

Preparation of solenoid probe for eddy current testing technique probe

ABSTRACT

The most crucial components in the eddy current system are the sensitivity of the eddy current probe to deliver a signal to detect a defect on the material efficiently. An ideal solenoid is when the turns are closely spaced, and the length is much greater than the radius of the turns. This paper presents a preparation of a solenoid probe for the eddy current testing (ECT) technique probe to detect surface and subsurface defects. The objectives of this research are to design and construct a high sensitivity rod-shaped solenoid probe, to find the optimal frequency for each metal testing, i.e., Copper (Cu), Aluminum (Al), and Stainless Steel for this solenoid probe, and to obtain the output testing signals imperfection with vary of thickness, i.e., 1.5, 3.0 and 5.0 mm and the hole of an artificial defect, i.e., 7.0, 14.0 21.0 mm has been established on each of the metal testings. This Solenoid coil was designed with an iron core with 65 mm length, 5 mm area, and vary of turns i.e., 50, 100, 150, and 200 N. It shows that the rod-shaped solenoid probe can be used to find different defects for Copper (Cu), Aluminium (Al), and Stainless-Steel. The optimal frequencies for copper were 7.850 MHz, Aluminium was 7.383 MHz, and Stainless-Steel metal was 7.956 MHz.