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**MEC299**

**PROPULSION SYSTEM DESIGN OF RIGID TUBE RIB**

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## CHAPTER 1 : INTRODUCTION

### 1.1 Background of Study

An extremely popular class of light boats that offers excellent performance and extra practical benefits is the rigid-hulled inflatable boat, or RIB for short . These vessels exhibit navigational stability as a result of unique design choices combining a sturdy and robust hull with flexible tubes at the gunwale. In addition, the inflatable collar can keep buoyancy even in the case of craft inundation in relation to bad sea conditions. [2]

RIBs typically range in length from 4 to 9 metres, while they can reach lengths of up to 18 metres. One or more outboard engines, generally with a power range of 4 to 200 kW, are frequently used to propel these boats. RIBs are a viable sailing option for a very broad range of applications, including specialised uses like rescue craft, sailing safety boats, and tenders for bigger boats and ships. These vehicles' unique benefits include their shallow draught, great manoeuvrability, speed, and relative resistance to damage in low-speed accidents. This is made possible by certain design solutions and materials. [2]

Traditional hull materials include steel, wood, or aluminium, while fiber-reinforced polymer (FRP) composites have recently become the most popular choice. Because of their production methods, FRP composites really make it feasible to produce desirable forms and smooth surfaces that are difficult, if not impossible, to achieve with other materials. [2]

Glass-reinforced polymers (GRP) appear to be the best balance between the many demands, with specific emphasis to performance versus prices, among the large section of reinforced materials for boat building. At the same time, reinforcements made of carbon fibres or natural fibres (such as flax or basalt) might be selected in situations where specific criteria, such as the highest structural standards (such as stiffness and lightness) or eco-sustainability, are necessary. In order to increase strength, some boat makers weave additional unusual reinforcements into the composite sheets, advancing technology toward hybrid materials.. [2]

A RIB's hull must be carefully developed and sculpted in addition to the material chosen, with the goal of enhancing the boat's performance in the water by enhancing its hydroplaning characteristics. This implies that benefits are provided for safety, comfort, and usage as well as speed, manoeuvrability, and consumption—a set of needs that has long intrigued naval architects and designers. [2]

## **1.2 Problem Statement**

Rigid Inflatable Boats RIB are the ideal form of boat for first rescuers, search and rescue teams, and all other rescue professionals due to the numerous advantages they provide over traditional boats. However, the cost of material was high and only can afford by rescue team from government. This project is to innovate some part of the boat to reduce the cost and make it affordable. So that, everyone can have their own boat for safety feature or use it for recreational activities.

Rigid Inflatable Boat RIB are using Teflon material for the inflatable part. This project replaces Teflon with PVC because it cheaper. However, the design of the boat must be followed by PVC structure. Other than that, engine power needs to be upgraded to increase the propulsion power because the PVC material is heavier than Teflon.

## **1.3 Objectives**

The main objective of this project are:

1. To design the boat's propulsion system by using CAD software such as PolyCAD.
2. To analyse the ship resistance from the propulsion system by using CAD software PolyCAD.

## **1.4 Scope of Work**

Teflon is a class of the plastics known as synthetic fluoroethylene. It was tough and has high boiling point, in addition, it was very light. For this project, the weight of the PVC may three or four times heavier than Teflon. The propulsion power needs to be upgraded to strengthening to transform of a rigid inflatable boat (RIB). Other than that, this project used the fiber glass to reduce cost and weight of this boat. The main idea of this project is to change the Teflon with the PVC, when it has come to pipe PVC it can't be inflatable. As a consequence of that, the boat design needs to be followed by the structure of the PVC pipe. The software for designing the boat is PolyCAD, and its also can calculate the resistance. The dimension of the boat is about 3 or 4 meter length.

## **1.5 Significances of project**

1. It can give students with opportunity to study and use the Poly-CAD program.
2. Increase creativity and innovation of students to make the general arrangement by using Rhinoceros 3D Software.
3. Open up a chance for ordinary people to afford this boat so that people can have their safety feature or for leisure time.