TOFD UT
Weld Inspection

Envirocoustics
Non Destructive Testing
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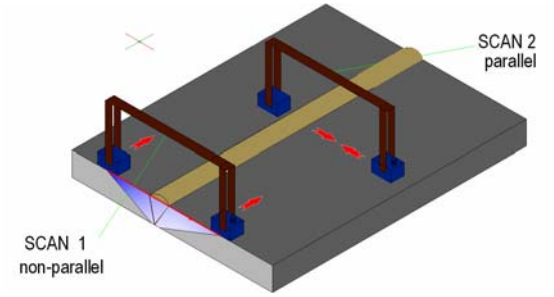
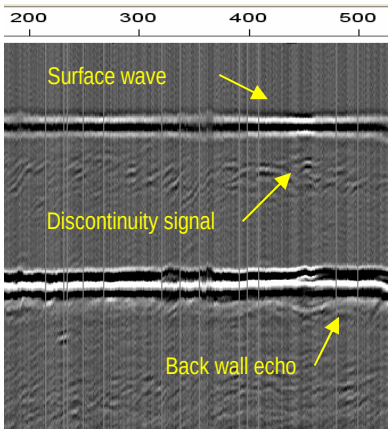
The use of ultrasounds for the control of welds integrity in metal constructions has been applied in the industry for decades.

In the recent past, an effort has begun for applying automated and semi-automated ultrasound inspection on welds, aiming at a more rapid control, repeatability and permanent recording of the inspection (as with radiography).



With this context the TOFD technique was developed. The method is a variation of the classic UT weld inspection technique and, according to that, two special longitudinal wave UT angle probes are used that are placed either side of the weld.

The first probe emits a wide ultrasonic beam which scans the weld and the Heat Affected Zone (HAZ) and the second probe receives the part of the beam that is reflected and the signals from the diffracted waves at the edges of discontinuities found inside the ultrasound beam.



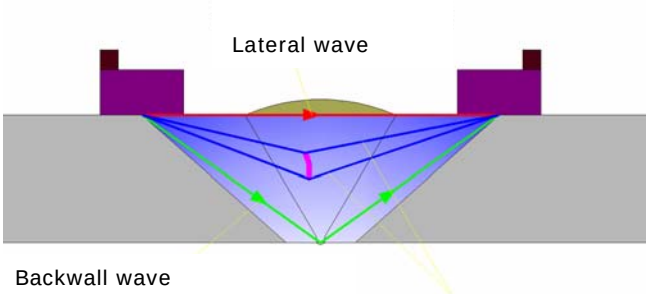
TOFD display (D-scan)

The discontinuity detection is based on the arrival times of the signals at the receiver and not on the intensity of these signals and is independent of their orientation.

The results are displayed in a D-Scan image (see picture) where the limits of the weld are specified by the direct surface wave between transmitter and receiver (upper part of the weld) and the reflected wave (lower part of the weld). The signals from the discontinuities are found in-between these two waves.

Advantages of the method:

- Weld inspection with usually one scan only.
- No interruption of the operation of the inspected object needed.
- Permanent record of the inspection data.
- Inspection repeatability. Suitable method for monitoring the propagation of discontinuities.
- The length, the depth and the height of the discontinuity are recorded in only one scan.
- Ideal for the detection of cracks on the interface between wall and internal cladding.
- No protection against radiation required, neither interruption of other peoples work.
- Continuous control of probe-surface contact through the back wall echo signals and the surface wave.



The inspection is made according the international standards ASTM 2373 and BS 7706.

Envirocoustics also provides manual UT and Eddy Currents welds inspection services.
Please visit www.envirocoustics.gr for more information.

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