

INFRARED THERMOGRAPHY

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NDT method for aerospace composites



Fig.1 Belgian Airforce AlphaJet

This study contributes to highlight the most prominent types of discontinuities seen in aerospace composites search as porosity, wateringress, disbonds or delamination, impact damage during the taxi or caused by birdstrike or by a tool during maintenance and, finally, inclusions.



Fig.3: Thales Military camera - CMT detector - LWIR : 8-12 μm

Then a complete signal processing is studied using time based information, spatial filtering and finally advanced post processing using automatic defect detection algorithm.

The research introduces thermography as new inspection method for composite parts testing in aircraft maintenance.

It is here proposed to investigate, compare and quantify the different possibilities to use thermography instead of radiography or ultrasonic testing on military aircrafts.

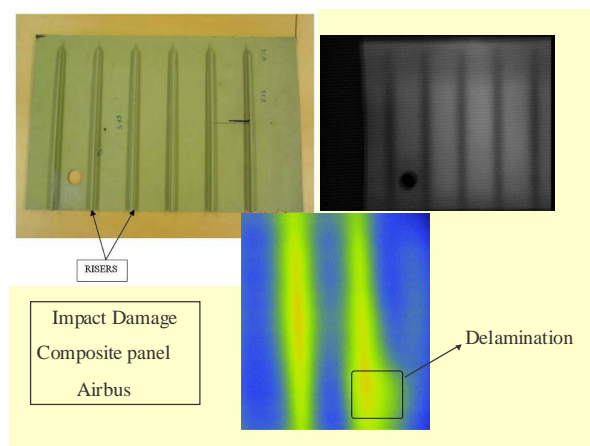


Fig.2 impact damage on a composite panel

The idea is to use conventional thermal imagers usually employed for night surveillance capable of measuring a very faint difference of temperature (less than 80 mK) and capable of delivering a high frequency video signal used to increase SNR.

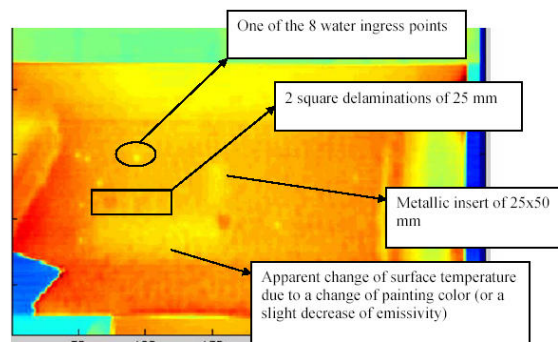


Fig.4 Time averaging IR image showing 8 water ingress points and 3 square delaminations

