

DATA SHEET

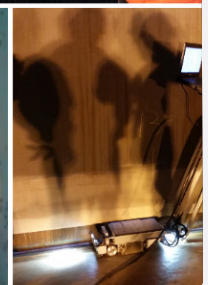
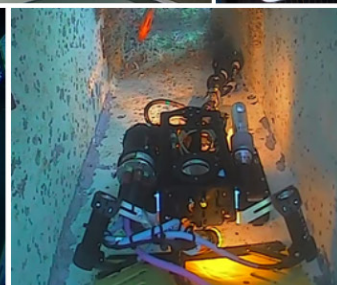
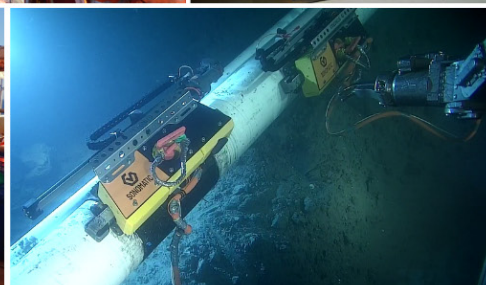
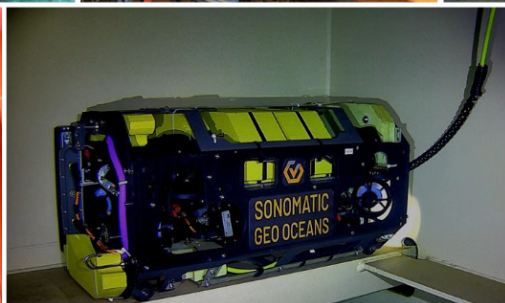
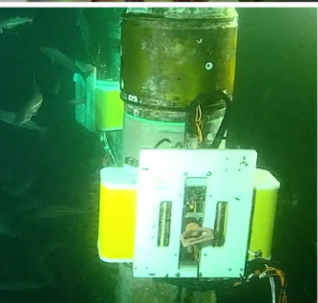
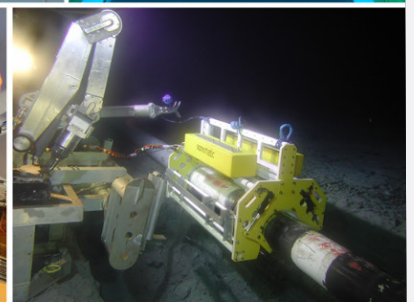
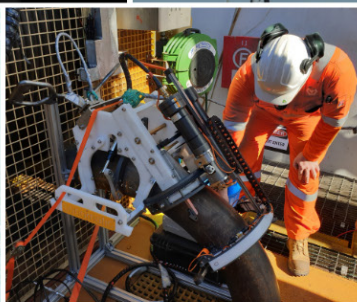
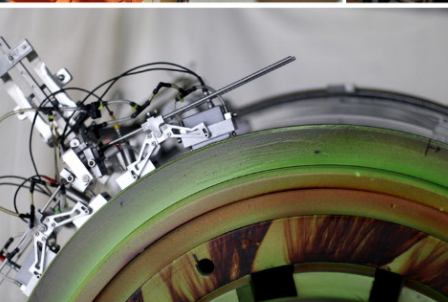
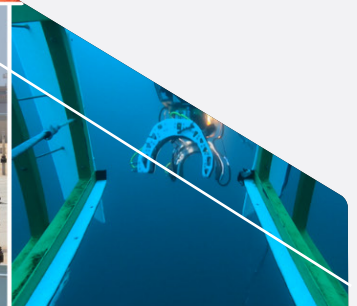
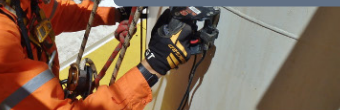
FRANSCAN (AP)

THE PURPOSE

This document is composed to assist our clients and the supply chain with a high-level understanding of the benefits, services and specialist packages associated with testing of annular ring and critical zone for corrosion damage and cracking with FranScan (AP)



SONOMATIC



FRANSCAN (AP)

COMBINED TESTING OF ANNULAR RING & CRITICAL ZONE FOR CORROSION DAMAGE & CRACKING

FranScan combines three techniques. This allows quantification of material loss, in the critical zone, from outside of the tank. Hence, overcoming the dead-zone restriction of SRUT. FranScan can also be used to examine the Shell to annular Fillet welds as well as other applications such as CUPS. The three Techniques involved are:

1. Wall thickness on protrusion - Zero Degree B-Scan
2. Short Range Ultrasonic Qualitative Scan
3. A-Ring Phased Array Quantitative Scan on critical zone.

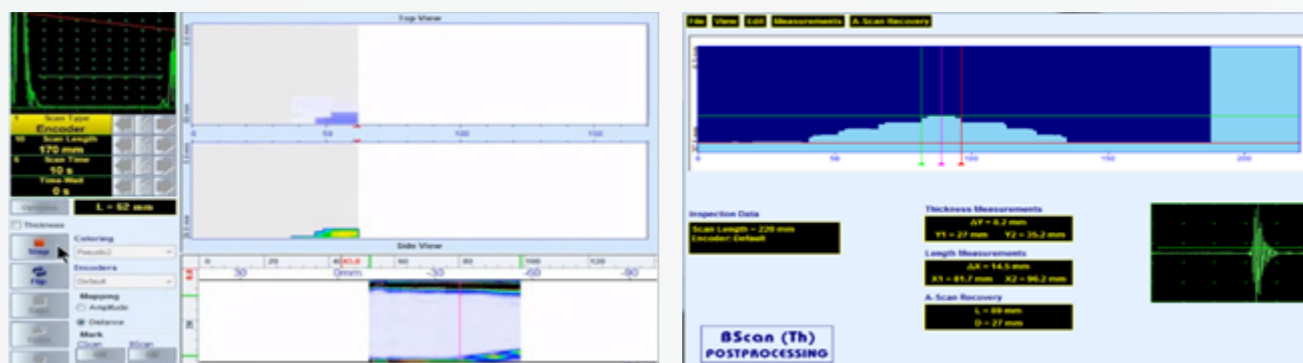
The True-To-Geometry coverage and imaging allows easy distinguishing between the defects in the annular ring plates and in the fillet welds, which may be the allowable incomplete penetration; the damages situated on the upper and bottom surface of the plate are distinguished as well.

SRUT is an NDT method whereby ultrasonic waves are transmitted in the form of guided laminar waves using a specialty purposed ultrasonic transducer probe. When the laminar waves hit a discontinuity a mode conversion occurs, and the reflection of the waves are then detected by the ultrasonic transducer.

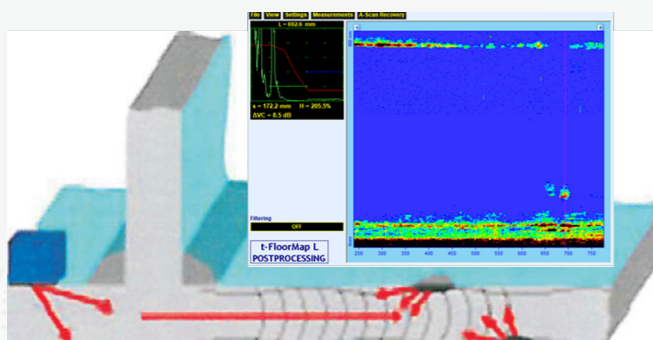
SRUT technology is a screening tool. The method does not provide a quantitative direct measurement of wall thickness or the exact dimensions of defects/defected areas.

FRANSCAN TECHNIQUES

1. WALL THICKNESS ON PROTRUSION (PHASED ARRAY OR B-SCAN)



2. SHORT RANGE ULTRASONIC GUIDED WAVE (SRUT)



Some limitations exist when using the SRUT technique including:

- ❑ No Differentiation between Product and Soil Side Corrosion.
- ❑ Must Have 1.5" Space for Probe Placement.
- ❑ Is purely a Screening Technique - Does not Quantify Material Loss.

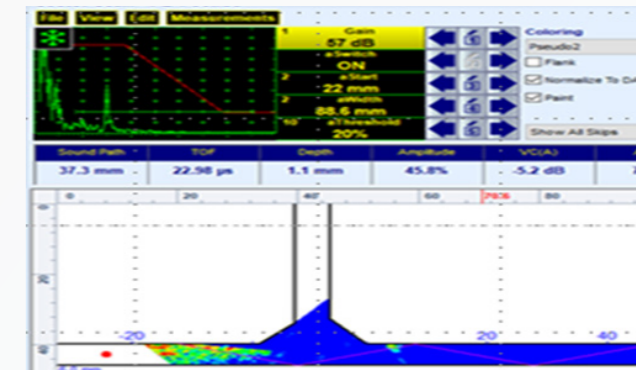
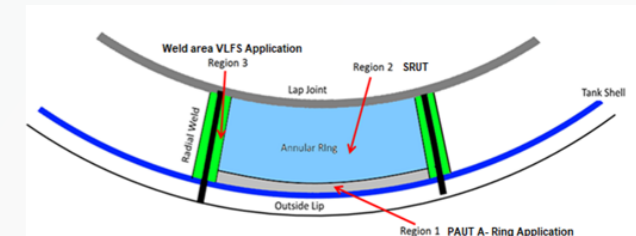
3. A-RING QUANTIFIABLE CRITICAL ZONE INSPECTION

A-Ring Phased Array was created for imaging, and SIZING of pitting corrosion under the fillet weld and up to 100 mm inside the storage tanks with full discrimination between Product and Soil Side Corrosion.

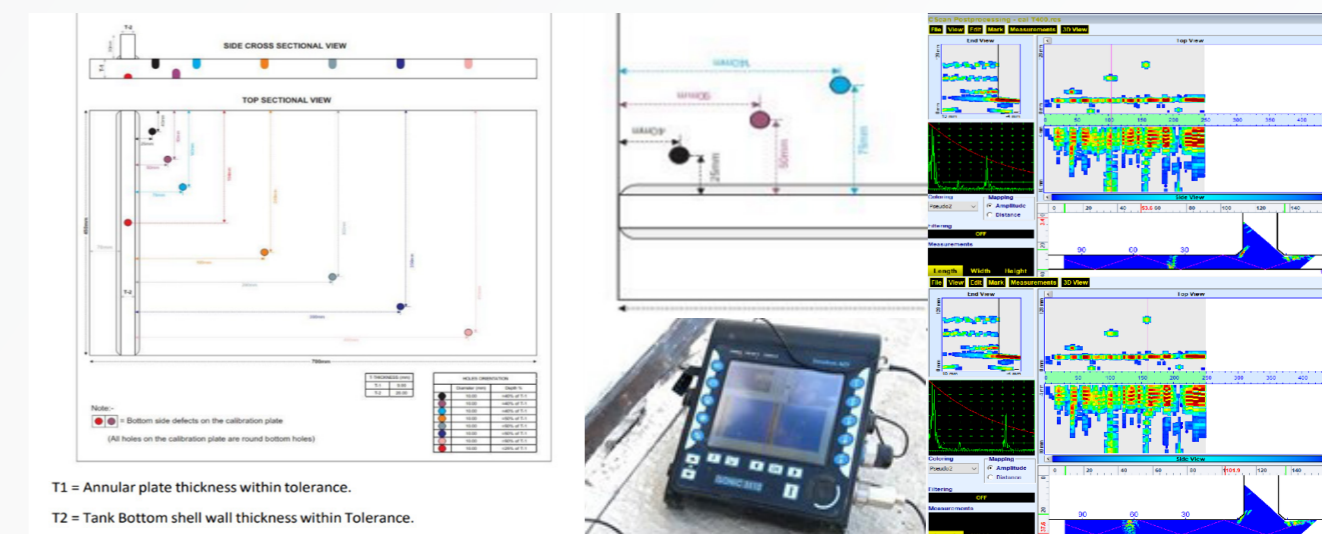
This allows quantification of material loss to within 1 mm accuracy from outside of the tank. Hence, overcoming the dead-zone restriction of SRUT.

The combination of the 3 techniques gives an overview of corrosion present in the annular ring with quantifiable results in the first 100 mm of the annular and in the protrusion.

- ❑ Tank Floor Annular Plate Testing
- ❑ Testing Concrete Coated Interfaces
- ❑ Testing Corrosion Under Pipe Supports
- ❑ Scan Under Vessel Saddles
- ❑ Remaining Wall Thickness under Scab Corrosion



FRANSCAN CALIBRATION PLATE SCAN

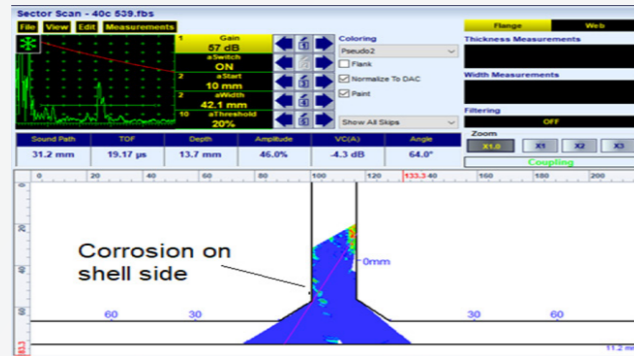
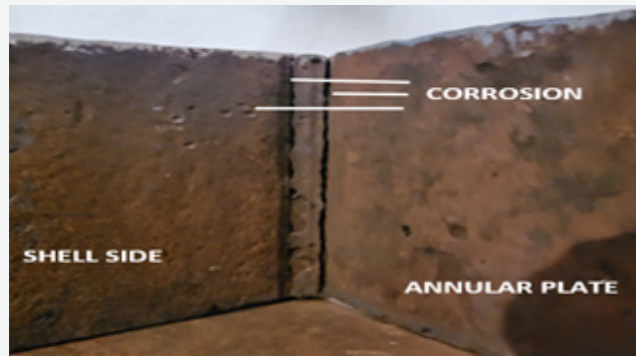


QA AND HS&E

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 |



ANNULAR RING AND CRITICAL ZONE FOR CORROSION DAMAGE & CRACKING



In addition to the A-ring application, an inspection from the shell side can be carried out, with the use of the fillet application, to get a full coverage of the fillet weld, especially the upper toe and HAZ for corrosion and/or cracking in that area.

“Corrosion found in upper and lower weld toe. The tank shell was scanned from the side looking down into the fillet, to look for cracking/corrosion in the HAZ area on the shell side.”

RESULTS OF THE RECENT FRANSCAN INSPECTION

FRANSCAN REPORT												
PAUT							B-Scan			Corrosion in Fillet Weld /Shell		
Run	Scan Length	Start	Length	Height	Range	P/S/I	Min	Average	Max	Weld	Shell	Comments
Number	mm	mm	mm	mm	mm		mm	mm	mm	mm	mm	
10-500	1150	674	166	2.2	61	I	9.6	9.7	10.0	3.7	3.0	Intermittent full length
		527	10	2.3	54	P						
		0	1150	1.9	-16/-30	S						Intermittent full length
10+720	1540	1165	200	2.5	30/66	S	9.3	9.8	10.0	3.7	4.9	Intermittent full length
		0	1540	2.7	-25/-37	S						Intermittent full length
20-800	900	246	13	3.3	72	P	9.8	10.0	10.1	3.5	3.5	Intermittent full length
		0	900	1.4	-24	S						Intermittent full length
20+150	1000	885	60	1.9	20/37	P	9.8	10.0	10.1	3.0	3.0	Intermittent full length
		0	1000	2.3	-15/-25	S						Intermittent full length
20+1150	1000	822	36	3.0	33/75	P	9.2	9.6	9.9	3.5	4.0	Intermittent full length
		307	50	2.8	30/72	P						
		200	800	3.5	12.0	S						Intermittent
20+2150	1140	591	28	4.0	26.0	P	9.7	9.8	9.9	2.7	4.0	Intermittent full length
		860	10	2.4	36.0	P						
30+180	300						9.1	9.4	9.6	2.5	3.5	Intermittent full length

KEY CONTACTS

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