

Optimisation frequency for different lift off on aluminium using Eddy Current

Testing (ECT) technique

ABSTRACT

One of the main hindrances of Eddy-current Testing (ECT) technique is the lift-off (LO) effect which it can easily mask defect signals. This paper is an ongoing study on analysing the optimum lift-off value distance for specific design of ECT technique theoretically and experimentally. Through this approach, the detection of imperfections was determined by the slope of the peak value of the different frequency varied by various lift off values and was verified by experiment with an established circuit. This circuit is efficient and could be used with different range of desired frequencies (i.e., 250 kHz -3.5 MHz) by using a function generator and an established probe consists of excitation coils and receiver coils known as dual sensors device. Result obtained from the output voltage signal at higher frequency becomes much lower as the lift-off distance increases. It showed that the signal responses for measuring the various lift-off values, whilst at certain lower frequency could not be detected, however convenient for detect imperfections. Throughout this, the applicable lift-off distance that used to detect imperfection for aluminium with different imperfection sizes was 3 mm for frequency 2.65 MHz, 2 mm for frequency 2.75 MHz, 1 mm for frequency 2.85MHz, and 0 mm for frequency 2.95MHz. It can be concluded that, using higher excitation can be used to measure suitable lift-off, however lower frequency can be used to detect imperfection including its sizes.