



SONOMATIC

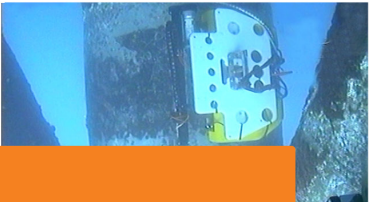
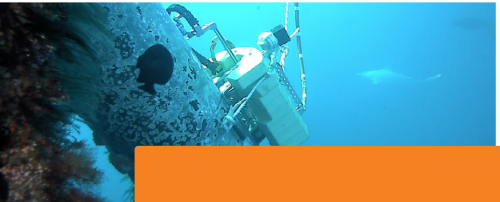
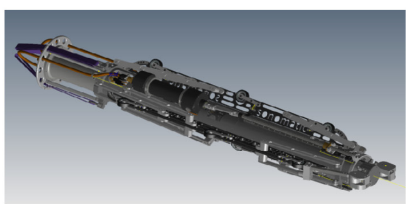
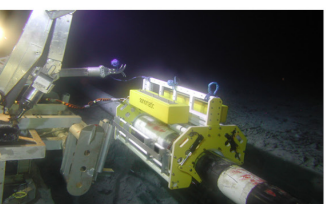
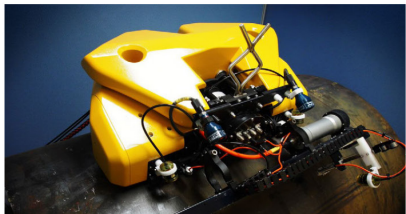
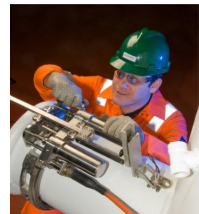
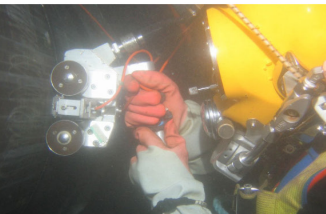
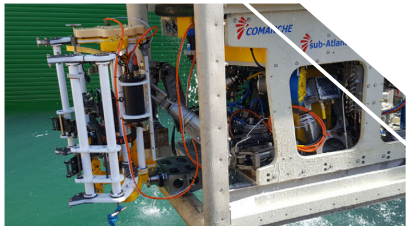
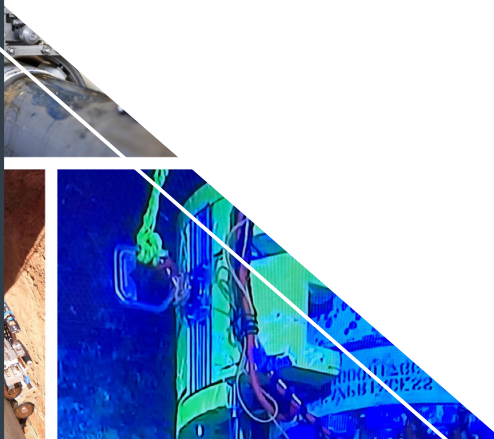
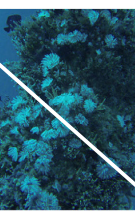
DATA SHEET

SONAR

IN-SERVICE INSPECTION OF BULK LIQUID STORAGE TANKS

THE PURPOSE

This document is composed to assist our clients and the supply chain with a high-level understanding of the benefits and services associated with our IN-Service Inspection of Bulk Liquid Storage Tanks using SONAR.



SONAR

IN-SERVICE INSPECTION OF BULK LIQUID STORAGE TANKS

The floors of storage tanks can be susceptible to internal and/or external corrosion which may lead to failure with severe consequences. Safe management of tanks therefore relies on inspection of the floor at appropriate intervals. Historically this inspection has been carried out by tools and techniques that rely on internal man entry following emptying and cleaning. This type of inspection relies on the tanks being taken out of service.

Sonomatic has developed and applies robotic technologies to deploy its world leading automated corrosion mapping to tank floors in-service. This approach gives a high degree of assurance of tank floor integrity while avoiding the need for costly shut downs and minimising the hazards associated with confined space entry.



Sonomatic's SONAR robotic tank floor capability is part of a comprehensive inspection offering in which we deliver a API 653 or EEMUA 159 compliant inspection with the tank remaining in operation throughout.

BENEFITS

In-service inspection is a cost effective alternative to out of service inspection for situations where the likelihood of degradation requiring repair has been assessed as low. In-service inspection provides significant other benefits to tank operators that include:

- ✔ Removes the need for shut downs.
- ✔ No reduction in critical storage capacity.
- ✔ Minimises site personnel requirements during plant shut downs.
- ✔ Eliminates hazards associated with personnel entry to tank internals.
- ✔ Improved knowledge of tank floor condition compared to existing out of service techniques.

A full in-service floor inspection is also provided:

- ✔ Acoustic emission (AE) provides 100% coverage of the tank floor.
- ✔ In-service robotic inspection is performed with sampling coverage.
- ✔ Density of coverage is guided by AE results as necessary.
- ✔ Sampling coverage is defined to ensure reliable information on the floor minimum thickness.
- ✔ Advanced statistical methods are used to assess the results.
- ✔ Fully compliant with API 653

STORAGE TANK TYPES

- FLOATING ROOF
 - UP TO 120m IN DIAMETER
 - CONE UP
 - CONE DOWN
 - SLOPING
- Products:**
- FUELS AND OILS (DIESEL)
 - CRUDE OIL
 - CHEMICALS
 - WATER

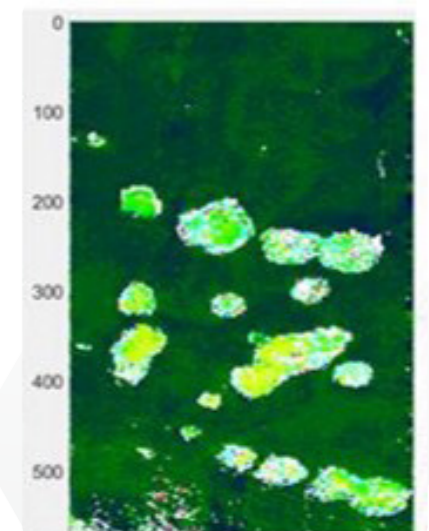
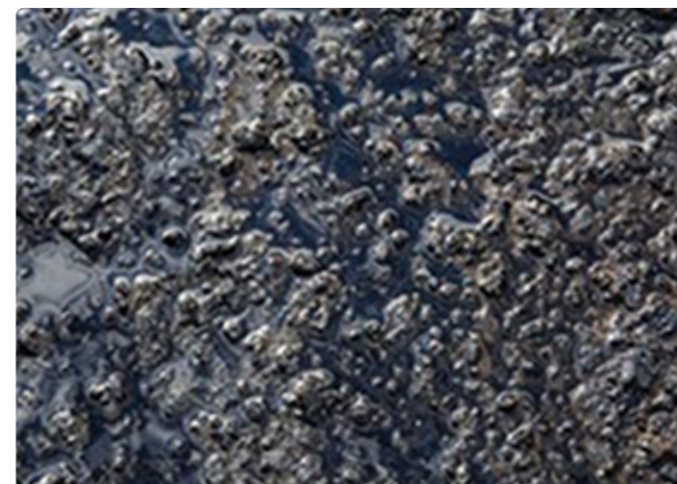


There can be potential application barriers when carrying out inspections if tanks have multiple internal obstructions on or near the floor, if tanks have internal floating roofs and fixed upper roof and/or if tanks have excessive sludge or have certain chemical content.

DESLUDGING AND WASTE MANAGEMENT

When it comes to desludging and waste management, Sonomatic provides services that include:

- ✔ Tank and Frac tank and truck set up.
- ✔ Filtration system and product polishing.
- ✔ Separator and Bag system.
- ✔ Water tank cleaning to a roll-off and bag system.
- ✔ Selling of sludge and waste products.
- ✔ Planning cleaning cycles maintenance



SONAR ROBOT

INTEGRATION WITH SONOMATIC INSPECTION PROJECT MANAGEMENT AND ANALYSIS SOFTWARE (MULTIMAP)

UMBILICAL CORD AND CARRIER WITH 106M TO 115M CABLE LENGTH

PURGE SYSTEM FOR PRODUCTS BELOW 37.5°C FLASHPOINTS

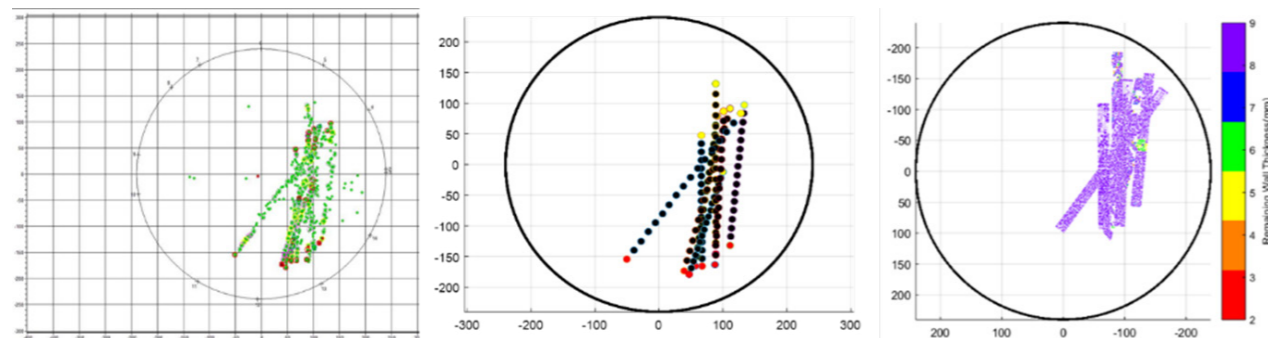
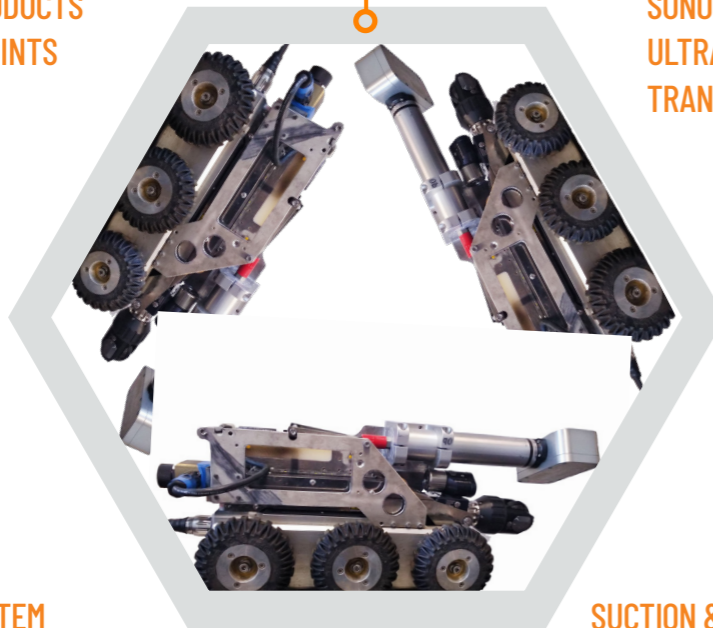
SONOMATIC ADVANCED ULTRASONIC IMMERSION TRANSDUCERS SYSTEM

ADVANCED NAVIGATION SYSTEM

TEMPERATURE RANGE 20°C TO 50°C

CAMERA AND LIGHT SYSTEM (OPTIONAL DEPENDING ON PRODUCT)

SUCTION & DISCHARGE PUMPS (OPTIONAL)



QA AND HS&E

Sonomatic operate under an integrated QHSE management system and are committed to the highest quality and safety of service provision | ISO 9001: 2015: 00007140 | ISO 14001:2015:00037371 | ISO 45001:2018:00037372 | ISO 17020: 2012: 4276 | Achilles FPAL Verified: 076712 | SEQual 1988 | British Safety Council Member: S0388440 |



CONTACTS

WORLDWIDE

Ian Daniel
SONAR Online Robotics Tank Manager
T: +44 (0) 1925 414 000
E: Ian.Daniel@sonomatic.com

Matthew Beatty
Global Robotics Applications Manager
T: +971 56 441 3172
E: Matthew.Beatty@sonomatic.com

EUROPE AND AFRICA

Graham Marshall
Subsea Project Manager
T: +44 (0) 1224 823 960
E: Graham.Marshall@sonomatic.com

Stuart Ley
Topside Project Manager
T: +44 (0) 1224 823 960
E: Stuart.Ley@sonomatic.com

Danielle Gunns
Project Delivery Manager (Warrington)
T: +44 (0) 1925 414 000
E: Danielle.Gunns@sonomatic.com

John Lilley
Senior Technical Consultant
T: +44 (0) 1925 414 000
E: John.Lilley@sonomatic.com

AUSTRALASIA

Jonathan Millen
Australia West Coast Project Manager
T: +61 415 850 346
E: Jon.Millen@sonomatic.com.au

Judd McCann
Australia East Coast Project Manager
T: +61 488 442 019
E: Judd.McCann@sonomatic.com.au

Zach McCann
South East Asia Regional Manager
T: +61 404 797 670
E: Zach.McCann@sonomatic.com.my

Alex Cesan
Australia & South East Asia General Manager
T: +61 498 442 666
E: Alex.Cesan@sonomatic.com.au

MIDDLE EAST

Gordon Reid
Regional Manager
T: +971 26 580 708
E: Gordon.Reid@sonomatic.com

AMERICAS

Esteban Cesan
General Manager Americas
T: +1 832 977 0303
E: Esteban.Cesan@sonomatic.com