

ABSTRAK

Dalam industri *shock absorber* kendaraan roda dua banyak terjadi kegagalan fungsi dari salah satu komponen *shock breaker* yaitu *innertube* yang dikarenakan nilai kekerasan permukaan yang rendah dibawah 900 HV sehingga menimbulkan *scrath* dipermukaan dan berakibat terjadi kebocoran di *shock breaker*. Tujuan dari penelitian ini adalah untuk mendapatkan kekerasan permukaan komponen *innertube* yang terbuat dari baja SAE1541 diatas 900 HV menggunakan proses *electroplating hard chrome* dengan menganalisis pengaruh kombinasi konsentrasi larutan elektrolit CrO_3 dan temperatur larutan elektrolit CrO_3 . Metode yang digunakan adalah metode eksperimental dengan jenis pre eksperimental. Pengambilan data yang dilakukan adalah dengan memberikan variabel bebas pada temperatur larutan elektrolit CrO_3 sebesar 55°C , 65°C dan 75°C . Setelah mendapatkan temperatur terbaik untuk mendapatkan nilai kekerasan permukaan diatas 900 HV dilakukan pengambilan data dengan memberikan variabel konsentrasi larutan elektrolit CrO_3 sebesar 250 gram/liter, 300 gram/liter, dan 350 gram/liter. Dalam penelitian ini, anoda menggunakan timah, untuk katoda menggunakan baja SAE 1541 berdimensi panjang = 100 mm dan diameter = 24 mm, tegangan arus DC 10-volt dan waktu perendaman 10 menit. Metode pengecekan nilai kekerasan menggunakan metode *Hardness Vickers tester*. Hasil penelitian menunjukkan adanya selisih nilai kekerasan permukaan yang dipengaruhi konsentrasi larutan elektrolit CrO_3 . Nilai kekerasan tertinggi didapatkan saat konsentrasi larutan elektrolit 350 gram / liter dan temperatur larutan elektrolit 65°C dengan nilai 1156,1 HV. Temperatur larutan elektrolit menunjukkan memiliki pengaruh dengan nilai kekerasan permukaan setelah proses *electroplating hard chrome*. Nilai kekerasan tertinggi didapat di temperatur 65°C dengan konsentrasi 350 gram / liter dengan nilai 1156,1 HV dan nilai kekerasan terendah didapatkan di temperatur 55°C dengan konsentrasi 300 gram / liter dengan nilai 833,8 HV.

Kata Kunci: logam baja, *electroplating hard chrome*, temperatur elektrolit, konsentrasi elektrolit CrO_3 , *Hardness Vickers*.

**ANALYSIS OF THE EFFECT COMBINATION TEMPERATURE AND
CONCENTRATION OF CrO₃ ELECTROLYTE SOLUTION ON HARDNESS
VALUE COATING ON SAE 1541 STEEL THROUGH A HARD CHROME
ELECTROPLATING PROCESS**

ABSTRACT

In the shock absorber industry for two-wheeled vehicles, there are many malfunctions of one of the component of the shock breaker, namely the innertube due to the low surface hardness value below 900 HV, causing scrath on the surface and resulting in a leak in the shock breaker. The purpose of this study was to obtain the surface hardness of the innertube component made of SAE1541 steel above 900 HV using the hard chrome electroplating process by analyzing the effect of the cpmbined concentration of CrO₃ electrolyte solution and the temperature of the CrO₃ electrolyte solution. The method used is an experimental method with a pre-experimental type. Data collection was carried out by providing independent variabels at the temperature of the CrO₃ electrolyte solution of 55°C, 65°C, and 75°C. After getting the best temperature to get a surface hardness value above 900 HV, data was collected by giving a variabel concentration of CrO₃ electrolyte solution of 250 grams/liter, 300 grams/liter, and 350 grams/liter. In this study the anode used tin, for the cathode used SAE1541 with dimensions of lemght = 100 mm and diameter = 24mm, 10 volt current volatege and 10 minutes of immersion time. The method of checking the hadrness value uses the hardness vickers tester method. The result showed that there was a difference in the value of surface hardness which was influenced by the concentrain of the CrO₃ electrolyte solution. The highest hardness value was obtained when the concentration of the CrO₃ electrolyte solution was 350 grams/liter and the temperature 65°C with a value of 1156,1 HV. The temperature of CrO₃ electrolyte solution has an effect on the surface hardness value after the hard chrome electroplating process. The highest hardness value wa obtained at a temperature of 65°C with a concentration of 350 gram/liter with a value of 1156.1 HV.

Keyword: metal steel, electroplating hard chrome, electrolyte temperature, electrolyte concentration, Hardness Vickers