

# Ultrasonic Sensors



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## Sensor innovation in NDT



### Single Element Wheel Probes

The single element wheel probe uses Sonatest NDTs rubber technology for near-dry Ultrasonic coupling. Using a single element 15mm immersion probe, the Single Element Wheel Probe is designed to operate between 1MHz and 10MHz and is available with a low pressure 38mm tyre (shown) and a higher pressure 25mm tyre. It is complete with an optical position encoder and can be connected to any conventional flaw detector such as the Sonatest MasterScan.

### Array Wheel Probe

#### 50mm array

Our famous patented array wheel probe is the result of many years of research and careful design, in consultancy with our RapidScan2 customers in the aerospace market. It features a wide conformable rubber tyre which is acoustically matched to water, providing low loss coupling into the test part for high quality results without the need for gel or large quantities of water.

It is ideally suited to hand scanning of large flat or slightly curved parts, covering large areas quickly and efficiently. A central spring loaded roller ensures consistent coupling pressure across the sensor even when scanning narrow parts. Incorporating a 64 element phased array with 0.8mm resolution, and a high resolution position encoder, the Array Wheel Probe provides high quality, high resolution data.



### Array Wheel Probe

#### 100mm array

For applications where very larger area coverage is required, the 100mm Array Wheel Probe is available. Due to its larger size it is best suited to flat horizontal components, but will scan curved parts too with a simple adjustment of the array angle.

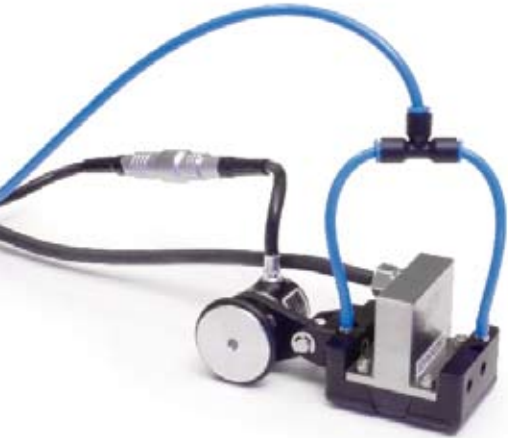
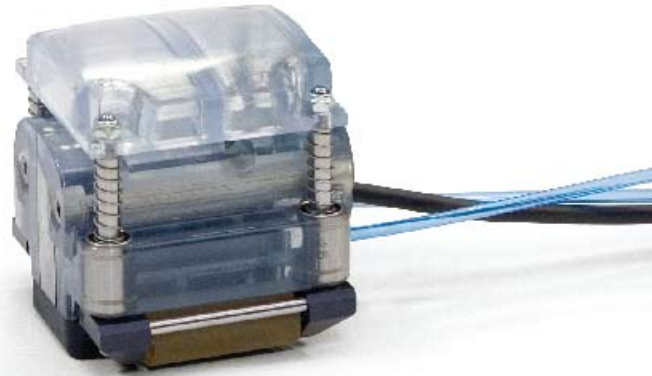
Employing a larger, wider tyre made from the same Sonatest NDTs rubber as our 50mm Wheel Probe, excellent coupling and data quality is achieved. This RapidScan2 sensor uses a 128 element phased array with 0.8mm resolution and a position encoder providing twice the area coverage as the 50mm Wheel Probe but with the same resolution.



## Sliding Bubbler Probe

### 50mm array

The Sliding Bubbler Probe is designed to work with the RapidScan3D and the FaroArm scanner, and is used for rapid coverage of areas that are inaccessible to the Wheel Probe such as webs, T-sections and confined regions. Using a 50mm array with 64 elements it produces excellent data quality and coupling is helped by two spring loaded rollers which ensure that the sensor is properly positioned on the surface of the part. A water feed is used which supplies a bubbler to produce a small pool of coupling water around the active area of the sensor.



## Miniature Bubbler Probe

### 40mm array

Scanning surfaces with curvatures is often a challenge for Ultrasonic NDT. The trade-off between large area coverage and surface profile means that sometimes physically smaller sensors produce the best results. The 40mm Bubbler Probe has been designed for difficult to access areas, and for curved components. It requires a water feed, and this provides exceptionally smooth operation on most metallic and composite surfaces. A spring loaded encoder wheel ensures that scan data is registered in the correct location, and the lightweight design minimises operator fatigue.

## Radius Probe

Many composite structures have radii which pose inspection challenges for Ultrasonic NDT. The radius probe shown here is designed to scan 5mm radii, and uses four single element focused transducers to cover the radius to inspect for detection of defects >1mm. A water irrigation system is included in the body of the sensor and ensures that each transducer is optimally coupled to the radius. This solution avoids the use of expensive curved arrays, by combining conventional immersion probes with innovative mechanical design. Sonatest NDTs will develop its range of radius probes to provide a solution for different radius geometries and defect size.

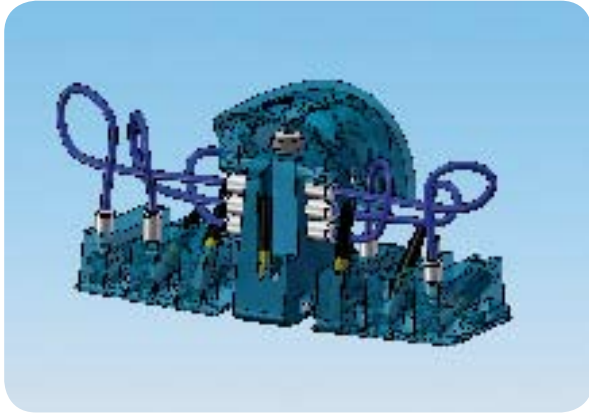


## Stringer inspection probe

The stringer inspection probe has been developed in consultation with aerospace manufacturers for scanning long stringer components where access to the stringer radius is critical. This sensor can be supplied with a standard 50mm array, a large 100mm array.

The sensor can be supplied with one or two high resolution spring-loaded encoders to ensure that 100% coverage at each end of the part to inspect. Using a solid hard-wearing rubber shoe, and moulded plastic hand grip, this probe is also suited to scanning curved parts.



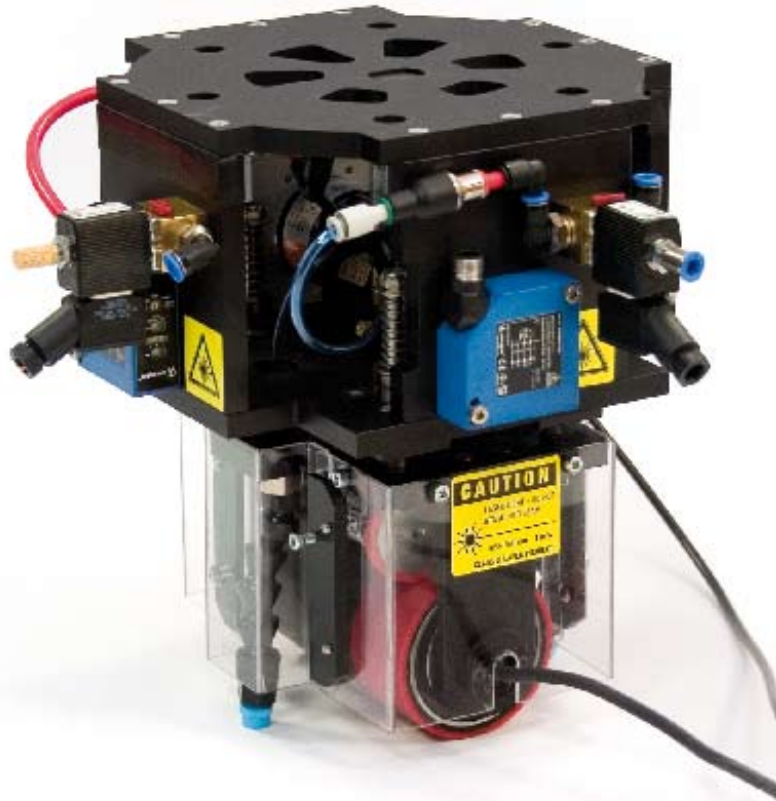


## Bespoke Sensor Design

Sonatest NDTs is able to design bespoke sensors for specialist applications. The one shown here is used to scan the curved radius of a composite aerospace part. Our sensors can incorporate conventional immersion and array transducers, as well as a range of positional encoders. We make extensive use of RP manufacturing technologies to realise complex 3D tools designed to scan challenging geometries.

## Special Application Probes

Sonatest NDTs customer projects often require specialist probes to be developed. The wheel probe shown here has been developed to mount onto a commercial Kuka robot, and is equipped with 4 laser sensors providing feedback to the robot for real-time surface normalisation, a low friction linear slide to ensure consistent coupling of the sensor with any manufacturing variances in the surface. Encoders are mounted inside the sensor to measure the distance travelled by the probe as well as the surface profile of the part being inspected. Pneumatic and water controls allow actuators and water misting devices to be operated during the inspection as required.



## RapidScan Instrument

The complete range of probes from Sonatest NDTs is compatible with the RapidScan2 and RapidScan3D instruments. These have been developed for high speed linear scanning using array technology to inspect large areas and evaluate the results quickly. With high speed A, B and C-Scan data capture and full A-Scan storage for post processing. Up to 6 encoder inputs allow virtually any positioning system to be connected, and RapidScan3D support for the FaroArm scanner allows complex 3D parts to be scanned, visualised and evaluated seamlessly with user friendly software designed for NDT workflow.

Also available in 19" rackmount form for automated and semi-automated applications.

NDT Solutions Ltd	Tel	+44 (0) 1246 267550
Dunston Innovation Centre	Fax	+44 (0) 1246 269381
Dunston Road		
Chesterfield, UK	E-mail	sales@ndtsolutions.com
S41 8NG	Web	www.ndtsolutions.com