

ELECTROCHEMICAL DEPOSITION OF NICKEL COATING ON COPPER

Stanko Spasojević^{1*}, Milena Milovanović², Danijela Jovičić¹, Stana Stanišić¹, Zorica Ristić¹, Marija Mitrović², Bojana Lukić¹, Milorad Tomić^{2,3}

¹ORAO, a.d. Šabačkih đaka 66, Bijeljina, Republic of Srpska, Bosnia and Herzegovina, stankos.1997@gmail.com*

²University of East Sarajevo, Faculty of Technology Zvornik, Karakaj 34a, Zvornik, Republic of Srpska, Bosnia and Herzegovina;

³Engineering Academy of Serbia, Kneza Miloša 9/IV, Belgrade, Serbia

Abstract

This work investigates the process of forming metallic coatings of nickel on copper using electrolytic deposition. By focusing on the optimization of deposition parameters, such as current density, electrolyte temperature and deposition time, high-quality coatings can be achieved in terms of corrosion resistance, strength, adhesion and aesthetic appearance of the material.

In the experimental part of this work, copper samples were treated with nickel-based electrolytes at different parameters of deposition time and current density while the temperature was constant. In the process of electrochemical deposition, the cathodes are copper plates, and the anodes are electrolytic Ni 99.999%. Electrochemical nickel coatings were deposited for 10, 15, and 20 minutes at current densities of 1, 1.5, and 2 A/dm², at a bath temperature of 42°C.

The results show that deposition parameters significantly affect the morphology and physical-mechanical properties of the formed layers. With an increase in the current density, there is an increase in the thickness of the metal coating deposited on the surface of the copper, as well as with an increase in the time of the electrochemical process.

Based on the obtained data, the work provides very important guidelines for the optimization of the process of electrochemical deposition of nickel on copper in industrial applications.

Keywords: *copper, nickel coating, electrochemical deposition, hardness, adhesion, coating thickness.*