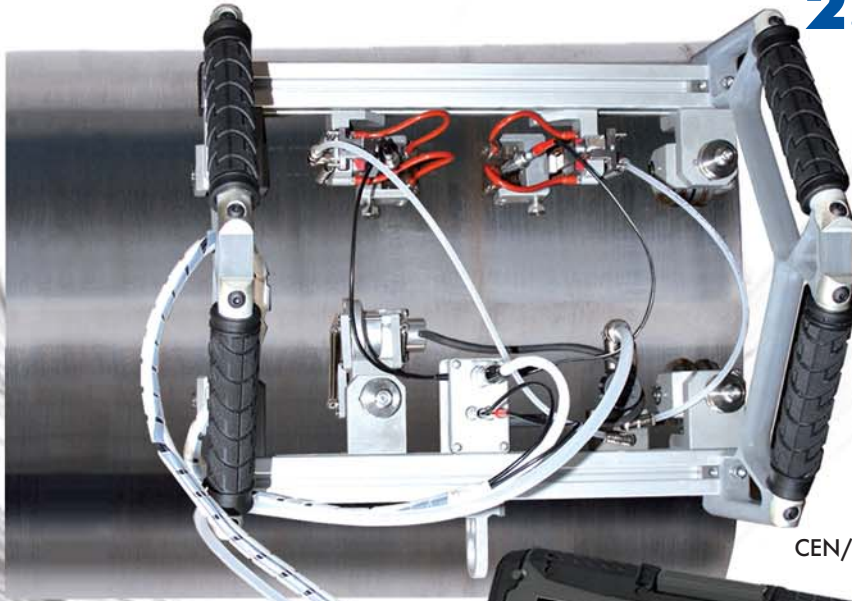


U_sC TOFD 2.10 PRO System



CEN/TS 14751:2004 Compliant
EN 5836:2000 Compliant



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PURPOSE

UsC TOFD 2.10 PRO System is intended for mechanized testing of welded joints using Time-of-Flight Diffraction (TOFD) technique. The System assures the solution of the following tasks testing the welded joints of:

- flat objects;
- tubes of mean and large diameters (with min. outer diameter of 600 mm);
- spherical and cylindrical oil and gas tanks (with min. diameter of 10 m).

CONFIGURATIONS OF TESTED WELDED JOINTS

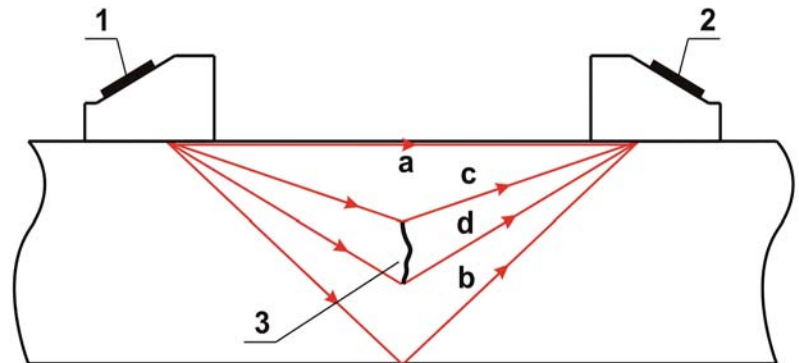
- profile types: CRC-Evans, single J groove weld, single V groove weld, double V groove weld, x - welds and etc.;
- conventional wall thickness: from 6 mm (0.25 inch) to 50 mm (2 inch) and more;
- tube material: standard carbon steels.

TASKS OF TOFD TECHNIQUE AND COMPLIANCE WITH STANDARDS

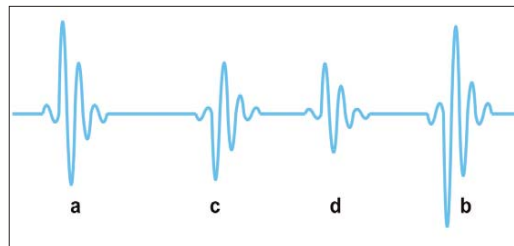
Time of Flight Diffraction (TOFD) technique is based on diffraction of ultrasonic waves from the tips of discontinuities. TOFD

technique is performed by means of two probes mode. UsC assures:

TESTING SCHEME BY TOFD TECHNIQUE



DISPLAYING THE SIGNALS ON A-SCAN



- 1 - transmitter;
- 2 - receiver;
- 3 - internal crack;
- a - lateral wave;
- b - back wall echo;
- c - diffracted signal from the top tip;
- d - diffracted signal from the bottom tip.

- Testing with the application of two TOFD probes according to standards CEN/TS14751:2004, ENV 5836:2000 Non-destructive testing. Time of Flight diffraction technique as a method for defect detection and sizing.
- Detection of defects of various orientation (longitudinal, transverse), precise

determination of a depth and length of defects, high sensitivity from its corner position.

- Testing scheme fully covers the groove area and the whole volume of a welded joint.
- Testing the whole volume of the welded joint per one scanning cycle.

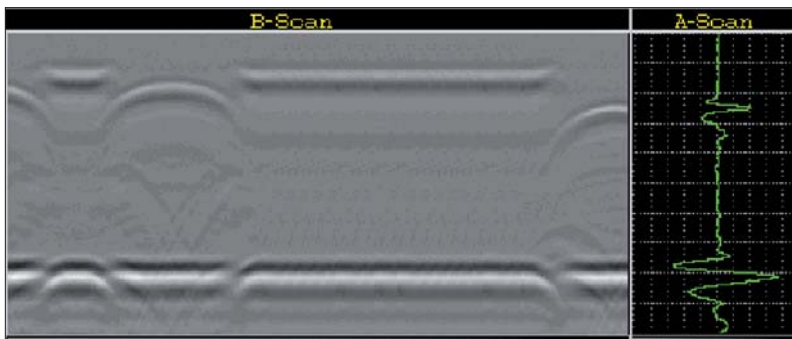
SOFTWARE

FEATURES OF SPECIALITY APPLICATION - DEPENDENT SOFTWARE

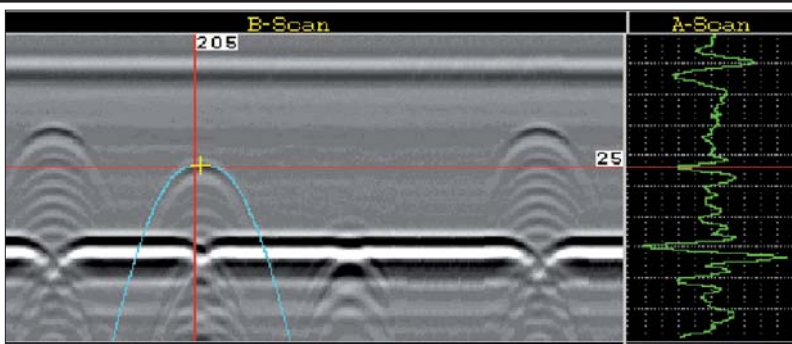
- TOFD wizard.
- Calibrating the distance between the probes (PSC).
- A clear B-Scan image.
- Possibility to use multi-TOFD schemes.
- Rectification of longitudinal lateral wave. These features ensure the easier and

faster setup, improved data acquisition and precision of detection of defects sizes increasing the general performance. Software is designed considering the simplicity of application, flexibility and scalability. User interface is optimized for speeding-up the training process.

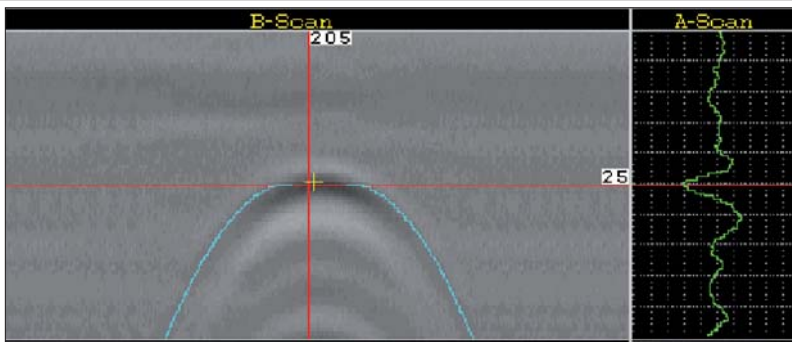
DISPLAYING RESULTS IN ACQUISITION MODE, A-SCAN AND TOFD B-SCAN



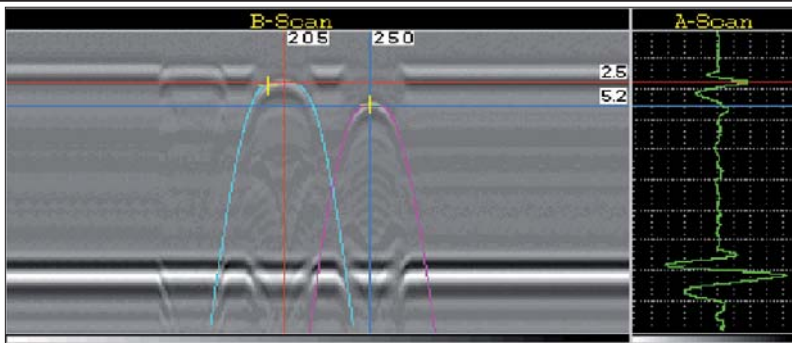
REVIEWING AND ANALYZING TESTING RESULTS, A-SCAN AND B-SCAN



SCALING THE TOFD B-SCAN



MEASURING PARAMETERS OF DISCONTINUITIES, TWO MEASURING GATES



FUNCTIONAL CAPABILITIES OF SOFTWARE

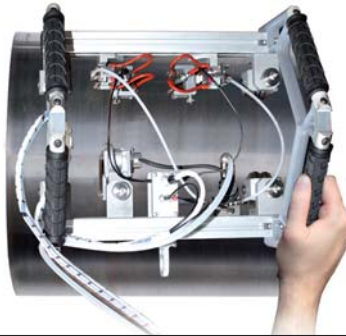
- Creating of testing setups.
- Displaying and recording the acquired data in real-time mode in a form of A-Scan and TOFD B-Scan.
- Quick and detailed analysis of testing results.
- Application of two standard cursors and two hyperbolic cursors.
- Selecting the hyperbolic cursors - auto-matic, manual.
- Scaling the data with the affixment to the first or second cursor.
- Defining the type, size and coordinates of defects in vertical plane and scanning plane while applying hyperbolic cursors considering the phase of diffracted signals.
- Adjustable color scheme.

USC TOFD 2.10 PRO SYSTEM COMPOSITION

INDUSTRIAL NOTEBOOK AND SOFTWARE

Shockproof industrial notebook with installed Microsoft Windows and Speciality application dependent software for data analysis and acquisition and with additional software.

TOFD 2.10 PRO SCANNER



- TOFD 2.10 PRO scanner is a compact, reliable and field-proven device allowing to achieve sustainable and stable results of scanning.

Magnetic wheels and springloaded probe holders ensure the probe firm stability on the surface being the necessary condition for highquality testing. Scanner can be easily manipulated and attached to ferromagnetic inspection surfaces.

DATA ACQUISITION AND TRANSMISSION UNIT USC TOFD

Data acquisition unit UsC TOFD and transmission in real-time mode via includes two channels for connection of Ethernet-interface to industrial notebook. ultrasonic TOFD probes.

Unit case is made of shockproof material.

Ultrasonic unit ensures data acquisition

COUPLANT-FEED UNIT

Couplant is supplied to the scanner with motorized pump and magnetic valve.

Couplant feed control is carried out with regulating valve set on the scanner.

SPECIFICATIONS OF USC TOFD 2.10 PRO SYSTEM

• UT probe connector	2 (Lemo)
• A/D converter	10 bit (100 MHz)
• Pulse amplitude	100, 400 V
• Gain	up to 110 dB
• Rectification	full wave, + halfwave, - halfwave and RF
• Bandwidth	0.2 - 27 MHz
• Encoder	1- axis encoder line
• PRF	15 - 8000 Hz
• Real-time averaging	1, 2, 4, 8, 16, 32
• Gate number	3 three-level gates
• Maximum scan velocity	100 m/s
• Operating temperature range	from minus 20 °C to plus 50 °C



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