

# GE90 FAN MAINTENANCE



## NON CONTACT DIMENSIONAL MEASUREMENT SYSTEM

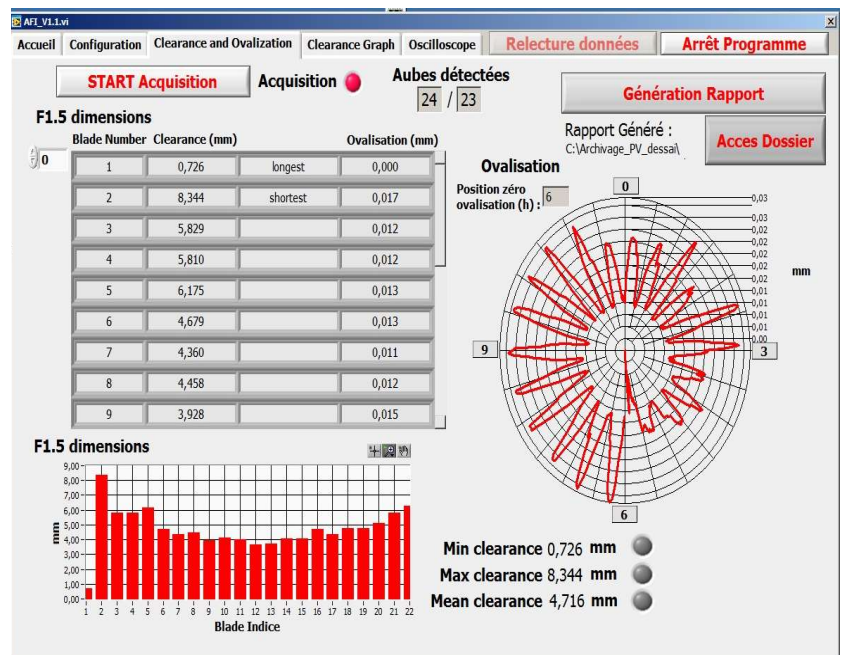
This system is dedicated to simultaneous blade tip clearance and abrable profile measurements

- Easy to use, suited to all GE90 series engines
- Complete MRO system from capacitive probes to data acquisition and analysis
- Full install and measurements done in less than 4 minutes (rotor moved by hand)
- Menu driven software, password protected for modification like calibration curve
- +/- 0.01 mm accuracy; 6 mm range for BTC; 3 mm range for abrable profile
- Automatic report edition with out of range pinpointed
- UPS for ac power off using
- Suitcase fitted with wheels for easy carry out

*Even during normal use, large engine like GE90, can ingest foreign objects or dust and sand. This may cause some damage at input fan blades and resin abrable surrounding casing.*

*In such situation, it is mandatory to control the blade tip clearance and the profile of the abrable. These measurements are very important because if values are out of limit, it is necessary to remove the faulty blade and renew the abrable. Using non-contact measurement, this verification takes a few minutes compared to hours with contact measurement.*

Measurement system included in a suitcase



Blade Tip Clearance & profile MMI

One of the maintenance operations on huge input fan engines such as the GE90 consists in checking the blade tip clearance (titanium / carbon composite) on the one hand and the concentricity of the abradable made with epoxy resin on the other hand.

To date, these checks are carried out manually using different Johnson block. This operation is long and it is observed that the results may differ from one operator to another. In order to reduce intervention time and eliminate dispersion among operators, a world-class aircraft manufacturer decided to automate the process.

These dimensional measurements (blade tip clearance and concentricity) are carried out using capacitive sensors. This technology has been chosen because it works equally well on conductive targets such as blades and insulating targets such as abradable (epoxy resin). The sensors are connected to capacitive conditioners themselves connected to analog-to-digital converters. The digitized signal is processed by a specific software which translates the values processed in distance thanks to the calibration curves previously loaded in the software. Finally, an Excel macro allows to edit a final report and pinpoint any anomalies that require intervention on the blades or the abradable.

This new means has therefore saved time and eliminated the uncertainties between operators.

## OTHERS CAPAAB CAPACITIVE PRODUCTS

- ⇒ MEDIUM BANDWIDTH DISTANCE OR CAPACITIVE MEASUREMENTS (0 to 20 kHz)
- ⇒ HIGH BANDWIDTH CAPACITIVE MEASUREMENTS / COAXIAL PROBES (0 to 220 kHz)
- ⇒ MEASUREMENT OF ROTATION SPEED ON CONDUCTIVE OR NON CONDUCTIVE TARGETS EITHER IN GAS OR LIQUID ENVIRONNEMENT (FROM -270°C to 1300°C)

220518b edition



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