

Lift-Off Effect Evaluation by Using Eddy Current Testing Technique on Copper (C101)

ABSTRACT

This study aims to develop an eddy current testing (ECT) probe that generates eddy current signals when a coil is placed above copper101 metal testing with and without nonconductive coating and the presence of lift-off height, i.e., 0, 2.5, 5.0, 7.5, and 10.0 ± 0.5 mm. Then, the metal test with a variety of thicknesses, i.e., 1.5, 3.0, and 5.0 ± 0.5 mm, and with varies of surface defects, i.e., 10, 20, and 30 ± 0.5 mm, engraved on the metal testing. The coil probe is a rodshaped solenoid coil designed with an iron core with 65 mm length, 5 mm area, and 200 N turns. It demonstrates how the rod-shaped solenoid coil may be used to detect various surface defects on copper101 (C101). The optimal frequencies for C101 are 7.850 MHz. In conclusion, the output voltage signals for larger surface defect sizes increase but decrease as the thickness becomes thicker. Furthermore, as the lift-off height increases, the output voltage for both coated and non-coated metal decreases accordingly. Therefore, besides comparing the output voltage for coated and non-coated metals, there are minor differences which shows that the ECT technique in this study is capable to detect surface defects appropriately.