سامية محمد مصطفى

شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

سامية محمد مصطفى

شبكة المعلومات الجامعية

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التوثيق الالكتروني والميكروفيلم

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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

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

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

سامية محمد مصطفى

شبكة المعلومات الجامعية

بعض الوثائق الأصلية تالفة

سامية محمد مصطفى

بالرسالة صفحات لم ترد بالأصل

MENOUFIA UNIVERSITY
FACULTY OF ENGINEERING
SHEBIN ELKOM
MECHANICAL POWER DEPARTMENT

A THESIS
SUBMITTED IN PARTIAL FULFILLMENT
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PERFORMANCE OF FINNED TUBE AIR COOLERS WITH DIFFERENT FIN GEOMETRIES

BY
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B. Sc. Mech. Eng.

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ABSTRACT

Experimental investigations of continuous flat and corrugated fin-and-tube air coolers are reported in this study. The air coolers consist of four fin and tube air coolers having flat fins and seven air coolers of corrugated fins with three staggered tube rows in the flow direction. The effect of fin spacing, the pattern depth and the corrugation frequency are investigated. For examining the influence of the number of tube rows on the Nusselt number, published experimental data are employed. Results are presented in terms of friction factor and Nusselt number. It is found that the friction factor decreases with increasing the Reynolds number and increases with increasing the fin spacing. The increase in both the pattern depth and frequency results in increasing the friction factor also. It can be concluded that the Nusselt number increases with increasing Graetz number and pattern depth as well as the number of corrugation waves per tube row. From another hand, the Nusselt number decreases with increasing both the fin spacing and the number of tube rows in the flow direction.

General correlations for the friction factor and Nusselt number are proposed for the present fin configurations. These correlations, which are applicable to a wide range of varieties, are found to be representative of the experimental data with a good accuracy. Comparisons between the present correlations and those proposed by different authors are reported. A somewhat small discrepancy in the range of uncertainty of the previously published correlations is obtained. The proposed friction correlation can describe all the experimental results within ± 5 %, while the proposed heat transfer correlation can describe all the test data within ± 10 %.

CONTENTS

CHAPTER 3: EXPERIMENTAL PROCEDURE AND DATA PROCESSING