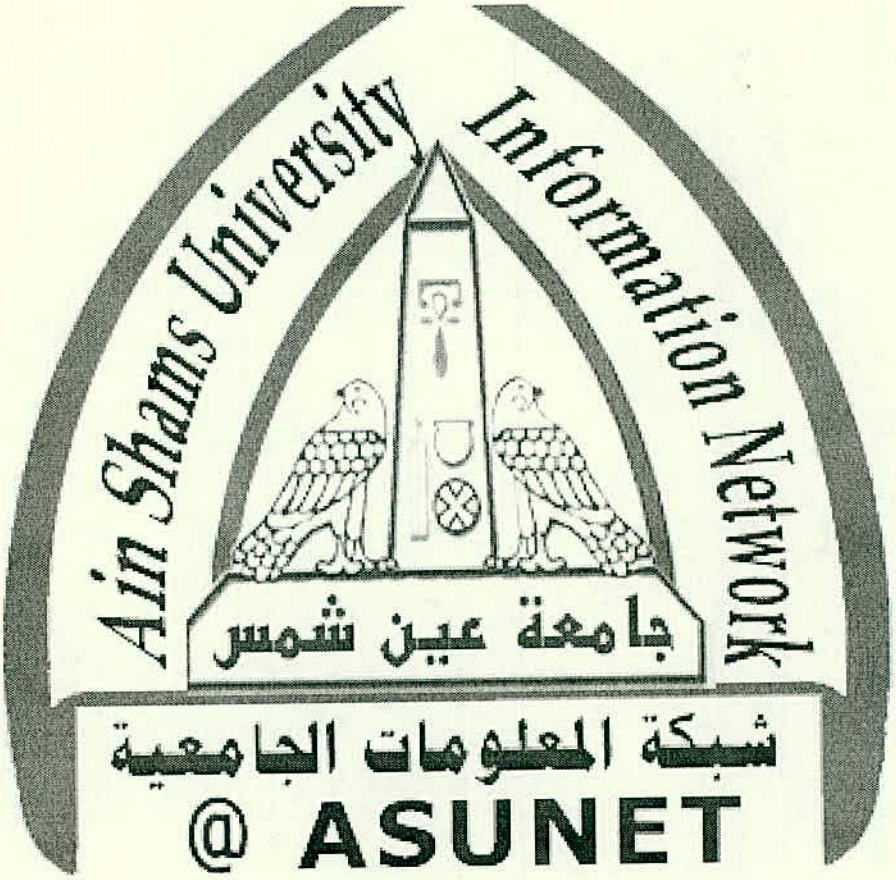
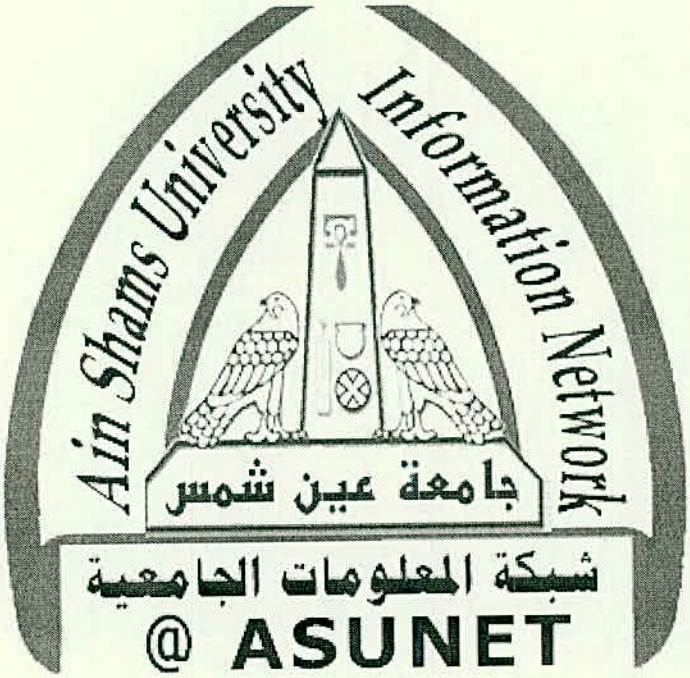
شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم





شبكة المعلومـــات الجامعية

التوثيق الالكتروني والميكروفيلم

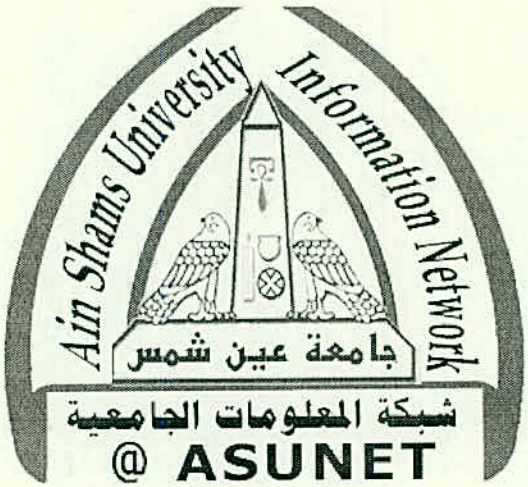
شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد اعدت دون آية 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 %

بالرسالة صفحات

لم ترد بالأصـــل

بعض الوثائق الأصلية تالفة

DEVELOPMENT OF AXIAL-FLOW PUMP FOR SURFACE IRRIGATION SYSTEMS

By

HESHAM MOHAMED EMAM
B.Sc. (Agric. Mechanization), Ain Shams University, 1995

A thesis submitted in partial fulfillment
of
the requirement of the degree of
MASTER IN SCIENCE

in

Agricultural Science
(AGRICULTURAL MECHANIZATION)

Department of Agricultural Engineering
Faculty of Agriculture
Ain Shams University

2001

Approval Sheet

DEVELOPMENT OF AXIAL-FLOW PUMP FOR SURFACE IRRIGATION SYSTEMS

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HESHAM MOHAMED EMAM

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Date of Examination / / 2001

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Abstract

Hesham Mohamed Emam. Development of the axial-flow pump for surface irrigation systems. Unpublished Master of Science Thesis, Ain Shams University, Faculty of Agriculture, Department of Agricultural Engineering, 2001.

An axial-flow pump is developed to meet the need of the surface irrigation in Egypt (low lift, 3 m or less). Dimensional analysis is used to compare the pump mechanical performance for the four different types of impeller (three of them were single stage and the fourth type was two stages). At 2800 r.p.m shaft speed and at the Best Efficiency Point (BEP) the fourth type of impeller (two-stage design, each stage had two blades and the spacing between the two stags was 150 mm) gave the capacity coefficient C_Q^* = 0.344, the head coefficient C_H^* = 0.726, the power coefficient C_{BHP}^* = 0.6, where the specific speed N_s = 0.462 and it, also, gave the highest efficiency (47 %) comparing with the other types of impeller.

The performance curves of the developed pump at 2500 and 2800 r.p.m shaft speed indicated that the double blades number and double stages number were improved the pump performance efficiency. The fourth type of impeller at 2800r.p.m and (BEP) gave discharge 0.054 m^3 / s, total head 3.95 m, brake horsepower 4.16 kW, and the efficiency 47 %.

Cost analysis showed that, the total costs was 3.11 L.E / hr and the total costs of lifting water was 0.016 L.E / m^3.

Key words

Irrigation, pump, axial-flow

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