



COMPOSITE
INSPECTION

A DIVISION OF MINTON, TREHARNE & DAVIES GROUP

ADVANCED NON-DESTRUCTIVE TESTING SOLUTIONS

FOR THE MARINE, AEROSPACE, RENEWABLES
AND AUTOMOTIVE INDUSTRY SECTORS.

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NON-DESTRUCTIVE TESTING

The Engineering Services Division of Minton, Treharne & Davies Ltd brings together all the applicable Non-Destructive Testing (NDT) methods and techniques to form a coherent material and structure based inspection service specifically for composite materials. We are a multi discipline Non-Destructive Testing

Team working in the Marine, Aerospace, Renewables and Automotive industry sectors. We offer what we believe is the broadest range of testing technologies and techniques delivered by experienced technicians who are trained and qualified to aerospace standards.

DIVERSE EXPERTISE



COMPOSITE
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COMPOSITE INSPECTION

THE COMPLEXITY OF COMPOSITE MATERIALS AND STRUCTURES, COUPLED WITH A VARIETY OF POTENTIALLY DEFECTIVE MATERIAL CONDITIONS, REQUIRES THE SELECTION OF DEDICATED NDT SOLUTIONS.

To inspect these materials effectively, we use a full complement of technologies as part of our “*toolbox approach*” which allows us to use the best method for the area under inspection. These include:

Rather than offering the strengths of one particular technology, our flexible approach ensures that we can design solutions to examine the full range of materials, components and structures for their integrity.

- ⊕ Laser Shearography Inspection
- ⊕ Thermographic Inspection
- ⊕ Ultrasonic Testing
(Conventional and Phased Array technology)
- ⊕ Mechanical Impedance Analysis
- ⊕ Bond Testing
- ⊕ Radiographic Testing
- ⊕ Liquid Penetrant Inspection
- ⊕ Remote Visual Inspection
- ⊕ Eddy Current Inspection



GLOBAL REACH ACROSS MULTIPLE SECTORS

NDT inspections are essential in a wide variety of fields where high end composite materials deliver the strength to weight ratio designers need. There are applications for these materials in every sector of industry and life, they range from racing yachts, to space craft, Formula 1 racing cars, to medical devices.

Hulls

Non-Destructive Testing of Composite Sandwich Structures – The use of composites in marine craft construction is well established. The strong, lightweight designs that utilise composite sandwich structures rely on the skin to core bond being sound, when in reality it can have inherent defects. Laser Shearography is an advanced NDT method which provides a rapid, sensitive inspection which detects these types of defects in a wide range of composite sandwich structures. Inspection

of a hull during construction allows the builder and the owner to have confidence in the build quality.

Once in service, repairing dis-bonds or voids in the structure often becomes an expensive exercise. An accurate understanding of the condition of the hull material allows the design team to use a targeted, faster, and more cost effective repair program to get the boat back in the water sooner.



Bonded Joints

Specific techniques have been developed to maximise the capability for inspecting bonded joints which often present unique challenges. Ultrasonic “pitch and catch”, Acoustic, Resonant, Harmonic and Mechanical Impedance principles provide tools for effective Bond Assessment.

Ingress of Fluids

The presence of water in any of its forms (gas vapour, liquid or ice) promotes corrosion, cell breakage and induces composite layer delaminations and skin disbonds. Ingress of fluids into Honeycomb Structures can be readily detected by passive infrared thermography using high-resolution thermal imaging cameras.

Masts

Non-Destructive Testing of Carbon Laminate Structures – The success of high strength, low weight carbon laminate structure is well proven in the highly regulated Aerospace industry, and its use continues to expand into the primary integral aircraft structure, where failure is unacceptable. Its success is supported by tightly controlled manufacturing protocols and robust testing regimes.

In transferring the use of these materials into the marine industry, it is essential that similar practices are adopted to ensure design criteria are met, and to give confidence in the integrity of the build and condition of a mast.



Testing masts, or any carbon laminate structure, is normally undertaken using advanced high frequency ultrasonic techniques. Whilst these may be varied, the use of the medically developed “Phased Array” technology leads the way in providing rapid high resolution inspection. Like medical “Ultrasound,” Phased Array technology produces a highly visual image of the internal structure of the component.

Manufacturing Defects

Voids, ply wrinkling, inclusions, folds in the material, fibre rich and resin rich areas can be identified with the use of the “tool box” approach.

Metallic Fixtures and Fittings

Long established Non-Destructive techniques such as high sensitivity Fluorescent Penetrant Inspection, Fluorescent Magnetic Particle Testing and Eddy Current Testing provide excellent testing and inspection methods for the examination of the wide variety of metal-based components used in marine vessels.

Accidental Damage

After an incident, the designers need a rapid and accurate assessment of damage to plan repairs. They need to know the extent of delaminations, far side dis-bonds and bulkhead separations. The speedy quantifying of the extent of damage, allows the costing and designing of appropriate repair schemes. Impact damage to marine sandwich composite structures often

has a far greater effect at the inner skin bond-line than is visually estimated. Fully understanding the damages caused by the incident is crucial to ensure the vessel is seaworthy after repairs.

Training & Certification of NDT Inspectors

The correct application of NDT technologies is vital to the successful detection of defects. The training, experience and qualification of NDT inspectors is controlled by international specifications to ensure high standards are maintained. ISO 9712, BS EN 473, BS EN 4179, and SNT-TC-1A mandate minimum standards for all NDT Inspectors.

All our inspectors comply with one or more of these standards. Our inspection team have over 30 years experience of aerospace and marine NDT, and unrivalled experience in Laser Shearography inspection of marine composite hulls, masts and superstructures. MTD is a long established testing company with the skills, engineers, resources, and commitment to stay at the forefront of composite inspection.

For further information or to arrange a meeting with a member of our team, simply call us on:

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