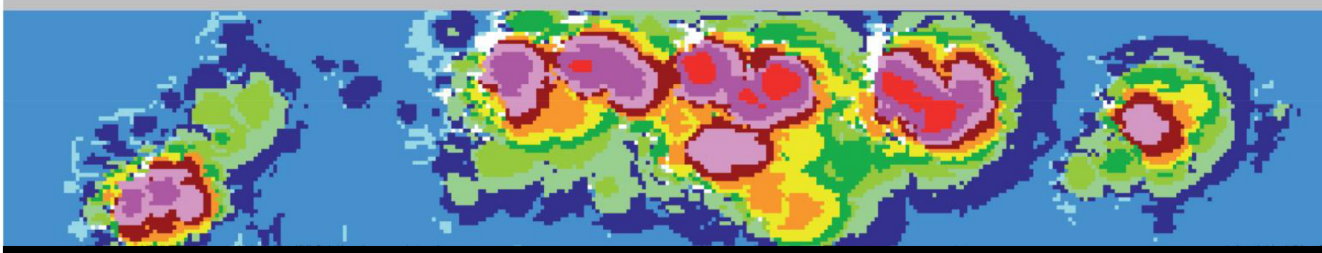
sonomatic®

innovative inspection technologies



Topside SH-EMAT Inspection

Pipe supports are often prone to degradation; visual inspection of the supports requires lifting the pipe which can cause further damage. Inspection of pipe supports in-situ allows the condition of the pipe to be determined without causing any damage. Due to the access restrictions presented by the support, many conventional inspection techniques cannot provide the assurance required on the condition of the pipe. For this reason, Multiskip and the Creeping Headwave Inspection Method (CHIME) are often used on thicker walled pipe (above 12 mm), for thinner walled pipe (15 mm and below) an alternative approach is required. Sonomatic Ltd have developed an electromagnetic acoustic transducer (EMAT) system to inspect thinner walled pipe. This is applicable to inspection at pipe supports and also for rapid screening of piping for detection of corrosion.

info@sonomatic.com www.sonomatic.com

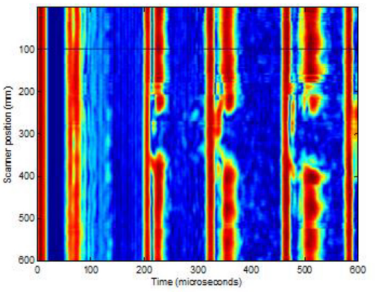
Sonomatic has offices in strategic global locations so we can respond quickly to customers' requirements wherever they may be situated. Our high quality products are matched only by our customer service. In addition to our field services, we offer training and consultancy at our sites in the UK or at clients' premises anywhere in the world. Sonomatic is committed to improving asset performance through applied and innovative technology; to delivering these benefits to our customers in the products and services that we provide; and to working with our customers, as value-added partners, to realise the maximum benefits of inspection technology.

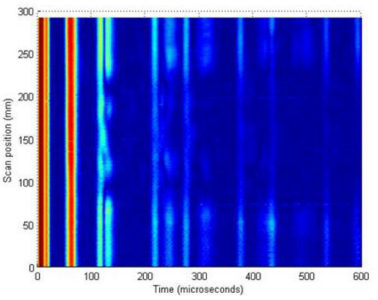
Unlike piezo-electric probes, EMATs do not require couplant, they can also tolerate an air gap between the bottom of the probe and the specimen. For this reason, EMATs are less sensitive to surface condition than other ultrasonic techniques. SH-EMATs are capable of scanning through coatings, however, the effectiveness of the technique depends upon the thickness of the coating.

The first wave mode produced by SH-EMATs travels at the shear velocity of the specimen under inspection. The remaining wave modes are dispersive, meaning their velocity is dependent upon the thickness of the specimen and the frequency of the signal, these modes will always have a lower velocity than the first mode. The arrival time of the first mode can be used to calibrate the velocity and probe separation of the system, the arrival times of the higher modes can be used to determine the average thickness of the specimen between the probes.

Any areas of degradation between the probes will affect the amplitude of the received signals and the arrival times of the dispersive modes. Should any degradation be detected, areas can be highlighted as requiring further investigation.

This is a screening approach which allows pipe supports and straight sections of piping to be inspected rapidly. In most cases any areas of concern can be identified directly from the scan, more detailed analysis can be performed when required to provide information on the average thickness of the material.





Standard Specifications

Diameter range	6” – 28”
Ambient temperature	0˚C - 45˚C
Wall thickness range	3 mm – 15 mm
Coating thickness	< 1 mm

Smaller diameters may be possible with scanner modification. Pipes with a diameter larger than 28” may also be possible, but may require multiple scans.

The system has been used on-site in the UK, Australia and South Africa. Scanning speed is variable and depends upon surface conditions and access. Once at a location typical scanner run speeds are around 2 m/minute. Time to complete work is often determined by ease of access. At one site, twenty four locations were inspected in four hours.

Collection of repeat circumferential signals ensures no dead zones are apparent.

Detection Capabilities

The system is applicable to inspection of both internal and external degradation and has capability for local and general wall loss.

Sonomatic has performed extensive internal trials as well as blind trials via the HOIS Joint Industry Project and with clients. In the corrosion under pipe support study completed by HOIS, the system achieved 100% detection with zero false calls on a trial including 21 pipes with varying diameters and thickness. The depths of corrosion varied from 20% to 80% through wall.

The system has demonstrated capability for detection of localised corrosion at 20% through wall depth and a diameter of 20 mm. Capability is, however, substantially influenced by the specific conditions of each application, e.g. defect morphology, surface condition and coating type and thickness. Sonomatic therefore recommends application specific trials for situations where accurate knowledge of inspection performance is critical for low level degradation.

Sonomatic can assist clients in developing the most effective approach for each application.

QA and HS&E

It is Sonomatic’s ongoing commitment to supply services and products, through the application of technical and engineering excellence, which complement both the customer’s and our own QA and HS&E requirements.

Sonomatic’s commitment to quality is maintained through continuous assessment and review of our Quality Management Systems to BS EN ISO 9001:2008. Sonomatic actively promotes the development, implementation and improvement of our QMS as a part of our ongoing drive to enhance customer satisfaction by meeting or exceeding customer requirements. In 2009 Sonomatic achieved UKAS accreditation as an Inspection Body to BS EN ISO/IEC 17020 (UKAS IB4276).