



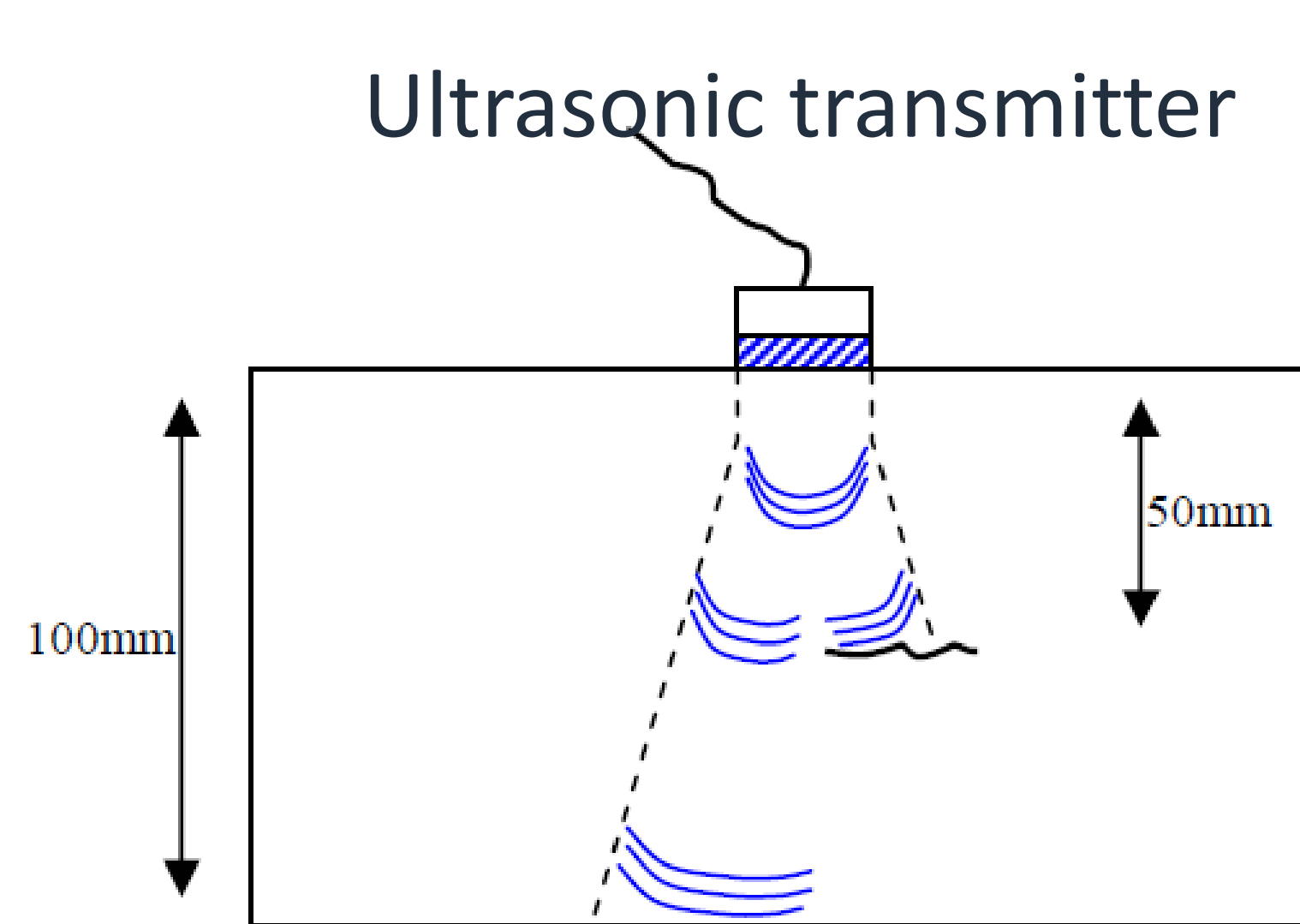
Inspection par Ultrasons

Ultrasonic Inspection

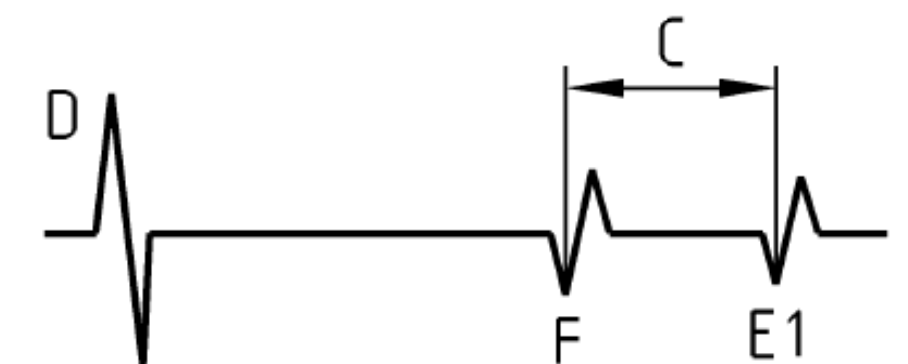
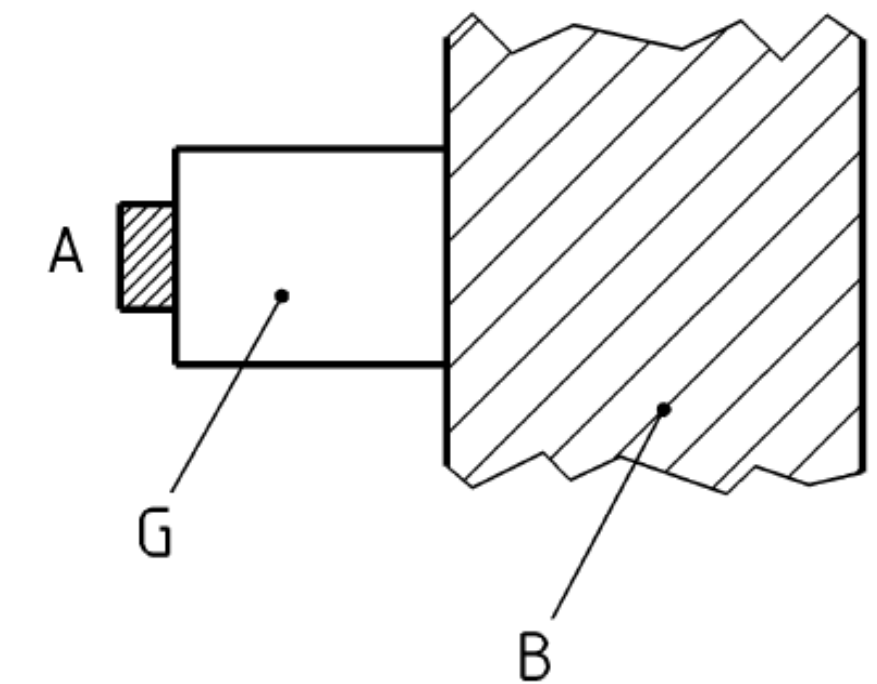
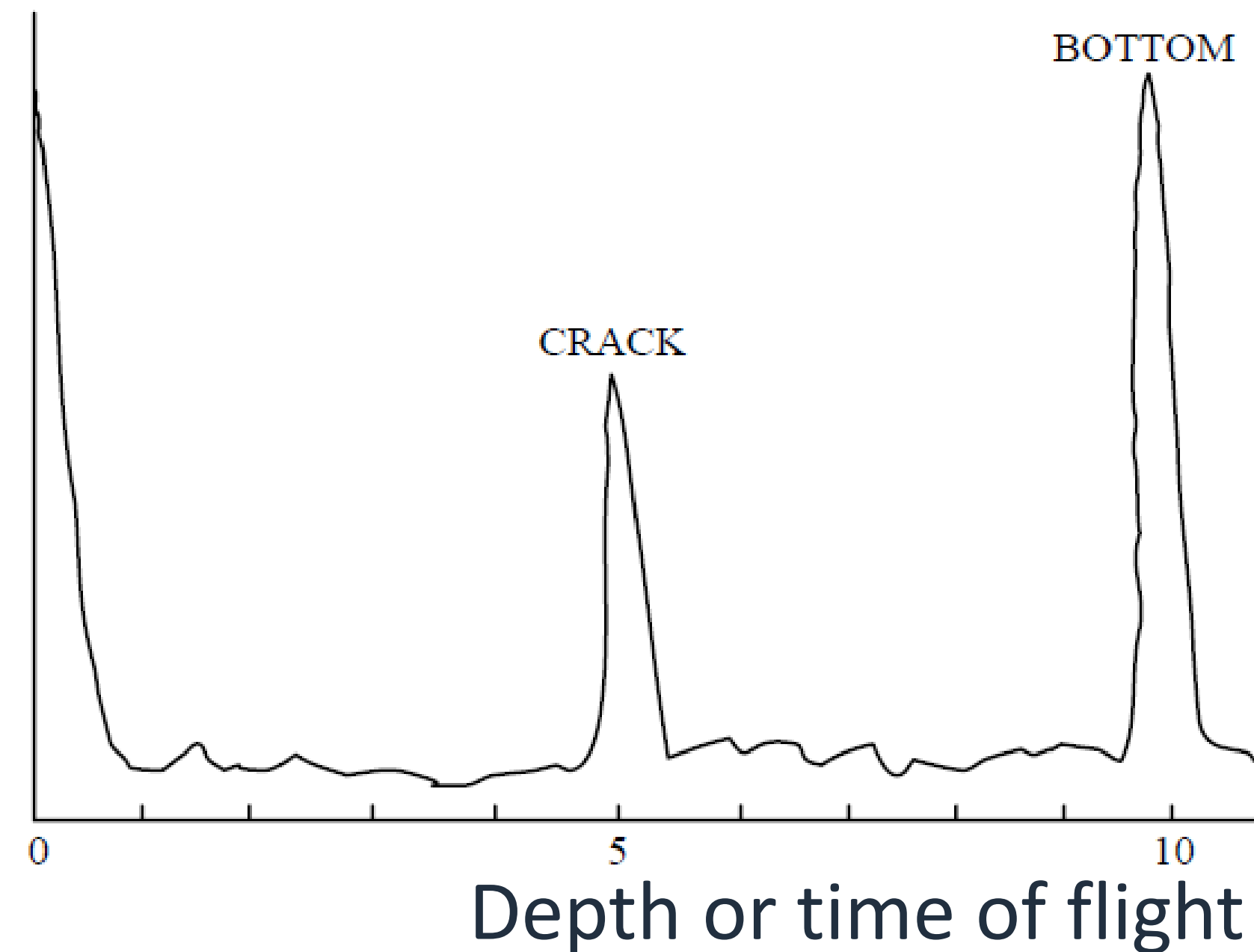


Principle

Principle : The ultrasonic technique utilizes a high frequency probe which emits an ultrasonic beam that passes through an inspected object's thickness. The signal reflects off each interface as the background echo and is received back by the original probe (reflection mode) or by a second probe opposite the transmitting direction from the first probe (transmission mode). The ultrasonic data is displayed in real time for interpretation by a certified level 2 Ultrasonic Testing inspector. The inspection technique must be validated by a certified level 3 UT Engineer.



Echo amplitude



Thickness measurement

Application

FAULTS SELECTED BY ULTRASOUND:

Porosity, crack, inclusions, shrinkage, creep cracks, delamination defects, lack of fusion (bonding), fatigue cracks, tearing, shocks, corrosion, unbond, change in local thickness

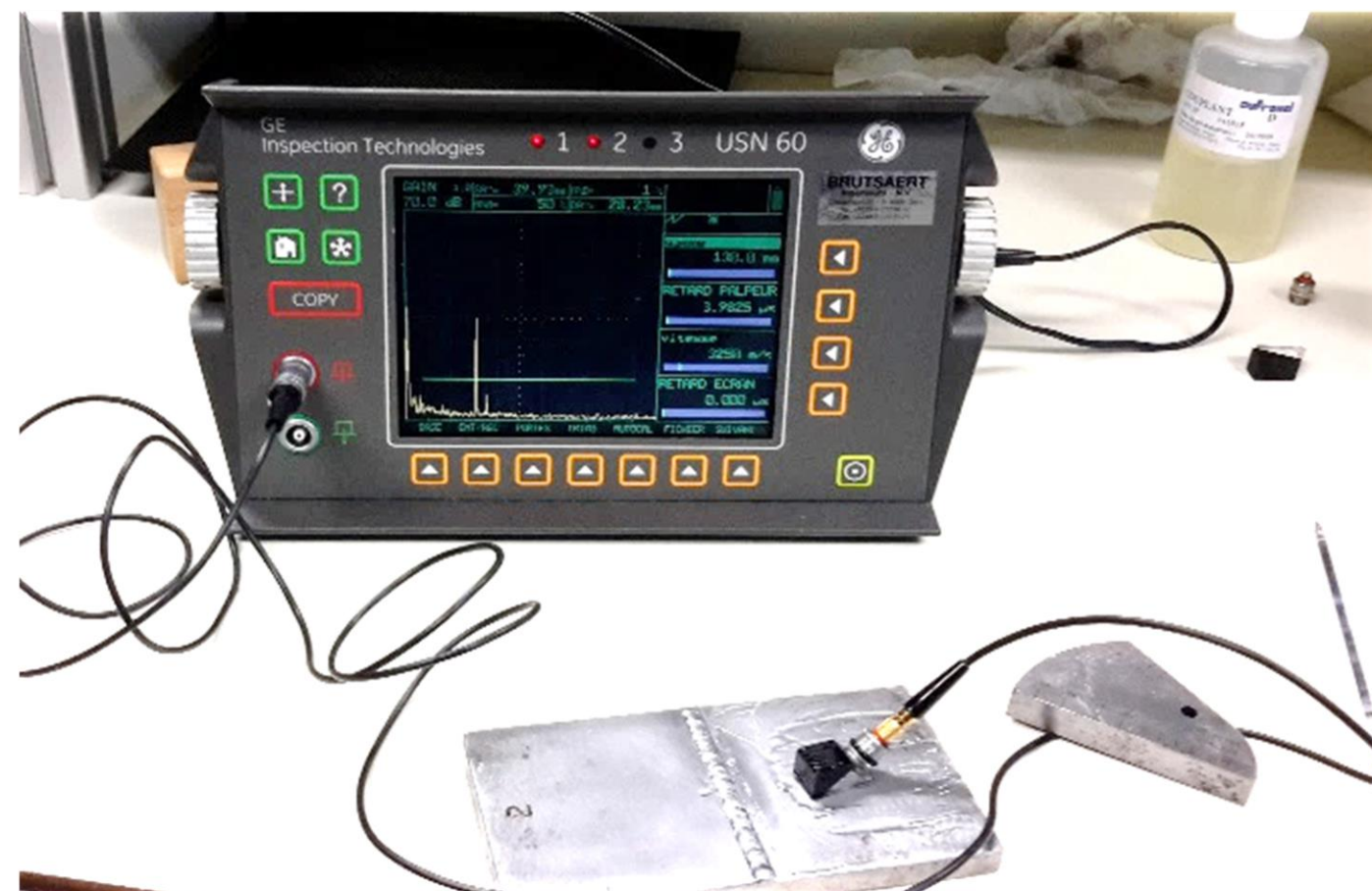
Engine Blade inspection



Sea Corrosion inspection



Inspections of Welds



Thickness Measurement



Delamination/ Porosity in Composites



Equipment



Reference standards



couplant



Angle probes

Ultrasound - portable digital technology



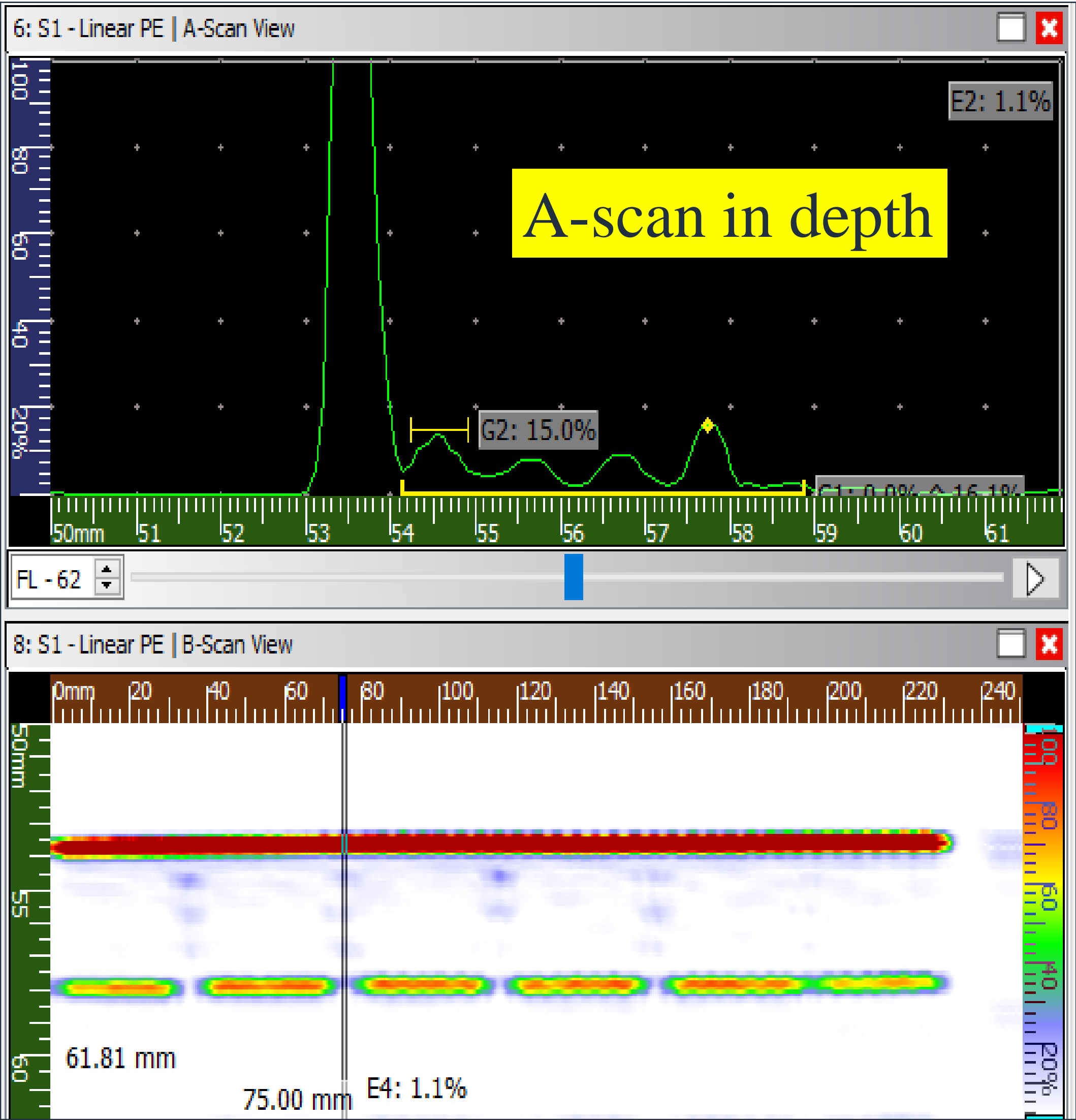
A-Scan station

Batteries



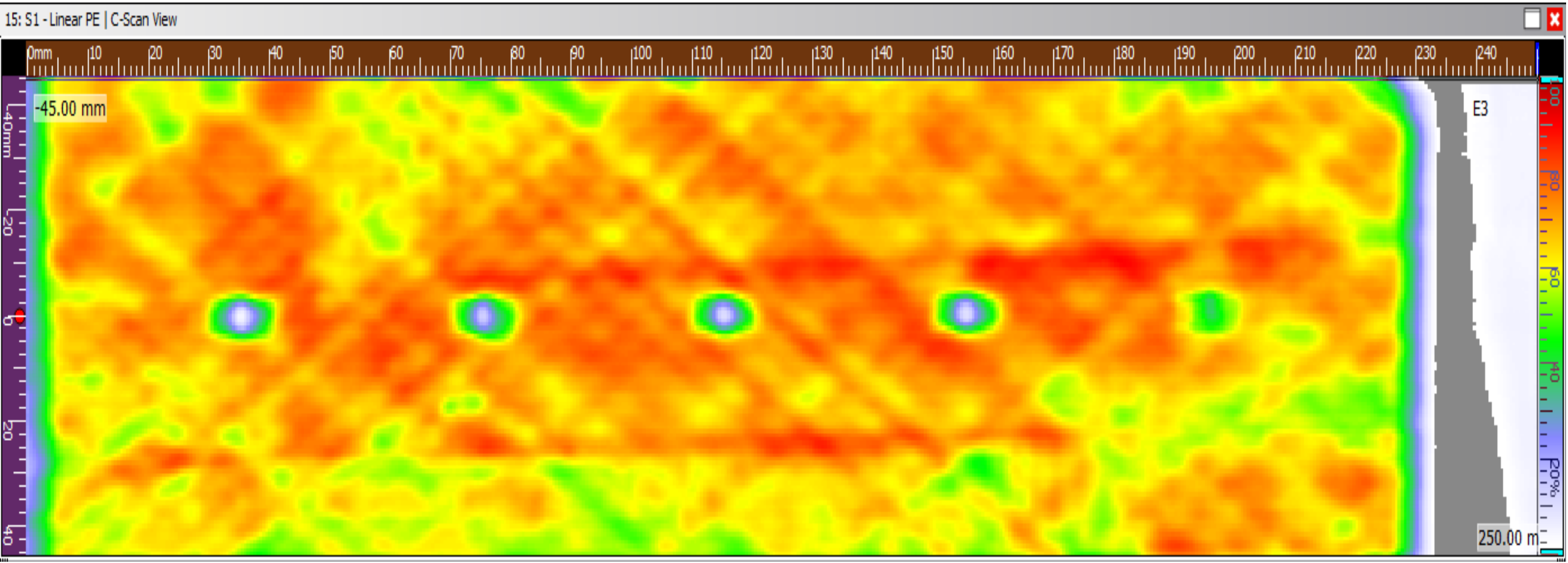
Multi-element equipment
Phased Array Technique

Interpretation



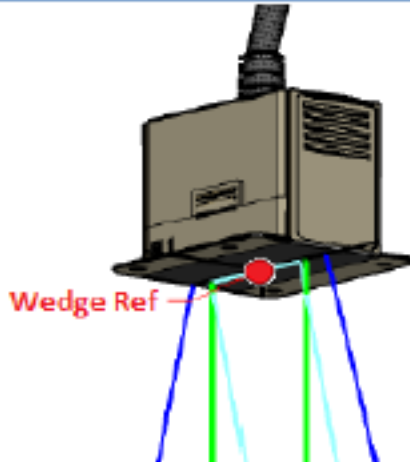
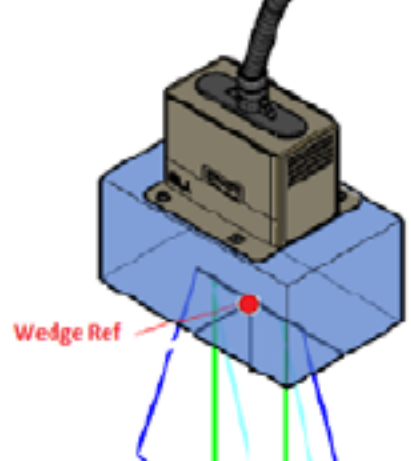
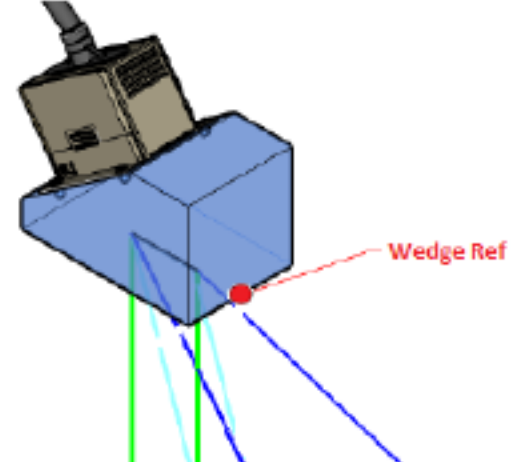
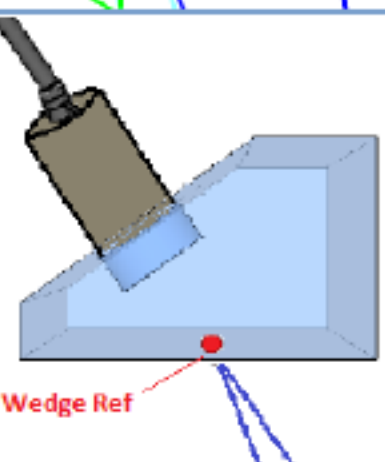
B-Scan View on 250 mm scan path

Voltage	50 V
Probe type	Phased-array
Frequency	5MHz
Elements	128
Impulsion type	Linear
Sabot	No
Control type	Immersion
OL speed	3136 m/s
Gain	4.4 dB
Values range	0 to 7 mm
Scan step	1 mm
Encoder	1 axis of 250mm



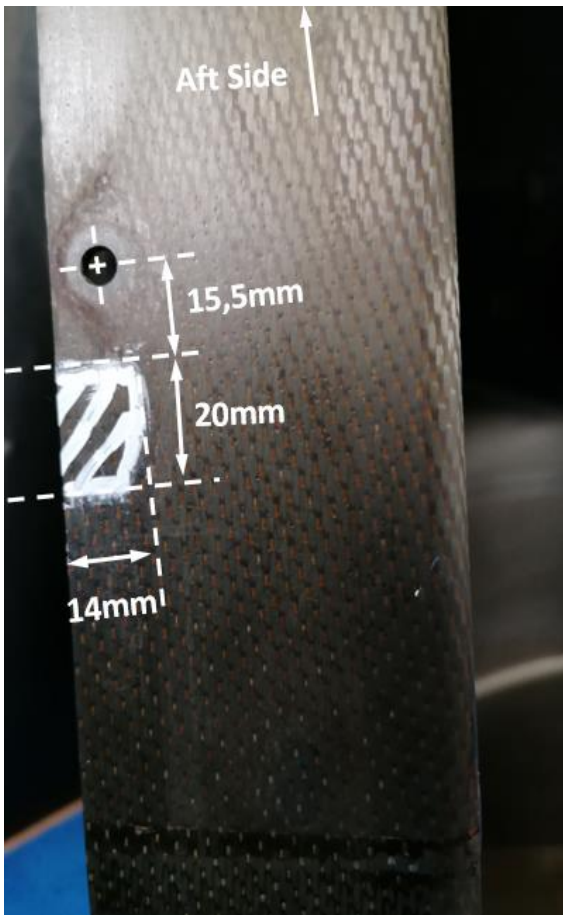
C-Scan of 5 defects

Ultrasonic Techniques used by MPP

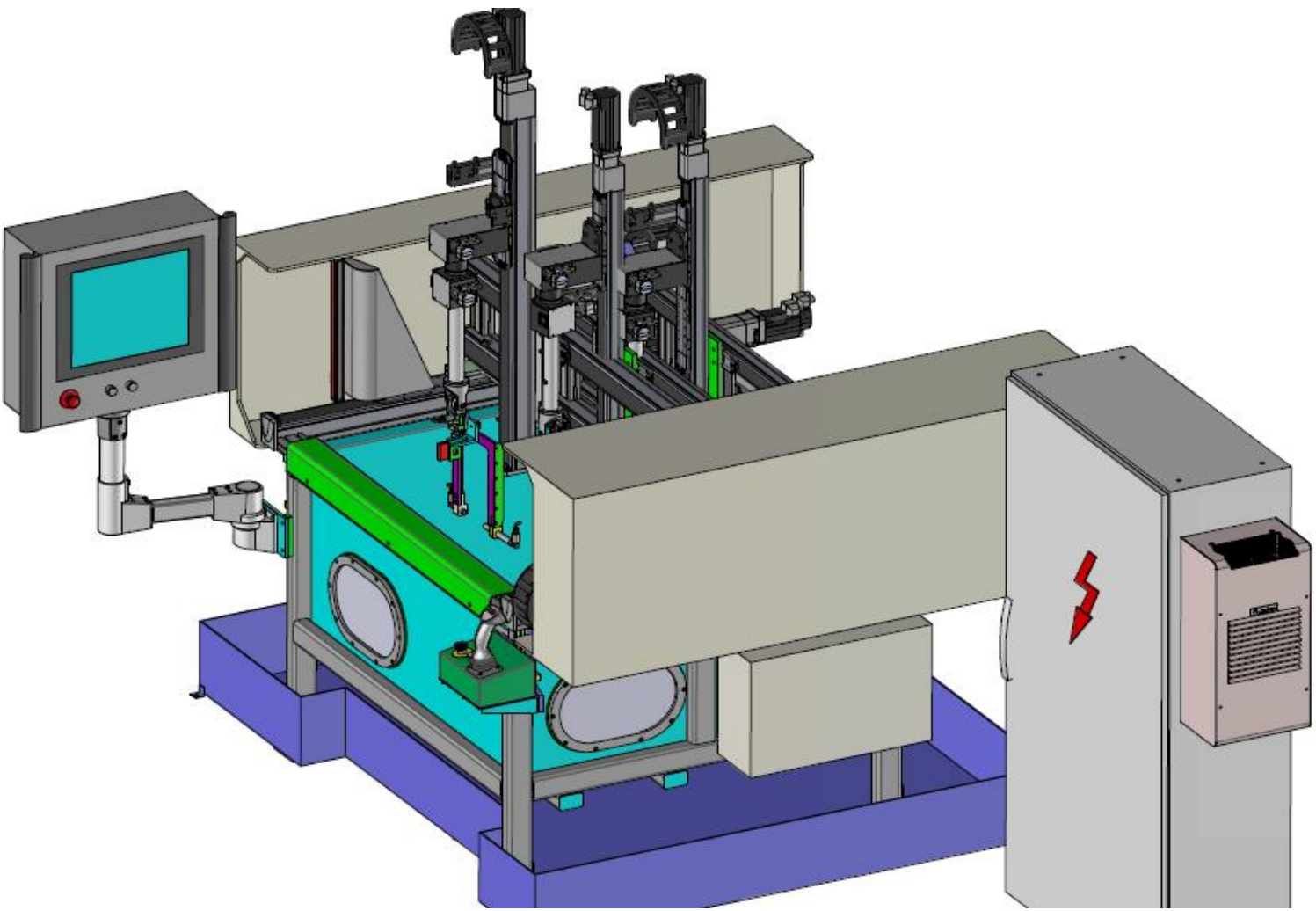
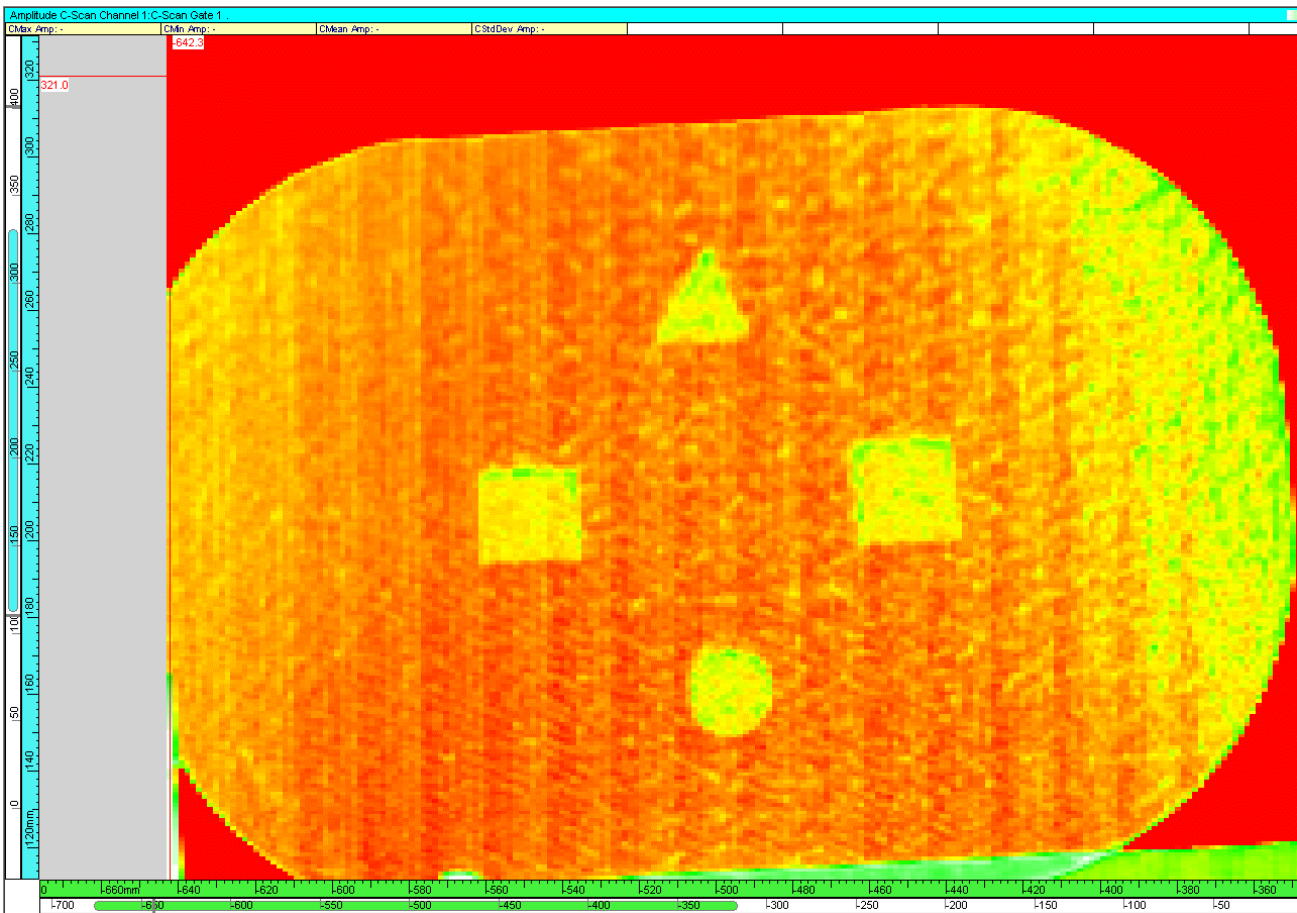
	Probe Type	Reference	Figure
Phased Array	Probe without wedge	Reference point in the center of the active surface of the probe	
	Probe with flat wedge	Reference point at the center of the wedge contact surface	
	Probe with angle wedge	Reference point in the middle of the front edge of the wedge	
UT Conventional	Probe with or without wedge	Reference point at the point of emergence of the beam	

Phased Array or conventional technique

defect marking



Caliber - 4 faults




Immersion Technique

Method	Equipment / Techniques	STAFF
RT Radiographic Testing	<ul style="list-style-type: none"> Digital radiography (from 50KV – 320KV) Resolution from 50 µm – 200 µm 	2 RT Level 1 2 RT level 2 and 1 RT3
UT Ultrasonic Testing	<ul style="list-style-type: none"> Immersion Testing Thickness measurement Phased Array Pulse Echo 	1 UT level 1 2 UT level 2 1 UT level 3
PT Penetrant Testing	<ul style="list-style-type: none"> Red Dye or Fluorescent penetrant Alkaline or Solvent Degreasing 	4 PT level 2 1 PT level 3
MT Magnetic Particle Inspection	<ul style="list-style-type: none"> Hand yokes Stationary MT bench 	3 MT level 2 1 MT level 3
IRT Infrared Thermography Testing	<ul style="list-style-type: none"> Hot air heater or 4 x 1000 W Halogen heaters IR Camera Flir T450sc 	2 IRT level 2 1 IRT level 3
ST Shearographic Testing	<ul style="list-style-type: none"> Hot air heater or 4 x 1000 W Halogen heaters Optrion Digital Shearographic Camera 	1 ST level 1 1 ST level 3
ET Eddy Current Testing	<ul style="list-style-type: none"> High and low Frequency Eddy Current Testing Rotating Probe ET 	2 ET level 2 1 ET level 3
VT Visual Testing	<ul style="list-style-type: none"> Direct VT of welds, castings and composite parts Indirect VT (endoscopy and digital microscope 220x) 	1 VT level 2 1 VT level 3

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