

Characterising the Effects of Heat Treatment on 3CR12 and AISI 316 Stainless Steels

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Abstract : This paper reports on the effects of heat treatment on 3CR12 and AISI 316 stainless steel grades. Heat treatment was conducted on the steel grades and cooled using two different media; air and water in order to study the effect of each medium on the evolving properties of the samples. The heat treated samples were characterized through the evolving microstructure and hardness. It was found that there was a significant grain size reduction in both the heat treated stainless steel specimens compared to the parent materials. The finer grain sizes were achieved as a result of impediment to growth of one phase by the other. The Vickers micro-hardness values of the heat treated samples were higher compared to the parent materials due to the fact that each of the steel grades had a proportion of martensitic structures in their microstructures.

Keywords : austenite, ferrite, grain size, hardness, martensite, microstructure and stainless steel

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