

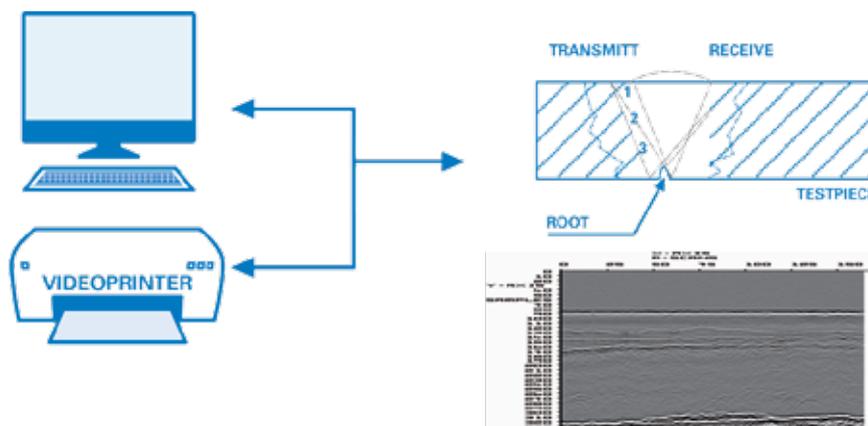
Weld Root Erosion - Determine and Assess Degradation of Weld Roots

The erosion of the root area of welds in piping while in service is a familiar phenomenon and poses a high risk to the integrity of any piping system. Inspection of the welds and detection of weld root erosion by means of conventional non-destructive testing (NDT) methods have generally proven ineffective, due to some subjectivity and coverage problems with some techniques.

To address these shortcomings, TÜV Rheinland Sonovation recommend the use of a specialized technique based on

Time of Flight Diffraction (TOFD) in combination with the ScanPlan® system. This has demonstrated the proof of coverage, repeatability and accuracy required. In addition, inspection data can be easily exported to other maintenance software packages, thanks to our own in-house developed software called ScanPlan®.

Our weld root erosion detection procedures provide you with an assurance of certainty and enable you to detect flaws early enough to take timely remedial actions.



Inspection approach

- Extensive consultancy services on application suitability prior to inspection.
- Specify or select key inspection parameters in ScanPlan®.
- Calculate optimal TOFD set up with ScanPlan®.
- Create a procedural work-instruction document for the inspection on-site.
- Present inspection results in a “D-Scan” format.
- Data collection, storage and manipulation using ScanPlan®.
- Creation of inspection reports, interpretation of data output.

Results of validation

For the validation of weld root erosion detection by means of TOFD, TÜV Rheinland Sonovation and the NAM (Nederlandse Aardolie Maatschappij BV) jointly developed several procedures and accuracy measurements by completing a full test program with test specimens. Both TOFD inspection procedures and mechanical measurements were conducted and the results subsequently compared. The TOFD measurements gave an accuracy of 0.22 mm and a 95% confidence level of ± 0.74 mm.

ScanPlan® - software developed in-house to enhance inspection results

Our in-house-developed tool ScanPlan® is an integrated software package that can either work stand-alone or together with a database. The relevant data consist of the client, site and component information, and of course the inspection data. It not only helps to find the optimum calibrations and configuration for TOFD inspection, it also has excellent reporting features.

Main benefits of ScanPlan®:

- Preparation of procedures and reports.
- Fast, easy and accurate input of component geometry.
- Instant calculation of inspection parameters.
- Instant visualization of inspection effectiveness on the actual geometry.
- Acceptance of weld profiles.
- Formulation of TOFD setup procedures.
- Optimization of proposed TOFD solution.
- Production of required test plans.
- Integration with reporting formats.
- Inspection-friendly design.
- Data management of complete inspection projects.

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.

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Benefits at a glance

- Accurate detection of weld root erosions.
- High repeatability and accuracy.
- All inspection data presented in a comprehensible graphic format.
- Highly qualified operators.
- State-of-the-art equipment.
- Many years of experience in the field of TOFD



Our expertise – your benefit:

TÜV Rheinland Sonovation has many years of experience of using the TOFD technique in every industrial segment from power generation to projects in the defense, manufacturing, chemical and petrochemical industries. Our aim is to achieve customer satisfaction by offering the latest and best technologies available.