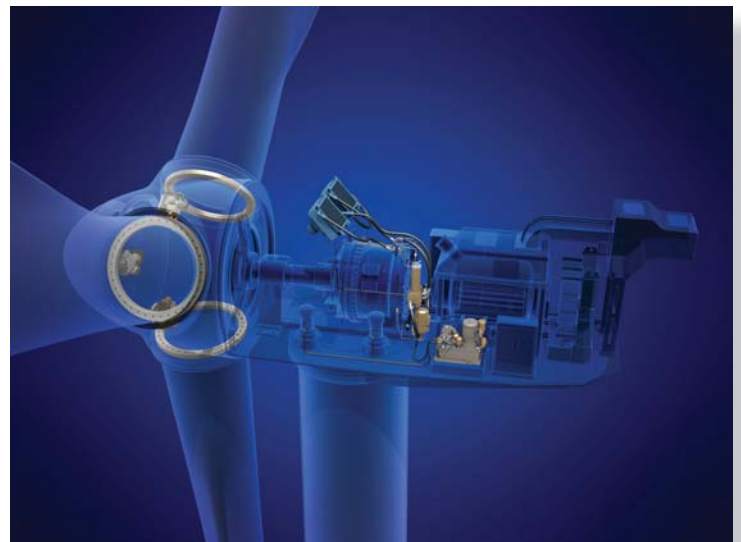
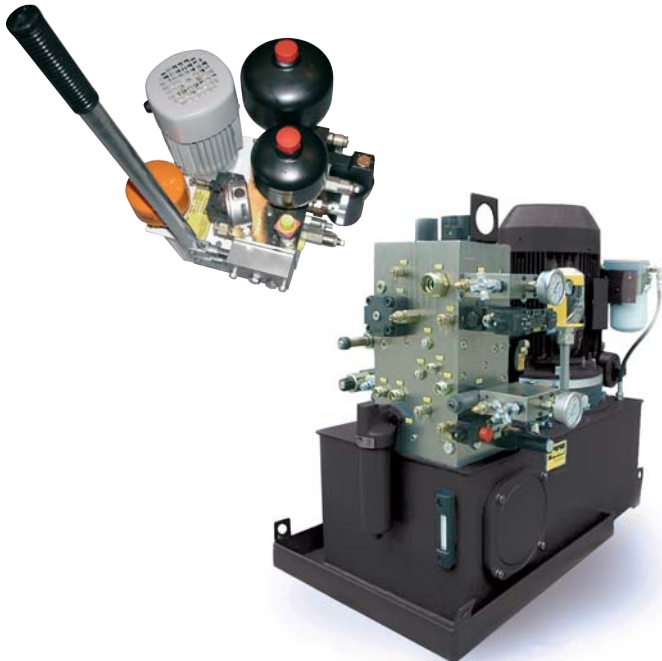


◀ Hydraulic Accumulators

encompass the industry's broadest range of piston and bladder styles. Available in steel, stainless steel, and carbon fiber construction, with optional high and low temperature seal compounds and special coatings for extreme duty service. With CE, ASME, CRN, and SELO certifications, Parker accumulators are the logical choice for maintaining or upgrading your wind turbine fleet.

▼ Hydraulic Power Units

units are designed with reliability, ease of maintenance and a wide operating temperature gauge in mind. Incorporating quality Parker valve, pump and filtration products assures the end user a package that works right the first time.



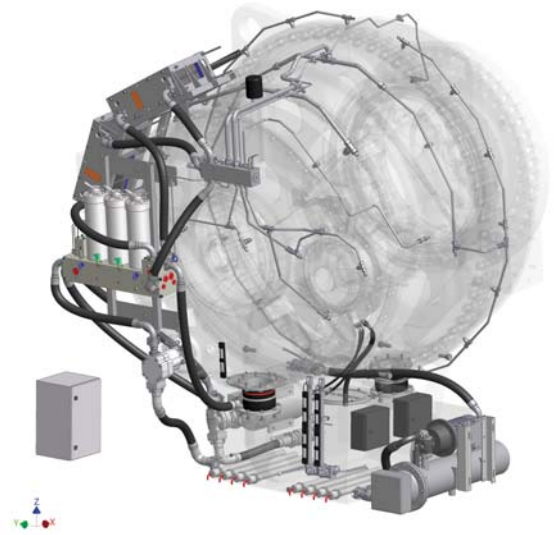
Filtration Solutions

*Integrating real-time intelligence in the gearbox filtration system
for Total Gearbox Health Management*

► Lube Oil Filtration System

Parker engineered Filtration Systems for wind turbines are proven to be effective in positively influencing the life of gearbox and bearings. Specifically designed **filter elements** extend filter element life and reduce the number of change-outs, thus increasing uptime and reducing service costs. Incorporating **sensing and communications modules** offers straightforward integration with the turbine control unit, and promotes what Parker has termed “total gearbox health management”.

Magnetic pre-filtration ensures ferrous particles are minimized in the oil circuit, thus ensuring that oil and circuit filter life are further extended, while progressive degradation in the bearing/gearbox is minimized.



► Condition Monitoring Solutions

Our **condition monitoring** systems provide accurate and real time data on the condition of the lubrication fluid, providing critical information on the health of the gearbox. This monitoring provides feedback that enables the customer to make proactive changes and preventative maintenance, saving both time and expensive repairs. The **sensing and communication modules** offer plug-and-play functionality with the turbine control unit.



▼ ParFit

hydraulic filter elements are designed to upgrade non-Parker filter housings with world class MicroGlass III media. Characterized by excellent dirt holding capacity, low clean pressure drops and high Beta ratios, the ParFit elements also give wind turbine service companies the ability to consolidate filter purchases for better inventory management.



▼ Guardian

filter system incorporates a transfer pump and high quality hydraulic filter into one compact, easy to use assembly. Ideal for service technicians, the Guardian will ensure your gearbox and hydraulic fluids are at the optimum cleanliness level for maximum uptime.



Fluid Connectors

Comprehensive solutions for demanding Wind Turbine applications

▼ Tube Fittings

are the industrial standard when it comes to durability and value. With the largest selection of English and Metric sizes, Parker Tube Fittings are the best option for the demanding environments wind turbines must survive.



► Unique Parflange® F37 technology makes welding unnecessary

With the new Parflange® F37 system you are signalling the future: from now on, non-welded tube connections for the largest tube dimensions and pressures up to 420 bar (6,000 psi) can be prepared quickly, cleanly and with reduced costs. Traditional welding is a thing of the past.



► Hydraulic Hose and Fittings

The most comprehensive range of hydraulic hose and fitting product is available from Parker to minimize your wind turbine downtime. Compounds for media compatibility, UV resistance and maximum flexibility plus standards that meet or exceed ISO and EN specifications make Parker your one stop hose source. If you need guaranteed cleanliness or special tracking numbers, Parker has you covered.



► Parker Tracking System (PTS)

Parker helps you easily identify and order replacement custom hose assemblies, faster - with an efficient barcode identification labeling system for every product, minimizing downtime. Find out more at: www.parkerhose.com

Fast. No waiting - call ahead for replacement hose assembly orders.

Easy. No need to remove your old assembly before ordering a new one.

Exact. No guessing - PTS assemblies are 100% accurate every time.

Insist on PTS tags for all your hose assemblies.



Parker Store

► Diagnostics Tools: *Senso Control*

diagnostic equipment can identify hard to detect variations in pressure, temperature and flow quickly and easily. A wide variety of mounting styles and pressure ranges makes the SensoControl an indispensable tool for all field service technicians.



▼ Subsea power cables

Parker Scanrope is a global supplier of subsea power cables and associated termination equipment to the offshore wind turbine and wave power industry. With our Engineering and Development staff, we have the experience and technical qualifications to supply customers with the necessary information for choosing the best design, customized to meet specific needs.



◀ Steel and stainless steel quick couplings

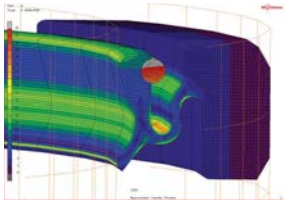
A complete range of quick couplings for any tough environment application.

Seal Solutions

Sealing and Shielding solutions for today's Wind Turbines

▼ Seals

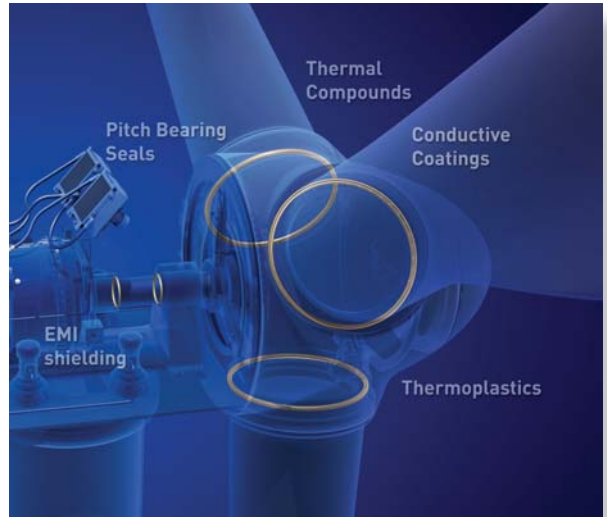
Parker's sealing and shielding capabilities include a unique combination of manufacturing expertise, materials experience, innovation and engineering excellence to fully support our customers' sealing requirements. Parker specializes in developing seals which extend the life of system components, from our non-contacting, labyrinth seal technology, to our corrosion resistant easy to install split radial seal designs. Our continuous molding technology produces O-rings in standard or custom sizes, in a variety of materials including FKM, HNBR, NBR & EPDM.



Rotary Seals



Labyrinth Seals



Thermal Compounds

Pitch Bearing Seals

Conductive Coatings

EMI shielding

Thermoplastics



O-Rings

Parker offers Pitch Bearing Seals, Labyrinth Seals and Rotary Seals

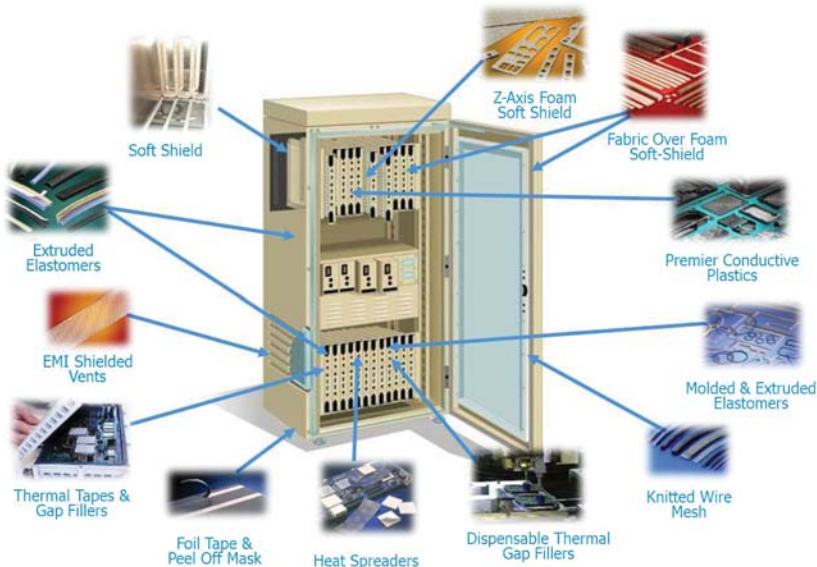
▼ Adhesives

Parker's adhesive family includes retaining compounds, instant adhesives and gasket sealants, thread lockers and thread sealants, and are effective in temperatures ranging from 50 – 1500 C



▲ Extruded Seals

Parker uses computer design simulation, material science, simulation testing and precision molding technology to create extrusions and spliced custom profile seals for challenging applications. Extruded pitch and yaw bearing seals can be vulcanized from a variety of cross sections and materials and are designed to yield high wear resistance and low torque.



Soft Shield

Z-Axis Foam Soft Shield

Fabric Over Foam Soft-Shield

Extruded Elastomers

Premier Conductive Plastics

EMI Shielded Vents

Molded & Extruded Elastomers

Thermal Tapes & Gap Fillers

Foil Tape & Peel Off Mask

Heat Spreaders

Dispensable Thermal Gap Fillers

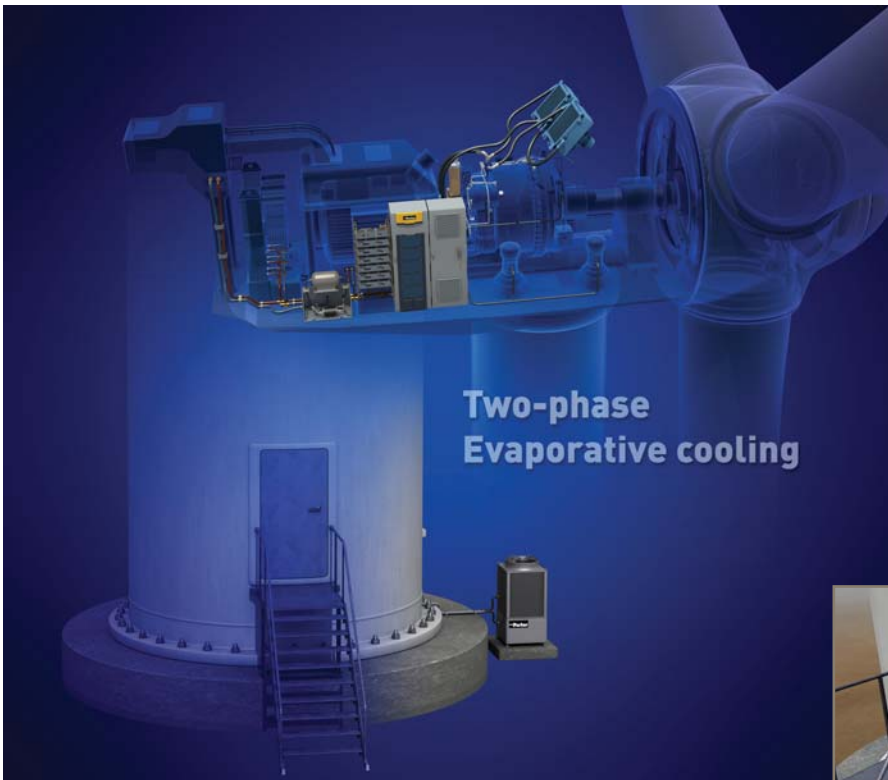
Knitted Wire Mesh

◀ Chomerics EMI Shielding and Coatings

Parker Chomerics is uniquely positioned to offer expertise in application design and products that enhance customer value through vertical integration of EMI Shielding, Thermal Management, Thermoplastic Components, Conductive Coatings and Elastomers.

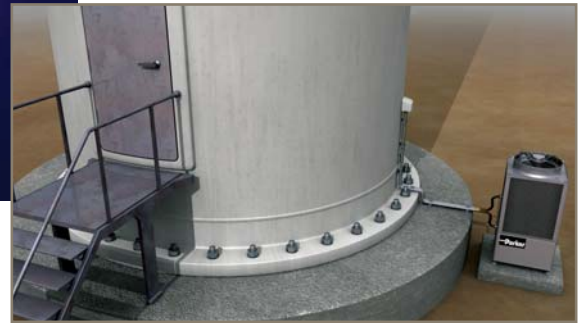
Thermal Management Solutions

Featuring 2-Phase Evaporative Cooling



Evaporative Cooling System Benefits:

- Overall lower system cost due to increased power density
 - Up to 40% higher power throughput
- Safer due to nonconductive coolant
- Reduced energy consumption
- Lower maintenance
- Scalable design -- Available in 18kW, 50Kw, 100kW or 200 kW cooling capacity
- Rack Integrated configurations also available
- Ability to mount in the nacelle, or at base tower (inside or outside mount)



NEW !

Stand-Alone Cooling Unit for wind converter and related systems

Featuring two-phase evaporative cooling



Available in a rack integrated design or as a stand-alone unit with capacities for 18KW to 200 KW of cooling, Parker's two-phase evaporative cooling system delivers!

Capable of cooling Power Conversion equipment, and other wind turbine systems including the reactor, transformer and generator, the inherent efficiencies of this thermal technology enable up to twice the power density or up to 40% higher throughput from existing electronics, at lower system cost.

Precision Cooling is ideal for large wind turbine systems that have outgrown air or water-cooled systems. Visit: www.parker.com/pc for more information.

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