شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

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 الاصلية تالفة

بالرسالة صفحات لم ترد بالاصل

AIN SHAMS UNIVERSITY
FACULTY OF WOMEN FOR ART,
SCIENCE AND EDUCATION

Ultrasonic and Mechanical Studies of Some Properties of Ductile Cast Iron

Thesis submitted in the partial fulfilment
of the requirements of the M. Sc.
By

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1998

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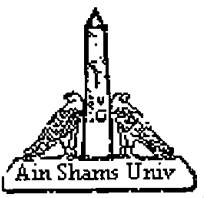

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ABSTRACT

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Mahmoud El-Sayed Abdel-Rehim El-Gazery. Ultrasonic and Mechanical Studies of Some Properties of Ductile Cast Iron. Ain Shams University, Faculty of women for Art, Science and Education, 1998.

Ductile cast iron round bars were prepared using alloys have carbon equivalent percentages **(C.E)** ranges between 4.50% and 4.76%. Different measurements were carried out on as-cast and heat treated specimens. Ultrasonic velocity and attenuation were measured using pulse echo technique at frequencies 1,2 and 4 MHz. Mechanical properties of the different bars were evaluated. The microstructures of specimens were investigated.

Results revealed that ultrasonic velocity decrease with increasing casting modulus, while attenuation coefficient increases.

Mechanical properties decrease with increasing casting modulus. Annealing reduces mechanical properties and hardness. Longitudinal and shear velocities were found to be correlated to the tensile strength and hardness using empirical relationships.

SUMMARY

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Ductile cast iron round bars of 0.75, 1, 1.25 and 1.5 cm casting moduli were prepared using alloys have carbon equivalent percentages **(C.E)** ranges between 4.50% and 4.76% Different measurements were carried out on as-cast and heat treated (annealed at 680°C for 6hr and air cooled to room temperature) specimens. Ultrasonic velocity and attenuation were measured using pulse echo technique at frequencies 1,2 and 4 MHz. Mechanical properties (namely; ultimate tensile strength, 0.2 % offset yield, elongation and hardness) of the different bars were evaluated. The microstructures of specimens were investigated.

Results revealed that ultrasonic velocity increases with increasing of carbon equivalent percentage while attenuation coefficient increases and for the same carbon equivalent percentage the ultrasonic velocity decreases with increasing casting modulus, while attenuation coefficient increases.

Also, the ultrasonic attenuation increase with increasing of frequency at the range from 1MHz to 4MHz. The magnitude of velocity for annealed specimens are