

## Introduction

Weld inspection of austenitic or “Exotic” materials can often require the use of specialised phased array (PA) methods. This is due to the material composition and grain structure having high attenuation values, this can cause poor signal to noise ratios (SNR) when using shear wave inspection methods.

PA Duel Linear Array (DLA) utilises a ‘pitch & catch’ method between two linear PA transducers, this significantly improves the SNR. Specialised wedges produce a natural focus point within the material, and transverse waves in the weld which are less affected by attenuative materials.

These benefits combined with the focusing and beam steering capabilities of PA, provide the ideal inspection solution for austenitic materials.



Figure 1 – DLA probe and wedge setup

## Single Sided Manual Inspection

Manual inspection of welds can be carried out with a single probe setup, either timed scanning or with an encoder (As seen in figure 2).

For a comprehensive package for carrying out manual PA DLA inspection see Package 1 at the end of this document.



Figure 2 – Manual DLA inspection of welds

## Industries

- Chemical & Petrochemical Sector
- Oil & Gas Sector
- Nuclear Energy Sector
- Maritime Shipping Industries
- Pharmaceutical Sector
- Construction and Infrastructure
- NDT Service Providers

## Application

- Corrosion / Thickness measurement
- Weld Inspection
- Storage Vessel Inspection
- Asset Integrity
- Flaw Detection and Evaluation
- Other applications

## Typical Parts

- Austenitic material welds
- Dissimilar metal welding
- Cladding materials

## Inspection Techniques

- Phased Array L-Scan
- Phased Array S-Scan

## Features and Benefits

- Better focusing capabilities
- Custom wedges available for bespoke inspections
- Better signal to noise ratio

## Single / Dual sided Semi Automated Inspection

Semi automated scanning can be carried out utilising scanners to position and guide the DLA transducers for the full weld inspection. This has the advantage of maintaining a constant probe standoff, fully encoding the scan for accurate defect measurement, and also allows for the use of multiple probe setups to be used simultaneously for quicker inspections. (see Figure 3)

For a comprehensive semi automated inspection package see package 2 at the end of this document.

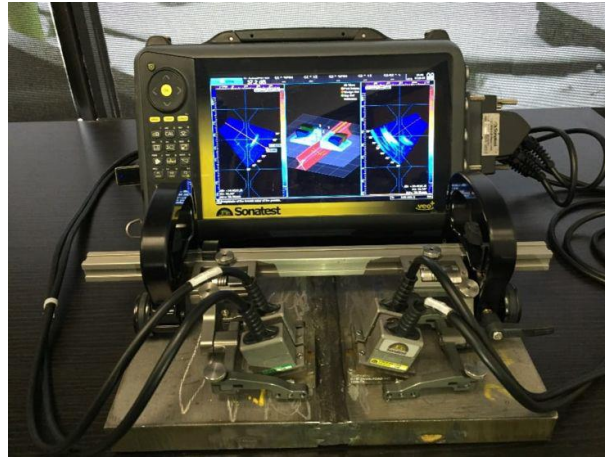



Figure 3 – Dual aided semi automated DLA inspection of welds

For further information or support, please contact the Sonatest Applications Team: [applications@sonatest.com](mailto:applications@sonatest.com)

### Recommended Tool Package 1 (Manual DLA Inspection)

Category	Part #	Description
Acquisition Unit	VEO3 32:64 PA Acquisition unit	
Probe	D1B Series (x 2) Available in 2.25MHz, 5MHz and 7.5MHz versions	
Wedges	D1BW Series	Note: The focal distance of the wedge is based on the thickness, outside diameter and material type. contact us to select your wedge focal distance. Customised wedges are available to order
Cable	D1-CABLE-003	D1-CABLE-D-QX2 (Dual cable) - 2 meters
Encoder	AXYS Encoder	

Recommended Tool Package 2 (Semi Automated DLA Inspection)

Category	Part #	Description
Acquisition Unit	VEO3 32:128 PA Acquisition unit	
Probe	D1B Series (x 4) Available in 2.25MHz, 5MHz and 7.5MHz versions	
Wedges	D1BW Series (x2)	Note: The focal distance of the wedge is based on the thickness, outside diameter and material type. contact us to select your wedge focal distance. Customised wedges are available to order
Cable	D1-CABLE-003 (x2)	D1-CABLE-D-QX2 (Dual cable) - 2 meters
Adapter	ADAP-006	64:64 IPEX Splitter
Scanner	JX-1001 Or PX-MULTIMAG-2-VEO	Jireh; 2 Probe PA/TOFD Scanner or Phoenix; VEO Multi Mag 2 (PA/TOFD) Scanner including tubes and fitting)
Irrigation Kit	JX-1003 and JXCMA014 Or 196102	Jireh; Irrigation kit and 7.9 litre (2.1 US gallon) portable manual couplant pump or Phoenix; 7Lt Portable Hand Spray Kit

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