

ABSTRACT

Title : Development of the eddy current probe for metal plate crack detection

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This study investigated the eddy current probe for crack detection in flat metal surface. The eddy current probe consists of a ferrite-core inductor coil and ceramic capacitors to form a parallel resonant circuit. The ac signal was amplified by using a mixer. In detection the crack, one can instantly observe the change in voltage waveform by using an oscilloscope. The several absolute and differential probes were made for comparison in the performance. When the absolute probe and the differential probe are tested with an automatic scanning system with a fixed 1 mm gap to the surface of test piece, the flaw with a minimum depth of 3 mm can be detected for SS304 stainless steel and aluminum plates. When scanned manually with the probe in contact with the surface of a buckle gauge block, the smallest depth of detectable flaw is only 0.2mm. In comparison with the differential probe, the absolute probe's structure is simple and the spatial resolution is better. The developed probes can be used for dynamic flaw detection in non-contact or contact mode. They will be suitable for applications in production line automation testing and on-site mobile testing.