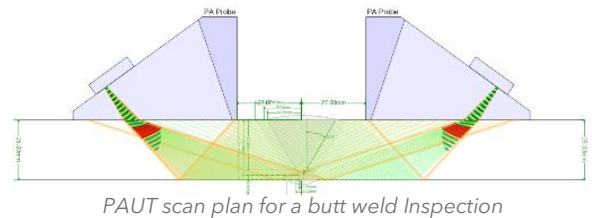
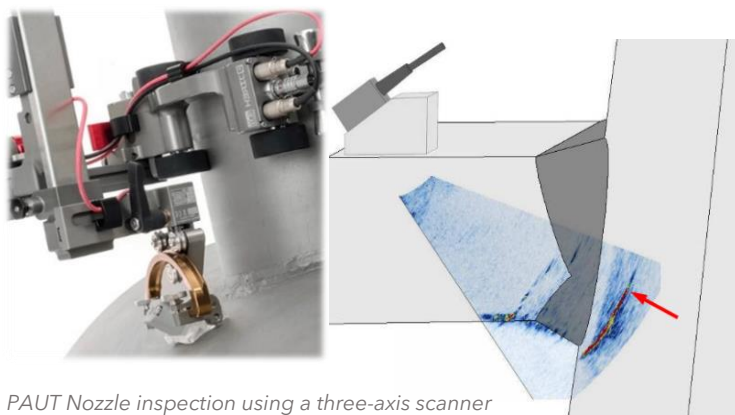


Weld Inspection: Failures of welds may lead to a loss of containment or other major consequences to the fitness-for-purpose of assets. PAUT reduces inspection time by simultaneously collecting multiple angle ultrasonic data in a single pass scan from either side of the weld.

Typical inspection rates are between 15-20 butts per shift. By ensuring accurate scan plans and specifically designed techniques, construction defects are readily detected, sized, and sentenced accordingly. Sophisticated analysis software enables experienced operators to interrogate welds from multiple orientations.

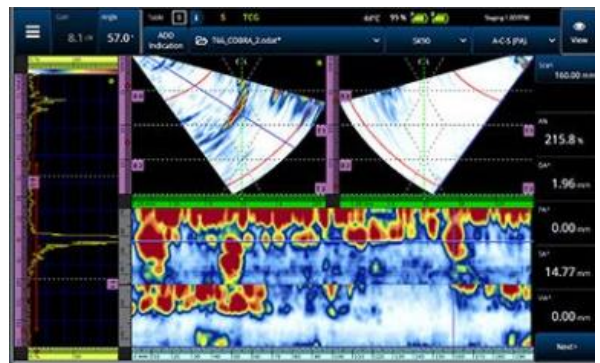


Combining phased array with non-orientation/non-amplitude reliant techniques Time of Flight Diffraction (ToFD) inspection with a phased array survey enables the interrogation of complex weld bevels or inaccessible fusion faces in the case of pipe-to-fitting joints.



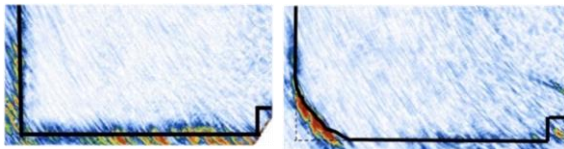
T-joints and similar weld geometries have always presented a challenge for ultrasonic testing, but there is now a way to validate that coverage is adequate and to reduce the adverse effects of this configuration.

- ⦿ Weld flaws such as lack of fusion, slag inclusions, porosity, inside diameter / outside diameter (I.D./O.D.) cracks, centreline cracks and incomplete penetration
- ⦿ Erosion or corrosion - pitting, material loss and root erosion
- ⦿ Inherent discontinuities in forged or casting materials such as laminations, forging bursts, cold shuts, hot tears and inclusions
- ⦿ Environmentally or process induced damage such as MIC, HIC, thermal fatigue cracking, caustic cracking and stress corrosion cracking

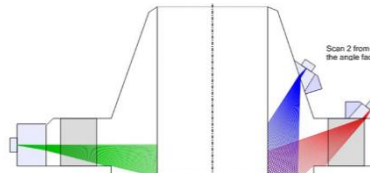


Typical PAUT raw data image from a weld inspection

Flange Face Inspection: is used to detect crevice corrosion between sealing surfaces and gasket material. The weld neck and body material can also be measured for material loss using PAUT. A total of 3 scan positions can be carried out depending on the flange configuration giving enough data to confirm the condition of the flange. This method of inspection makes for a reliable screening process while keeping production online.



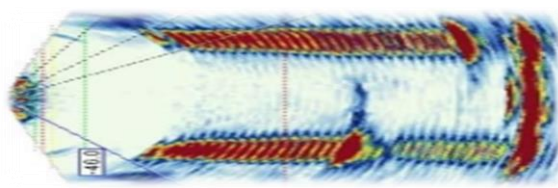
Data from Flange Face Inspection
Left Image: no corrosion Right Image: corner loss



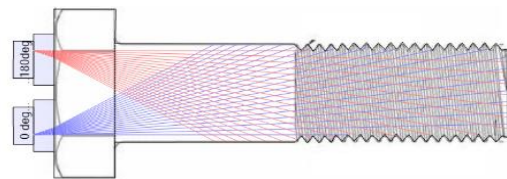
Left: scan plan of flange Inspection.
Right: Crevice corrosion detected with PAUT which was later repaired



Bolt Inspection utilises a scanner with a phased array probe that is attached to the head or end of a bolt. The bolt is then flooded with ultrasound and by means of a sectoral scan, defects are visualised without disassembling the bolt/nut.



Data collected from PAUT damaged bolt.



Scan plan of PAUT bolt Inspection.

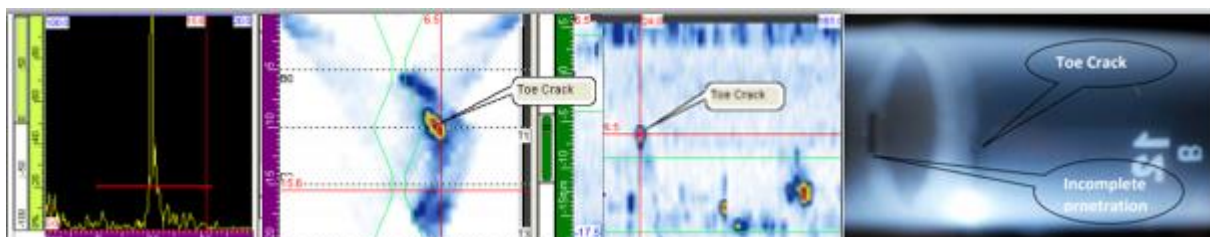
Any corrosion-related degradation of the thread can be observed, as well as the shaft of the bolt. Indications will be visible when they are shaped as linear indications between the toes of the thread.

Small Bore Pipework previously most small diameter pipe welds were radiographed for defects. However, radiography has significant limitations: safety and licensing issues, disruption to work schedules, chemical wastes, film storage, and poor detection of planar defects.

PAUT enables inspection of thin walled piping by providing semi-automated data collection. The low-profile scanner is specifically designed for use on small bore piping where minimal clearance is a limitation.



PAUT small bore pipe scanner



Data comparison from PAUT & RT on detecting defects showing the Lack of penetration and Toe crack