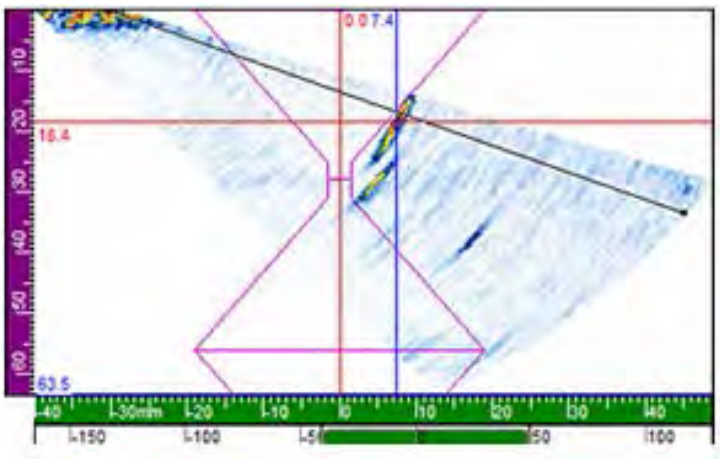
PHASED ARRAY ULTRASONIC TESTING

TOMTEC NDT MARINE SERVICES PTE LTD

PHASED ARRAY ULTRASONIC TESTING (PAUT) typically consist of a transducer assembly with from 16 to as many as 256 small individual elements that can each be pulsed separately. These may be arranged in a strip (linear array), a ring (annular array), a circular matrix (circular array), or a more complex shape. As is the case with conventional transducers, phased array probes may be designed for direct contact use, as part of an angle beam assembly with a wedge, or for immersion use with sound coupling through a water path.

A phased array system will also include a sophisticated computer-based instrument that is capable of driving the multi-element probe, receiving and digitizing the returning echoes, and plotting that echo information in various standard formats. Unlike conventional flaw detectors, phased array systems can sweep a sound beam through a range of refracted angles or along a linear path, or dynamically focus at a number of different depths, thus increasing both flexibility and capability in inspection setups.



The benefits of phased array technology over conventional UT come from its ability to use multiple elements to steer, focus and scan beams with a single transducer assembly. Beam steering, commonly referred to sectorial scanning, can be used for mapping components at appropriate angles. This can greatly simplify the inspection of components with complex geometries. The small footprint of the transducer and the ability to sweep the beam without moving the probe also aids inspection of such components in situations where there is limited access for mechanical scanning. Sectorial scanning is also typically used for weld inspection.

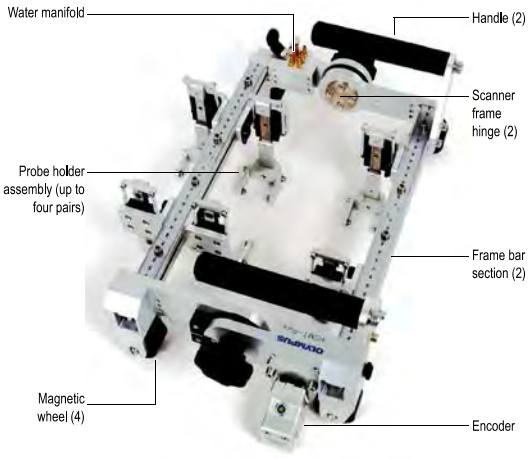
The ability to test welds with multiple angles from a single probe greatly increases the probability of detection of anomalies. Electronic focusing permits optimizing the beam shape and size at the expected defect location, thus further optimizing probability of detection. The ability to focus at multiple depths also improves the ability for sizing critical defects for volumetric inspections. Focusing can significantly improve signal-to-noise ratio in challenging applications, and electronic scanning across many groups of elements allows for C-Scan images to be produced very rapidly.

48 Toh Guan Road East, #08-127, Enterprise Hub, Singapore 608586
Tel: (65) 62624462 Fax: (65) 64681995
Email: tomtecmarine@tomtecndt.com
Website: http://www.tomtecndt.com

PHASED ARRAY ULTRASONIC TESTING

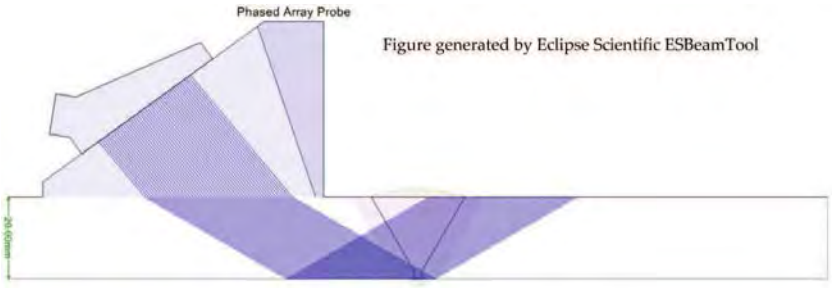
TOMTEC NDT MARINE SERVICES PTE LTD

Advantages



- ✓ Ability to sweep beams through a range of angles without moving the probe enables PA probe to be used in places where mechanical raster scans are not possible
- ✓ Ability of interrogating a defect with different angles increases the probability of detection (POD) of defects regardless of their orientation
- ✓ Ability to dynamically focus at different depths, improves ability for sizing critical defects by improving the signal to noise ratio
- ✓ Ability of plotting return signal data in various standard display formats
- ✓ Ability to increase the number of elements used, thus increasing sensitivity by reducing beam spread and sharpening the focus
- ✓ Most modern PA instruments have calibration wizards, which facilitate rapid and accurate calibration for multiple angles or simultaneous scans
- ✓ Ability to individually process returning signals according to arrival time and amplitude
- ✓ High inspection speeds over conventional UT employing raster scanning
- ✓ Increased signal to noise ratio using focused beams
- ✓ Data software is readily available for post – processing capabilities

At TOMTEC, we ensure that all our technicians are competent and certified to internationally recognized standards. TOMTEC performs Phased Array Ultrasonic Testing to provide you with an accurate assessment of the condition of your assets.



48 Toh Guan Road East, #08-127, Enterprise Hub, Singapore 608586
Tel: (65) 62624462 Fax: (65) 64681995
Email: tomtecmarine@tomtecndt.com
Website: http://www.tomtecndt.com