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بسم الله الرحمن الرحيم

HOSSAM MAGHRABY

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شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها

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بالرسالة صفحات

لم ترد بالأصل

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THERMAL SPRAYING OF WEAR-RESISTANT COATINGS ON ALUMINUM ALLOYS BY CAST IRON POWDERS

Thesis

Submitted to

The Faculty of Science – Cairo University

By

Magdi Farouk Morks

For

The Degree of

Doctor of Philosophy

CENTRAL METALLURGICAL RESEARCH AND DEVELOPMENT INSTITUTE

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APPROVAL SHEET FOR SUBMISSION

Title of Ph.D. Thesis:

"THERMAL SPRAYING OF WEAR-RESISTANT COATINGS ON ALUMINUM ALLOYS BY CAST IRON POWDERS"

Name of the candidate: **Magdi Farouk Morks**

This thesis has been approved for submission by the SUPERVISORS:

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ABSTRACT

Name of Candidate: Magdi Farouk Morks

Title of Ph.D. Thesis: Thermal Spraying of Wear-Resistant Coatings on Aluminum Alloys By Cast Iron Powders

Degree: (Ph.D.) Thesis, Faculty of Science, Department of Chemistry-Cairo University

The objective of this study is to improve the wear resistance properties of dicasting aluminum alloy materials by spraying superior wear-resistant coating of cast iron via plasma-spraying approach. Since graphite in cast iron is the main role for superior wear resistance, our objective is not only to spray cast iron, but also to get the optimum spray parameters required for graphitization. The effects of spray parameters such as substrate temperature, chamber pressure, particle size, spray distance and powder composition on splat morphology, microstructure, pore formation and graphitization have been studied. The coating microstructure (including graphite) was examined by X-ray diffraction and observed by SEM. The wear and friction properties were evaluated.

Key words: cast iron, plasma spraying, aluminum alloys, microstructure, graphite, solidification, wear, friction

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CONTENTS

To My Family

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INTRODUCTION