

ABSTRACT

Mahogany tree is a plant frequently found in tropical areas, one of which is Indonesia. The tree has high economical value, almost all of Mahogany's parts can be utilized, from its wood to its seed. Up until now, the use of Mahogany tree is limited to its wood as raw materials and the use of its seed as an alternative medicine to reduce cholesterol level due to its flavonoid content. In the research of this final assignment, the author utilizes the Mahogany Tree flower in terms of geometry and topology to be synthesized and produced into a propeller. The reason behind this research is because Mahogany flower has a geometry that is almost similar to a blade on a propeller. Moreover, when a Mahogany flower is thrown vertically upwards, the Mahogany flower will come back down in a circular motion like a propeller's rotation. By taking advantage from 3-dimensional design and printing techniques, it is expected to help the creation of new propeller products with designs similar to geometry and topology that of Mahogany flowers. The results of this study show the largest number of rotations are 1641.5 RPM which was produced from a propeller with 8 blades on sample 1 with blade width of 0.021 m and propeller diameter of 0.188 m. Meanwhile the highest power coefficient value is generated by propeller on sample 5 with 8 blades, which is 0.56066 with blade width of 0.026 m and propeller diameter of 0.183 m. While the greatest local velocity value is generated by the propeller on sample 4 with 2 blades, which is 0.53741 with a blade width of 0.022 m and a propeller diameter of 0.187 m.

Key words : *Mahogany Flower, Propeller, 3-Dimension Design, 3-Dimension Printing, Modeling*