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FLIP-FLOP LIGHTS FOR MARINE SAFETY
(LAMPU FLIP-FLOP UNTUK KEAMANAN LAUT)

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ABSTRACT

A flip-flop lamp has been created for sea safety, so as to minimize ship accidents, which means guaranteed sea security, protecting the marine ecosystem and maintaining sea cleanliness. The working principle of the flip-flop lamp is based on the concept of Ohm's law, Archimedes's law, and hydrostatic pressure. The time obtained to float the flip-flop lamp is 0.779 s, with a hydrostatic pressure of 2000 N / m, Flip-flop lights made for marine safety can float in water. From the data it can be that the 2000 N / m2 hydrostatic pressure takes 0.779 s, which means the tool can float completely in water because it does not take up to 1 second. this means it is ready to use at sea

Kata Kunci : A flip flop lamp, Ohm's law, Archimedes's law, and hydrostatic pressure, sea safety..

1. INTRODUCTION

Flip-flop lights are made for marine safety, with the intention of marking ships coming and going. Why is the sea not safe? Because of irregular traffic at sea. This is also the same as the traffic situation on the ground, if there is no traffic it is possible that there will be many cases of accidents between motorized vehicles, as well as at sea (Busea, 2017) . With this flip-flop lamp will regulate the passing of ships passing in the ocean. Even though ship wreck injuries may occur but this will reduce accidents at sea. Therefore, the Sultan Iskandar Muda Senior High School physics research team made an innovation of flip-flop lights as traffic lights in the ocean to maintain sea safety with purpose sea safety and ship not accident.

By applying the concept of physics in the form of ohm's law, archimedes's law and hidrostatic pressure, made a device in the form of a flipflop lamp for safety at sea. So that ships that come and go there are no bumping into each other and safe. Fliplop lights as a sign of ships coming and going, so that sea security is more awake.

1.1 Scope Of Problem

The limitation of the problem in this study is only to use a flip-flop lamp.

1.2 Problem Formulation

a. How do you make a flip-flop lamp?
b. What are the tools and materials to make these tools?
c. What are the uses of the tool?
d. Why was the device made?

1.3 Research Objectives

a. Can make flip-flop lights for marine safety.
b. Can innovate and utilize flip-flop lights to improve sea safety

1.4 Research Benefits

a. To protect sea safety

b. To minimize the occurrence of ship accidents
c. To protect the marine ecosystem
d. To maintain the cleanliness of the sea

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2. RESEARCH METHOD

2.1. Research Sites

Physic labotory akademi maritim belawan Medan on Kapten Muslim no.26 Medan Helvetia.

2.2 Research Time

The time of this research was from April 1 to Mei 05, 2022.

2.3 Tools and Materials

a. Tool:

- solder
- scissor
- rule
- cutter
- pliers
- screwdriver
- multitester

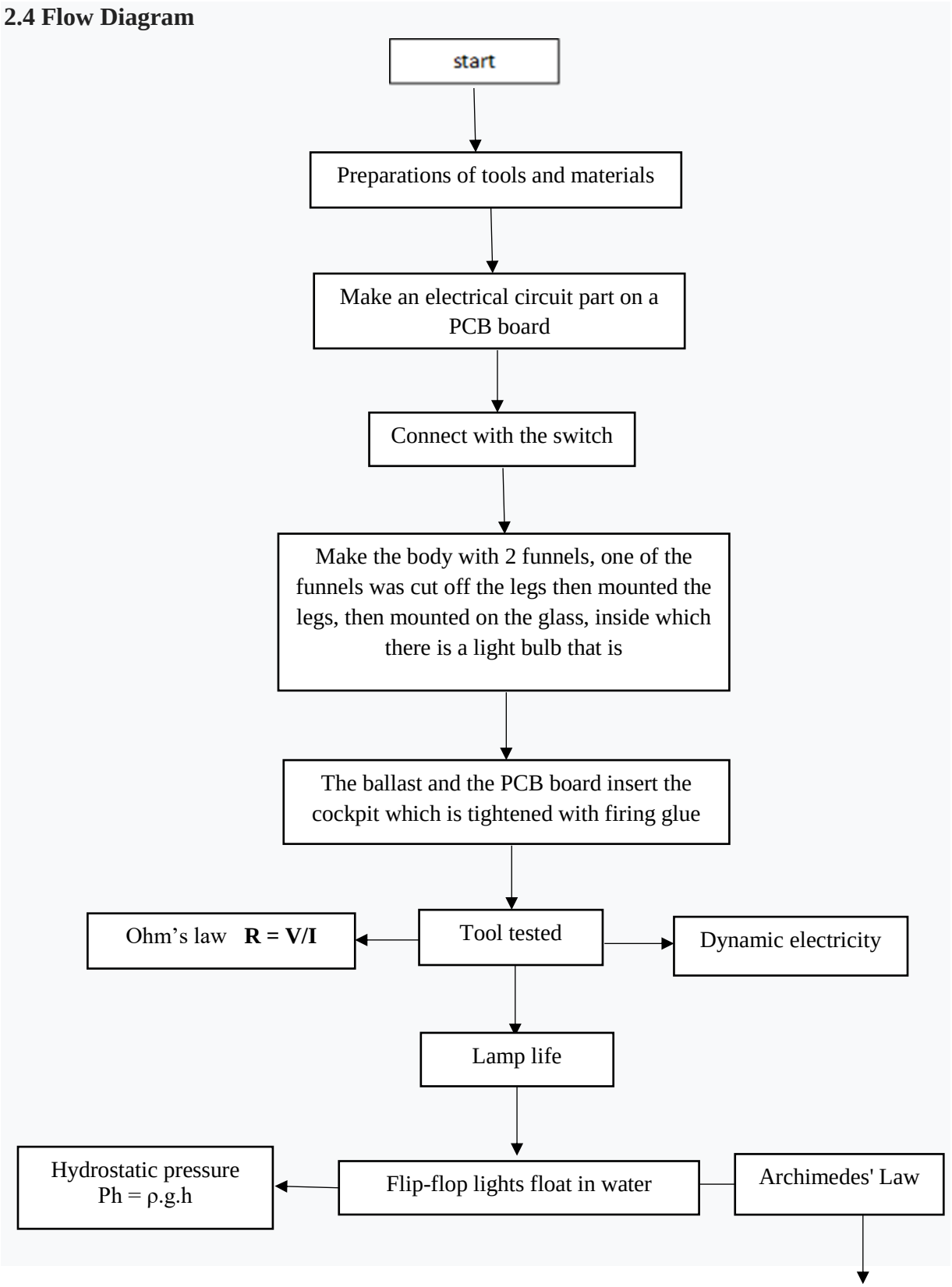
b. Material:

- 2 large mouthpieces
- Wayar
- Light
- Switch
- Resistor
- PCB board
- Lead
- Ballast
- LED lights
- Gun glue
- Glass (tube)

3.4 Work Procedures

- Prepare tools and materials
- Large funnel cut off the algae with the cutter
- For the ballast
- Do the PBC section:
  a. Image of PCB section
  b. Put the resistor and LED lights in accordance with the circuit
  c. Solder with lead to glue it
  d. The output is connected to the wire, the wire is connected to the outside switch.
- PCB board that is ready to be attached to the ballast
- Then put it in the funnel
- Both funnels are glued together with firing glue
- On the top, connect it to the glass tabuung in which there is a light bulb that is connected to a PCB board that has been connected to the switch
- The tool is tested on the surface of the water using Archimedes' law in floating conditions.

2.4 Flow Diagram



Picture 1: Diagram

3. RESULT AND DISCUTION

Water level (h) / Time (t) / Cm	m	gravity (g)	ρ (rho)	
200,2		1,29	10	1000
20	0,2 0,47	10		1000
20	0,2 1,33	10		1000
20	0,2	0,60	10 1000	
20	0,2	0,68	10	1000
200,2		0,60	10 1000	
20	0,2	0,62	10	1000
20	0,2	0,54	10	1000
20	0,2	0,55	10	1000
20	0,2	0,54	10	1000

Picture 2: Result

From the results of the above research it can be concluded that:

1. Flip-flop lights made for marine safety can float in water
2. Flip-flop lights are made that can answer the solution to minimize collisions at sea
3. For the height of water taken a sample of 0.2 m is required 10 times for g = 10 m / s2, ρair = 103 kg / m2 and for ρlaut = 800 kg / m2, and a time of 0.729 s. This means that time is needed until 1 s to make flip-flop lights float on water.
4. From the table obtained Ph1 = ρ.g.h = 1000.10.0.2 = 2000 N / m3
5. From the data table above it can be concluded that the 2000 N / m2 hydrostatic pressure takes 0.779 s, which means the tool can float completely in water because it does not take up to 1 second

4. CONCLUSION

The conclusions of this study are:

1. A flip-flop lamp has been created for sea safety, so as to minimize ship accidents, which means guaranteed sea security, protecting the marine ecosystem and maintaining sea cleanliness.
2. The working principle of the flip-flop lamp is based on the concept of Ohm's law, Archimedes's law, and hydrostatic pressure.
3. The time obtained to float the flip-flop lamp is 0.779 s, with a hydrostatic pressure of 2000 N / m, this means it is ready to use at sea.
4. This sea safety flip-flop tool is made with simple tools and materials at a cost of Rp. 273,000.00. This means that with a low cost, this tool has been of great benefit.

Suggestions

The suggestion from this research is to continue this research a motion sensor system can be installed.

5. REFERENCES

1. Anwar, Alizar (2017). “Hirdostatic and archimedes”. Journalist Workshop on Water Issues.
2. Bob Ewing (2018). “physic and sea”. http://www.digitaljournal.com/article/250604/Nanotechnology_Used_to_Clean _Water
3. Kho Dickson, Electronics Engineering, 2019
4. LeChevallier, Mark W. dan Au, Kwok-Keung (2004). Process Efficiency inAchieving Safe sea. World Health Organization (WHO).
5. McMullan, Bob (2009). “AusAID: physic water”. M2 Communications Ltd.http://proquest.umi.com/pqdweb?did=1665500131&sid=1&Fmt=3&clientId=67249&RQT=309&VName=PQD