



EXCELLENCE CERTIFIED

**Precision Inspection. Verified Integrity.
Zero Compromise.**

*Advanced & Conventional NDT and Allied Engineering
Services for Critical Industrial Assets*



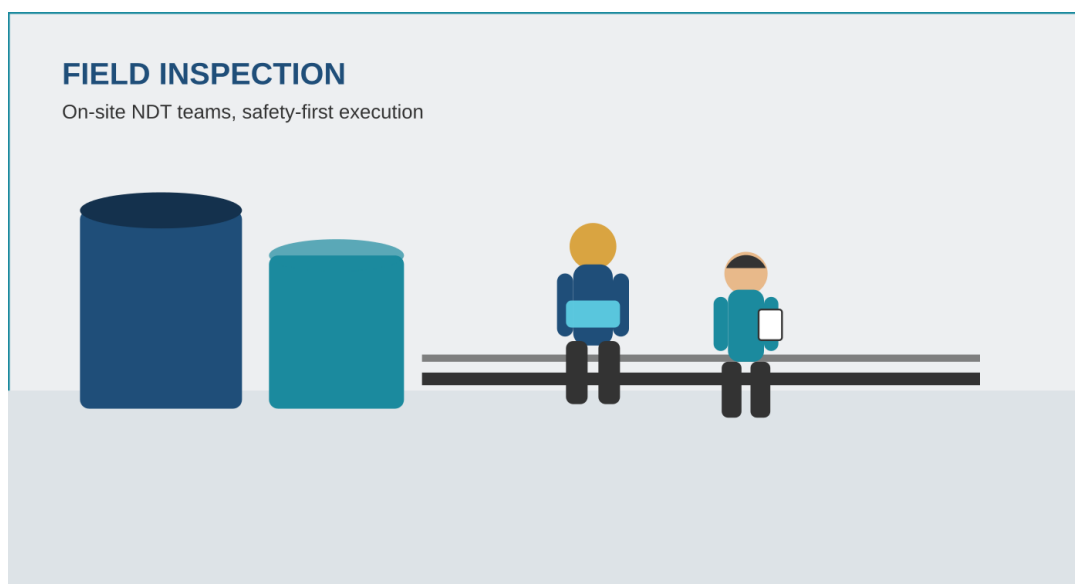


Who We Are

Quantum NDT Private Limited is a Gujarat-based Non-Destructive Testing (NDT) and Allied Engineering Services provider, established to protect the structural and operational integrity of critical assets across India and abroad. We serve the Oil & Gas, Petrochemical, Power Utility, Marine, Fertilizer, Chemical, Cement, Heavy Engineering, and Foundry sectors, delivering both conventional and advanced inspection methodologies through specialists trained across the full spectrum of NDT disciplines.

Every inspection we perform is executed in accordance with recognized engineering codes and international best practice — the discipline behind our commitment to Excellence Certified service — giving asset owners, QA/QC directors, and safety engineers the assurance they need to make confident, defensible integrity decisions.

Our client base spans Government, semi-government, and private-sector organizations in India and overseas. We have built specialized capability in heat exchanger tube inspection, storage tank and pressure vessel integrity assessment, and rapid corrosion screening of pipelines and plant piping — supporting maintenance planning that reduces unplanned downtime and extends asset life.



Inspection That Protects Your Bottom Line



Minimize Downtime



Ensure Compliance



Detect Early



Extend Asset Life



Auditable Records

- Minimize unplanned downtime through predictive, condition-based inspection data
- Maintain compliance with API, ASME, EN and other governing integrity standards
- Detect corrosion, cracking, and wall loss before they become failures
- Extend asset life and defer costly capital replacement decisions
- Support confident, auditable integrity records for regulators and stakeholders



Core Inspection Capabilities

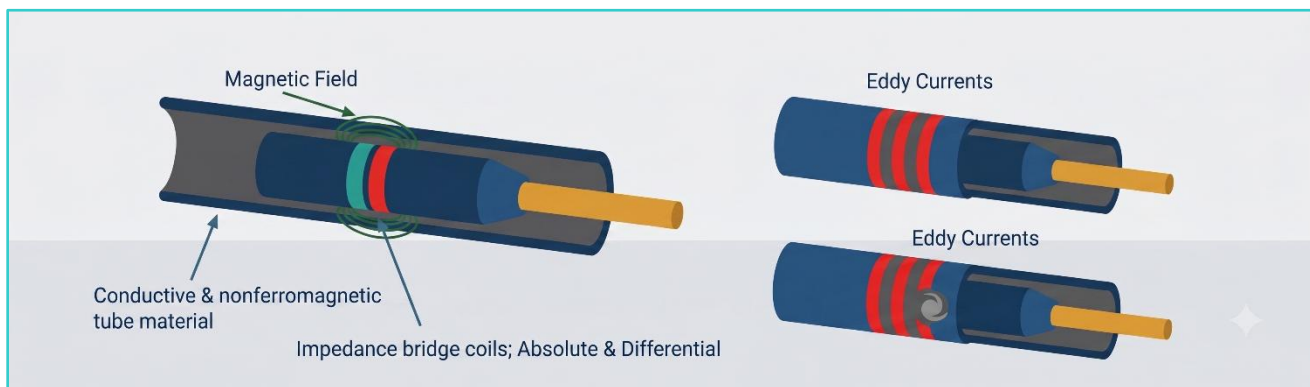
We offer experienced, cost-effective, and fully independent inspection guidance across two integrated service tiers: Advanced NDT Techniques for complex, inaccessible, or high-consequence applications, and Conventional NDT Techniques for established, code-driven integrity verification.

Advanced NDT Techniques

Eddy Current Testing (ECT)

A noncontact electromagnetic method for inspecting non-ferromagnetic tubing. Excited coils induce eddy currents in the tube wall; any discontinuity — corrosion, erosion, wear, pitting, baffle cuts, wall loss, or cracking — alters coil impedance in a measurable way, enabling reliable detection and sizing of defects in nonferrous materials.

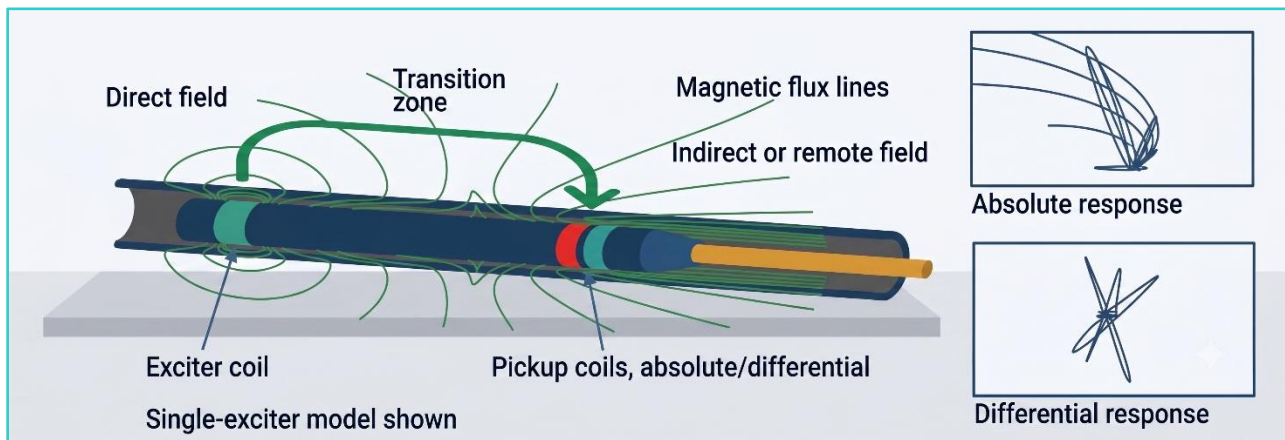
Applications: *Condensers, feed water heaters, coolers, evaporators, chillers*



Remote Field Testing (RFT)

A proven technique for ferromagnetic tubing such as carbon steel or ferritic stainless steel, offering strong sensitivity to volumetric defects caused by erosion, corrosion, wear, and baffle cuts.

Applications: *Boiler generating bank tubes, feed water heaters, carbon steel heat exchangers*

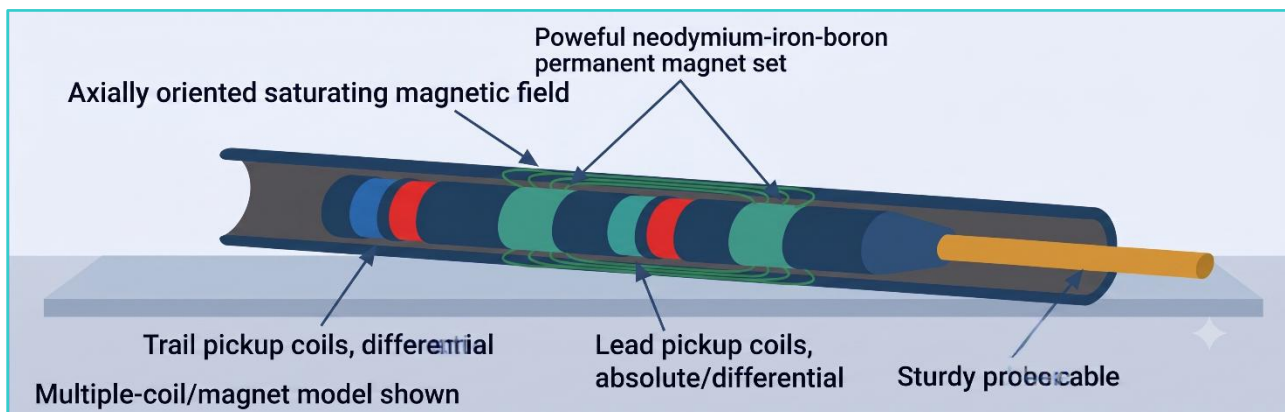




Magnetic Flux Leakage (MFL)

A high-speed inspection technique for measuring wall loss and detecting sharp-edged defects — pitting, grooving, and circumferential cracking. MFL remains effective on aluminium-finned carbon steel tubing, as the magnetic field is largely unaffected by the presence of fins.

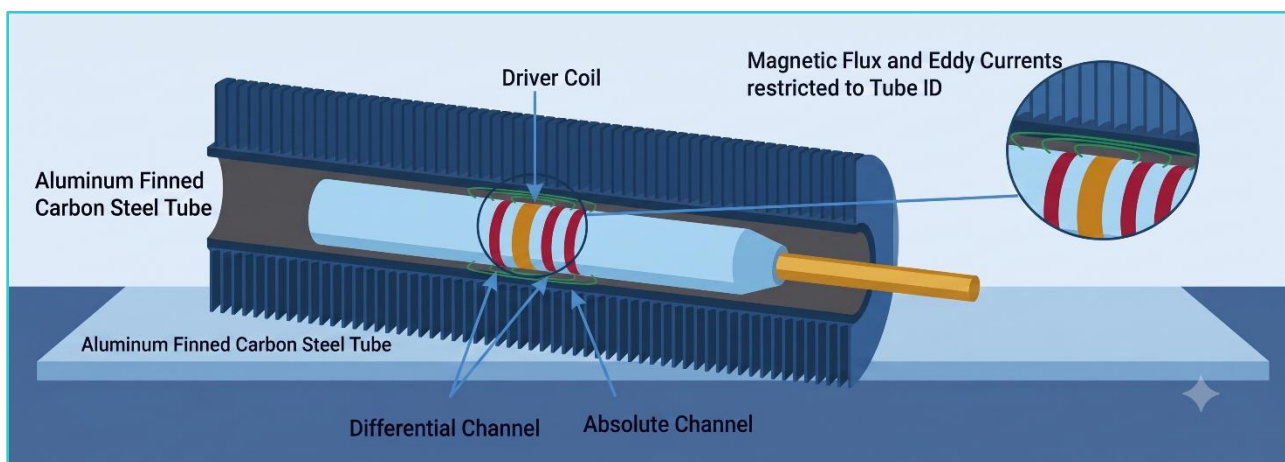
Applications: Air coolers, feed water heaters, carbon steel heat exchangers



Near Field Testing (NFT)

A rapid, low-cost driver-pickup eddy current solution purpose-built for fin-fan carbon steel tubing. NFT targets internal corrosion, erosion, and pitting on the tube ID, and — because eddy current penetration is confined to the inner surface — remains unaffected by external fin geometry.

Applications: Air coolers, carbon steel heat exchangers

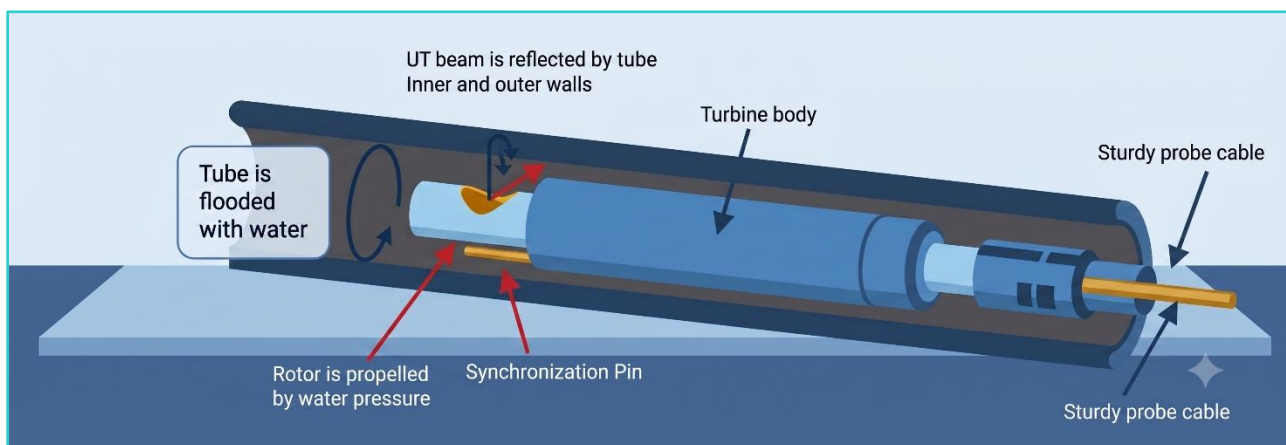




Internal Rotary Inspection System (IRIS)

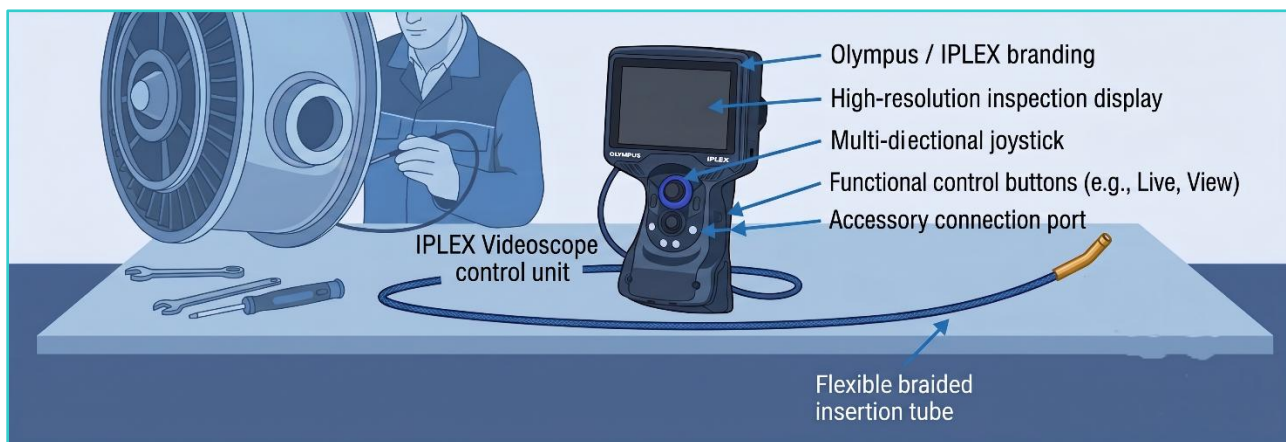
An ultrasonic immersion technique used across ferrous, nonferrous, and non-metallic tubing to detect and size wall loss from corrosion, erosion, wear, pitting, and baffle cuts. A water-driven rotating transducer reflects ultrasonic pulses radially through the tube wall, measuring wall thickness via the time interval between inner- and outer-wall echoes. The resulting helical scan path delivers 100% volumetric coverage — widely used as a prove-up technique for RFT, MFL, NFT and ECT findings.

Applications: *Boiler generating bank tubes, feed water heaters, air coolers, heat exchangers*



Remote Visual Inspection (RVI) / Videoscopy

Enables inspection of inaccessible areas without dismantling equipment or surrounding structure. RVI identifies surface defects, poor welding, pitting, corrosion, degradation, blockages, and foreign material before they escalate into major failures.



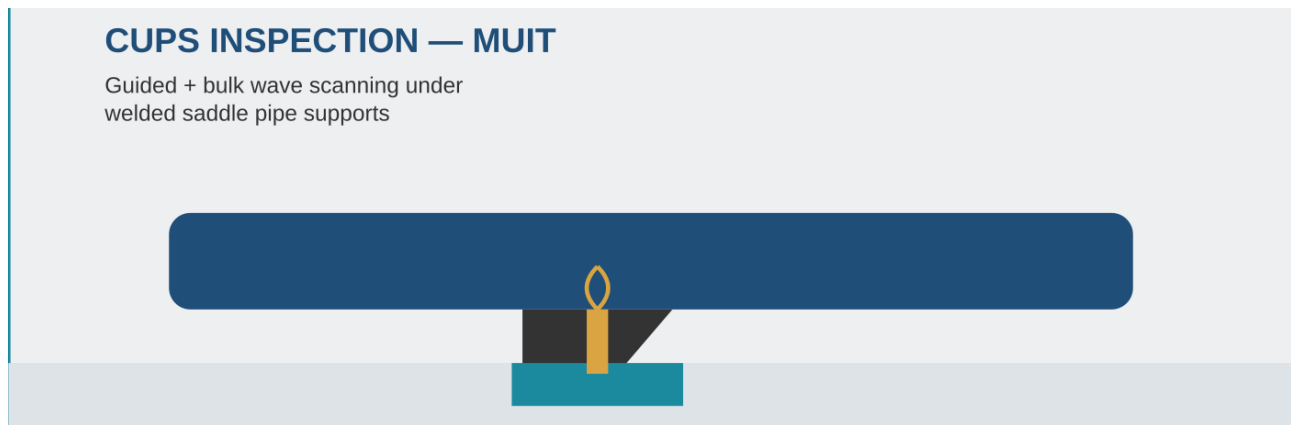


Multimode Ultrasonic Inspection Technique (MUIT)

A proprietary Quantum NDT solution engineered to solve one of the industry's most persistent blind spots: Corrosion Under Pipe Supports (CUPS). Conventional ultrasonic methods struggle where weld geometry interferes with signal interpretation, leaving critical support zones effectively uninspected.

MUIT combines multiple Lamb-guided and bulk wave modes (shear and longitudinal) to generate high signal-to-noise responses that remain uninterrupted by welds or fillet welds. Operating across a 500 kHz–6.5 MHz frequency spectrum, MUIT maps corrosion profiles through insulation, composite wraps, and concrete bund walls, achieving $\pm 5\%$ accuracy against Laser Profilometry validation and sizing wall loss from 15% to 85%. Effective on pipe diameters from 1.5 inches up to flat surfaces, with wall thicknesses from 2 mm to 25 mm.

Applications: *Welded saddle, clamp, and touchpoint pipe supports; pipes through bund walls or concrete slabs; insulated and composite-wrapped components; pressure vessel skirts, stiffener rings and anchor bolts*



MFL Inspection: Tank Bottom Plate Integrity

The industry standard for rapid, non-destructive evaluation of storage tank floor plates, supporting API 653 compliance. Powerful permanent magnets saturate the steel floor; metal loss disrupts the contained magnetic flux, producing a detectable leakage signal that precision sensors convert into a calibrated wall-loss reading.

Key technical advantages: Motorized scanners cover large floor areas significantly faster than manual UT; flaws are detected through internal linings and epoxy coatings up to 6mm thick, without costly coating removal; advanced bridge sensors discriminate between top-surface pitting and bottom-surface soil-side corrosion; and a full CAD-integrated heat map of the tank floor is generated for targeted, cost-efficient repair planning.

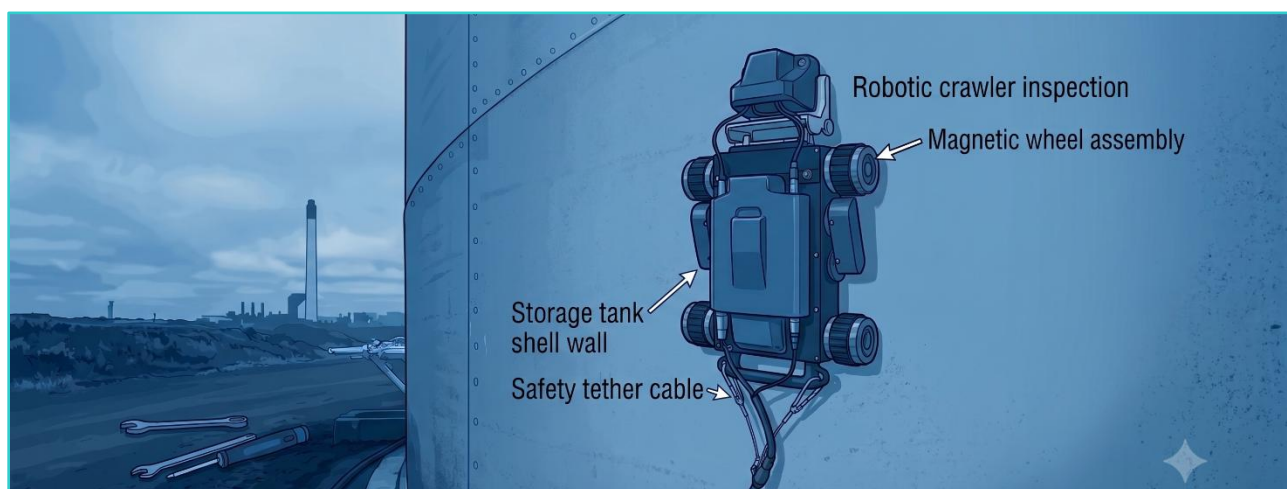




AUT Inspection: Robotic Crawler Thickness Mapping

A safer, faster, and more accurate alternative to scaffolding-based manual UT for high-elevation assets. Magnetic-chassis robotic crawlers carry ultrasonic probes across tank shells, pressure vessels, and piping — even vertical and inverted surfaces through thick coatings — while inspectors remain safely on the ground.

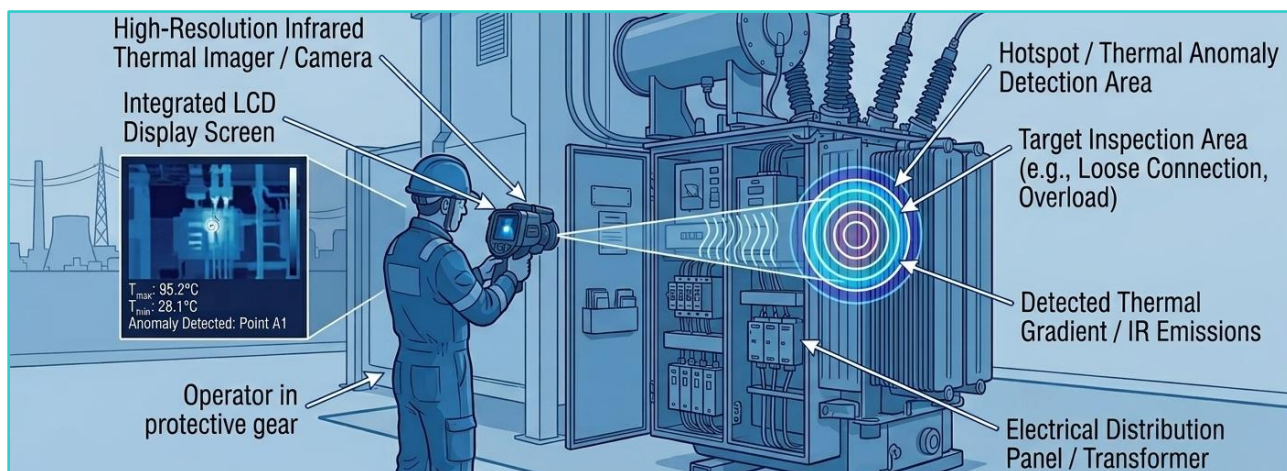
Continuous B-scan measurement captures thousands of data points per linear meter, each digitally geo-referenced for 100% traceability. Because crawlers can operate while assets remain in service, inspection no longer requires costly shutdowns or rope access.



Thermography

Infrared thermal imaging identifies abnormal heat signatures — loose connections, worn bearings, and other developing faults — without physical contact. Because no shutdown or process interruption is required, thermography surveys can be performed under fully operational conditions.

Applications: *Electrical panels and switchgear, mechanical and rotating equipment*

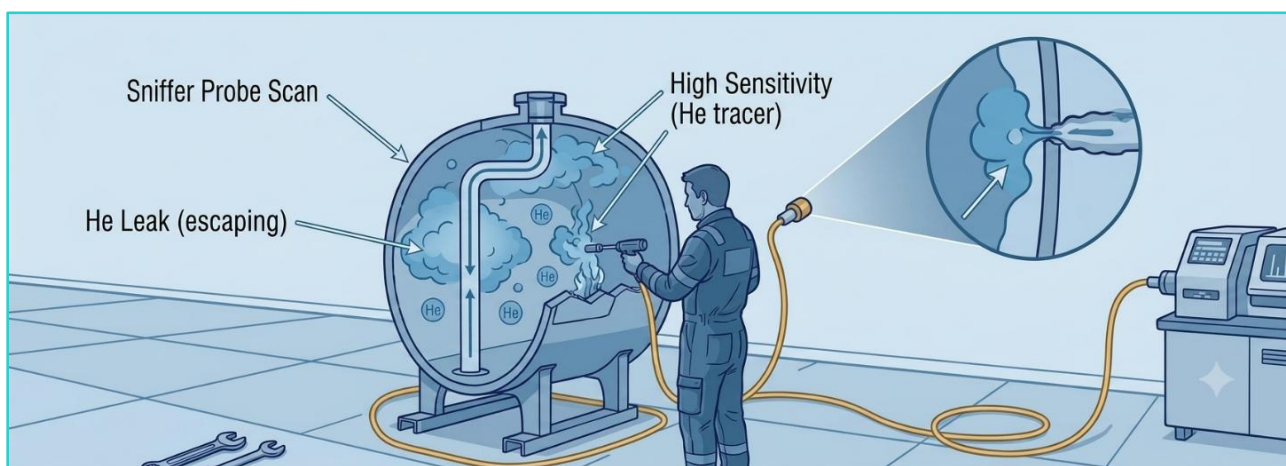




Helium Leak Testing

Helium's small atomic size, inertness, and near-absence from ambient air (≈ 5 ppm) make it the industry-preferred tracer gas for leak detection. A Mass Spectrometer Leak Detector (MSLD) introduces helium to the test part and measures the partial pressure of gas escaping through any leak path, delivering precise, quantifiable leak-rate data for quality assurance.

Applications: *Hermetically sealed packages, valves, manifolding, seals, vacuum vessels and systems, medical devices, high-purity piping, brake and fuel lines, hydraulic lines, refrigeration assemblies, radiators, heat exchangers, condensers, storage tanks*

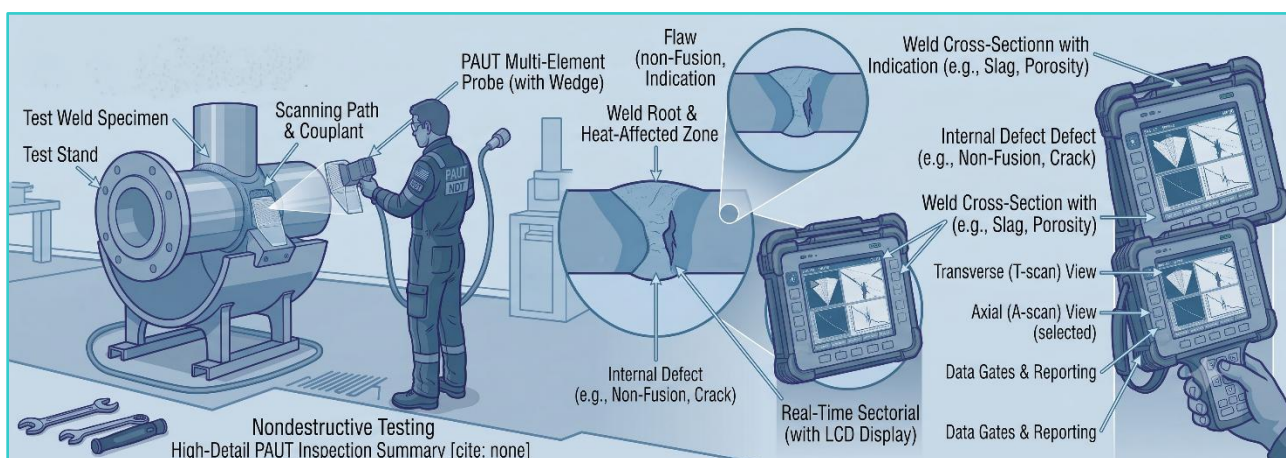


Phased Array Ultrasonic Testing (PAUT)

A multi-element transducer (typically 16–256 elements) is pulsed in programmed sequence, electronically steering and focusing the ultrasonic beam to generate a wide range of inspection angles from a single probe assembly. Sectorial scanning enables mapping of complex geometries and multi-angle weld inspection without repositioning the probe — significantly increasing probability of detection.

Electronic focusing optimizes beam shape at the expected defect depth, improving both detection and sizing accuracy for volumetric flaws, while high-speed electronic scanning enables rapid C-scan image generation.

Applications: *Weld inspection and crack detection across aerospace, power generation, petrochemical, metal billet and tubular goods, pipeline construction, structural metals, and general manufacturing; corrosion survey wall-thickness profiling*



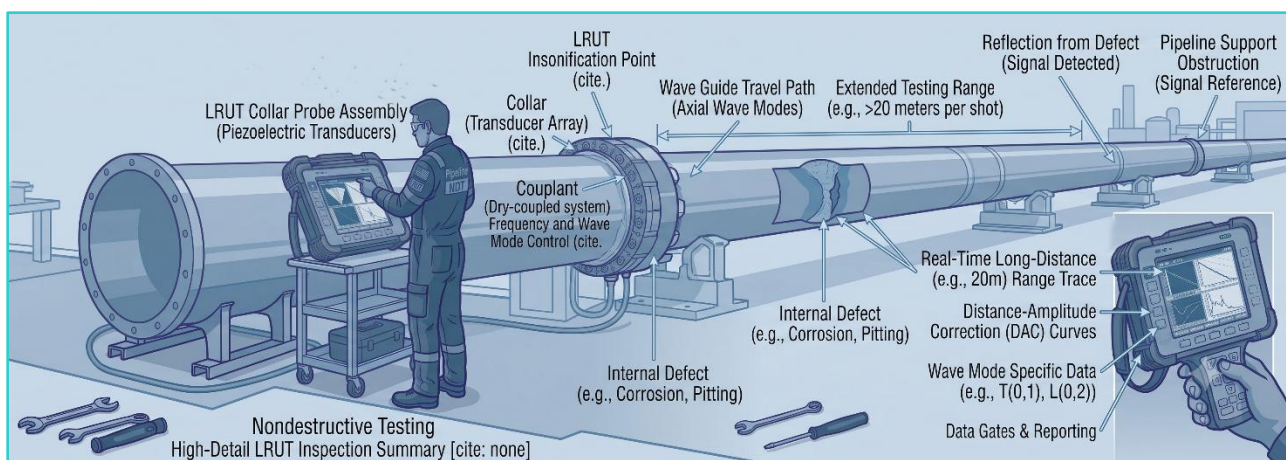


Long Range Ultrasonic Testing (LRUT)

LRUT provides fast, cost-effective screening of long pipe runs from a single measurement location, using low-frequency guided ultrasonic waves to achieve 100% coverage of the pipe wall without moving the transducer — including insulated and buried sections, and while the pipeline remains in service.

A transducer ring is fitted at one accessible point; guided waves travel along the pipe and return echoes that reveal corrosion, erosion, and other anomalies with accurate axial positioning. Typical single-location range is $\pm 30\text{m}$ (98 ft), extending up to 150m (450 ft) under ideal conditions. No liquid Couplant is required, and coating or insulation removal is minimized — reducing both maintenance cost and inspection time. Standard for pipe diameters 6"–78", with smaller-diameter versions available for 2", 3", and 4" pipe.

Applications: Buried pipe, insulated pipe, road crossings, elevated and overhead piping, offshore pipelines, clamped and difficult-to-access piping systems





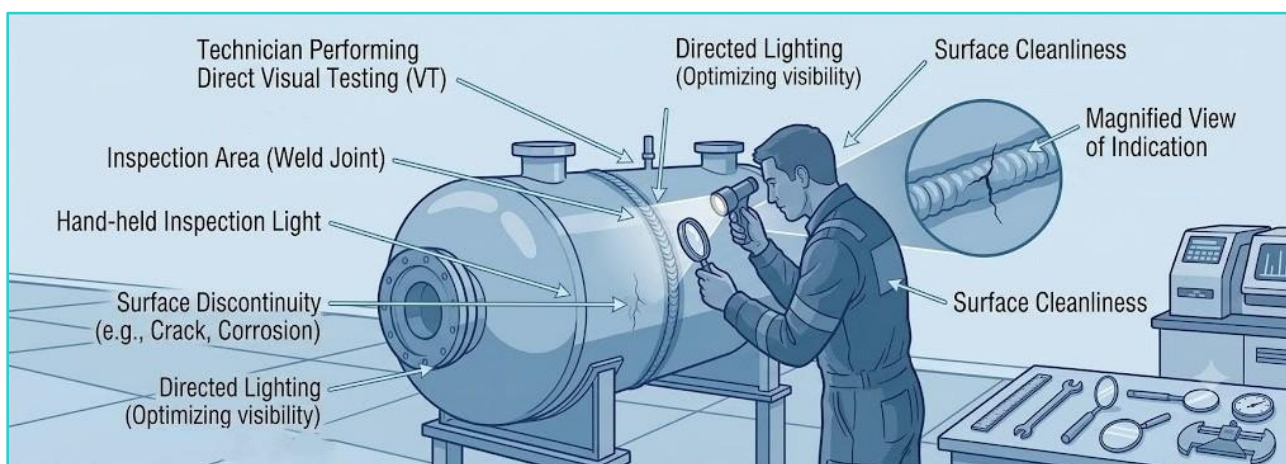
Conventional NDT Techniques

Our conventional NDT services form the code-mandated backbone of asset integrity programs — reliable, well-established methods applied with the same rigor and quality control as our advanced techniques.

Visual Testing (VT)

The foundational NDT method and typically the first step in any examination sequence, applied to castings, forgings, machined components, and weld elements. Trained inspectors combine direct sensory examination — aided by magnifiers, dental picks, and stethoscopes — with structural knowledge and reference documentation to identify surface conditions accurately and cost-effectively.

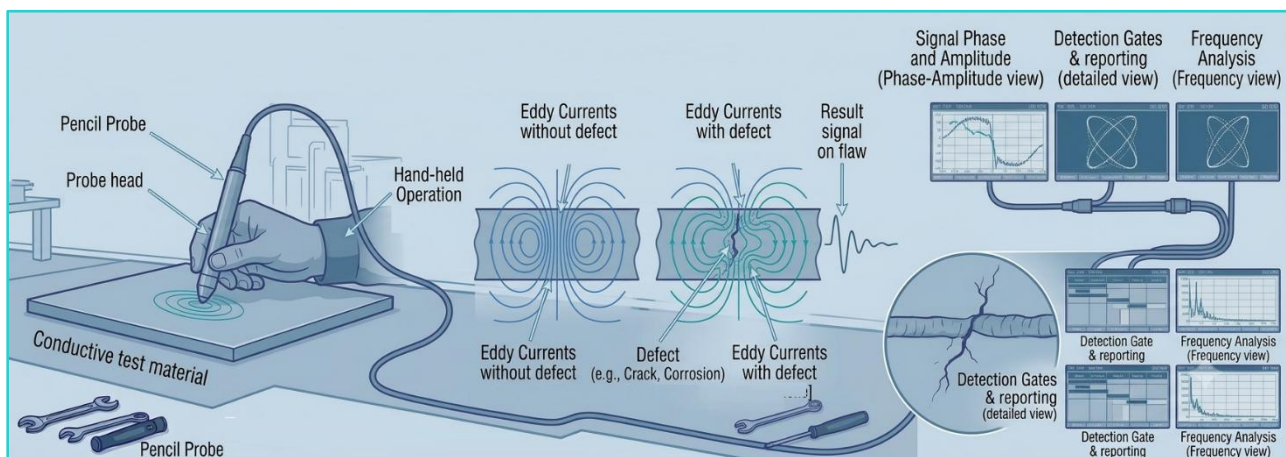
Applications: Structural steel, automotive, petrochemical, power generation, aerospace



Surface Eddy Current Testing

Portable eddy current flaw detectors deliver highly reliable detection of surface and near-surface defects in metallic components by measuring induced current effects on coil impedance and phase.

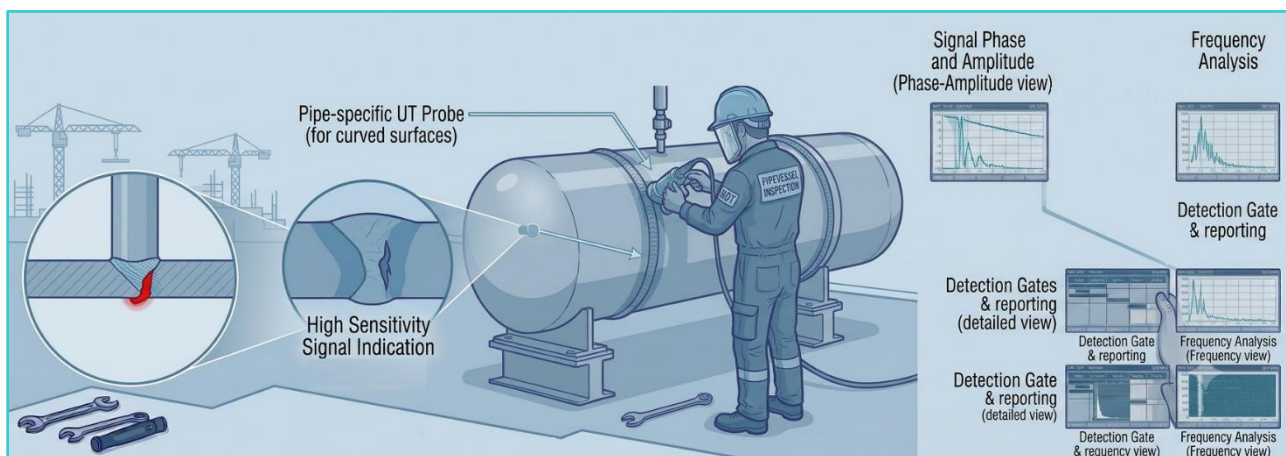
Applications: Aircraft crack and corrosion inspection, material/alloy sorting, bolt-hole defect detection, ASME-code heat exchanger examination, conductivity and coating-thickness measurement





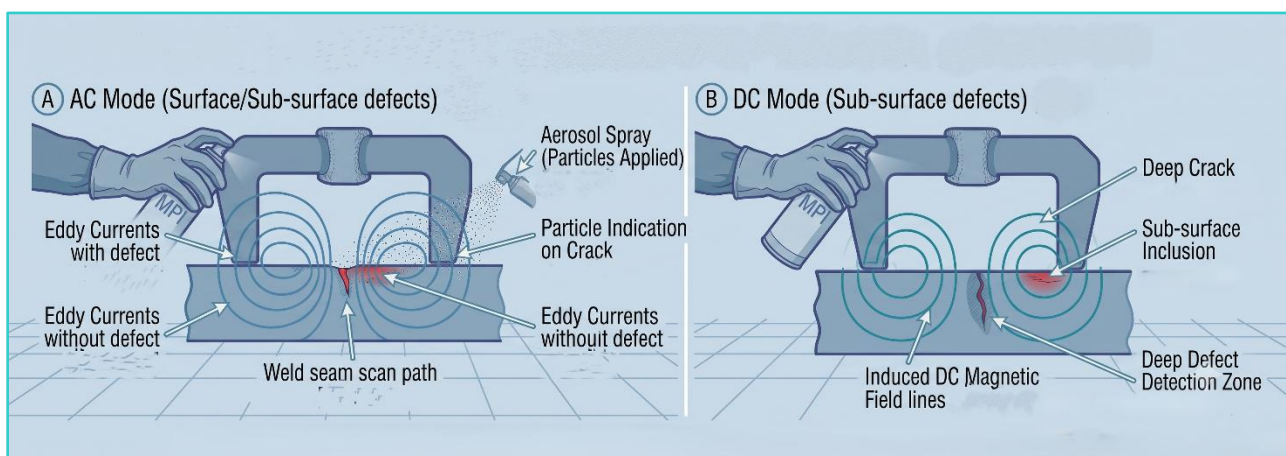
Ultrasonic Testing (UT)

High-frequency sound energy is introduced into the material and reflected back from internal discontinuities, revealing flaw location, size, orientation, and material characteristics. UT offers superior depth of penetration versus other NDT methods, requires only single-sided access in pulse-echo mode, and delivers instantaneous, highly accurate results with minimal part preparation — including detailed imaging when paired with automated scanning systems.



Magnetic Particle Inspection (MPI)

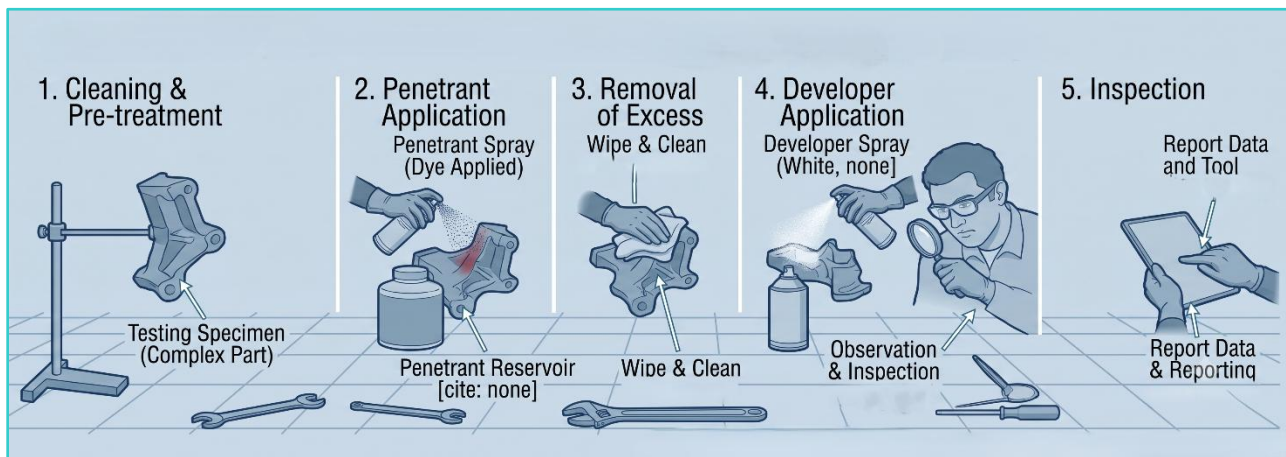
An extremely cost-effective method for detecting surface and near-surface flaws in ferromagnetic materials. Following magnetization, ferrous particles are applied and drawn to areas of magnetic flux leakage caused by surface-breaking defects, producing a clearly visible indication.





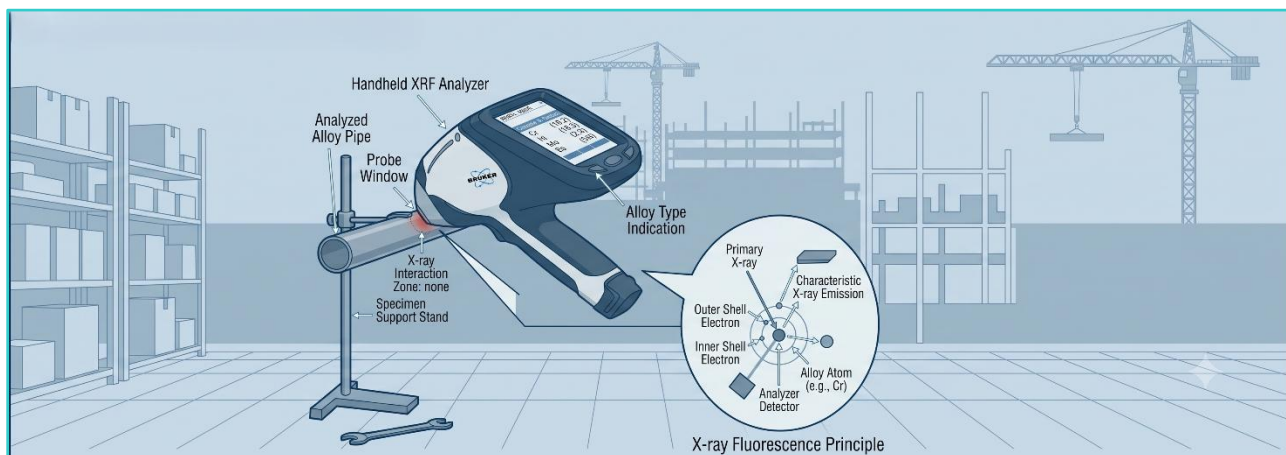
Dye Penetrant Testing (DPT)

A low-cost method for detecting surface-breaking flaws — cracks, cold laps, porosity — on non-porous metallic and non-metallic materials. Penetrant is drawn into surface flaws by capillary action; a developer then draws it back out to produce a visible surface indication.



Positive Material Identification (PMI)

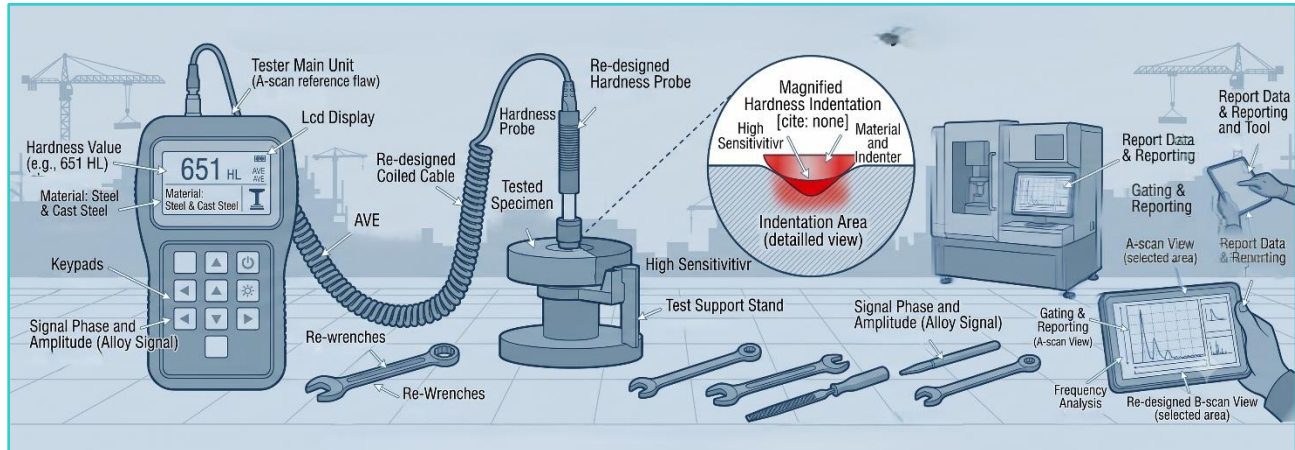
Material mix-ups — at the vendor, in storage, or during fabrication — can result in major safety incidents and significant financial loss. Quantum NDT delivers PMI verification at every stage of plant commissioning using PMI equipment for alloying-element analysis (Mn, Cr, Ni, Nb, V, Ti, Cb, Mo, W), and portable optical emission spectrometry for carbon, sulphur, phosphorus, and silicon analysis where a flat 25×25mm surface is available (best suited to components 50 NB and larger; 99.99% pure argon required). Together, these capabilities build full confidence in material traceability across the project lifecycle.





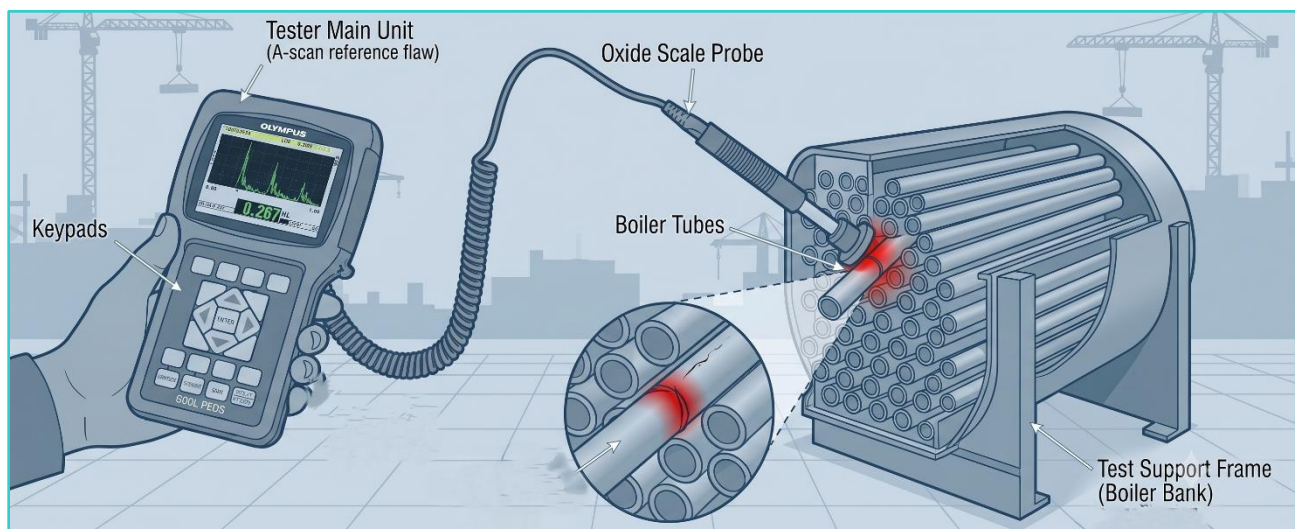
Hardness Testing

The Leeb Rebound Hardness Test (LRHT) is among the most widely used portable hardness methods, measuring the coefficient of restitution on sufficiently large workpieces without damaging the component.



Oxide Scale Measurement

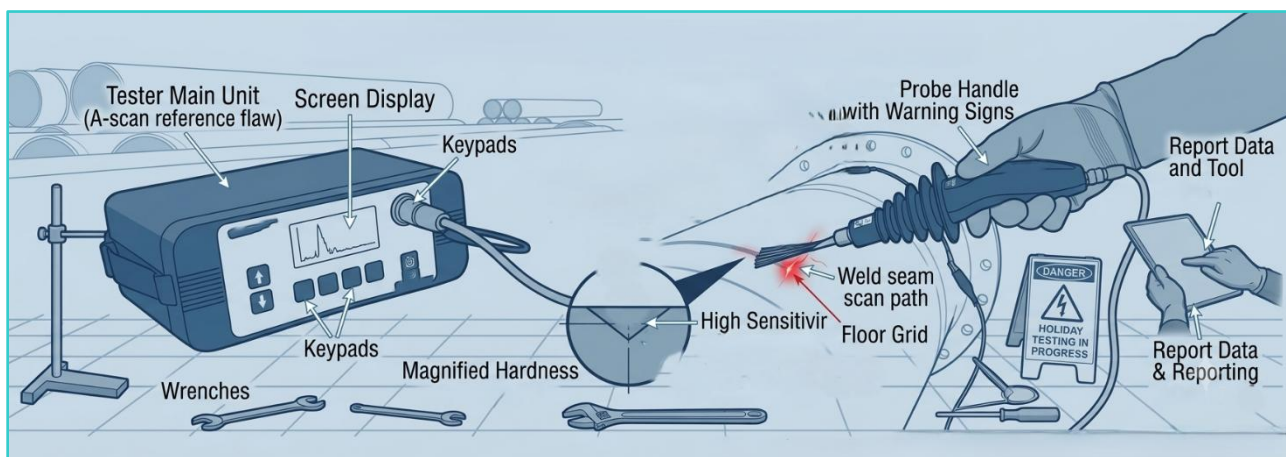
Sustained high-temperature boiler operation (in excess of 800°C) drives the formation of magnetite scale on steel boiler tubing — an insulating layer that, left undetected, raises tube-wall temperatures beyond design limits, driving intergranular micro-cracking, creep deformation, and ultimately tube failure by bursting. Oxide exfoliation further risks turbine erosion downstream. Ultrasonic testing offers a fast, non-destructive way to measure scale thickness, detecting internal oxide layers down to approximately 0.2 mm (0.152 mm using a specialized 20 MHz shear-wave probe and couplant), enabling proactive maintenance before failure occurs.





Holiday Testing (Spark Test)

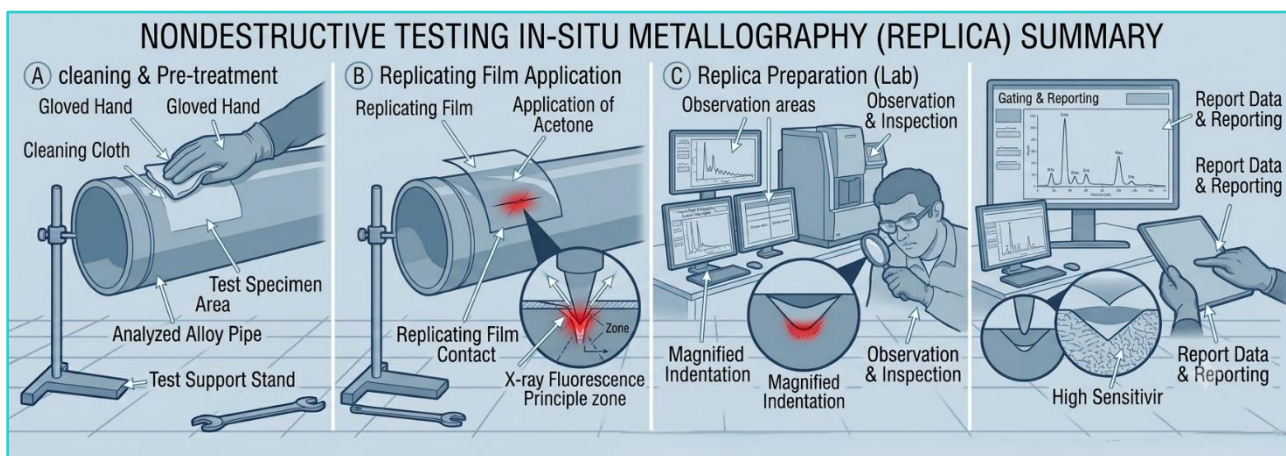
Detects discontinuities in painted and coated surfaces using portable holiday detectors that exploit the conductivity contrast between exposed metal and non-conductive coatings. A ground wire and probing electrode share a common power source; contact with a coating discontinuity completes the circuit and triggers an indicator, pinpointing the flaw. Note: because detection relies on the coating being non-conductive, holiday testing is not effective on conductive metallic coatings such as zinc-rich primers.



In-Situ Metallography (Replica)

Determines in-service degradation of critical components operating under high temperature, high pressure, or corrosive conditions. Our metallurgists have interpreted more than 10,000 replica microstructures, building an extensive proprietary databank spanning power, oil & gas, refining, petrochemical, and fertilizer industries — including rare records of microstructural damage mechanisms.

Applications include in-service degradation assessment, fire-damage evaluation, microstructural surveys of boilers, pipelines, reactors, and vessels for condition monitoring, data-bank development for preventive maintenance planning, welding recommendations, and pre-service microstructure verification. Custom-developed field polishing equipment enables high-quality replication on-site, including on warm components.





The Quantum NDT Advantage

Asset integrity decisions carry real consequences — for safety, for compliance, and for the bottom line. Clients choose Quantum NDT because we combine deep technical specialization with the independence, discipline, and transparency their programs demand — the foundation of our Excellence Certified standard.



Full-Spectrum Capability



Purpose-Built Solutions



Independent & Compliant



Trusted Partnership

Full-Spectrum Capability — From foundational VT and UT through advanced techniques such as ECT, RFT, IRIS, MUIT, PAUT, and LRUT, we cover the complete inspection toolkit under one accountable provider — reducing vendor coordination and audit complexity.

Purpose-Built Solutions for Hidden Risk — Our proprietary MUIT technology directly addresses Corrosion Under Pipe Supports, one of the industry's most consistently under-inspected failure points.

Independent, Confidential, Code-Compliant — Every service is delivered with independent, confidential reporting aligned to relevant engineering codes and standards, including API 653 tank floor integrity requirements.

Safety Without Shutdown — Robotic crawler AUT, thermography, and LRUT are all designed to inspect assets in-service — protecting production continuity while protecting your people.

Deep Metallurgical Expertise — A dedicated metallurgy team and a databank of more than 10,000 interpreted microstructures underpin our In-Situ Metallography service, giving clients defensible, expert-backed condition assessments.

National and International Reach — We serve Government, semi-government, and private-sector clients across India and abroad, with field teams equipped for demanding site conditions.



Protect Your Assets. Partner With Certainty.

Undetected corrosion, cracking, and wall loss don't announce themselves until failure. Quantum NDT gives asset managers, QA/QC directors, and safety engineers the inspection data needed to act early — protecting people, production, and compliance standing.

Speak with our engineering team about a tailored inspection program for your facility.

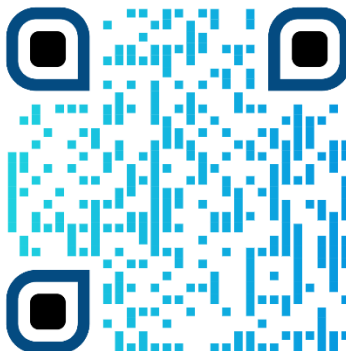
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