innospection

Remote Field Eddy Current Technique

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The Remote Field Eddy Current (REFT) is a variation of Eddy Current send-receive probe technique.

The RFET technique allows the use of the differential- and absolute mode. This technique is capable for the detection of localised defects with the differential mode and gradual defects with the absolute mode.

The detector coils are separated by a distance equivalent to two or three times the tube diameter. The receiving coils sense the flux lines that cross the tube wall twice. Remote field has an equal sensitivity to internal and external indications while the phase shift is directly proportional to wall loss. Diagram 1 shows the principle of this technique.

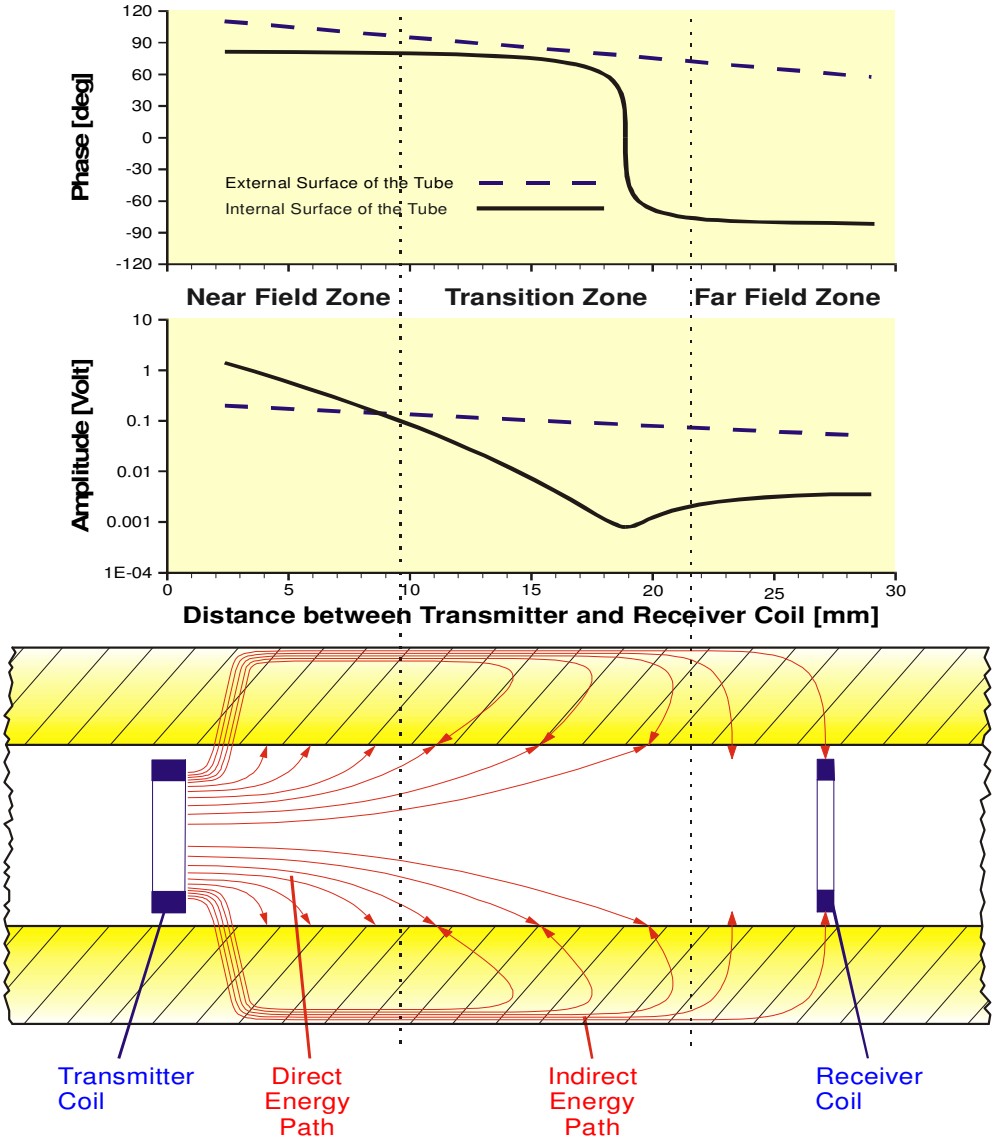

Diagram 1: Principle of Remote Field Eddy Current Technique

The signal phase can be use to identify the defect depth, whereas the signal amplitude identifies the defect volume.

The receiver coil receives in the remote area the remaining energy path field lines passing trough the wall over distance. Although these field lines are of low strength, dedicated amplifiers used allow the analysis of the received induction very well. Debris or external electrical noise might induce noise signal which could influence the defect signal strength.

As the Remote Field principle works in low frequencies (typical 10Hz -1kHz), the inspection speed is therefore limited. The technique allows the designing of probes for u-bend inspection, which are generally possible for running u-bends with the radius from ~ 15 x I inner tube diameter.

The signal analysis of the RFET technique is shown in Diagram 2 and 3.

The differential mode is used for local defects while the absolute mode is used for gradual defects (thinning). The frequency is adapted to the material and wall thickness and the signal amplitude shows the volume of the defects.

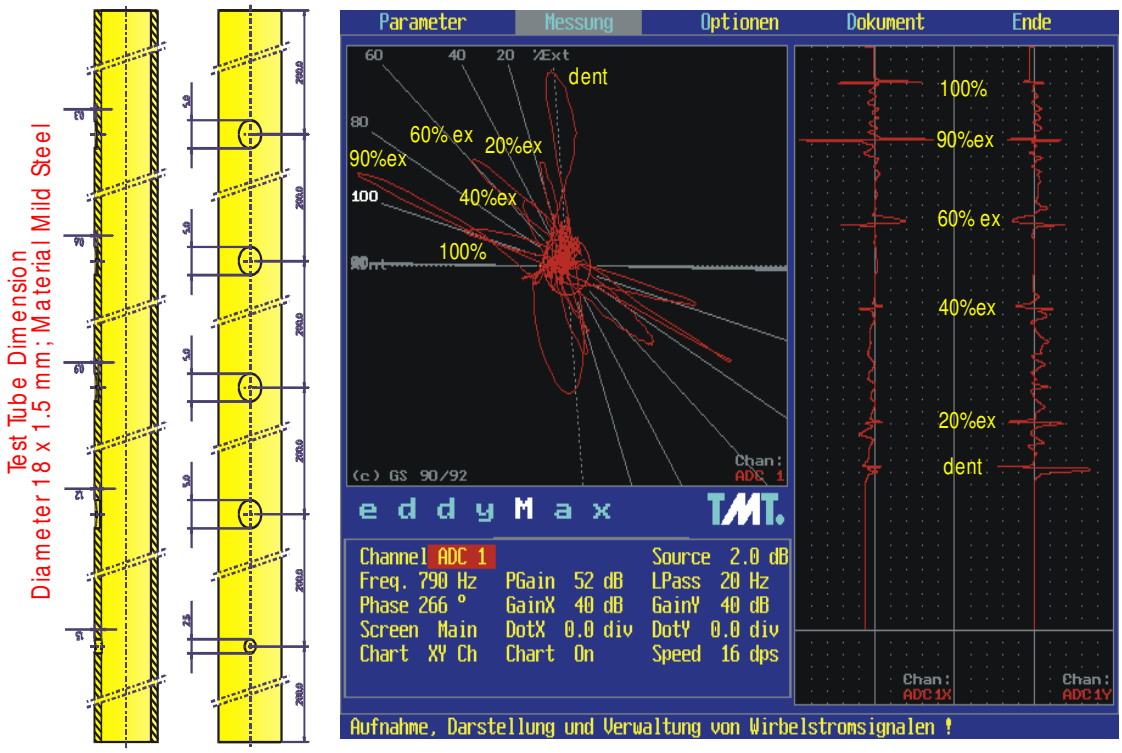

Diagram 2: Signal analysis of RFET technique
Differential Mode for local defects

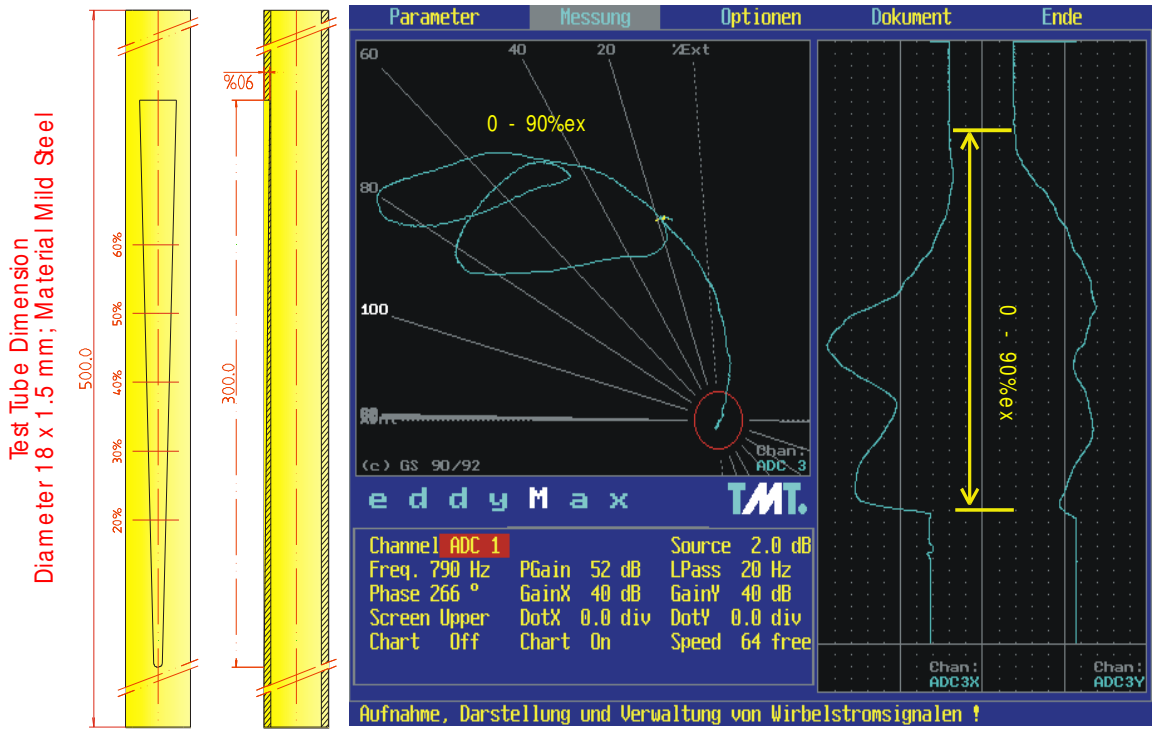

Diagram 3: Signal analysis of RFET technique
Absolute Mode for gradual defects