APPLICATION DATASHEET

Leading Edge | Handheld

INSPECTION PROBLEM

The leading edge of a vane or blade used in aircraft or power system engines must maintain its designed contour within an acceptable range for safe and efficient operation of the engine. Measurements that are critical include the edge radius and the width or thickness of the blade at varying distances away from the edge.

Previously, the only reliable method of inspecting the blade was to use a coordinate measurement machine (CMM). However, this process is very time-consuming and requires each part to be transported to a central location for inspection.

REQUIREMENTS

Measurements – The leading edge inspection algorithm utilizes engineering data to configure a template and match the part to the template at multiple locations. The leading edge is accurately scanned to ± 0.0005” and compared to the template to determine if the contour falls within the acceptable range. All out-of-spec conditions are noted graphically and numerically on the display.

Instrument – Blades are inspected before they are put into service. They are also inspected during regular repair cycles. If it is important to be able to use the inspection instrument at different locations in the production facility and at different stations in the repair center, the portability of the light-weight Leading Edge Hand Held sensor is an ideal solution.

LASERGAUGE® SOLUTION

LASERGAUGE® SYSTEM

A unique imaging approach, called cross-vector, was adapted to give the sensor the capability to simultaneously capture surface data around the leading edge and on both sides of the blade. The handheld sensor model HS730LE-F04, has a 0.250" setback range while the HS733LE-F02 has a 0.150" setback for smaller blades. “Setback” is the distance from the tip of the blade to the furthest point on each side that can be scanned. Anything beyond this is unseen by the sensor.

The sensor connects via a USB cable to a laptop running the Windows™ 10 operating system. The sensor captures the image and sends it to the computer for processing by the Leading Edge software.

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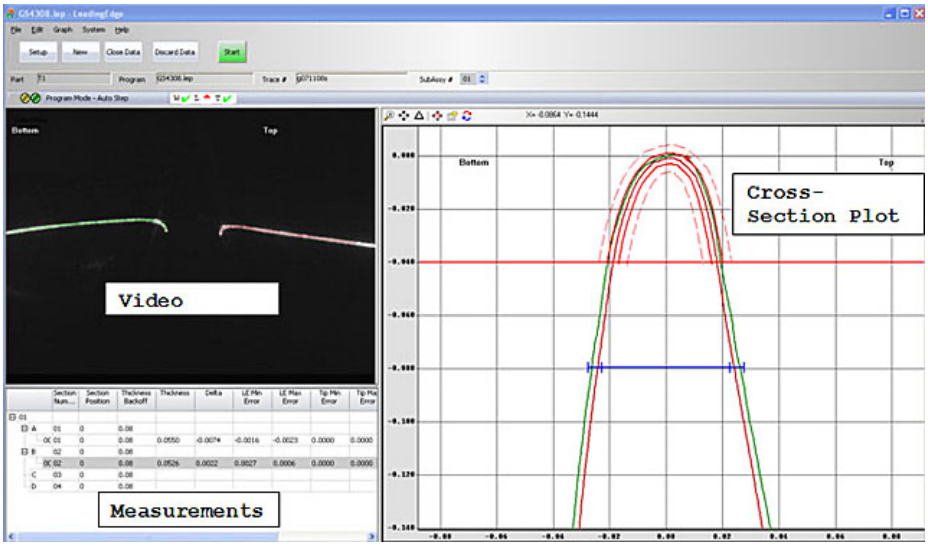
OPERATION

The sensor is positioned on the blade at the desired starting point, then scans are taken with multiple distances from the leading edge by pressing the trigger button on the sensor. The raw scan of both sides of the blade is shown in the display, and the combined plotted profile of the blade is shown as well.

MEASUREMENTS

Made automatically as the operator scans the blade and are associated with a user-defined section number and position. The measurements include:



- Thickness of the blade at the selected offset distance from the leading edge and the delta difference. Up to 10 thickness calculations are available.
- Leading edge MIN and MAX error relative to template.
- Tip MIN and MAX error relative to template.

DOCUMENTATION

Data displayed in the table can be saved as documentation of the measurements. A scan or profile can also be saved to a file. The file is a flat tabular file with x,y,z coordinates of each point in the scan, with the x value representing the position along the blade.

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