Shearography: A fast optical NDT Method for Composite Inspection
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Non-Destructive Inspection With Shearography

- Technique to identify defects in almost any material
- Slightest surface excitation leads to surface deformations from the internal flaws
- The shearography system can detect these very small deformations
- Full-field, non-contact technique
Principle of Shearographic Measurement

= Differential displacement (between sheared points)
Typical Result

- core
- skin
- defect
- loading

Deformation of surface

Gradient of deformation
Standard Q-800 System

Q-800 Shearography Sensor for various applications in production or in-Field

• Variable field-of-view

• Lightweight

• Compact design

• Any excitation method

For most materials no surface preparation required
Q-810 Vacuum Hood System

Q-810 portable Shearography System for applications in production or in-Field Service

- Large area coverage (15sqm/hr)
- Hood mounted touch-screen monitor
- Thermal and vacuum loading
- Lightweight
- Long cable connection >20m
Application Example of Portable Inspection Hood

Shearography Inspection on AWACS
Mobile Shearography on Aircraft
Testing of Blades
Examples of Defects

- Porosity
- Delaminations
- Disbonds
- Core masering
- Hole in leading edge
Lightning Damage

- Strong material with visible lay-up direction
- Large deformation measured
- Boundary of damaged material
Overloaded blade

Visible cracks
Wrinkles

Many transverse wrinkles found

Some cracks visible in gelcoat (yellow)
Examples of Wrinkles/ Waving

Image 5: Typical results of wrinkles in a laminate
Summary Shearography on Blades

High Speed inspection for large areas

In Field Inspection Systems

Wrinkling Detection

Certification according to all main NDT standards since 2008
Large area Inspection

Hull 20mm at keel down to 12.5 mm thick - Rovimatt 120
Automatic Robot System for Aerospace
Robotic Inspection system

- Robot installation, control room and new measuring head
- Combination of thermal and vacuum loading
Results

Part with defects

Part without defects
Thank you for your attention!

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