ABSTRACT

The objective of this research is to study the effects of Tempering on physical and mechanical characteristics of MS 709. The characteristics observed were tensile strength, Brinell Hardness Number and microstructures.

Tensile strength of material is carried out by tensile test. Quenching has been performed at temperature of 850^0C and soaking time of one hour. Tempering has been done at temperature of 500^0C and holding time of 0,5 ; 1,5 ; 2,5 ; 3,5 ; 4,5 hours.

The results of the research show that the ultimate strength is 91 kg/mm^2 for raw material ; 140 kg/mm^2 for tempered material of 0,5 hour ; 122 kg/mm^2 for tempered material of 1,5 hours ; 110 kg/mm^2 for tempered material of 2,5 hours ; 109 kg/mm^2 for tempered material of 3,5 hours ; 109 kg/mm^2 for tempered material of 4,5 hours ; 108 kg/mm^2. The hardness of the raw material is 272 kg/mm^2 quenched material is 395 kg/mm^2 tempered material for 0,5 hour is 255 kg/mm^2 for 1,5 hours is 237 kg/mm^2 for 2,5 hours is 228 kg/mm^2 for 3,5 hours is 199 kg/mm^2, and for 4,5 hours is 180 kg/mm^2. Generally, if the holding time increases the ultimate strength and the hardness decrease. The raw materials have ferrit and pearlit structures and these structures are smaller than tempered materials structures.