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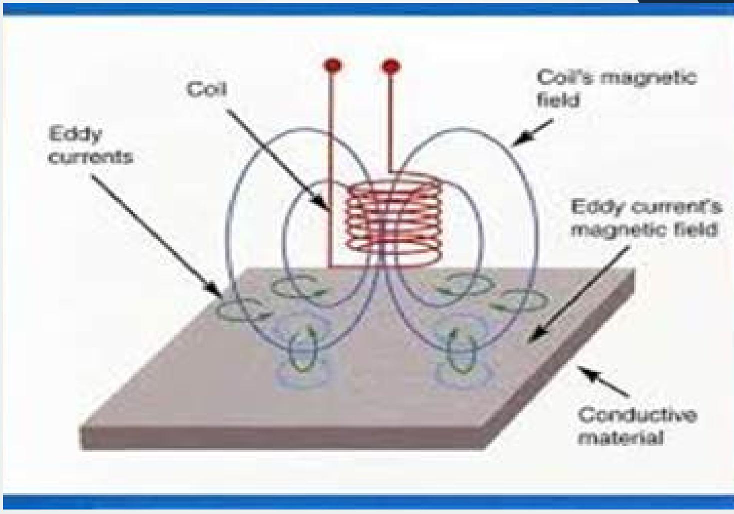
Eddy Current Testing

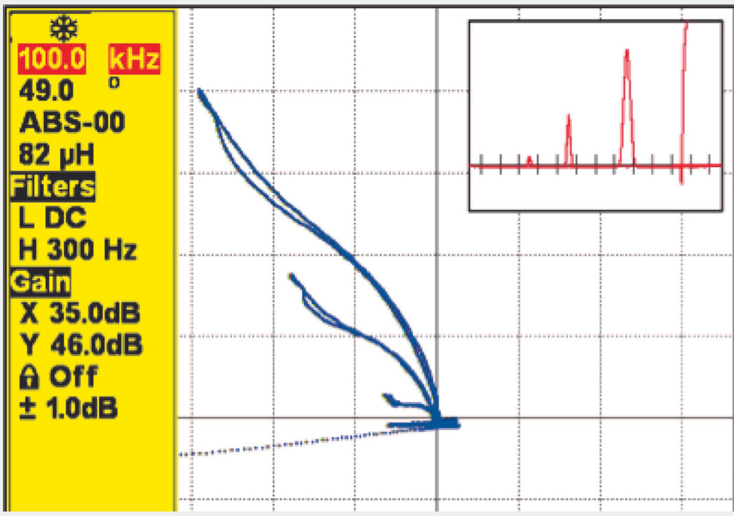
Eddy current testing can be used for a wide range of applications. It is often applied for surface crack detection and material sorting.

It's usually carried out with pencil probes or 'pancake' type probes on ferrous or non-ferrous metals. Frequencies from 100 kHz to a few MHz are commonly used. Depending on surface condition it is normally possible to find cracks 0.1 mm or less in depth.

Eddy current testing uses the principle of electromagnetic induction to detect flaws in conductive materials. An excitation coil carrying current is placed in proximity to the component to be inspected. The coil generates a changing magnetic field using an alternating current, which interacts with the component generating eddy currents.

Variations in the phase and magnitude of these currents are monitored either by using a second coil, or by measuring changes to the current flowing in the excitation coil. The presence of any flaw will cause a change in the eddy current field, and a corresponding change in the phase and amplitude of the measured signal.





In the case of non-destructive testing (NDT), these are displayed on an eddy current flaw detector as a distinct change in signal. The main advantages of eddy current inspection include:

- provides a faster scanning speed than conventional ultrasonic testing (UT);
- unlike UT, requires no fluid couplant;
- Eddy current testing can be used through several millimeters of coating;
- can detect very small cracks in or near the surface of the material;
- physically complex geometries can be investigated;
- testing devices are portable & provide immediate feedback.

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