

WrapIt

Flexible Phased Array Scanning Tool



WrapIt is a conformable ultrasonic phased array probe that can be wrapped around a curved geometry to quickly inspect along a component.

The flexible array transducer is housed in a rubber enclosure that both protects and pre-forms the array whilst allowing the adaptability to scan parts with changing curvature.

Benefits

- Conforms to the shape of the component or inspection surface
- Simple inspection setup as probe is always normal to the surface
- No adjustment needed when scanning a changing radius
- Cost effective for multiple geometries as a single transducer can be used in several housings
- Compatible with standard phased array instruments

Patents pending
PCT/GB2011/052031
PCT/GB2013/052059



Applications

Typical applications for WrapIt include curved composite laminates found in:

- **Aerospace:** wing spars, aerofoils, stringers, leading edge
- **Marine:** mast, hull, rigging, rudders
- **Wind Energy:** blade spar, leading edge
- **Motor Sport:** Chassis, suspension and aerodynamic components

WrapIt is a conformable probe designed for the inspection of radii and curved surfaces. At the centre is a truly flexible ultrasonic phased array transducer that operates on both concave and convex surfaces.

Surrounding the array is a two-part rubber enclosure that is set to a nominal curvature. The rubber housing is adaptable and functionally it confines the flexibility in order to protect the array from potential damage of being over-flexed. The array can be easily interchanged between rubber housings to scan different radii. Every housing is suitable for inspecting a range of radii without any mechanical adjustment required.

Attached to the WrapIt is a wheel encoder positioned to run on the radius so it is clear of panel cut outs and gaps. The high resolution encoder is waterproof and sprung loaded onto the part giving a stable and reliable operation.

WrapIt incorporates low friction plastic skids to provide stability and a smooth scanning motion.

Within WrapIt, between the array transducer and the component is a flexible rubber delay line. This is accompanied by couplant irrigation channels that feed water to the front face of the probe providing consistent continuous coupling of the ultrasound.

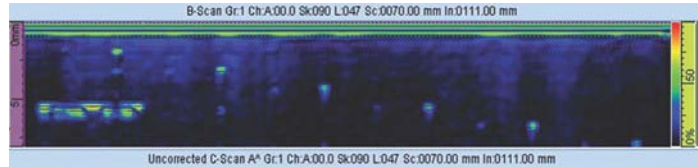
Features

- Flexible array transducer for use on concave or convex radii
- Rubber housing set to nominal geometry, limits the variation for protection against accidental damage
- Waterproof encoder (33 steps/mm)
- Frequency 1-10MHz
- Number of elements 8, 16, 32, 64, 128
- Element pitch 0.3-2mm
- Minimum bend radius is dependent upon the frequency and size (e.g. 5MHz, 1mm pitch achieves $\pm R15\text{mm}$; 10MHz, 0.3mm pitch achieves $\pm R3\text{mm}$)

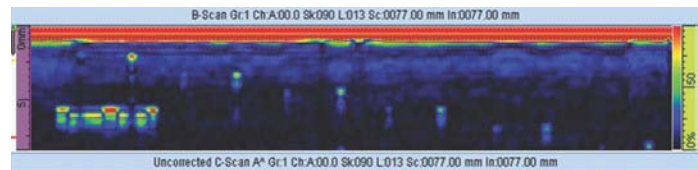
Flexible Array Probe Performance

Defect detection of 6mm diameter flat bottom holes in aerospace carbon fibre laminate

Rigid array probe direct contact



Flexible array probe direct contact



Kit

- Flexible array transducer
- Rubber housing set to a nominal geometry
- Encoder with 5m cable
- Protective carry case



Scan

For more information about WrapIt:

