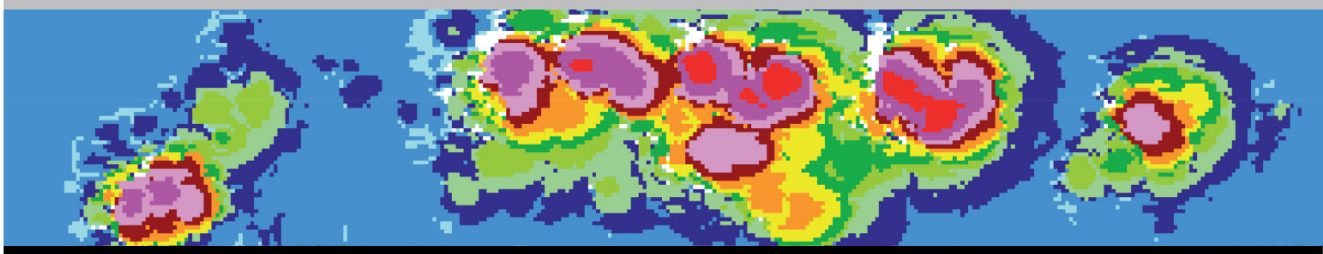
sonomatic®

innovative inspection technologies



DRS Inspection Through Coatings

Dynamic Response Spectroscopy (DRS) is an innovative ultrasonic inspection technique developed by Sonomatic for corrosion mapping through challenging coatings where conventional ultrasonic testing is ineffective. It also maps delaminations in coatings such as composite repairs and corrosion protection tapes.

DRS is deployed on Sonomatic's range of field proven and customisable topside and subsea inspection tools.

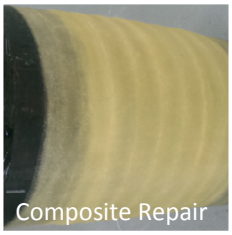
info@sonomatic.com **www.sonomatic.com**

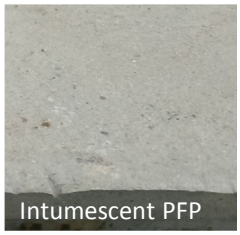
Sonomatic has offices in strategic global locations so we can respond quickly to customers' requirements wherever they may be situated. Our high quality products are matched only by our customer service. In addition to our field services, we offer training and consultancy at our sites in the UK or at 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.

DRS Technique

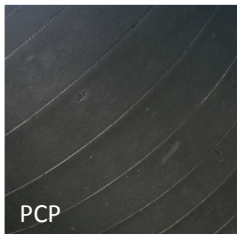
A custom DRS probe excites the steel with a range of *low* ultrasonic frequencies that pass easily through challenging coatings. The steel responds, vibrating at natural frequencies related to the local thicknesses. Using advanced algorithms, these frequencies are extracted and used to determine the steel thickness profile. The probe travels over the coating, constructing a map of the underlying steel wall thickness.

Where delamination type flaws exist in the coating, the signals cannot travel into the steel. DRS detects these flaws by loss of response from the steel.


Composite Repair


Intumescent PFP

CPT


PCP


Coal Tar Enamel


Multi-layer PP

DRS Maps

DRS thickness measurement accuracy is typically ±0.5 mm (80% tolerance)

DRS maps are suitable for:

- Identifying flaws in coatings
- Quantifying extent of steel wall loss
- Determining if corrosion growth is active and estimating growth rates
- Input to Fitness for Service assessment, including Level 3 using finite element analysis
- Statistical analysis of limited coverage inspections

Applications

DRS has been optimised for inspection through a range of coatings, including:

- Composite Repairs
- Intumescent Passive Fire Protection (PFP)
- Corrosion Protection Tapes (CPT)
- Polychloroprene (PCP), e.g. Neoprene®
- Coal Tar Enamel and Coal Tar Epoxy
- Multi-layer Polypropylene
- Injection Moulded Polypropylene (IMPP)
- Polypropylene (PP) and Polyethylene (PE) Shrink Wraps

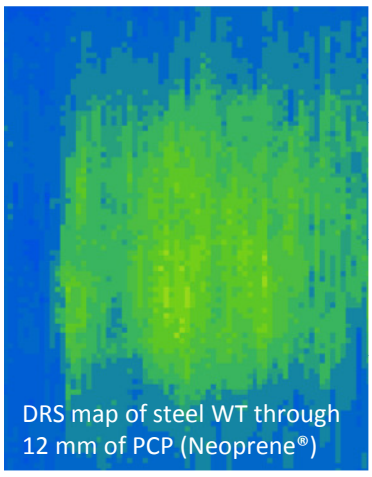
Application to other coatings is ongoing.

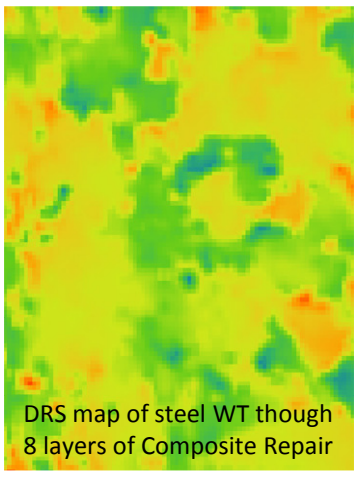
Deployment

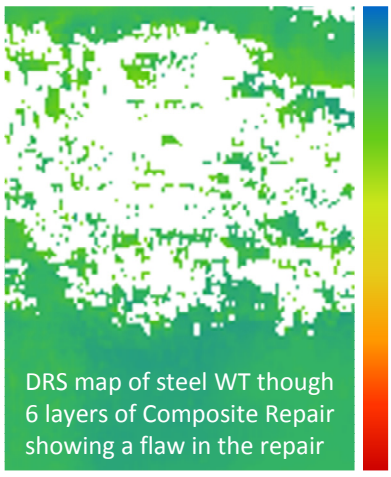
DRS is deployed on a range of field proven tools:

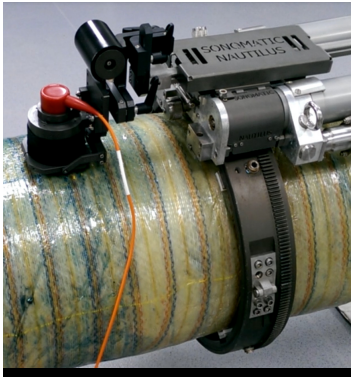
- Nautilus – topside and subsea inspection system
  - Diver deployed subsea
  - Diameters from 6” up to flat
- Internal Caisson Tool
  - Inspection of wet and dry regions
- ROV-iT – subsea inspection system
  - ROV deployed
  - Depths to 2000 m (6500 ft)
  - Diameters from 6” to 30”
  - Horizontal and vertical deployment

Sonomatic inspection systems are designed in-house and can be modified to suit project requirements.

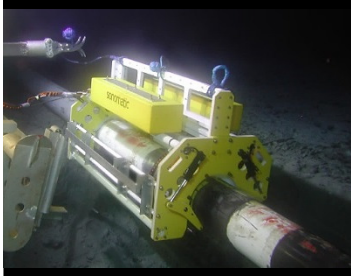

DRS map of steel WT through 12 mm of PCP (Neoprene®)


DRS map of steel WT though 8 layers of Composite Repair


DRS map of steel WT though 6 layers of Composite Repair showing a flaw in the repair


Topside Nautilus


Subsea Nautilus


Subsea ROV-iT

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 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).