

## Introduction

Butt welds are one of the simplest types of welded joint, and one of the most suitable welds for ultrasonic inspection. Made by joining the ends of two materials on the same plane on plate to plate or Pipe to Pipe for example, this method of welding is suitable for high thickness ranges and for joining dissimilar metals.

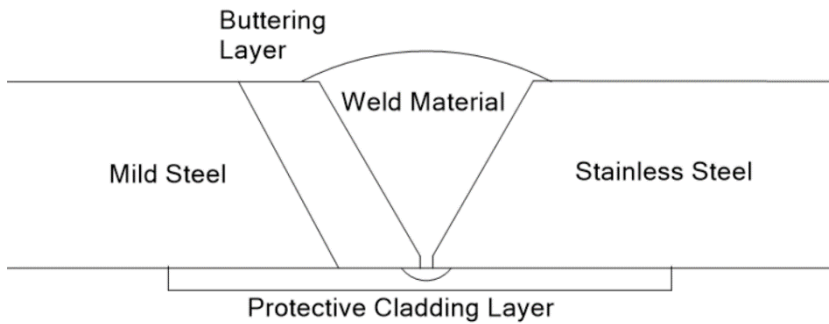


Figure 1 – Example of a dissimilar butt weld plan

Conventional ultrasonic inspection is a long-standing industry trusted method of inspection, using multiple angled transducers to detect signals from defects within the weld zone. These indication details were then transferred to a physical diagram using beam profiles to plot positions and interpret echo paths.

The Sonatest Wave introduces new tools to aid with the calibration, interpretation, and defect location of weld inspection along with the standard inspection tools provided by Sonatest's Legacy of ultrasonic flaw detectors.



Figure 1 – Ultrasonic butt weld inspection using Sonatest Flaw detectors.

## Calibration

Ultrasonic calibrations are made simpler and quicker with the touch screen technology allowing gates to be positioned easily with the move of a finger, zooming and typing input of calibration values.

### Industries

- Aerospace Aeronautical Inspection
- Aerospace Astronautical Inspection
- Chemical & Petrochemical Sector
- Oil & Gas Sector
- Nuclear Energy Sector
- Wind Power Renewables Sector
- Maritime Shipping Industries
- Mining Sector
- Construction and Infrastructure
- NDT Service Providers

### Application

- Weld Inspection
- Plastics Inspection
- Storage Vessel Inspection
- Material Bonding Inspection
- Asset Integrity
- Flaw Detection and Evaluation

### Typical Parts

- Pipeline Circumferential welds
- Storage vessel shell, floor and roof welds
- Infrastructure welds
- Plastic pipe welds

### Inspection Techniques

- Manual UT

### Features and Benefits

- Wave Scan plan aids the technician identify signal locations, reducing false calls
- Simple calibration processes help speed up inspections.
- DXF CAD import feature to instrument to draw complex butt joints and to add ROI insights where the defects may appear.



Figure 2 – DAC calibration on the Wave

### **Interactive Scan Plan**

The introduction of the Wave scan plan and recent update to download CAD DXF files allows the technician to see where indication echoes are originating from, this can help identify geometry signals from actual defect signals, reducing false calls. Screen shots of the scan plan showing indication locations within the weld can be used for reporting and informing the client of a defect location in an easy to understand format.

### **Building welds profiles and validating scan plans**

Using the PC Companion software, the technician can build or import any 2D weld profile for use with the Wave. Once imported the surfaces of the weld are assigned to be contact, non-contact or scanning surfaces, this ensures that bevel details are shown but do not act as a reflective surface. Companion also allows the review of the scan plan with any transducer to ensure full coverage is achieved and any geometry reflections are seen and anticipated before the inspection is carried out.

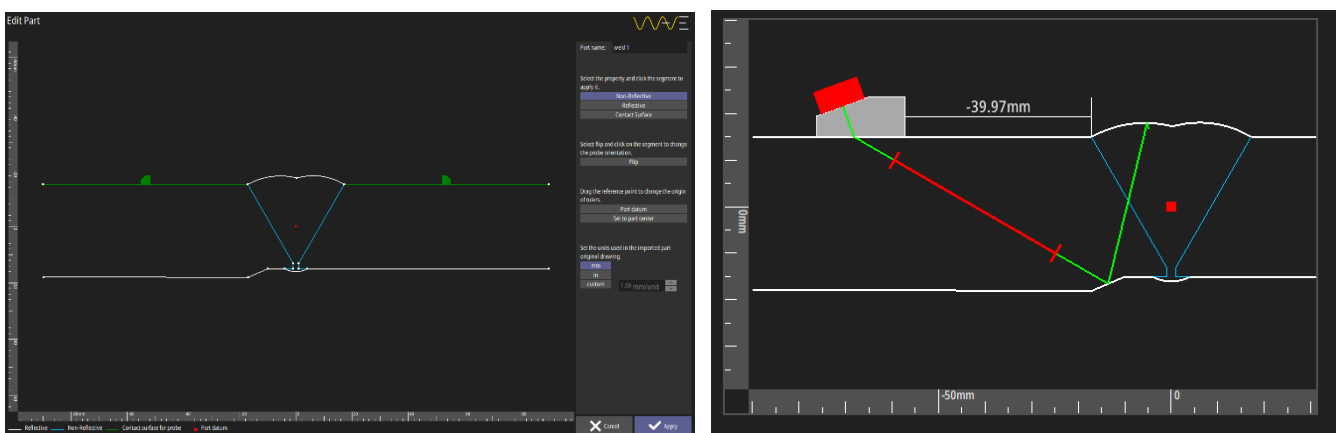


Fig 3 – Companion building and validating scan plans



Figure 4 – Interactive Scan Plan on the Wave

## Conclusion

The Wave is the most advanced flaw detector on the market, bringing innovative new tools and solutions to help technicians carry out inspections quicker and with more confidence in their results. The Wave is the perfect tool for the code compliant inspection of butt welds found throughout industry anywhere in the world.

CTA: For further information or support, please contact the Sonatest Applications Team:

[applications@sonatest.com](mailto:applications@sonatest.com)

## Recommended Tool Package

Category	Links to our website
Acquisition Unit	The Wave Flaw Detector details can be found here <a href="https://sonatest.com/products/flaw-detectors/wave">https://sonatest.com/products/flaw-detectors/wave</a>
Transducer	Our UT transducer list and catalogue can be found here <a href="https://sonatest.com/products/transducers">https://sonatest.com/products/transducers</a>
Calibration Block	Our calibration block list can be found here <a href="https://sonatest.com/products/calibration-blocks">https://sonatest.com/products/calibration-blocks</a>

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