

# Automated Ultrasonic Testing for Fabrication Inspection

With the issue of new codes and standards, welds are increasingly being examined by automated ultrasonic testing (AUT) in preference to more traditional radiographic testing methods.

TÜV Rheinland Sonovation offers fully compliant AUT inspections implementing a variety of techniques and equipment.

## Why Ultrasonic Inspection?

Several round-robin tests have clearly demonstrated that automated ultrasonic testing has obvious advantages of a higher probability of defect detection coupled with lower false-alarm-rates which lead to a reduction in unnecessary repairs.

In addition, this approach has significant financial benefits, both logistically and in decreased project time. Although more sophisticated equipment development and increased cost of training for AUT inflate upfront cost of inspection, other benefits clearly offset this initial investment.

## Equipment

TÜV Rheinland Sonovation has a complete range of equipment, usually designed and manufactured in-house. Such an asset makes us completely independent from and not reliant on any third-party technical or resource support.

## Available Scanning Methods

- Semi-automated time of flight diffraction
- Semi-automated pulse echo
- Semi-automated nozzle inspection
- Fully-automated free ranging scanning systems

## Our Experience

TÜV Rheinland Sonovation is innovative in new technology and has gained more than 25 years of experience with automated ultrasonic inspection applications. In particular, for those described below.

### Pressure Vessels

- Thicknesses from 8 mm to 300 mm
- Nozzle inspection, set through and set on
- Man way inspection
- Experience with hot reheat cracking
- Partially filled welds at elevated temperatures
- Elevated-temperature inspection up to 475°C (900°F)



Figure 1: Intermediate Inspection at Preheat Temperature

### Pipework Welds

- Welds from 8 mm thick upwards
- Pipework welds 75 mm and above
- Pipework welds with bends of 1.5D
- High-temperature inspection up to 475°C (900°F)



### Benefits at a Glance:

- No problems with radiation issues, allowing more work to be carried out in the immediate inspection vicinity
- No logistical problems such as chemical provision and subsequent environmental disposal
- No transporting of pressure vessels to radiographic bunkers
- Shorter inspection times
- Higher probability of detection
- Lower false-alarm rates, therefore reducing repairs
- All data digitized, providing easy data storage
- Inspection data easily transferable via the internet.

All of our technicians are suitably qualified. The staff for site inspections is qualified to the relevant International (ISO), European (EN) and/or American (ASNT) standards.

Our fully-audited competence management system assures that our operators have adequate and relevant experience in the application of the techniques, interpretation of the data produced, and are fully conversant with AUT equipment.

In addition, we have a large team of Level III engineers to assist in procedural preparation and any required independent consultancy.

### Your contact:

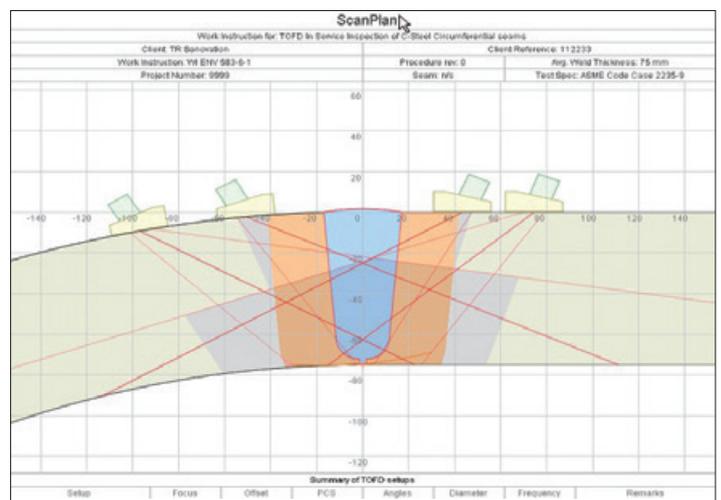
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### Procedures and ScanPlan®

The preparation of adequate procedures and scanning plans is most important for AUT on construction welds.

Therefore, TÜV Rheinland Sonovation has developed its own ScanPlan® system, for integration with procedural and contractual obligations related to the technique offered.

It is now possible to subject a basic weld profile to fully code-compliant inspection that covers all existing practical and economic issues.



For more complex geometries, we have full modeling and simulation capabilities which have been proven in several projects where the boundaries of technology and quality of inspection were pushed even further.

### About TÜV Rheinland:

Founded 140 years ago, TÜV Rheinland is a global leader in independent inspection services, ensuring quality and safety for people, the environment, and technology in nearly all aspects of life.