

ABSTRACT

**THE EFFECT OF TIME AND VOLTAGE FOR HARD CHROME
PLATING HARDNESS TO CARBON STEEL**

The purpose of this study is : (1) hard chrome plating on low carbon steel with a carbon content of 0.254 % as the work piece. (2) Determine the increase in hardness on the surface layer of low carbon steel that has gone through the process of hard chrome plating with the variation of time (t) and voltage (V).

The study begins by preparing an electrolyte solution consisting of chromic acid 3000 g / l, sulfuric acid 17.4 g / l, catalyst and 300 ml of distilled water 20 liters. Followed by hard chrome plating experiments. In this study, the rectifier as a current source, selected low carbon steel as the work piece and hung on poles that are negative cathode in the electroplating bath. The variables measured include the length of time used for dyeing process for 150, 180, 210 and 240 minute (t), a large voltage is 11 volts used and the distance between the anode to the cathode to 150 mm. Large DC voltage used by 6, 8, 10 and 12 volts (V), long time immersion for 180 minute and the anode to cathode distance as far as 150 mm.

From the research conducted, it can be concluded as follows : (1) Has successfully use hard chrome plating material low carbon steel with a carbon content of 0.245% as the work piece. (2) From the results obtained by increasing the value of the surface hardness of hard chrome coatings are best obtained at 407.71 HV on the time variation of the coating process for 240 minutes and a large applied voltage is 11 volts to the anode to cathode distance as far as 150 mm . And varied voltage of 12 volts and duration of immersion for 180 minutes with the anode to cathode distance as far as 150 mm, which is best obtained hardness value of 340.81 HV.

Keywords : electroplating, hard chrome, surface hardness.