



# Sondex

CENTRALISER

ELECTRONICS & TELEMETRY SECTION

12 MINIATURE SENSORS

MAGNETIC WAVE TRANSMITTER

## DESCRIPTION

This tool is designed to investigate variations of metal thickness within down-hole tubulars. It is run centralised within a wellbore, ideally combined with a multi-finger imaging Tool or with MIT data available. The tool has an array of 12, specially developed, miniature magnetic sensors mounted on the inside of a set of bowsprings. Each sensor of the array measures a magnetic value and all 12 values are simultaneously transmitted to the surface where the waveform is recorded. Optional imaging software is available to create and display a 3D representation of recorded data. The tool is designed to be able to pass through tubing to log casing up to 7".

## OPERATING PRINCIPLE

The tool generates an alternating magnetic wave, which propagates out of the tool and permeates through the casing. Once outside the casing, the wave travels a short distance along the length of the pipe, before re-entering the well bore in order to complete its path. It is in this region, where the magnetic wave re-enters the well bore, that the sensor array is positioned. Each sensor then detects localized information about the magnetic wave that has travelled through the casing wall.

The velocity and amplitude of the emitted magnetic wave are affected by the thickness of metal through which it has travelled. Greater metal thickness results in slower wave propagation and greater attenuation. As a result a sensor that is adjacent to an area of thinner metal will receive a wave of greater amplitude some time before a sensor that is adjacent to an area of thicker metal. These differences can be used to locate and quantify variations in metal thickness along the tubular.

## APPLICATIONS

- Inspection of Tubing and casing for internal & external metal loss.
- Casing can be logged after the tool has passed through restrictions.
- Measures absolute wall thickness.
- 3D visualisations provide powerful qualitative images of well condition.
- Detects pitting and gradual wall loss.

## INTERFACING & TOOL COMBINATIONS

- Available with ULTRAWIRE telemetry.
- Simultaneous operation with other Sondex ULTRAWIRE tools.
- Requires MIT data for internal diameter.
- Requires centralisers.
- Standard 1 3/16" UN 12tpi Sondex/ GO.

## SPECIFICATION

|                     |  |
|---------------------|--|
| Temperature rating  | 150 degree C   |
| Pressure rating     | 15,000psi  |
| Tool body diameter  | 1 11/16" (43mm)  |
| Make-up Length      | 85.8" (2.179m) without centralisers  |
| Weight              | 30lbs (13.6kg)   |
| Number of sensors   | 12   |
| Magnetic generator  | One. Multi-frequency sinusoidal waveform   |
| Min/ Max. pipe size | 2" i.d. tubing to 7" casing  |
| Toolbus Standard    | Ultrawire  |
| Minimum defect      | 30% wall thickness, 3/4" (18mm) defect internal or external; 40% for 3/8" defect |
| Coverage            | 100% with 12 sensors up to 5" i.d. casing  |



Comparing MTTview output with original defect in 7 inch casing.

Defect is 3 cm x 5 cm with penetration up to 40% in the centre.

