

ECHOGRAPH Phased Array Ultrasonic Testing Systems for Tubes

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KARL DEUTSCH has developed ultrasonic testing equipment since 1951 and has shipped the first inspection system for welded tubes in 1967. Many improvements for the ECHOGRAPH-electronics, the robust testing mechanics and the ultrasonic probes have led to our current state-of-the-art. All components are developed and assembled in-house. KARL DEUTSCH maintains a strict quality management system according to DIN EN ISO 9001:2015. For tube inspection with automated through-put at high testing speed, special testing chambers with exchangeable probe cassettes were designed. Non-contact ultrasonic coupling is carried out in immersion technique. The ultrasonic probes are mounted to probe cassettes. The cassettes are available in various sizes depending on the respective tube diameter. All probes are centrally arranged around the tube axis with a fixed distance (sound path) to the tube surface. The sound fields produce overlap in the circumferential and axial direction. The ultrasonic Phased Array probe configuration is dependent on the testing task and the respective specification: • Longitudinal flaw detection with 16 Phased Arrays probes transmitting ultrasound in the clockwise direction. Another 16 Phased Arrays probes are designated for the anti-clockwise direction. Ultrasound penetrates into the tube under a refraction angle between 30° to 70° (adjustable dependent on the ratio of wall thickness and diameter). One probe cassette carries 16 probes. Therefore, one set of two cassettes is required during the inspection. One cassette size can be used for a certain diameter range. Several sets are used to cover a larger diameter range.