

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ





# شبكة المعلومات الجامعية التوثيق الالكتروني والميكرو فيلم





شبكة المعلومات الجامعية

# جامعة عين شمس

التوثيق الالكتروني والميكرو فيلم

## قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها  
علي هذه الأفلام قد أعدت دون أية تغيرات



## يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of  
15-25- c and relative humidity 20-40%

# بعض الوثائق الأصلية تالفة



# بالرسالة صفحات نم ترد بالاصل

# **Austempering of Spheroidal Graphite (SG) Cast Iron**

By

**Amer Ahmed Abd Alhkeem**

A thesis Submitted to the  
Faculty of Engineering at Cairo University  
in partial fulfillment of the  
requirements for the degree of  
**MASTER OF SCIENCE**

in

**METALLURGICAL ENGINEERING**

FACULTY OF ENGINEERING, CAIRO UNIVERSITY  
GIZA, EGYPT  
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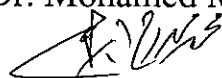
in

**METALLURGICAL ENGINEERING**

Under Supervision of

Prof. Dr. Mohamed M. Ibrahim

Prof. Dr. Ismaeel A. El-Sesy



Dr. El-Zahraa M. Yehia

Dr. EL ZAHRA Yehia

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# ***Acknowledgement***

I would like to express our sincere appreciation and gratitude to **Prof. Dr. M.M. Ibrahim, Prof. Dr. I. A. El - Sesy and Dr. El - Zahraa M. Yehia** for suggesting the research program and their generous assistance and fruitful discussions.

I would like also to extend our thanks to the academic staff of Metallurgical Department for their continuous encouragement throughout the courses of our study in the department.



## ***Abstract***

As the spheroidal shape of graphite can not be further improved, the subsequent thrust on research and development has, therefore, been towards the modification of the matrix structure of ductile iron.

Austempering treatment applied to ductile iron provides a quantum leap in mechanical properties – almost doubling its strength while retaining its toughness. The combination of diverse properties such as strength, toughness, ductility, good machinability and low cost has made austempered ductile iron (ADI) substitute forged steel in many industrial applications.

In the present work a systematic study has been made to determine the effect of austempering treatment cycle on the mechanical properties of ductile cast iron. The causes behind the superior combination of strength and ductility have been discussed on the basis of microstructures observed. The results are encouraging. The strength properties obtained with the unalloyed ductile iron used in this work are approaching the properties of alloyed ductile iron reported in the literature.



