



**THRUST MEASUREMENT STAND AND DATA FOR WATER PROPULSION –  
ROCKET**

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## ABSTRACT

One of the important parameters that determine the performance of a water rocket is the propulsion system. The availability propeller characteristics such as water and pressure, which changes with advance ratio, are important to the designer so that the optimal and accurate resolution can be made. Due to the lack of characteristics data for water propelled rocket in the market since rocket technology is a very close guarded secret, a decision was made to design and construct a propeller test stand that can be used to acquire these propel characteristics which intended to be used as a guide and creates research interest for future development in rocketry. This project are divided into two phase. The first phase is the fabrication of water propeller test stand. The test stand was successfully designed and fabricated using facilities available in the Faculty of Mechanical Engineering's Workshop and Laboratory. The test stand was designed for an educational aid with maximum pressure 80PSI of compressed air. The proper design of water propelled rocket stand is made by using CATIA V5 R13 software. The second phase is to determine the thrust force ( $T_f$ ). Literature review provides the background to the study and also basic principles related to thrust measurement. In this phase, we will estimate water rocket performance and analyze the impact of water volume on the maximum thrust achieved by the rocket. The time of water fully expelled out of bottle will be determine using the Video Editing Software (adobe Premier 7.0) while the propeller test stand design allows the simultaneous measurement of thrust using the ammeter. It was observed that 40% is the optimum value for water volume produce maximum effect of thrust value. Details of the observation and analysis are shown in chapter 6.

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