

FD100 – UT Flaw Detector

The Proceq FD100 a flexible high tech ultrasonic inspection instrument. The basic UT model can be upgraded with the



Ultrasonic Time of Flight Diffraction (TOFD) and Phased Array (PA) modes anytime and anywhere, even on site. A flexible and portable high tech Ultrasonic Flaw detector for metal of all types. Fully compatible with a very wide array of conventional and both focused and unfocused phased array probes. Offering technicians most of the popular flaw sizing techniques including DGS, DAC, AVG, TGC and AWS. Thanks to the A, B, C, True Top and End scans imaging capabilities, users can address many applications from one instrument. 3D scan plans assist in creating inspection procedures and analysing the results.

The Proceq Flaw Detector features best in class User Experience that is unmatched using grouped options on screen, shortcut keys and a click-wheel for fast navigation and easy setup, calibration, and analysis enabling faster detection of flaws and other hidden properties in the part inspected. It features settings that can be saved and re-used, the wizards and option specific help allowing for fast configuration.

Housed in a rugged IP66 rated housing with advanced features aimed at faster identification and simplifying reporting. Available in 4 options, with the Proceq Flaw Detector 100UT as the base model. Can be upgraded from base model to TOFD & PA on field anytime. Making it the instrument of choice by many technicians.

Theory

Ultrasonic testing is based on time-varying deformations or vibrations in materials. Ultrasonic testing (UT) a non-destructive testing technique that pulses ultrasonic waves in a material and measures the time the pulses take to return to the transducer. In most common UT applications, very short wavelength, high frequency ultrasonic pulse-waves are transmitted into

materials to detect internal flaws or to characterize materials. The information gathered is traditionally displayed on an A-Scan display that plots time taken on the x-axis and returning intensity on the y-axis.

Ultrasonic testing is often performed on steel and other metals and alloys, though it can also be used on concrete, wood and composites, albeit with less resolution. It is used in many industries including steel and aluminium construction, metallurgy, manufacturing, aerospace, automotive and other transportation sectors.

Advantages of using ultrasonic technique for inspection include:

- Requires less preparation of test surfaces than other NDT methods.
- With the use of different techniques, high sensitivity can be achieved on surface and sub-surface flaws.
- The use of high frequencies achieves excellent sensitivity for detection of flaws perpendicular to the axis of wave propagation.
- The use of lower frequencies allows for penetration that is superior to any other NDT method.
- Multiple applications and techniques can be achieved by simply swapping transducers. Ultrasonics is one of the most versatile techniques available.
- Access to only one face of the material required when using a Pulse-Echo method for flaw detection.
- Determining the reflector's (flaw) position, shape and size in the object tested is highly accurate with a skilled operator.
- High resolution images provide instant results making report generation simple and effective.
- Testing can be automated, and reports generated continuously for production type environments.

Applications

Users can perform many applications including:

- Ultrasonic Thickness Surveys
- Corrosion detection and measurement
- Flaw detection in welds, castings and forgings
- Pipeline weld inspection projects
- Complex geometries
- Forgings and castings

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- Aircraft composites delamination

For efficient weld inspection, Proceq offers both focused and unfocused PA scan options.

Standards

- AS 2207 - 2007: Non-Destructive testing - Ultrasonic testing of fusion welded joints in carbon and low alloy steel.
- AS 2452.3 -2005: Non-destructive testing - Determination of thickness
- AS 1065 - 1988: Non-destructive testing - Ultrasonic testing of carbon and low alloy steel forgings
- ASME BPVC Section V -2017, Article 4: Ultrasonic Examination methods for welds
- ASME BPVC Section V -2017, Article 5: Ultrasonic Examination methods for materials
- AWS D1.1/D1.1M:2015 - Clause 6, 6.13 UT.
- BS EN 12668-1:2010: Non-destructive testing. Characterization and verification of ultrasonic examination equipment. Instruments.
- BS EN 15317:2013: Non-Destructive Testing. Ultrasonic testing. Characterization and Verification of ultrasonic thickness measuring equipment.
- BS EN IS 18563-1: Non-Destructive Testing. Characterization and verification of ultrasonic phased array equipment.

Features

The basic UT model can be upgraded with the Ultrasonic Time of Flight Diffraction (TOFD) and Phased Array (PA) modes anytime and anywhere on-site.

The instrument offers technicians an extremely comprehensive measurement solution and features all popular flaw sizing techniques such as DGS/AVG, DAC, TCG and AWS.

Featured with 3D scan plans which help to create inspection procedures and to analyse the results.

Settings can be saved and re-used, the wizards and option specific help allow fast configuration.

Ability to bring down the bandwidth to 200 kHz for testing attenuative materials.

Sensitive amplifiers can make TOFD inspections possible without preamp and all models have 2 axes encoding.

Protected by a rugged IP 66 cover.

User-friendly interface.

Software

Proceq FD Link Software for preparation, setup and reporting. Key features include:

- Create layout for data collection and new layers / customize the layout
- Review data / add markers / extract box / extract view
- Add free measurements and create images for reports
- Show defective position using the 3D tool kit and add notes
- Produce, open and review a PDF report
- Export data from Amplitude Top / C-Scan as .csv file

Benefits

- Fully compatible with a very wide range of conventional and phased array probes
- Customisable screen with selectable layouts
- Best in class user experience, featuring wizards and option specific help for fast configurations and analysing results
- Best in class software and reporting
- Lightweight for single handed operation
- Field upgradeable from base model to TOFD, PA 16:16 & PA 16:64
- All models feature dual axes encoding

Industries

- Oil & Gas
- Aerospace
- Automotive
- Railways
- Machine Parts
- Training & Research

About PCTE

PCTE have over 30 years' experience in the measurement and testing of construction materials. PCTE can provide more than just the equipment, they can provide expert training. PCTE have a service centre in Sydney in which they can provide calibration, repairs and warranty repairs.