



شبكة المعلومات الجامعية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ





شبكة المعلومات الجامعية



شبكة المعلومات الجامعية

التوثيق الالكتروني والميكرو فيلم

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم



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



يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %



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بعض الوثائق الأصلية تالفة



شبكة المعلومات الجامعية



بالرسالة صفحات

لم ترد بالأصل



B 11 CES

Mansoura University
FACULTY OF ENGINEERING
MECHANICAL POWER ENG. DEPT

EFFECT OF SURFACE TEMPERATURE ON THE FOULING OF HEAT TRANSFER SURFACES

A Thesis

Submitted in Partial Fulfillment for the Degree of
Master of Science In Mechanical Power Engineering

By

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Mansoura
2006

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FOULING OF HEAT TRANSFER SURFACES

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Examination Committee

**Thesis Title : EFFECT OF SURFACE TEMPERATURE ON
THE FOULING OF HEAT TRANSFER SURFACES**

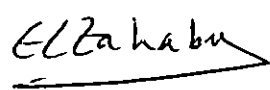
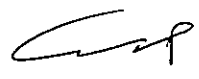
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ACKNOWLEDGEMENT

Thanks go first of Allah, the author wishes to express his sincere gratitude and deepest appreciation to all who help in preparation and carry out this work.

I am deeply grateful to prof. Dr. HELMY. E. GAD Head of Mechanical power Engineering Dept, Mansoura University for his helpful participation and guidance in this work.

I am very grateful to Dr. MOSTAFA AWAD; Faculty of Engineering, Mansoura University for His valuable suggestions, progressive help, encouragement, and his contribution in the experimental work and carrying out this research.

Finally, I wish to acknowledge the Engineers, Technicians and all workers in the Hydraulic Machine Laboratory, laboratory of Chemistry, and workshops of the Faculty of engineering, Mansoura University for contributed participation and generous help.

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Mansoura - 2006

Abstract

The surface temperature is one of the important parameters affecting the surface fouling. To study this effect, an experimental test rig has designed and constructed. The experimental loop has a Perspex test tube of 300 cm length, 5.53cm inner diameter, and 3mm thickness. Water with a solid particle concentration of 1gm/lit is used as a test fluid. Three electric heaters are fixed in series arrangement at the center of the test tube.

A circulating pump has been used to circulate the test fluid with a constant velocity . To have a closed loop experimental test rig, a water cooler has been used to obtain a constant inlet temperature. The surface temperature of electric heaters and test fluid temperature at each section of test tube are observed and recorded by a digital temperature recorder. The heating water flows in a closed loop to keep constant solid particle concentration.

The experimental runs have been carried out under different surface temperatures (from 55°C to 95°C) with a constant flow velocity of 0.08 m/s. All experimental runs have been carried out for a long time each to surface temperature (about 280hrs) to reach the asymptotic fouling.

The obtained results have been analyzed and studied. From the discussion, it can be concluded that, the fouling resistance and the asymptotic fouling resistance decrease with increasing the surface temperature. The delay time is very small and seems to approach zero in all experiments that is due the high concentration of the foulant (about 1gm/lit). The saw teeth effect have been obtained in all runs. Results show also that the surface temperature has a great

effect on the fouling resistance in the range from 55°C to 71°C. This effect seems to be smaller when the surface temperature increases from 75°C to 95°C.

The data collected from the present work seems to be important in the practical applications. A future work with other fluids and particle concentrations is recommended. The need of extensive theoretical analysis of the fouling problem is also essential.