INVESTIGATION OF HARDNESS GRADIENT IN CARBURIZING OF FE-24MN STEEL

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"I declared that this thesis is the result of my own work except the ideas and summaries which I have clarified their source. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any degree."

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Abstract

The superiority of High Manganese steel (Fe-24Mn) is it provide high strength and at the same time it also have high formability. The application of this type of steel is suitable for the automotive industry which requires excellent strength and excellent formability. The effect of carburized Fe-24Mn was analysed. Samples were carburized at 930 °C with different carburizing time from 1 hour to 3 hours under pack carburizing and 30 minute under gas carburizing. After carburizing process, the test sample was subjected to hardness and spring-back test. Optical microscopic test and was carried out to evaluate the case hardening profile. The hardness gradient of the Fe-24Mn steel was analysed using the Vickers hardness test with various case depth. Microscope was used in order to analyse the microstructure. The Fe-24Mn steels was bent using a die with an angle of 120° and the actual bending angle are measured using a profile projector to determine the spring-back factor. Based on the mechanical test, overall it shows that the hardness of the Fe-24Mn steel increased with the carburizing time and spring-back factor also increase with carburizing time.

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