

# Reflection-type probes for eddy current flaw detection in steel.

## Brunel University - Eddy Current Probes

### 6. Eddy Current Testing

Electrical currents are generated in a conductive material by an induced alternating magnetic field. The electrical currents are called **eddy currents** because the flow in circles at and just below the surface of the material. Interruptions in the flow of eddy currents, caused by imperfections, dimensional changes, or changes in the material's conductive and permeability properties, can be detected with the proper equipment.

- Eddy current testing can be used on all electrically conducting materials with a reasonably smooth surface.
- The test equipment consists of a generator (AC power supply), a test coil and recording equipment, e.g. a galvanometer or an oscilloscope
- Used for crack detection, material thickness measurement (corrosion detection), sorting materials, coating thickness measurement, metal detection, etc.

Description: -

- Reflection-type probes for eddy current flaw detection in steel.
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### Straight surface pencil probe (Reflection type)

Alternative coil arrangements are shown in Figures 3 25 and 4. The problem with this definition is that probes can be connected differentially in a reflection system as well as when using two pickups such as most scanner-driven bolt hole probes. In the arrangement illustrated in FIGS.

### The Advantages of Flexible NDT Probes for Eddy Current and Ultrasonic Testing

The Eddycon C portable eddy current flaw detectors is powerful NDT tools for a wide range of applications in aerospace, railway, power generation, petrochemical, and heavy machinery industries.

### Straight surface pencil probe (Reflection type)

The connecting cable is considered to be an active part of the eddy current system, as losses or capacitance in the cable result in signal attenuation which reduces the signal to noise ratio in the system.

### Eddy Current Probes

Shielding has several advantages: first, it allows the probe to be used near geometry changes, such as edges, without giving false indications; next, it allows the probe to touch ferrous fastener heads with minimal interference; last, it allows the detection of smaller defects due to the stronger magnetic field concentrated in a smaller area. Again, the holder, or fixture, 40 is formed of a suitable non-conducting, non-magnetic material.

### Eddy Current Probes

The matching 10 transformer or transformers 4 are preferably placed very close to the windings 2,3, typically less than 50mm apart. The invention also provides a method of making a probe according to the invention described above, comprising converting an existing probe by inserting an 25 inductive coupling to couple a winding in the probe to coupling means; the coupling means being for connection, in use, to transmVreceive apparatus for driving the probe with a drive signal and for analysing a sensed signal from the probe.

## **Reflection**

In the presence of a flaw in the metal surface the detection winding voltages are unbalanced, and the unbalance is detected by the voltage measuring instrument. A metallic test piece 14 is scanned by the probe for the production of eddy currents.

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