

Maximum distance of lift-off height to detect defect on testing materials by using eddy current testing technique

ABSTRACT

Eddy Current Testing (ECT) technique is one of the Non-Destructive Testing (NDT) techniques that is sensitive to the unintended signal such as the lift-off (LO) effect. For ECT technique, LO effect is one of the constraints due to the weakened detection that affected the output of the signals. This presented research aims to develop coil probe that generates eddy current signals from an ECT technique in order to determine the optimum signal distance of LO height for three different chosen materials (e.g., copper, brass, and magnesium alloy) of three (3) different thickness which are 1.5 mm, 3.0 mm and 5.0 mm each. The output voltage of the defects signal of the tested materials can be determined from the optimum signal distance of LO height of the ECT technique. The coil probe used consists of an exciter-receiver coil, where 5.25 MHz is the optimal frequency. This frequency then generates the signal of the ECT technique. This technique was set up using a 50 ohms function generator and an established amplifier to boost up the output signals. The acquired optimum distance LO height for this research is approximately 2 mm. The findings from this established technique indicate the determined LO height can be used to find the output voltage signal of the defects as well as to detect the thicknesses. The output voltage signal from the ECT technique was analyzed and compared. In a conclusion, the output voltage signals slightly increased for larger material defects and subsequently decreased with greater thickness detection. Hence, the lift-off height parameters of the ECT technique in this research is capable to detect defect appropriately.