

## **Numerical Simulations of Eddy Current Testing For Plated Aluminum Parts**

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### **ABSTRACT:**

Eddy current testing is a non-destructive inspection method applied to conductive materials. Its effects on aluminum are more effective than other materials. Modeling is a good tool for understanding and analyzing impedance responses due to flaws. In this paper, discretization by finite element method is used to solve the electromagnetic field equations in terms of magnetic vector and electric scalar potentials in order to calculate the probe impedance. Simulation by finite elements method was realized to calculate the electromagnetic energy of the interaction between coil and tested part. The real and imaginary components of the probe impedance were deduced from calculated energy that allows determining the characteristic parameters of a crack in aluminum parts.

**Keywords:** Non destructive testing, eddy current, finite element method, aluminum parts, numerical simulations.