

## ABSTRACT

Electroplating is the process of coating metal using the help of an electric current through an electrolyte solution. The coating material is called the anode and the coated material is called the cathode. Electroplating itself aims to make a metal rust resistant, wear resistant, and decorative. The purposes of this study are to determine the effect of the electric current density on the thickness of the nickel chrome layer on the stud and to determine the effect of the electric current density on the corrosion resistance of the nickel chrome layer on the stud.

In this study, stud specimens are made from cast iron coated with nickel chrome. The electric current density variations are used at  $7 \text{ A / dm}^2$  and  $9 \text{ A / dm}^2$ . The first coating process is carried out for 40 minutes in the nickel solution and the second coating is carried out for 30 seconds in the chrome solution. Layer thickness measurements are carried out using an Olympus BX53M series microscope. Whereas corrosion resistance testing refers to the ASTM B117 standard with a testing time of 12 hours.

The results showed the highest layer thickness for the variation of current density of  $7 \text{ A / dm}^2$  is in the 8th segment with a value of  $57 \mu\text{m}$  and the highest layer thickness for the variation of the current density of  $9 \text{ A / dm}^2$  is in the 8th segment with a value of  $83 \mu\text{m}$ . While the percentage of rust that occurs in the two variations in current density of 2%. Rust in the current density variation of  $7 \text{ A / dm}^2$  occurs in the low current area and in the current density variation  $9 \text{ A / dm}^2$  occurs in the high current area.

Keywords: Electroplating, Stud, Density Current, Nickel Chrome, Low Current, High Current