

COMPARISON OF MECHANICAL PROPERTIES OF MEDIUM CARBON STEEL WITH DUAL PHASE STEEL

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ABSTRACT

In this research work investigations were carried out to study the effects of heat treatment on the mechanical properties (toughness, hardness) of medium carbon steel and on Dual phase steel development from Medium carbon steel. Dual phase steel is developed by intercritical annealing in order to improve the hardness and impact toughness. Medium carbon steel of 0.46% carbon content is first inter critically heated in furnace and then rapid cooling in water is done to obtain the martensite steels and named as Dual phase steel. Different samples of Dual Phase steels are prepared by the intercritical annealing process for holding time of 2, 4 and 6 minutes for temperature ranging from 740°C to 840°C. The heating temperature and different time of heating (holding time) of the steel is used to make different percentage of Martensite steel. Dual phase steel so obtained is now tested and properties of the Dual Phase steel are evaluated. Rockwell Hardness test and Charpy toughness test for each Dual phase steel specimen is conducted to compare its hardness and toughness with untreated medium carbon steel. The result indicates that the specimen hardness and toughness increased with the increment in the heating temperature and holding time. The increase in heating temperature and holding time followed by quenching will convert austenite into martensite.

KEYWORDS: Austenite, Dual Phase Steel, intercritical Annealing, martensite, Medium Carbon Steel