



**OPTIMIZATION OF SNAP FIT FEATURES DESIGN FOR RAPID  
PROTOTYPING FABRICATION**


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**A thesis submitted in partial fulfillment of the requirement for the awards of  
Bachelor of Mechanical Engineering (Manufacturing) (Hons)**

**Faculty of Mechanical Engineering  
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**MAY 2010**

“I declared this thesis is the result of our own work except the ideas and summarizes which I have clarified their sources. The thesis has not been accepted for any Degree and is not concurrently submitted in candidature of any Degree.”

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## **ACKNOWLEDGEMENT**

In the name of Allah S.W.T, the Most Gracious who has given me the strength and ability to complete this project and report. All perfect prices belong to Allah S.W.T Lord of the Universe. May his blessing belong upon the prophet Muhammad S.A.W and members of his family and companions.

Firstly, I would like to express my appreciation to my advisor Dr. Ing Yupiter HP Manurung and co-supervisor Mohd Reza Bin Dollah Sajat, who has given me support and excellent guide in completing my project. I very appreciate for your guidance, ideas, support and patient in advising and assisting through this project. During the project, I made a lot of mistake and I had learned from my mistake. Insyallah, the understanding and learning from this project can guide me in my future job and lifetime.

My appreciation also goes to my family who never stop give blesses and from them I can managed to get through this far. Not forget to all lab technicians, other lecturers at UiTM Shah Alam, Faulty of Mechanical Engineering and my friends for their support. Lastly to people surrounding me, I appreciate their patient and contribution, understanding, support and ideas throughout this project.

## ABSTRACT

Introduction of elastic integral mechanical interlock on product design take an advantage in eliminating miscellaneous parts. In other word, cost and time reduction can be made by simplification unwanted parts. The elastic integral mechanical interlock or known as Snap-fit can be divided into several types. Namely cantilever beam, annular snap, compression hook and etc. Snap-fit extensively applied in automotive parts, electronic devices, biomedical apparatus and toys. The main goal of this study is to determine the most favorable snap fit design so that it can working successfully depend on specified task. In order to achieve the above objective, snap-fit design optimization has to be accomplished before it can be implemented to a particular design. However, this study will just focus on cantilever snap fit. The performance of the snap fit will be determined by manipulating certain parameter to generate the insertion and retention force. The testing also will determine the allowable deflection of the snap fit when the part is joining together with the mating part. For testing purpose, special jig was design, fabricate and attached at Instron Machine. The specimens for testing were fabricated using Rapid Prototyping (RP) which using multi-jet technology (MJM). Before the parts are fabricated using RP, the design will be done using CATIA V5 and will be repair using Magics software in STL format. From tensile test result, it shows that the material will become weaker when exposed to environment. The surface roughness on top and bottom surface on specimens is different. Dimensional accuracy test indicates that there are shrinkage occur on specimens. For snap fit testing, fillet and taper will provide robustness characteristics to the snap fit.

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