

Optimisation frequency design of Eddy current testing in titanium and nickel metal with difference thickness

Abstract

This paper is to find the optimisation frequency for designed non-destructive testing (NDT) metal instrument. The testing technique is Eddy Current Technique (ECT), where Titanium (Ti) and Nickel (Ni) metals in 100mm X 100mm and with different type of thickness (1.5mm, 3mm and 5mm) dimension were chosen as the metal testing. Three different kind of thickness in each metal were tested to identified the optimal frequency for the instrument with identical artificial defect that constructed on the metal testing. The input frequencies were ranged between 250kHz - 3.5MHz and a dual-sensors were designed and established to gather the output. The output signals of the voltage of testing from the sensor circuit then compared to analyse the optimal of range frequency for the testing instrument. The result of this research showed that the nondestructive metal testing instrument of dual- sensor by using eddy current method can be used to find different defect for Titanium (Ti) and Nickel (Ni) metal. The optimal frequencies for Titanium was 2.83MHz and Nickel was 2.85MHz. The categorisation of thickness on metal for the eddy current testing instrument is suitable at 2.83MHz for Titanium and 2.85MHz which are also known as optimal frequency.