EXPERIMENTAL STUDY OF THE INFLUENCE OF TEMPERING TEMPERATURE ON MECHANICAL PROPERTIES OF AISI 4140 STEEL IN QUENCHING - TEMPERING PROCESS

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Abstract

AISI 4140 is one type of low alloy steel which has a chemical composition 0.40% C, 0.79% Mn, 0.89% Cr, Mo and 0.16%. Examples of applications of AISI 4140 steel is a component of the machine (as vehicles, gears, and sprockets). From the example application, it is known that AISI 4140 steel is widely used in applications requiring high toughness and hardness.

This research was conducted by quenching-tempering heat treatment in AISI 4140 steel. Quenching heat treatment process begins by heating in the kitchen until austenisasi temperature of 885 °C. At temperatures austenisasi specimen given detention time for 1 hour, then the specimen immersed in the quench oil until it reaches room temperature. Specimens that have undergone the process of quenching reheated at temperatures that varied tempering of 350 °C, 400 °C and 450 °C with a hold time of 1 hour. Cooling medium in the process of tempering is Fress water. In specimens that have undergone the process of quenching - tempering impact testing, tensile, hardness (hardness), metallography and XRD test.

The expected results, are known to quenching-tempering treatment effect on mechanical properties and the microstructure of the AISI 4140, in order to get specimens which have the hardness and good toughness and
microstructure are owned by tempering temperature variation imposed

**Key words:** AISI 4140, quenching - tempering, impact, tensile, hardness (hardness), metallography and XRD