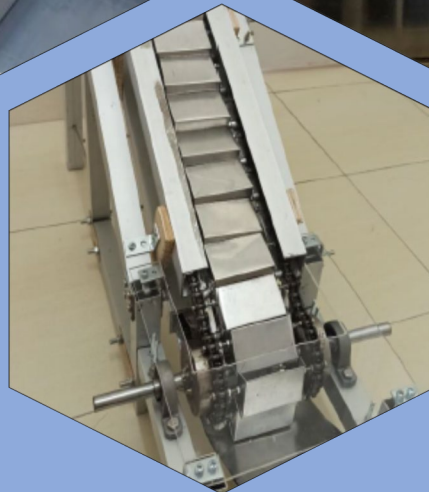


# PROTOTYPE DESIGN COLLECTION

## SERIES 1



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# FOREWORD

This digital book on Prototype Design Collection Series 1 (PDC Series 1) 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 30

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#### PROJECT DESCRIPTION

This project was carried out with two objectives. The first objective was to design a prototype of a glass bottle cutter machine and the second objective was to fabricate a glass bottle cutter machine based on the designed prototype. The glass bottle cutter machine is capable of helping the community to reproduce new products like drinking glass, ashtray, and vases based on the recycled bottles. It can be placed at the recycling service store or craft shop. The design of the glass bottle cutter varies from others as it is heavy-duty and long-lasting. With the scope to cut the bottle clean and safe for reuse and recycling, the design and fabrication process went through several processes. Started with brainstorming for the suitable cutting mechanism before proceeding with the fabrication process including measuring, cutting, welding, and drilling. This glass bottle cutter is made from metals, operated by a DC motor for the cutting purpose and rotation of the wheel and diamond blade as the cutting tool. The cutting tool was a diamond blade instead of a wheel cutter which helps to decrease the requirement of human forces. Test results show the glass bottle is able to be cut in less than 1 minute. As compared to the existing glass bottle cutter, it is done manually, the user is required to score the glass bottle with a wheel cutter and immerse the glass bottle in hot and cold water for 1 minute respectively. This shows that it is such a long process and the existing product itself does not last longer for cutting a number of the glass bottles. The machine provides an alternative to less human forces and has fine cutting-edge finishing. To conclude, the fabrication of a glass bottle cutter machine based on the design and analysis of the prototype achieved the mentioned objectives. Some recommendations can be added as an initiative to improve this glass bottle cutter machine such as adding a safety button, applying coolant to prevent the glass dust from shattering all over the place, and providing the function of polishing the cutting edge.

**Keywords:** *Bottle, Cutting machine, Design and Fabrication*

#### PROTOTYPE



### DESIGN PARAMETER

