

THE FINAL YEAR PROJECT REPORT
DIPLOMA IN MECHANICAL ENGINEERING
: SCHOOL OF ENGINEERING
MARA INSTITUTE OF TECHNOLOGY
SHAH ALAM
SELANGOR DARUL EHSAN

TOPIC

THE DESIGN AND FABRICATION OF A MACHINE
TO TEST THE ABRASIVE WEAR RESISTANCE OF
A METALLIC MATERIALS

REPORT BY :

JEFFRI/JAIS B. JAAFAR

ITH 1/C NO : 84600455

NQORDIN B. SADIMAN

ITH I/C NO : 85294828

PROJECT ADVISOR :

MR. D.H. PEIRIS

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and

NOORDIN SADIHAN

(b.)

	Page
PREFACE	a
ACKNOWLEDGEMENT	b
CONTENTS	c
CHAPTER I	1.
CHAPTER II	7.
CHAPTER III	17.
CHAPTER IV	32.
CHAPTER V	52.
CHAPTER VI	67.
BIBLIOGRAPHY	
APPENDIX A	SPECIFICATION AND LIMITATION OF THE EQUIPMENT
APPENDIX B	DRAWING
APPENDIX C	TABLE

1. INTRODUCTION

1. OBJECTIVE AND PURPOSE OF THE PROJECT

The objective of the project is to design and fabricate a machine that can be used to analyse the abrasive wear resistance properties of a metallic materials.

This machine relates the problems in the real world for example in the cement industries to the laboratory condition. We can observe the effect of the speed, hardness, specimen size and abrasive wear particle size etc on the abrasive wear rate of materials.

2. THE IMPORTANT OF THE TESTING

Abrasive wear may result in serious problems not only to the operation of the machine but also the production among other things.

In the cement industry, one of the major problems is the ununiform wear of the balls and mill liner plates. The wear of the grinding balls will produce an iron powder. (One of corrosive elements). The element would certainly have adverse effects on the properties of cement and concrete.

In order to control the abrasive wear of the grinding operation, the abrasive wear governing the specification of the balls must be tested. The life and the replacement periods of the grinding balls can be determined too.

3. WEAR (GENERALLY)

Wear is one of the three most commonly encountered industrial problems leading the replacement of components and assemblies in engineering. The other being, fatigue and corrosion.

It occurs every where around us, stones, woods are wearing too, but it takes a very long time. In Engineering System Components, wear is rarely catastrophic as a reasonable wear has been considered when designing, but it reduces operating efficiency by increasing the power losses, oil consumption, and the rate of component replacement.

a., Wear in Industry

Wear encountered in industrial situations can be broken down into the following categories, though there are situations where one type changes to another or where two or more