

# BLADE ALIGNMENT

## Energy Assessment

### Type Testing & Technical Expertise

## Test Site Operation

When the power performance of your turbines and wind farm is off, you know it. The question is, what's the cause? It might be your rotor blade alignment.

## Correct blade angle is essential to maintaining consistent and optimized turbine power performance.

windtest north-america, in cooperation with WIND-consult, will determine whether your blade angles deviate from their OEM setpoints without the financial costs and operational losses of a full battery of power performance tests.

We offer contact-free, laser-optimal, 3D scanning of rotor blade geometry for precise angle measurements, within 0.2°. We can verify if your blades need adjustment and eliminate their alignment as a possible contributor to power performance reductions.

In addition to boosting performance, precise blade alignment can also reduce noise emissions and loads on the wind turbine. So not only will you avoid unnecessary expense, but you'll also be able to get your turbines back to optimal operation as quickly as possible.

**By any measure, you'll have the data necessary for keeping your blades angled as precisely as they need to be.**



## WHY WINDTEST NORTH-AMERICA?

### Accredited Expertise

We offer accredited services in accordance with ISO/IEC 17025 and adhere to the latest national and international standards.

### Experienced

Our parent company, windtest grevenbroich gmbh, has been serving clients around the world for more than 25 years and in North America for more than 15. All told, we've completed thousands of measurement and evaluation projects.

### Blade Alignment Leader Cooperation

We are the exclusive North American partner of WIND-consult, the company that pioneered blade alignment measurement technologies and processes. WIND-consult has completed more than 1,200 blade alignment projects for OEMs and wind farm owners/operators around the world.

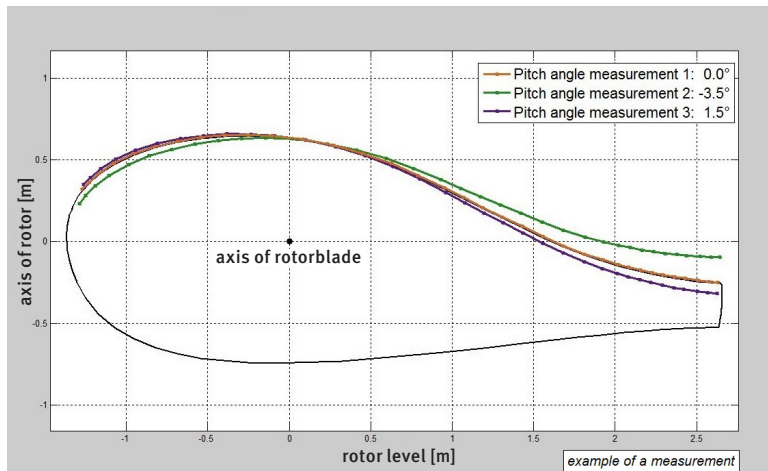


## Getting Back to the 0° Setpoint

We measure your blades from the ground at a distance of 100 to 300 meters. To ensure precision, wind speeds need to be minimal, the turbine must be stopped, the blade being measured has to be perpendicular to the ground and it must be set at the 0° pitch angle position (control target). Measurement precision also depends on variations of each wind turbine's components.

We detect the entire profile of each blade's area of maximum chord at specific measurement points from leading edge to trailing edge. Scanning all three blades takes a half to a full day.

We analyze the resulting 3D coordinates in a CAD model. With a CAD design profile, we can calculate the angle offset absolutely. Without one, we can still determine the blade angle to identify possible aerodynamic imbalance.



*A comparison of the profile cut CAD-Data provided by the manufacturer and the three laser scanned surfaces of the blades.*

### See How We Measure Up

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