

Rev. No.: 00

July 2015

TOFD (Time-of-Flight Diffraction) Technique for NDT (Non-Destructive Testing) of Welds

Description

TOFD (Time-of Flight Diffraction) technique is a NDT (Non-Destructive Test) method used to detect and size discontinuities in welded joints. The salient points of the technique are as follows:

- First published in 1975 in UK by Silk and Liddington as a research tool.
- TOFD technique is an ultrasonic testing method.
- Other amplitude based methods depend upon the defect orientation.
- TOFD uses time-of-flight which is independent of defect orientation.
- A transmitter and a receiver are placed on either side of the specimen weld.
- One signal is transmitted along the pipe surface and one is reflected from the far wall of the pipe.
- If there is no defect the receiver probe receives two waves – from the surface and from the far wall.
- If there is a defect there will be diffraction of the ultrasonic waves from the tip(s) of the defect.
- Using simple trigonometry the depth of the defect is calculated automatically.
- TOFD technique is more reliable than radiographic, pulse echo manual and automated weld testing methods.

Standards

- ISO 10863 Welding – Use of TOFD technique for the examination of welds.
- EN 5863-6 Non-destructive testing – TOFD technique for detection and sizing discontinuities.
- EN 15617 Non-destructive testing – TOFD technique – Acceptance levels.

Schematic

