



Blade Optimization





POWERED BY BOULDER IMAGING



Wind turbine design engineers need to accurately predict how turbine blades behave under various operating conditions in order to optimize design and efficiency. **Boulder Imaging** (BI) provides the ability to **monitor**, **image** and **measure** how wind flows across blades while in motion. The results are used to continually optimize performance as turbines grow in size and energy output.

Boulder Imaging is uniquely qualified in the area of sophisticated, high throughput image acquisition and machine vision processing technology, enabling our customers to effectively analyze turbine blade flex and twist. Our software performance is enhanced by two decades of experience delivering inspection solutions and high-speed image acquisition for NASA, the Department of Defense and industrial products manufacturers.

Specific blade optimization capabilities include:

-  Inspection of substantial objects (measuring over 30 meters/150' in length) that reside outside and are exposed to weather and to highly variable lighting (varying with blade rotation, time of day, and season)
-  Precise measurements of flex and twist of turbine blades to an accuracy of 1mm and 1/10°
-  Real-time feedback on how wind turbine blades correlate to wind speed, direction, energy production, and efficiency – allowing engineers to make immediate design adjustments
-  Comprehensive reporting capabilities, extensive results and highly rich data in non-proprietary formats make for customizable and easy access to results and data.



BLADE OPTIMIZATION Powered by Boulder Imaging:

- Measures every 10Hz
- Time stamps images to +/- 2 millisecond of any time code
- Utilizes cameras built for all lighting conditions
- Incorporates storage for 4 hours of live video and up to 50 hours of archival video

	Loc 1	Loc 2	Loc 3	Loc 4	Loc 5
Distance from Blade Root Face [m]	39.1	45.4	50	52	55.5
Displacment Measurment Accuracy [mm]	0.87	1.02	1.12	1.19	1.25
Angular Measurment Accuracy [degrees]	0.18	0.18	0.21	0.26	0.43



**BOULDER
IMAGING**

TRANSFORMING PERFORMANCE THROUGH MACHINE VISION

By leveraging machine vision technologies perfected for the defense, aerospace and industrial products industries, Boulder Imaging offers a growing suite of integrated systems and software that "Inspect the Unexpected™". From the manufacturing lines of flooring and ceiling tile producers to the precision printing of banknotes or rugged wind farm environment, our inspection technology provides revealing visual data for our clients.

SUPERIOR CUSTOMER SERVICE AND PROJECT DELIVERY

While we are proud of our technology, we are also passionate about our customer care. Boulder Imaging supports you as a trusted partner throughout the life of your business. Our staff is composed of some of the industry's most experienced software, optical, and mechanical engineers. Further complemented by highly qualified, versatile and experienced project managers, trainers and field application engineers, our staff acts as an extension of your team to help you every step of the way.

To learn more, visit our webpage at www.boulderimaging.com or email us at sales@boulderimaging.com.