

Combined half- and full skip inspection of 200 mm thick calibration block: focal point migrates along the vertical line connecting the centers of the reflectors



### Inspection SW Application for ISONIC 3510 - Pha Vertical Line Focusing Scanning and Imaging inspection of planar and circumferential narro ER welds, welded rails, etc)

- ⇒ True-To-Geometry Volume Corrected Imaging Cross End- View and 3D
- ⇒ Sector-Scan and B-Scan (Linear Scan) Cross Sectiona ⇒ Intuitive Image Guided PA Pulser Receiver with Beam
  - ⇒ DAC / TCG Normalization
  - ⇒ Built-In Ray Tracer Scanning Pattern Design
  - ⇒ Independent on TCG Angle Gain Compensation / Gain
  - ➡ Automatic Coupling Monitor
  - ⇒ Encoded and Time based C-Scan
  - ➡ 100% Raw Data Capturing
  - ⇒ FMC/TFM Protocol for the data acquisition and imaging
  - ⇒ Automatic Defects Alarming Upon C-Scan Acquisition
  - Automatic Creation of Editable Defects List

⇒ Puzzling Suitable C-Scan Inspection Record - Ability of Both Side with Storing a Number of Files Mergeable Into a Si ⇒ Comprehensive Postrpocessing Including:

→ Recovery and Evaluation of Captured A-Scans from (Sector Scan / B-Scan) and C-Scans

- → Recovery of Cross Sectional Views from the Record
- $\rightarrow$ Converting Recorded C-Scans or their Segments into
- $\rightarrow$ Off-Line Gain Manipulation  $\rightarrow$
- Off-Line DAC Normalization of the Recorded Images  $\rightarrow$ Numerous Filtering / Reject Options ( by Geometry /
- etc)  $\rightarrow$ Defects Sizing
  - Creation of Defect List and Storing it Into a Separate  $\rightarrow$
- Automatic creating of inspection reports hard copy / PDF File  $\rightarrow$



	Order Code (Part ##)
ased Array Modality: VLFS – ( (typical application: ow gap heavy thickness welds,	SWA 3510006
Sectional and Top (C-Scan)- / Side- /	
al Coverage Forming View	
n Per Focal Law Correction	
g Completed	
of Scanning Weld In Several Shots from ingle File Inspection Report	
the Recorded Cross Sectional Views	
led C-Scans to 3D Images	
s / DAC Evaluation / Position / By Amplitude / dB-to-DAC /	
e File / PDF File	

4		Coloring		Thickness Measurements
1	-	Pseudo2	•	
2	$\lfloor /$	E Flank		
1		V Normaliz	e To DAC	Width Measurements
-		V Paint		
4	-/	Max Ech	0	Filtering
5		Show All S	ikips 👻	OFF
			Anole	Zoom
	4		24.5%	X1.0 X1 X2 X3
		0.6 dB	34.3*	Coupling
		300	350 400	450 500 550 E
		210	280	350 420
/	and the second s	XX		
	1	<b>V</b>		

Combined half- and full skip inspection of 200 mm thick calibration block: focal point migrates along the vertical line connecting the centers of the reflectors





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- Automatic creating of inspection reports hard copy **→**

	Sector Scan - VLFS.vsb			
Fi	le View Ed	it Measuremen	ts	
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145.3 100 50				
200 145.3 100 50				



	Order Code (Part ##)
A-Scope - Phased Array Modality: Imaging (typical application: ow gap heavy thickness welds,	SWA 909806
Sectional and Top (C-Scan)- / Side- /	
al Coverage Forming View	
n Per Focal Law Correction	
g Completed	
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e File / PDF File	

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	Pseudo2	-	
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é 🗆	V Normaliz	e To DAC	Width Measurements
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	VC(A)	Angle	Zoom
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210	14	10 70	0 0mm -70
210	14	10 70	0 0mm -70
210	14	10 70	0 0mm -70
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210	12	10 70	<u>0</u> mm -70
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Item

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Thickness Measurements
t Width Measurements
hold OFF
K1  X2    X3    Max Echo      AScan   BScan
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400 500 600 700 800 830 0 130 0mm -130







Reverse TOFD: compression wave PE detection of the cracks and lack of side wall fusion defects in narrow gap heavy thickness welds based on the receiving and waveform analysis of the upper and lower tip-diffraction echoes





Reverse TOFD: compression wave PE detection of the cracks and lack of side wall fusion defects in narrow gap heavy thickness welds based on the receiving and waveform analysis of the upper and lower tip-diffraction echoes















# *Reverse TOFD: Every planar vertical defect with sharp edges returns the diffracted signals from the upper and lower tip*

Coloring Pseudo2 Flank Normalize To DAC Paint Max Echo C(A) Angle 130% 23.0° State of the second se		
Coloring Thickness Measurements   Pseudo2 Image: Second Seco		
Pseudo2  Flank Normalize To DAC Paint Max Echo Filtering C(A) Angle X3.0 X1 X2 X3 80 300 320 440 560 560 560 560 560 560 560 560 560 56	Coloring	Thickness Measurements
Flank   Normalize To DAC   Paint   Max Echo   Filtering   OFF   Zoom   X3.0   X1   X2   30   300   320   340   360	Pseudo2 👻	
Normalize To DAC     Paint     Max Echo     Filtering     C(A)   Angle   I30%   23.0°     80   300   320   340   360     E     E     E     Image: Comparison of the system of the syst	Flank	
Paint       Max Echo       Filtering         C(A)       Angle       Zoom         X3.0       X1       X2       X3         80       300       320       340       360         80       300       320       40       40       40         80       300       320       100       100       100         80       300       320       100       100       100         80       300       100       100       100       100         100       100       100       100       100       100         100       100       100       100       100       100       100         100       100       100       100       100       100       100       100         100	Normalize To DAC	Width Measurements
Max Echo       Filtering         C(A)       Angle         I30%       23.0°         80       300         320       340         360         60         60         60         60         60         7         80         300         320         340         360         60	7 Paint	
C(A)       Angle       Zoom         130%       23.0°       X1       X2       X3         80       300       320       340       360         9       300       320       40       40       40         10       10       10       10       10       10         10       10       10       10       10       10         10       10       10       10       10       10         10       10       10       10       10       10         10       10       10       10       10       10         10       10       10       10       10       10         10       10       10       10       10       10         10       10       10       10       10       10         10       10       10       10       10       10       10         10       10       10       10       10       10       10       10         10       10       10       10       10       10       10       10       10       10       10       10       10       10       10 </td <td>Max Echo</td> <td>Filtering</td>	Max Echo	Filtering
C(A)       Angle       Zoom         130%       23.0°       X1       X2       X3         180       300       320       340       360         180       300       320       -       -         180       300       -       -       -         180       300       -       -       -         180       -       -       -       -         180       -       -       -       -         180       -       -       -       -         180       -       -       -       -         180       -       -       -       -         180       -       -       -       -         180       -       -       -       -         180       -       -       -       -         180       -       -       -       -         180       -       -       -       -         180       -       -       -       -         180       -       -       -       -         180       -       -       -       -         180		OFF
30%     23.0°     X3.0     X1     X2     X3       80     300     320     340     360	C(A) Angle	Zoom
	130% 23.0°	X3.0 X1 X2 X3
	80 300	320 340 360
		E
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Reverse TOFD: It is possible to provide the sectorial scan coverage of the region of interest combining focusing along the vertical line and gating the A-Scans in a manner providing the cross-sectional gated imaging. This allows the phase analyzing for the signals received: as for the traditional TOFD technology the phase shift is 180 deg for the upper / lower tip diffraction echoes







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Coloring		Thickness Measurements
Pseudo2	•	
Flank		
V Normalize To DAC		Width Measurements
✓ Paint		
Max Ech	0	Filtering
		OFF
C(A)	Angle	Zoom
0 dB	44.0°	X1 X2 X3
° uD	1.1.0	
170	180	190 199.7 210 2:
		^ 
4		E
<u>}</u>		



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Gain

69 dB

ON

112.4 mm

aThre

Depth

106.0 mm

140

20%

10

aStart

aWidth 29.1 mm

5

160

Amplitude

44.9%

150



80

8

102.000

110



# <u>Shear wave</u>

Inspection of ERW / thermite joints in the rails – detection and sizing of planar vertical and other defects

Secondary inspection of rails for confirming/rejecting AUT findings and precise sizing of confirmed indications







4, Pekeris st., Rabin Science Park, Rehovot, 7670204, Israel Phone: +972-(0)8-9311000, Fax: +972-(0)8-9477712 www.sonotronndt.com **ROI S-Scan** 

### FMC/TFM

# Compression wave

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Sonotron NDT

1 x x x

**ROI S-Scan** 



FMC/TFM