

ABSTRACT

Anodizing is a surface treatment for coating metal surfaces to protect them from the destructive effects of the environment and to produce attractive, textured and colored metal appearance, and resistance to friction. The purpose of this study was to determine how the effect of electric voltage on the anodizing process on the microstructure of the oxide layer thickness, macro, roughness and hardness on the aluminum surface of the 1xxx series.

This study uses voltages of 20, 22 and 24 with sulfuric concentration of 40% acid solution, current of 2 A in the anodizing process, is expected to produce a higher value of hardness and thickness. The specimens used in this study were aluminum plate metal series 1XXX with a length of 50 mm, width of 30 mm and thickness of 5 mm. The anodizing process was carried and in several steps starting from sanding then cleaning, rinsing, etching, rising, desmut, rising, anodizing, rinsing, coloring , rising, sealing, rinsing, and finally drying. Thickness test, surface structure, roughness and hardness test were conducted to characterize the surface.

The results showed that the electric voltage in the anodizing process had an effect on the thickness of the oxide layer, surface structure, roughness and hardness of aluminum surface 1XXX. The highest thickness after going through anodizing and sealing process is 13.1 μm at a voltage of 20 volts, the highest hardness of the oxide layer is at 24 volts 143.10 VHN after anodiz and coloring process. Increase the thickness of the oxide layer and the hardness of aluminum 1XXX ..

Keywords: Aluminum 1XXX, anodizing, oxide layer, surface hardness, electrical voltage.