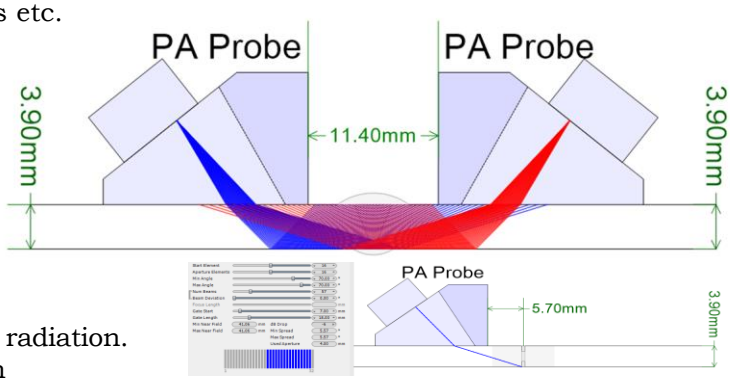
Phased Array Ultrasonic Examination for Small Diameter, Thin-Walled Piping Inspections

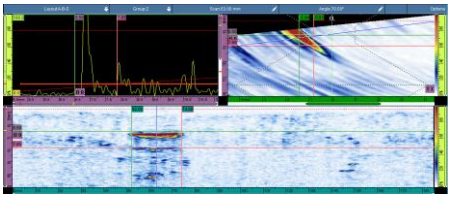
In the past small diameter thin walled welded pipes were radiographed, however radiography has substantial limitations. With the introduction of PAUT, these technique in recent years has become commercially viable and even a cost saving application.

- Covers standard pipes from 0.84 in. to 4.5 in. OD (21 mm to 114 mm).
- Operates within 12,5 mm (0.5 in.) clearance (on all standard pipes), permitting inspections in limited access areas.
- Wall thickness equal to and above 3,8mm.
- Holds up to two phased array probes for complete weld coverage in one pass.
- Easy installation and manipulation from one side of a row of pipes.
- Can be configured to perform one-sided inspections for pipe-to-component evaluations.
- The design provides stable and constant pressure around the full circumference of the pipe.
- Wedges and probes can be changed quickly and easily.
- The spring-loaded scanner can be used on ferromagnetic and non-ferromagnetic pipes.
- Numerous applications: Boiler Tubes, Process and Product Piping, Small Set on Nozzles, Flange welds etc.

Phased Array Ultrasonic Testing (Advantages)

- Able or reliably technique to detect all types of linear indications.
- Fix images for evaluation and storage. (Hard and soft copy)
- No production down time.
- No contractual delays.
- No Safety, Health and Environment risk due to radiation.
- Display A-Scan, S-Scan and B-Scan or C-Scan
  - Interpretation online or offline of signals/data
  - Sizing and characterisation of indications.
  - Length, depth and through wall height can be determined.
- Repeatability of encoded data.
- One-sided inspections for pipe-to-component evaluations are possible.





DEFECT COMPARISON		RT		PAUT	
		Detectability	Characterisation	Detectability	Characterisation
Volumetric Indications	Isolated Porosity	Good	Good	Good	Good
	Inclusions	Good	Good	Acceptable	Acceptable
	Cluster Porosity	Good	Good	Acceptable	Good
	Wormhole/piping	Good	Good	Good	Acceptable
Planer Indication	Lack of root fusion (LORF)	Acceptable	Acceptable	Good	Good
	Lack of side wall fusion (LOSF)	Poor	Poor	Good	Good
	Weld toe crack	Poor	Acceptable	Good	Good
	Weld root crack	Poor	Acceptable	Good	Good
	Lack of root penetration (LOP)	Good	Good	Good	Good
Other	Root concavity	Acceptable	Acceptable	Good	Acceptable
	Excess penetration	Good	Good	Acceptable	Acceptable

NJM

Heat Treatment & NDE Services (PTY) Ltd

Phased Array Ultrasonic Testing successfully replaced Radiography with equal or higher reliability obtained from examination.