

Measuring deflections in a wind tunnel



This case study highlights how Mobius can measure remote deflection in a wind tunnel for multiple points simultaneously and compensates for secondary movement on a moving rigid body.

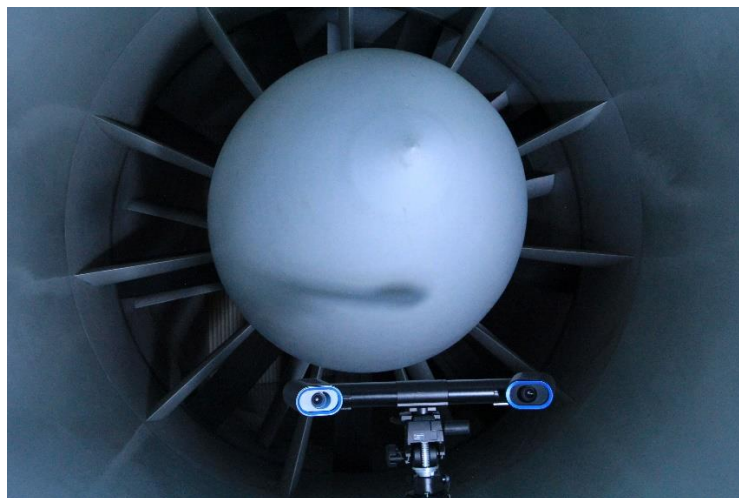
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Challenge

Testing in wind tunnels is a complex and critical task for several sectors. None more so than in aerospace or motorsport. The smallest deflection of components can significantly impact performance. Therefore, accurately measuring these deflections without unknowingly affecting them is critical to validating the computer simulations and delivering the intended characteristics of the aircraft or car. The desired deflection to be measured can also often be masked by the overall motion of the test object.

Solution

Imetrum's industrial Measurement Head Mobius provides highly precise 3D measurements of the deflections of objects and structures.



Mobius has the advantage of delivering the deflections of multiple points with micron level accuracy remotely in a position out of the airflow. This delivers a true reading for the deflection of each point measured from a single device.

It is supplied as a fully integrated, pre-calibrated unit and combines class-leading accuracy and resolution with the most data-rich output of any 3D Digital Correlation system (DIC) on the market.

Using the Rigid Body Motion Correction functionality in Video Gauge™, the large motions of test objects can be compensated for. Delivering a true measure of deflection. Using a set of reference points on the rigid body, all measurements made are compensated in real time and reported in the desired coordinate frame.

Results



A single Mobius can replace a host of physical contacting sensors that would affect the characteristics of the object under test and lead to false results. This remote nature further saves setup time and complexity and results in an increased test throughput.

The Rigid Body Motion Correction feature allows for the compensation of movement of secondary reference points relative to the main target. This allows for motion compensation when there are additional moving components creating a pitch or roll on the structure affecting the relative movement of your actual target.

This results in the ability to measure even the smallest of deflections during a test on a moving object. This additional insight can provide the necessary data to validate the design of the smallest of details as a part of the whole design.

Visit the website page: <https://www.imetrum.com/case-studies/measuring-deflection-in-a-wind-tunnel/>