

EDITORS

ERRY YULIAN TRIBLAS ADESTA

MOHAMMAD YEAKUB ALI

AKM NURUL AMIN

DESIGN FOR MANUFACTURE

Towards Improved Manufacturability



IIUM Press

DESIGN FOR MANUFACTURE

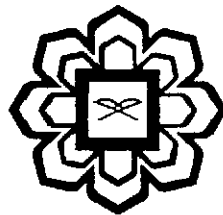
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Effects of Austempering Treatment on Mechanical Properties of Ductile Iron

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1. Introduction

The objectives of this research is to highlight the effect of austempering heat treatment on mechanical properties of ductile iron (DA), to study the effect of the heat treatment on the microstructure of the ductile iron and finally and to study the impact of the austempering temperature on the tensile properties of the iron. The methodology adopted in this research is a library based and data were collected from reliable sources. The research focuses on impact of the austempering treatment on the ductile iron properties which gave the ductile iron the chance to be a compatible and substitute to steel. The research explores the reported mechanical properties affected by the austempering treatment, which is suitable for a material to be utilized in automotive applications.

Austempered Ductile Iron (ADI) is considered as a new engineering that has attracted the attention of the automotive industries to look for low cost, weight and reliable materials to substitute the heavy, difficult to machine and expensive steels and aluminum[11-12]. ADI belongs to the ductile iron family that combines the characteristics of the forged steels: It has considerable wear resistance, tensile strength, fatigue resistance and fracture toughness [6-9]. Not neglecting the basic characteristics of the cast irons which are the high machinability, load elasticity to density to and the castability of the iron. These superior properties have made the ADI a good competitor material to traditional casted and forged steels. The improvement of the mechanical properties of ductile iron and other ferrous materials can be attributed to the heat treatment process that controls the microstructure of the materials. Austempered ductile iron is basically ductile irons have been treated isothermally at a controlled temperature called austempering temperature after austenitization the iron above the austenitization temperature and soak for considerable time to