

DATA SHEET

SONAR

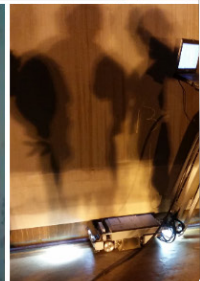
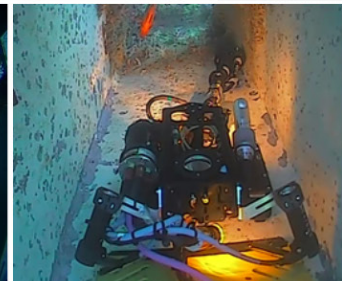
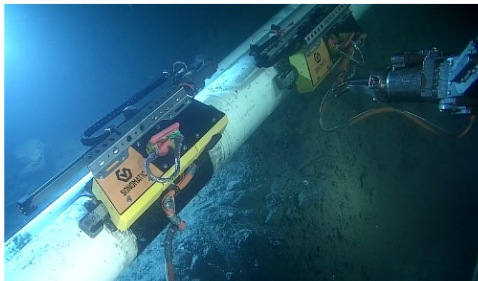
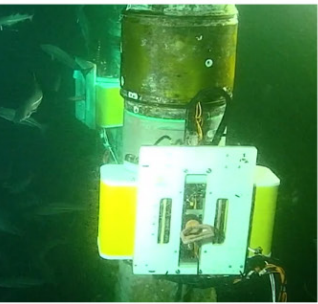
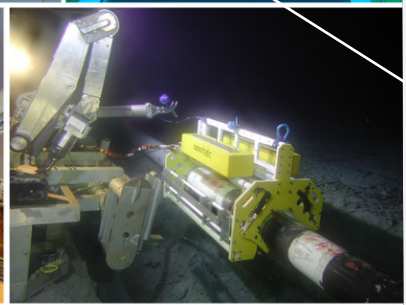
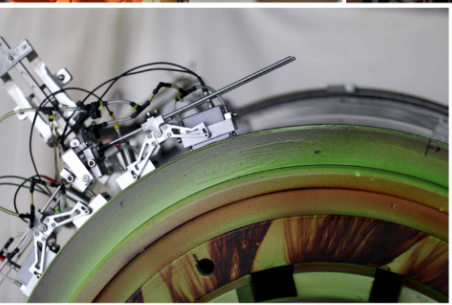
IN-SERVICE INSPECTION OF BULK LIQUID STORAGE TANKS

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.



SONOMATIC

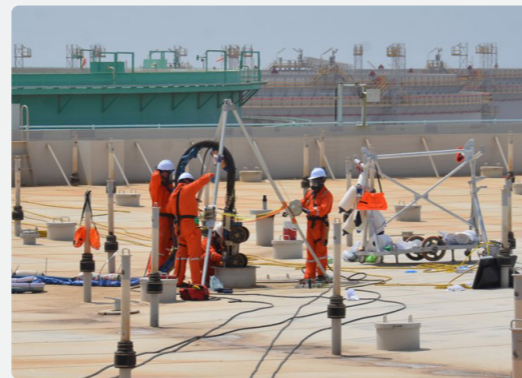


SONAR

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

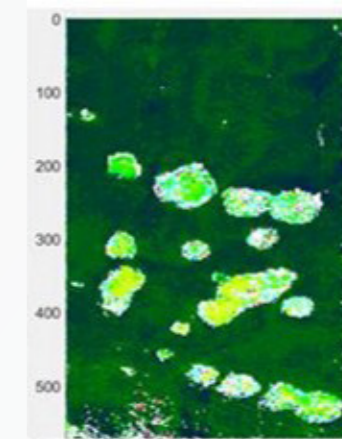
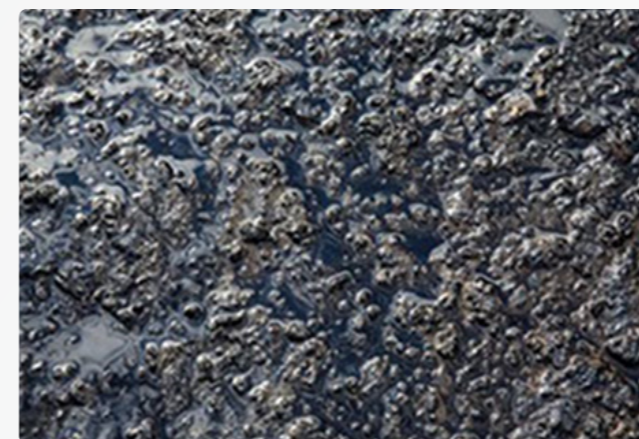


There can be potential application barriers when carrying out inspections if tanks have multiple internal obstructions on or near the floor, if tanks have internal floating roofs and fixed upper roof and/or if tanks have excessive sludge or have certain chemical content.

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

IN-SERVICE INSPECTION OF BULK LIQUID STORAGE TANKS

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

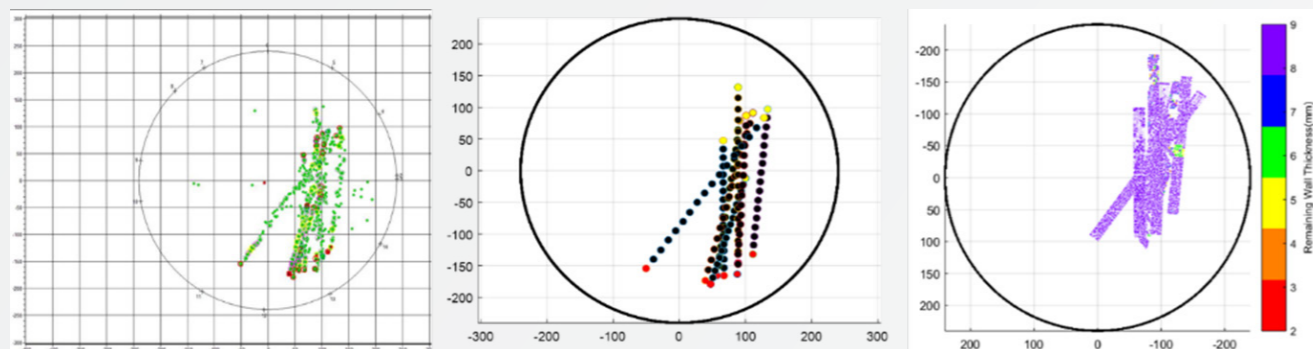
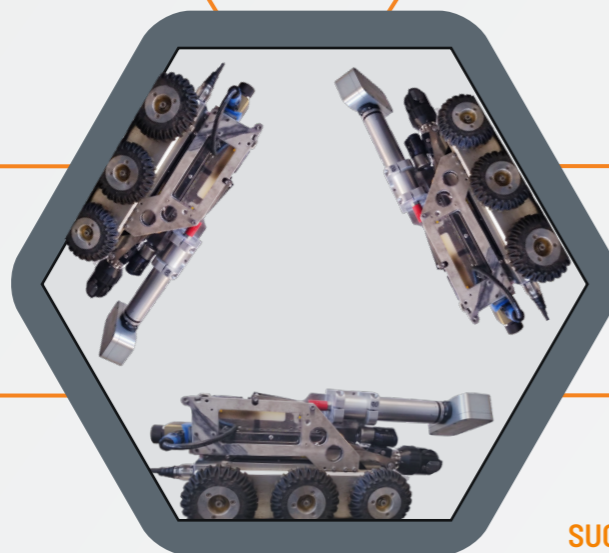
SONOMATIC ADVANCED ULTRASONIC IMMERSION TRANSDUCERS SYSTEM

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 |



KEY 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

Charles Loader
General Manager - Europe & Africa
T: +44 (0) 1925 414 000 | M: +44 (0) 7376 714 765
E: Charles.Loader@sonomatic.com

MIDDLE EAST

Clayton Webb
Regional Manager
T: +971 26 580 708
E: Clayton.Webb@sonomatic.com

AUSTRALASIA

Jonathan Millen
Operations Manager - Australia
T: +61 477 030 058
E: Jon.Millen@sonomatic.com.au

Alex Cesan
General Manager - Australia & NZ
T: +61 498 442 666
E: Alex.Cesan@sonomatic.com.au

Zach McCann
Region Manager - South East Asia
T: +60 361 581 185 / 1180
M: +60 12 555 1569 / +61 404 797 670
E: Zach.Mccann@sonomatic.com.my

AMERICAS

Esteban Cesan
President
T: +1 832 977 0303
E: Esteban.Cesan@sonomatic.com

Agata Surowiec
Vice President - Business Development
T: +1 832 316 9925
E: Agata.Surowiec@sonomatic.com



www.sonomatic.com