ABSTRACT

Magnetic field induction method which is a concept of NDT (Non-Destructive Testing) with the process of testing materials, objects, tools without damaging the usability function of the material. In this study the Non-Destructive Testing method was used to detect variations in metal depth in the soil. In the magnetic field induction method requires a coil configuration as a transmitter and a receiver. The tests were carried out using a coil pair of 200 turns, 300 turns and 400 turns with an object (laterite soil) and without an object (air) and used iron, copper and aluminum metals with 10 Vpp input on the transmitter coil. In this study, which can determine the presence of metal in the soil optimally with the working parameters of the coil, namely the number of turns and the distance between the coils, using a coil of 200 turns at a frequency of 240 kHz. The maximum depth value in determining the position of the metal in the soil with the coil working parameters, namely the number of turns and the distance between the coils is determined by using the value of the voltage difference between the depth of the metal in the soil and each transducer in the soil without metal. In ferrous metals, the maximum depth with a voltage difference value is close to zero, namely at a depth of 4 cm with a voltage difference value of -269 mV. In copper metal, the maximum depth with a voltage difference value close to zero is obtained at a depth of 0.5 cm with a voltage difference of -4494 mV. In aluminum metal, the maximum depth with a voltage difference value is close to zero, namely at a depth of 5.5 cm with a voltage difference value of -186 mV. Overall, when testing the coil working parameters, the number of turns affects changes in the voltage value when detecting metal depth. In addition, the distance between the coils can also affect the voltage value because the farther the distance between the coils, the less likely it is to detect the depth of metal in the soil.

Keywords: *Metal, NDT, Magnetic Field Induction, Coil, Soil*