

PROTOTYPE DESIGN COLLECTION

SERIES 2



Prototype Design Collection

Series 2



AHMAD NAJMIE RUSLI

**UNIVERSITI TEKNOLOGI MARA CAWANGAN JOHOR
KAMPUS PASIR GUDANG**

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FOREWORD

This digital book on Prototype Design Collection Series 2 (PDC Series 2) is published as a reference design for mechanical engineering students. The designs presented experience a few phases of analysis before fabrication of prototype. Each project summarises the project description, prototype, figures, and design parameter. The design products vary in tools or equipment for household, workshop, entrepreneur, etc. Suggested material and detail of prototype dimension are also mentioned in this book.

It is hoped that this book will assist the students to have more ideas on innovation design products in the future.

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CHAPTER 27

Design and Fabrication of Crushing Machine

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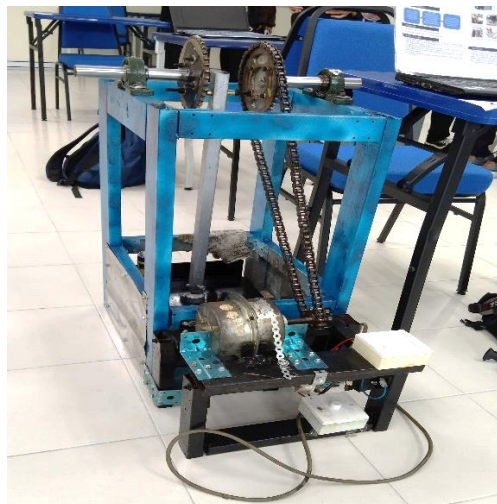
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PROJECT DESCRIPTION

This study presents the design and fabrication of a crushing machine, motivated by the escalating production rates and consequential accumulation of waste materials such as brick, glass, and cement, all characterized by brittleness. The proliferation of such waste materials has engendered multifaceted challenges spanning industrial, environmental, and economic domains at a global scale. The primary complications arise from the voluminous space required for waste storage, exorbitant costs associated with waste transportation to recycling facilities, and the substantial labour force needed to manage the accumulated waste. These issues are especially pronounced for smaller contractors, amplifying the magnitude of their operational and financial burdens. In response to these challenges, this project presents a crushing machine that operates on fundamental mechanical principles. The mechanism incorporates angular motion and piston-like functions driven by an electric motor. The hammer, for instance, moves from the apex to the nadir, effectively comminuting the waste materials upon impact. In summation, the development of this crushing machine offers a viable resolution to the intricate challenges confronting industrial sectors. It promises cost reductions, operational efficiencies, and enhanced waste management capabilities, rendering it a promising asset within the industry.

Keywords: *Crushing*

PROTOTYPE



DESIGN PARAMETER

COURSE NAME : MEC 300 : FINAL YEAR PROJECT 2	
NAME: MOHAMAD AMIRUL AIFIEQ DANIAL	
STUDENT ID: 2020496562	
CLASS: J4EM1105B	
TITLE: CRUSHING MACHINE	
Approved:	Checked:
PART NAME: FULL DESIGN	
PART NO.: FULL DESIGN	
SCALE: 1:4	SHEET 1

NO.	PART NUMBER	DESCRIPTION	QTY.
1	FYP 2 BEARING 1	SKS BEARING	2
2	AFBMA 18.2.3.4 - 18NIM35 - 24.S(AC,24	ROLLER BEARING	4
3	FYP 2 GEAR SHAFT	STAINLESS STEEL	2
4	FYP 2 700 MM SQUARE HOLLOW	1mm THICK	4
5	FYP 2 1H hollow square mild steel	1 mm THICK	8
6	FYP 2 SHEET 1 MM	FRAME COVER	2
7	1H hollow square mild steel	FRAME	9
8	FYP 2 2MM SHEET	FRAME	1
9	FYP 2 GEAR 39 TEETH	SPROCKET	2
10	FYP 2 MOTOR HOLDER PART	MOTOR HOLDER	4
11	FYP 2 SQUARE HOLLOW	FRAME	2
12	FYP 2 BEAM	FRAME	1
13	FYP 2 AC FAN MOTOR	24K Outdoor Motor	1
14	FYP 2 WASHER	NUT AND BOLT	1
15	FYP 2 SMALL L BRACKET	JOINT	4
16	FYP 2 THREAD	JOINT	1
17	FYP 2 HAMMER HEAD	CRUSHING	1
18	FYP 2 15 TEETH GEAR	SPROCKET	1

COURSE NAME : MEC 300 : FINAL YEAR PROJECT 2	
NAME: MOHAMAD AMIRUL AIFIEQ DANIAL	
STUDENT ID: 2020496562	
CLASS: J4EM1105B	
TITLE: EXPLODED ASSEMBLY CRUSHING MACHINE	
Approved:	Checked:
PART NAME: FULL DESIGN	
PART NO.: FULL DESIGN	
SCALE: 1:7 (WEIGHT 30 KG)	SHEET 1