Tube & Tank Inspection

temate® MRUT (Medium Range UT)

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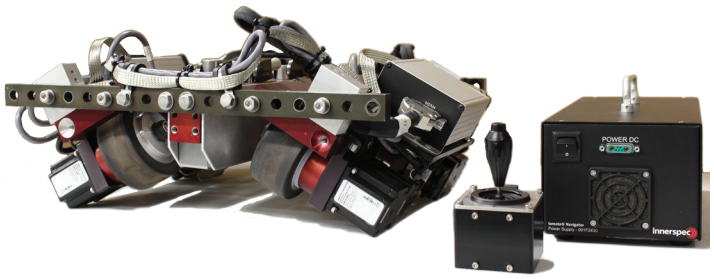
The **temate® MRUT** uses medium-range guided waves with a typical inspection range between 0.1m (4") and 5m (200") to detect corrosion, cracks and discontinuities on tubes, gas lines, oil pipelines and storage tanks. The system uses Electro Magnetic Acoustic Transducer (EMAT) technology to perform fast scanning on exposed tubes and tanks as well as inspections of inaccessible areas from a fixed position. With the use of higher frequencies and a shorter range, this technique detects isolated pitting and wall loss with up to 10 times better resolution than Long Range UT systems with minimal dead zone.

Axial Scanning

Separate transmitter and receiver in through-transmission configuration send sound around the tube or across a plate to measure attenuation and/or velocity changes in the signal due to corrosion, cracks or other defects. Ideal for inspection under supports when the top of the tube is accessible or to inspect large spans of exposed pipe or tank walls at speeds up to 150mm/s (6inch/s). The inspection can be performed on rough and corroded surfaces and when covered with thin wraps and coatings (<3mm). The equipment options include a hand-held instrument and scanner for smaller, easy-to-access jobs, and a high-speed, portable system with an automated crawler for fast scanning and climbing on pipes and tanks horizontally and vertically. The hand-held instruments are designed to be used with permanent magnet sensors, while the high-speed system can be used with permanent or pulsed magnet sensors for superior signal-to-noise.

Circumferential Scanning

Single or dual sensors send guided waves along a tube or a plate and measure reflections from any corrosion and defects up to 5m (200") in front of the sensors. Ideal for inspection of pipes under supports, air-to-soil interfaces and any tubes and plates where there is no direct access to the area inspected. The equipment includes different sensors to excite Lamb and Shear Horizontal guided wave modes, including a new patent-pending magnetostrictive scanner and custom software designed for the inspection of pipes with heavy coatings and CUPS (Corrosion Under Pipe Supports).



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GUIDEDWAVE

Innerspec
High-performance NDT solutions

temate® MRUT - Specifications

	Hand-Held Scanning	Automated Scanning
Components	**Innerspec PowerBox H** with Signal Conditioning Permanent Magnet Sensors **temate® MRUT Lamb Hand-Held Scanner** **temate® MRUT SH (MS) Hand-Held Scanner** Magnetrostrictive Strip (for operation with MS Scanner) Cables (up to 2m)	**Innerspec PowerBox 2 (PB2)** **Innerspec PowerBox MP (PBMP)** Pulsed or Permanent Magnet Sensors **temate® Navigator Scanner** Laptop with **temate®** software Cable bundle (up to 100m)
Inspection Speed	Approx. 25mm/s (manual scanning).	Approx. 150mm/s (manual or automated scanning)
Power Requirements	Battery Operated (3-8 hours)	100-240VAC, 47-63Hz
Dimensions & Weight	Dimensions: 203mm x 229mm x 100mm (8”x9”x4”) Weight: 2.72Kgs (6lbs)	Dimensions PB2 and PBMP: 324mm x 336mm x 235mm (12.75”x13.25”x9.25”) Weight: 10Kgs (22lbs) each
Materials Inspected	Metallic (magnetic and non-magnetic) materials, including carbon steel, stainless steel and inconel. Minimum OD: 25.4mm (1”) Minimum ID for inspection: 1219mm (48”) Maximum Thickness: 25mm (1.0")	
Inspection Technique	.	
Defect Detection	Axial Scanning (Through Transmission) • 25mm x 20% wall smooth corrosion, 10% for perpendicular cracks. • Cross sectional area - 1.4% of 14” pipe / 3.3% of 4” • 0.125mm (0.005”) surface defect detection. Circumferential Scanning (Reflection) • 25mm x 30% wall smooth corrosion, 0.1m to 5m coverage. • SH (MS) Scanner permits inspection of pipes with heavy coatings (Tapecoat, tar coating).	
Software	Automatic (encoder triggered) and manual operation control modes. Simultaneous, real-time data acquisition and analysis. Programmable defect thresholds for each ultrasonic channel. A-Scan (oscilloscope), Strip Chart, and B-Scan presentation of results. MRUT-A and MRUT-C custom software with automated calibration and post-inspection processing capabilities. PC Viewer software available for results review and exportation to CSV.	

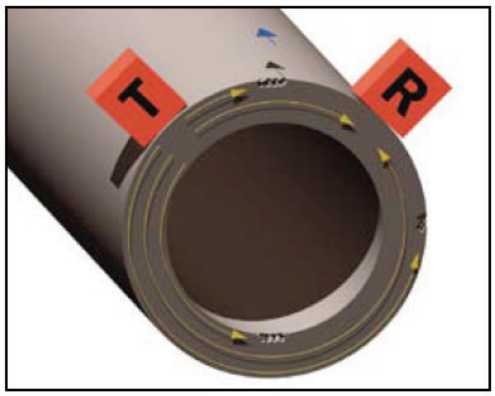

Figure 1: Axial scan method

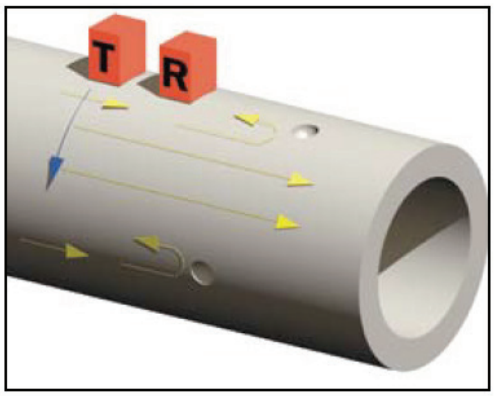

Figure 2: Circumferential scan method

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