



Advanced EMC
Technologies

WIND ENERGY

Sealing System Solutions



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Wind Energy Facts

Challenges of Wind Turbines

- By 2020 it is predicted that in the United States alone enough wind energy will be produced to power 25 million homes annually.
- There is an increasing need for reliability and overall productive lifespan of wind turbines requires firsthand efficient and cost-effective technology wind energy seals and bearing systems.
- Innovative robust solutions that address potentially extreme weather conditions and the mechanical challenges of wind turbines have created more demand for low friction, extended life NBR, HNBR, UHMW PE and PTFE energized seals.
- Since machines are considered only as good as their parts, the challenge lies in the industrious engineering and cutting-edge design of key components within the wind turbine system. A greater need for high performance wind power sealing solutions is impossible to ignore.
- Quality sealing or sealing systems play a key role in the overall success or failure of the wind turbine structure.
- Polymer-based spring energized sealing systems reduces maintenance costs by extending seal life beyond that of rubber and other elastomeric sealing materials
- Protecting the pitch and yaw bearings are critical in wind turbine operations because their failure is expensive. Polymer seals reduce potential failure and loss of revenues due to repairs by reducing maintenance requirements.

Wind Energy Seals



Extended Service Wind Turbine Formulated **NBR, HNBR, PTFE Seals & UHMW Seals** by Technologies

- Specially formulated NBR, HNBR, PTFE, Modified PTFE, UHMW PE blends for ultimate life.
- Polymer coated 301 Series Austenitic Stainless Steel springs for corrosion resistance.
- Split PTFE & UHMW PE seal design and elastomeric for onsite installation.
- Seal dimensions up to 110" diameter.
- Solid or segmented back up rings in PEEK.

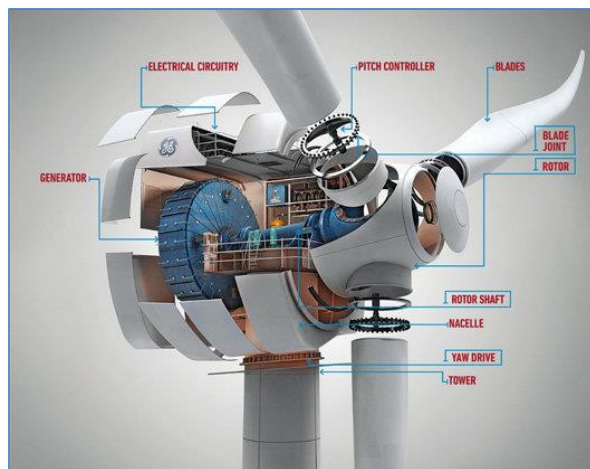


Read the facts— investigate the technology. And now check out the YouTube video at [Advanced-EMC.com/Videos](https://www.advanced-emc.com/Videos).



Sealing Solutions for Wind Power Systems

- The operating temperatures expected of a wind turbine range from -30°C in Arctic regions to $+60^{\circ}\text{C}$ in the subtropical climates. Depending on the location the installation is exposed to differing levels of ozone, humidity, UV light, dust and salt water.
- The ultimate goal of using cutting-edge design UHMW PE, Elastomeric or PTFE wind turbine seals is the increased reliability and life span of wind turbine seals, creating competitive solutions to the most challenging applications in the wind turbine industry.
- Rotor Bearings – Rotary shaft seals with a corrosion resistant steel spring are recommended to ensure effective sealing over a long life.
- Blade and Lower Bearings - Double lip seal designs are used with the inner seal elements to retain the lubricant, and the outer lip serves to deter the ingress of contaminants.

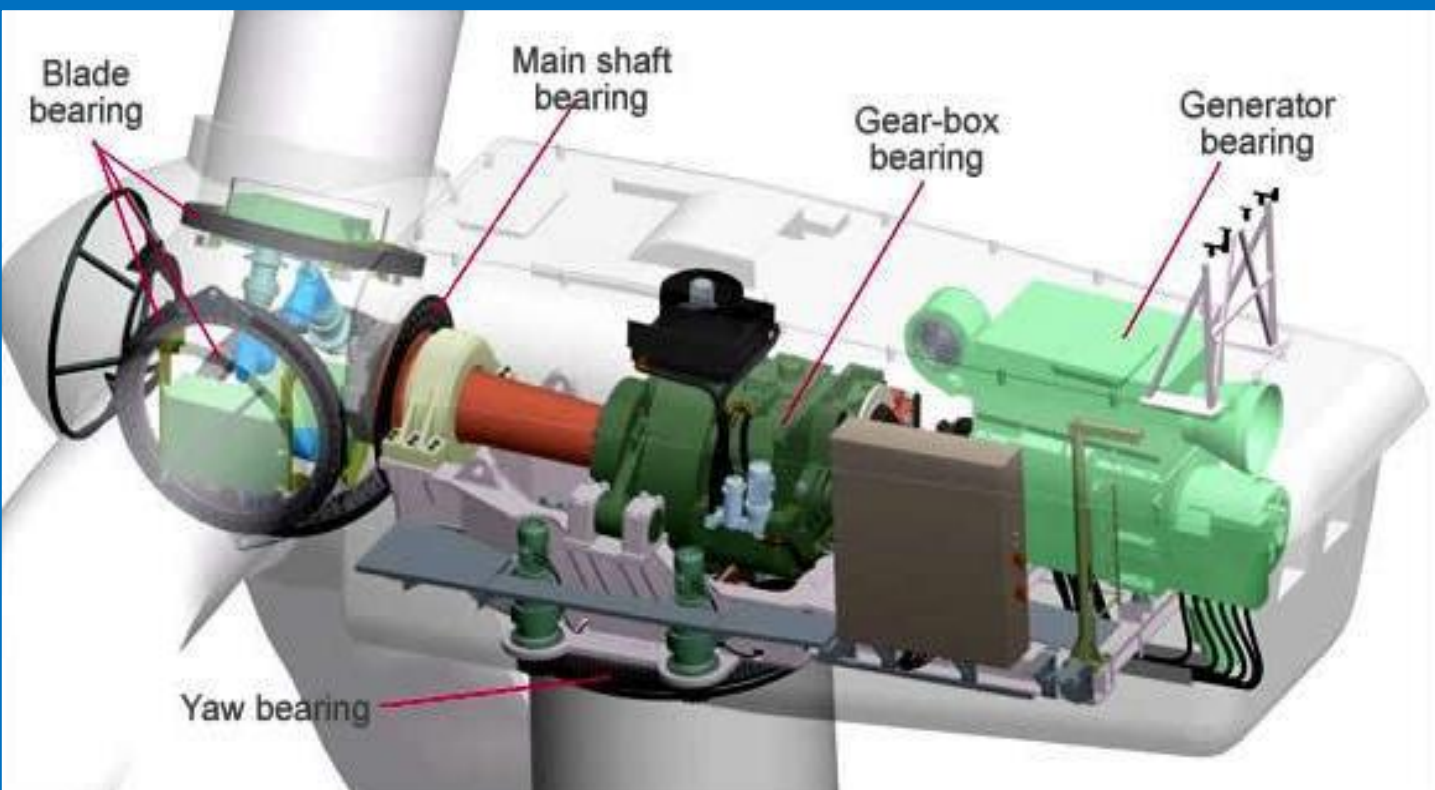
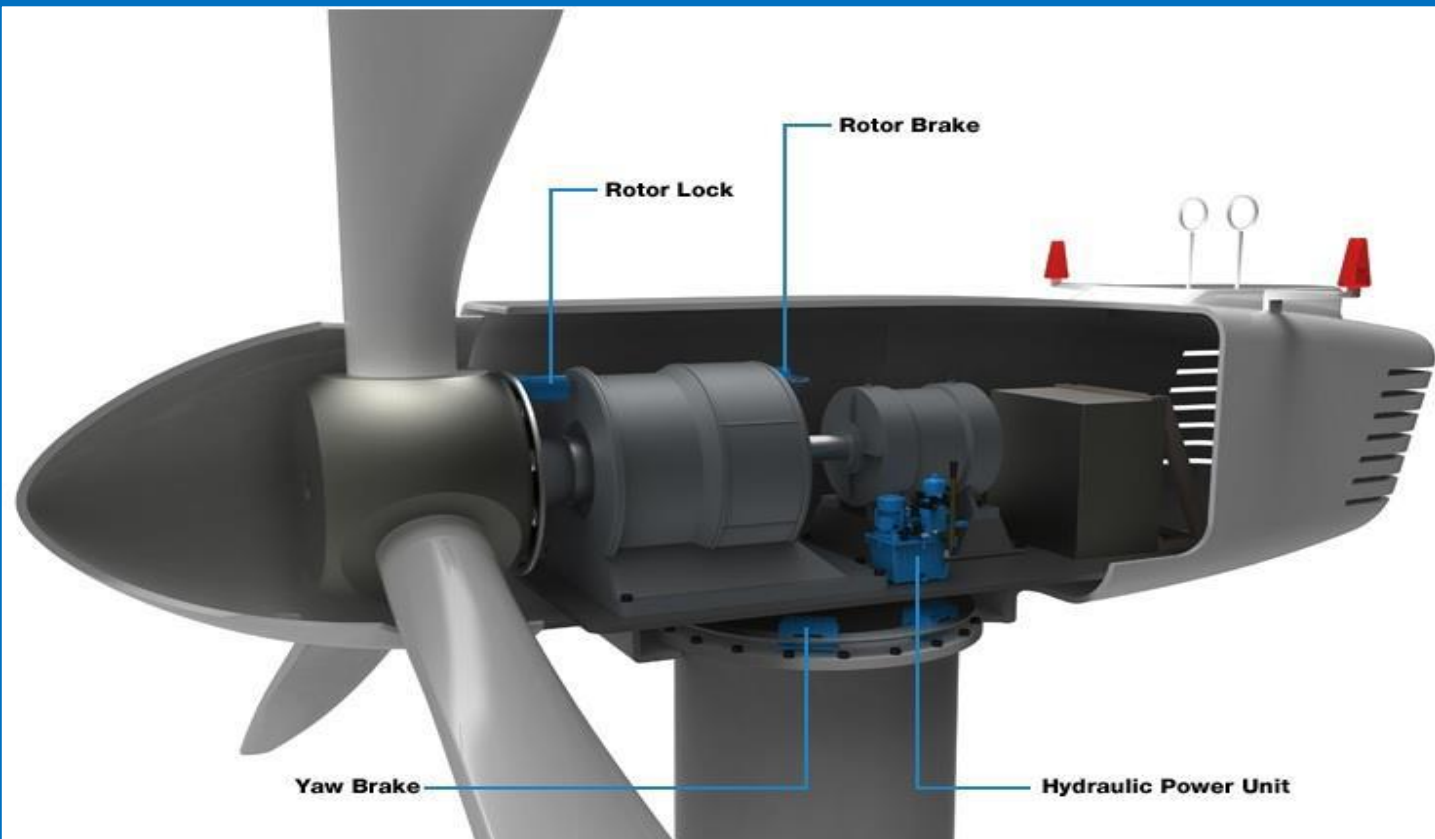


To design a sealing system to meet your custom needs contact one of our design engineers at info@advanced-emc.com

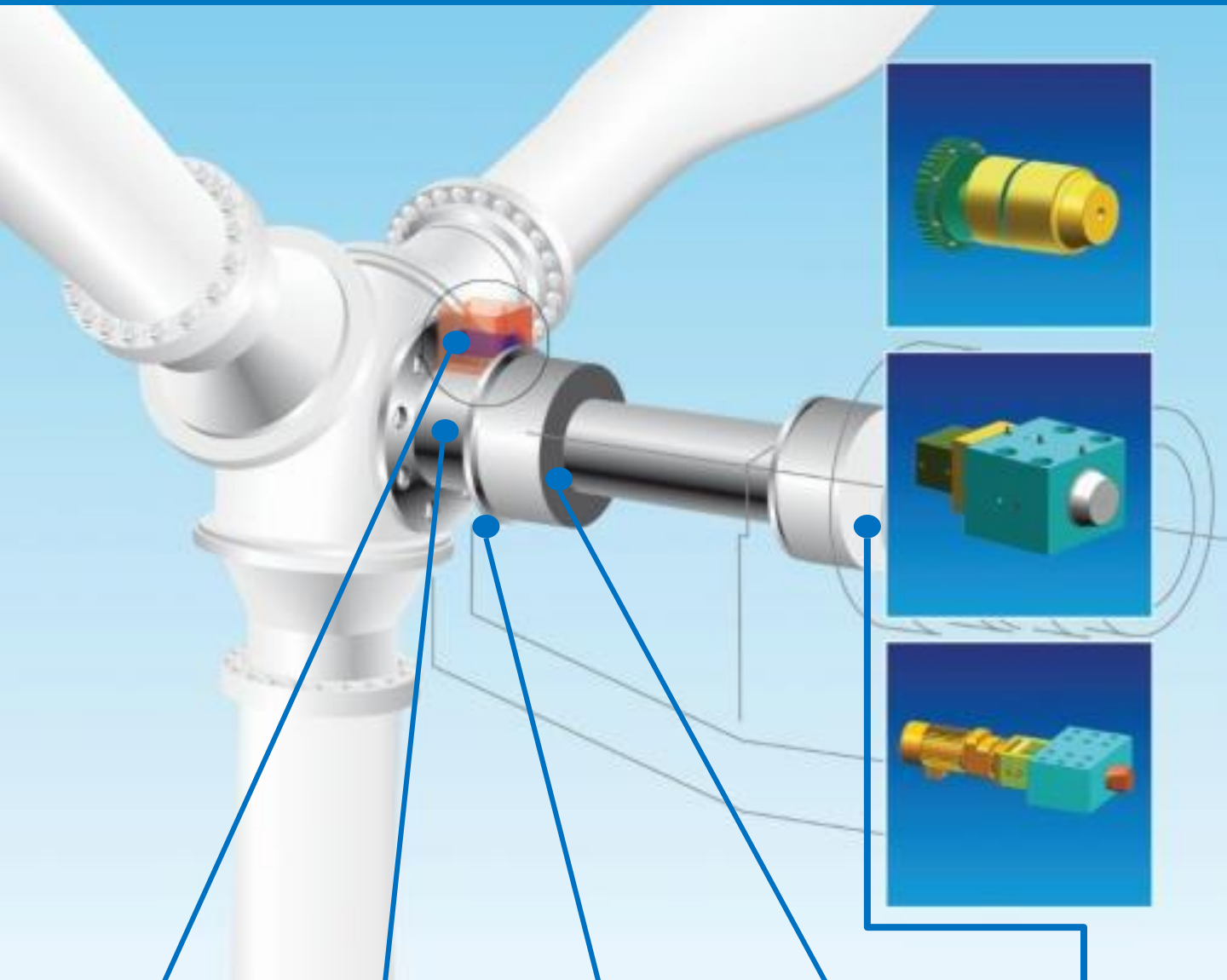
Or call us at 800 644-9770 or 713 389-5049



New Sealing Solutions in Wind Energy Technology



New Sealing Solutions in Wind Energy Technology



1

Seals for Locking the Cylinder

This seal is used to assist in locking the rotor blades in order to prevent rotation during maintenance.

2

Damping Bearings

Designed to accommodate torsional movements and axial and radial loads converting vibration energy into non-relevant force.

3

Seals for the Pitch Cylinder

A combination of dynamic seals, wear rings, and static seals serve to control the angle at which the rotor blades face the wind.

4

Seals for the Main Bearing

This rotary seal holds the main shaft in position

5

Sandwich Mounts

Designed to provide a high compressive strength and low shear stiffness to help reduce noise and control vibration during operation.



Turbine Seal Data

Many factors affect the performance and service life of PTFE /Polymer Energized Seals; accurate application or service input is critical.

1. **SIZE** – Size of the shaft, the housing bore, and width available to the seal.
2. **TEMPERATURE** – Continuous and maximum operating temperature.
3. **APPLICATION PARAMETERS** – Equipment type, misalignment of the sealing surface to housing bore and dynamic shaft run-out.
4. **MEDIA** – Type of lubricant and level of lubricant relative to the seal.
5. **PRESSURE** – Continuous and maximum pressure that the seal will be exposed to.
6. **SURFACE SPEED** –Continuous and maximum surface speed of the rotating shaft surface. This is calculated from the shaft diameter and RPM of the shaft.
7. **MATING SURFACE** – The type mating surface the seal will contact on both shaft and housing or bore, i.e. stainless steel, carbon steel.
8. **SURFACE FINISH** –The finish of both shaft and housing is extremely critical to the design.

All customer applications are not the same; therefore performance and anticipated life of seals cannot be specifically derived. The best way to determine life of the seal is to perform functional testing of that seal in the specific application. As discussed above, many factors can contribute to the success, or failure, of seals in service. This is where the advantages of [PTFE energized sealing systems](#) can be seen.

For additional information please contact us!

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