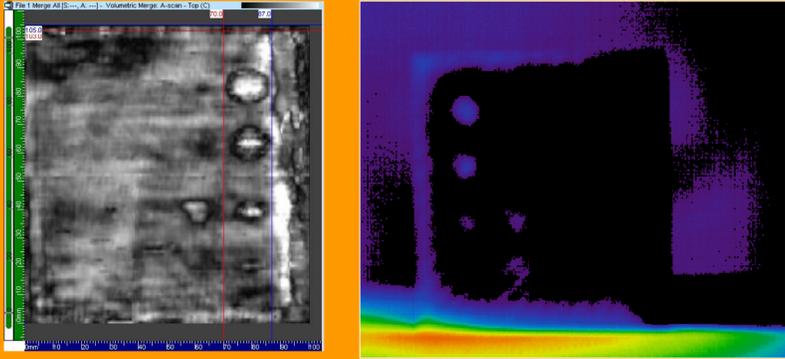


# Comparison of thermography and ultrasonic Non-Destructive Testing methods in carbon fibre plates.



Blind drilled carbon fibre plate – Ultrasonic C-Scan (L) and Thermographic (R) analysis

## Introduction

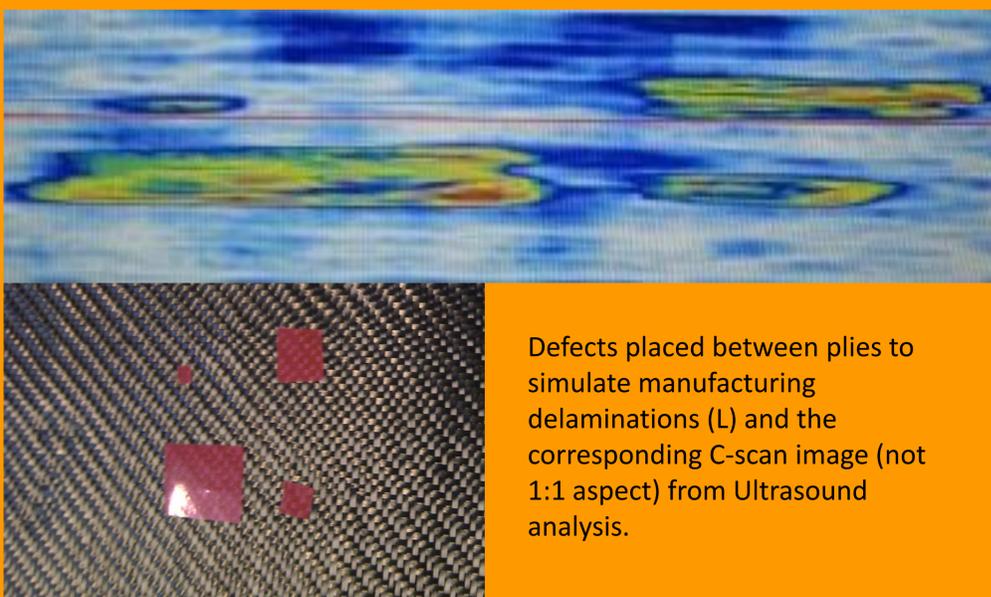
Composite materials are increasingly being used within modern industry. Aircraft, boats and high performance cars are all being manufactured from carbon fibre composites. Babcock Marine has developed an Ultrasound method for examining Fibre Reinforced Plastics (FRP) plates and the aim of this study was to compare a basic thermography method with the Babcock method, to identify any possible industrial uses of thermography.

Many modern aeroplanes, boats and high performance sports cars utilise composite materials. The combination of thermography and ultrasound testing could be used to speed up quality control and damage inspection processes

## Methodology

A basic thermographic method was compared to an established Ultrasound method developed by Babcock Marine. A range of plate thicknesses were tested, these plates contained a variety of defects

Fine glass inclusions and simulated kissing contacts were detected and measured using the Ultrasound method, however the Thermography was unable to detect either of these defects.



Defects placed between plies to simulate manufacturing delaminations (L) and the corresponding C-scan image (not 1:1 aspect) from Ultrasound analysis.

## Results

The thermography managed good result in the detection of BVID resulting from the drop test, however in all other tests the ultrasound method proved superior, both in terms of defect detection and sizing.

## Conclusions

Ultrasound analysis is more time consuming and requires larger amounts of manpower than the basic thermography it was compared to in this study, it is however more capable of locating and sizing defects in carbon fibre reinforced plates. Thermography could potentially be used to find areas of interest in the plates more quickly, allowing targeted use of the ultrasonic method and reducing overall testing time.

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