



# Corrosion WheelProbe



# Where there's a wheel..... There's a way!

Developed for pipe, pipeline and vessel testing the evolutionary ergonomic design of the Corrosion WheelProbe enables constant and even pressure to be applied in the testing environment, thanks to the conformable WheelProbe tyre, resulting in consistent and repeatable amplitude response.

Excellent coupling is achievable, even on rough corroded surfaces, thanks to the conformable water filled tyre. Fine water misting is all that is required for coupling, no mechanical pumping of water is necessary.

Encoded 50mm wide strip scan, B or C Scan, amplitude of Time of Flight (depth) - dependant on the host instrument or reporting software. The inspection width of 50mm provides greater detection capability.



## Circumferential & Longitudinal Scanning

The Corrosion WheelProbe has been designed specifically with Circumferential Scanning in mind. The minimum diameter that can be accommodated is 4 inches/10 cm. Adjusting the inspection angle of the Corrosion WheelProbe is very quick and can simply be done in situ using the lever and guide on the side of the WheelProbe, tightening the thumb wheel to lock the instrument at the desired angle.

Scanning along the length of a pipe or cylinder is also easily performed, again the minimum diameter for this application is 4 inches/10 cms. An enhancement to the construction of the Corrosion WheelProbe is the front roller accessory which has been developed specifically

for Longitudinal scanning. On pipe diameters of less than 24 inches/60 cm, this accessory improves stability by supporting the WheelProbe tyre, allowing you to obtain the best results from the WheelProbe over a greater range of pipe diameters.

Performance of the Corrosion WheelProbe is additionally enhanced due to the integral encoder which enables repeatable and consistent C-Scanning for Defect Evaluation and Sizing.



## Suitable for use with any Portable Phased Array System.

Including the Olympus Omniscan range, AGR Handyscan and products from the M2M range.

# Application Illustration: Oil Storage Tank Floors

Above ground storage tanks usually have a set of inspection requirements:

- A complete bottom scan, including the annular ring area, will be carried out via the MFL or SLOFEC method.
- The floating roof will be measured on the top and bottom side, sleeves and welding etc.
- The thickness of the tankwall will be measured.

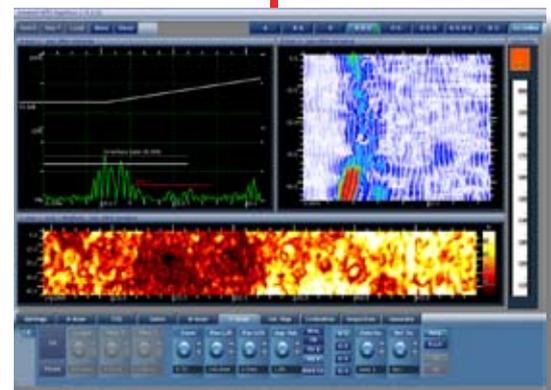
Magnetic Flux leakage is a qualitative not quantitative inspection tool but is a reliable detector of corrosion on tank floors. Due to the environmental and physical restrictions encountered during real inspections no reliable quantification of indications is possible. Amplitude alone is an unreliable indication of remaining wall thickness as it is more dependant on actual volume loss. Defects exhibiting various combinations of volume loss and through wall dimension can give the same amplitude signal. Couple to this the continually changing spatial relationship of magnets, sensor and inspection surface, it is absolutely clear that an accurate assessment of remaining wall thickness is virtually impossible. Truly quantitative results can only be obtained using a combination of Ultrasonics and Flux Leakage.

Providing reliable ultrasonic prove-up even with the latest digital flaw detectors is beset with problems: surface conditions, probe size etc.; finding the minimum thickness of a single pit or the minimum area of lake corrosion. Cone type corrosion pitting is very common and is the most difficult to detect ultrasonically. The major reflecting surfaces are not favourably orientated, the surfaces are rough and often ridged, and the target area is often small in relation to the beam cross section. The latter is true particularly of the tip of the pit, which may not be the most reflective facet of the ridged pit. This type of corrosion has the lowest probability of detection and the greatest inherent inaccuracy in its measurement.

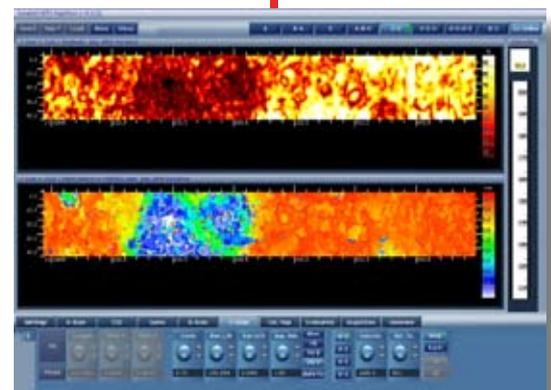
The Sonatest Rapidscan2 linear scanning system with the Corrosion Wheel Probe is a major advance on the conventional techniques providing features that help overcome problems and increase the probability of detection and therefore correlation with the MFL inspection. The design of the WheelProbe allows use in the overhead and vertical positions as well as floors, making it ideal for all tank inspection requirements.

C-Scan mapping in both ToF (Depth) and Amplitude makes detection of small conical pits more reliable, as often the amplitude loss over the cone cannot be detected. Using the corresponding amplitude B-Scan allows differentiation between the top and bottom surface wall loss, whilst helping to differentiate between corrosion defects and, most importantly, plate inclusions that can easily be mistaken when using a single A-scan. The C-Scan allows the minimum thickness to be found over the area scanned, and the resulting pictorial image is much easier to evaluate.

## Typical Underfloor Corrosion with Breakthrough Hole 6 mm Plate



**A-Scan/B-Scan  
C-Scan Time of Flight**

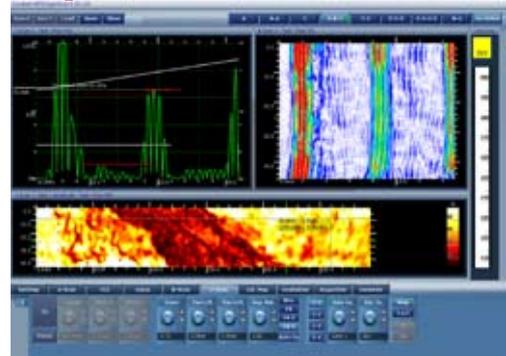


**C-Scan Thermal Amplitude  
C-Scan Time of Flight**

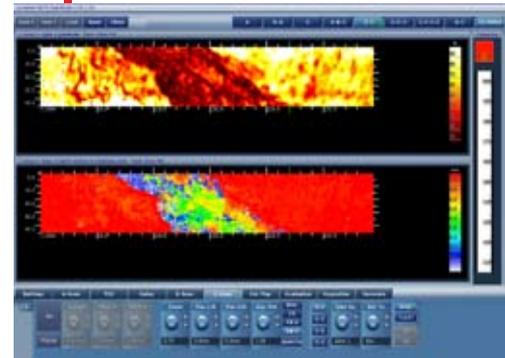
Sensor Specifications	
Sensor Frequency	2,5 and 10 MHz
Number of Probe Elements	64
Sensor resolution	0.8 mm
Active Area	44.8mm
Recommended Apertures	8 elements
Positioning Specifications	
Encoder Resolution	1/16th mm
Encoder Connection	7w LEMO (as required)
Connectivity	
Maximum Cable Length	10m (5m @ 10MHz)
Cannon ITT Connector	•
Hypertronics Connector	•
Olympus Connector	•
Rapidscan 2 compatible	•
Typical Applications	
Corrosion Mapping	•
Marine Inspection	•
Aerospace Fuselage	•
Aerospace Large Area Scanning	•
Automotive	•



**Water Flow Erosion  
7 mm Plate**



**A-Scan/B-Scan  
C-Scan Time of Flight**



**C-Scan Thermal Amplitude  
C-Scan Time of Flight**



## RapidScan Instruments

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.

Sonatest Ltd  
Dickens Road,  
Old Wolverton,  
Milton Keynes, UK  
MK12 5QQ

Tel +44 (0) 1908 316345  
Fax +44 (0) 1908 321323  
E-mail sales@sonatest.com  
Web www.sonatest.com

© Copyright Sonatest Ltd 2010. All rights reserved.



Part No: 147381