Study the Effect of Surface and Internal Heat Treatment on Mechanical Properties of C40 Steel Alloy

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Received on 3/6/2013 & Accepted on 5/12/2013

ABSTRACT

The research aims to study the effect of quenching, tempering and laser surface treatment on the mechanical properties of C40 steel. The steel specimens were heated to a temperature of 860°C, soaked for 60 minutes and quenched in oil and then tempered at different temperatures (100,200,300,400,500,600,700) °C. Laser hardening were carried out by using Nd: YAG laser with different pulses up to 5 pulses, the applied laser energy was 500 mJ.

The mechanical tests such as: impact test and microhardness, were carried out for the specimens before and after heat treatment. Microstructure evaluation was carried out using computerized optical microscope. The results showed an improvement in the internal and surface properties of the metal.

Keywords: Mechanical Properties, C40 Steel, Quenching, Tempering, Impact Test, Micro hardness And Microstructure.