

TWI Non-Destructive Testing Services



WORLD CENTRE
FOR MATERIALS
JOINING TECHNOLOGY

TWI's Specialised Non-Destructive Testing Services

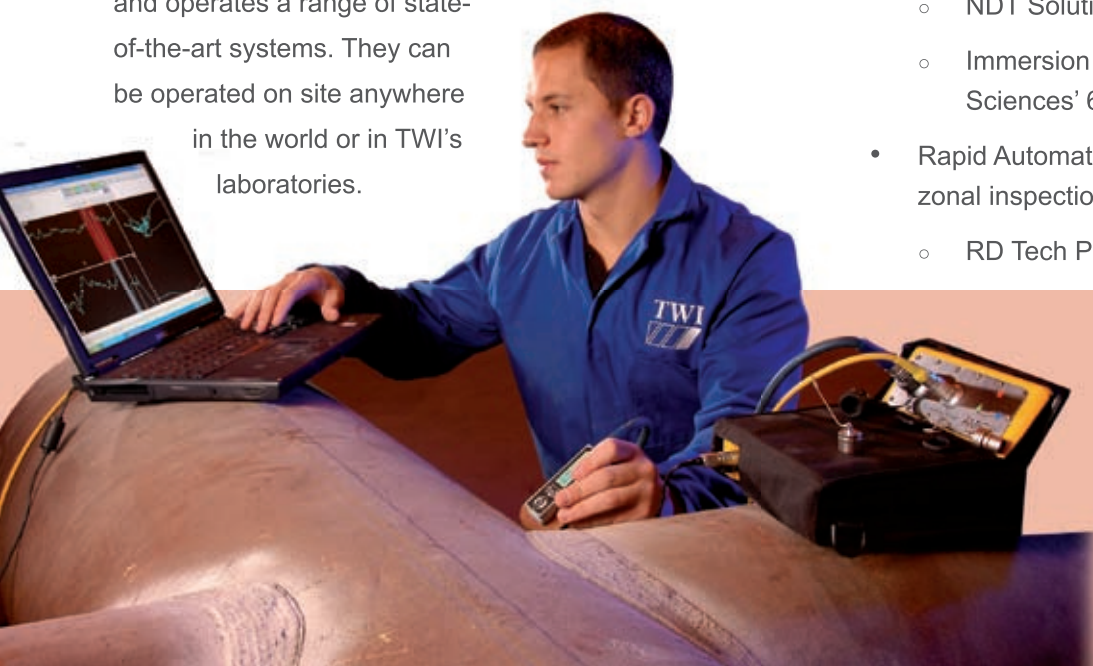
Over many years TWI has been developing a powerful group to conduct research and provide consultancy and laboratory and site services in the field of non-destructive testing (NDT). There are now over 50 scientists and technicians working at TWI in this area. In 2003, TWI was selected by the Welsh Development Agency to establish a centre of excellence in NDT technology at Port Talbot in South Wales. TWI's NDT services are now provided from this centre and from TWI's headquarters at Abington, near Cambridge.

Also based in Port Talbot and managed by TWI is the Non-destructive Testing (NDT) Validation Centre. This was officially opened in March 2006. The Centre is run in collaboration with Swansea Institute of Higher Education and Swansea University and is an independent organisation, which assesses the accuracy and consistency of NDT methods used in manufacturing and construction and in service. It addresses the need to verify and improve the accuracy of inspection techniques and the reliability of flaw detection to increase the confidence of manufacturers, regulators and users alike.

TWI is able to deploy a wide range of technologies to solve the NDT problems of Industrial Member companies. To support these technologies it owns and operates a range of state-of-the-art systems. They can be operated on site anywhere in the world or in TWI's laboratories.

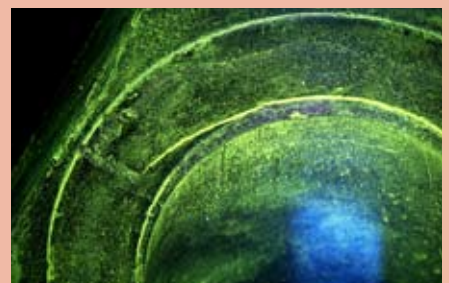
The technologies and the supporting systems available at TWI are:

- Computerised ultrasonic flaw detection, location and sizing:
 - Phased array systems
 - ◆ Olympus NDT Tomoscan Focus
 - ◆ Olympus NDT Omniscan MX PA
 - ◆ Peak NDT Micropulse 5PA
 - ◆ Harfang X-32 (8 units)
 - Advanced multi-channel computerised flaw detection systems
 - ◆ Force P-Scan System 4+
 - ◆ Zetec Tomoscan III
- Ultrasonic Time of Flight Diffraction (TOFD) for critical flaw sizing
 - Force P-Scan System 4+, Sonotron Isonic 2005 and Inspection Solutions USB Sectorscan
- Ultrasonic corrosion mapping:
 - Force P-Scan System 4+ used in the thickness scan (T-Scan) mode
 - Inspection Solutions USB Sectorscan
- Ultrasonic bond testing
 - Bondmaster 1000
- Ultrasonic flaw imaging in the C-Scan mode
 - NDT Solutions RapidScan 2 system
 - Immersion testing using Ultrasonic Sciences' 6 axis probe manipulation gantry
- Rapid Automated Ultrasonic Testing (AUT) for zonal inspection of pipeline girth welds
 - RD Tech Pipewizard



- Long Range Ultrasonics (LRUT) for pipe and pipeline inspection
 - Plant Integrity Limited's *Teletest*® and *Teletest Focus*™ systems
- Ultrasonic modelling
 - Abaqus Finite Element analysis software
 - CIVA / Acoustic Ideas' Continuum software
- Acoustic emission (AE)
 - Physical Acoustics 2-channel AE system
- ACFM for surface crack detection and sizing
 - Three ACFM Amigo Units
- Eddy current testing for surface crack detection and sizing
 - RD Tech MS 5800-ER computerised system (2 units)
 - TMT eddyMax 4U computerised system
 - Phasec 2D portable dual frequency
- Optical Imaging and Digital Image Processing mainly used for inspecting electronic components and PCBs
 - Machine Vision Products (MVP) AOI system
- Laser Shearography
 - Laser Optical Engineering Ltd's Strain Mapper
- Thermography
 - Fluke Ti30 hand-held thermal imaging camera
 - LOT Oriel / Thermal Wave Imaging Inc system
- Digital Radiography / Computed Radiographic Tomography
 - X-Tek 450 keV
 - X-Tek 75 keV portable
- Micro-focus X-ray
 - X-Tek 225 keV Microfocus

Experienced and fully qualified PCN/CSWIP technicians operate all these systems. Apart from Teletest®, TWI has no direct interest in the supply of any of these systems. It can therefore offer totally unbiased advice on the appropriate systems to be used for any particular industrial application.



Supporting Industry

Industrial Member companies benefit from the technical support offered by TWI across all areas of NDT, structural integrity, materials engineering and joining technology. This enables our customers to:

- reduce costs/increase profitability
- improve safety, quality and availability
- extend useful service life
- increase competitive advantage
- develop and innovate processes
- improve material assessment and selection

Examples of TWI's NDT projects and services

Technical audits, etc.

- Writing and reviewing procedures
- Witnessing inspections
- NDT Level 3 services

Automation:

- Robotic inspection of aircraft structures
- Vehicle-mounted rail inspection
- Robotic ACFM for storage tanks
- Automated inspection of GRP air turbine blades

Phased Array Systems:

- Probe specification
- Application to critical components in aerospace, vehicles, oil & gas and rail transport infrastructure

Long Range Guided Wave:

- Phased array development
- Wave propagation and defect detection modelling

Friction Stir Welding:

- Detection of fabrication flaws
- Process parameter monitoring for control of joint line remnants
- Complex shapes

Novel Methods:

- Low frequency modal analysis
- Computed / digital radiography and tomography
- Thermography

Corrosion:

- Detection and Mapping
- Statistical Modelling
- Probabilistic Analysis

Site Inspection Services:

- Manual UT, eddy current, ACPD & ACFM
- TOFD & phased array UT weld inspection
- Automated pulse echo zonal inspection of pipeline girth welds
- Long-Range Ultrasonic Testing
- Automated Corrosion Mapping

Materials:

- Metals
- Plastics
- Composites
- Ceramics
- Adhesive Bonds

Structural integrity:

- Inspection Validation and Qualification
- Condition Monitoring

Microtechnology:

- In-line quality control
- Integration of multiple techniques
- Micro-focus X-ray

Manufacturing Support:

- Production line detection of porosity in magnesium castings
- Control of PCB quality
- UT inspection of pressure vessels to ASME codes

Training and Education:

- NDT training and certification to international standards
- Technology overviews and application specific courses, tailored to your requirements



Please contact TWI if you would like to know more about the services outlined in this brochure.

NDT Technology Group

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