

Temperature Depended Austempering of High Carbon Steel using Epoxidized-Transesterified Cotton Seed Oil

Authors : R.M. Dodo, Z. Musa, K. A. Bello, U. Abdullahi, G. A. Faruna

Abstract : Temperature depended austempering of high carbon steel using epoxidized-transesterified cotton seed oil (ETO) was examined. Five set of samples were heated to 850oC and held for one hour then quenched in oil bath of ETO at 250oC at one hour holding time. The same procedure was performed on the rest of the samples and austempered at 270oC, 290oC, 310oC and 330oC. Next, mechanical properties' tests conducted. The austempered samples were then analyzed for microstructure using scanning electron microscope (SEM). The results indicate that tensile strength and hardness dip with increase in the temperature. Again, impact strength improved with rise in the temperature. It was observed that 270oC is the best austempering temperature, since it produces austempered sample with the best combination of mechanical properties.

Keywords : epoxidized transesterified cotton seed oil, austempering temperature, high carbon steel, bainitic structure

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