

**RESEARCH STUDY OF  
DESIGN OF SELF-CLEANING FILTERING MACHINE  
FOR WASTE WATER TREATMENT**

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This report is being proposed as a  
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“I hereby, declare this report is the result of my own research except as cited in the references ”

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## **DEDICATION**

For my beloved father and mother,  
thank you for giving full commitment  
for your elder son.

## ACKNOWLEDGEMENT

Firstly, I would like to convey my gratitude towards the Al-Mighty for giving me the strength and willingness to complete Engineering Internship Training. A special thanks to IR Abd Talib Bin Din, Supervisor for Projek Sarjana Muda 1 for giving me a chance to be a part of the student in the project for the 14 weeks period. To my beloved executive and technician including En. Saifulizam, En. Mokhtar, En, Nasir, En. Mahazan and En. Mahadzir at Hicom-Honda Manufacturing (M), I would like to thank them for their guidance and encouragement throughout the process of completing this project. This project program is part of degree requirements for subject of Engineering in order for students to successfully complete the Bachelor of Engineering course. This program exposes the students to real problem and actual working for an engineer in industries. I deeply appreciate the understanding, encouragement and help of friends. Also lastly I want to thank to my family which fully support me from behind eventhough a lot problem occurred.

## ABSTRAK

Penapis terdiri daripada penggunaan secara automatik dan secara manual. Kebanyakan daripada produk penapis yang di jual pada hari ini, adalah jenis automatik iaitu dengan sendirinya akan membersihkan penapis. Produk ini menjadi pilihan kepada jurutera, syarikat yang menjalankan perniagaan dan perumahan kerana terdapat banyak kelebihan daripada penapis jenis ini.

Antara kelebihan yang terdapat pada penapis jenis ini adalah, ia tidak memerlukan penjagaan yang rapi, jaminan kualiti yang sama setiap masa, menjimatkan kuasa kerana penggunaan tekanan yang tinggi pada penapis dan menyebabkan kadar alir menjadi perlahan. Penapis akan bertindak dengan kadar yang sama tetapi melakukan kurang kerja. Penapis jenis ini juga melambatkan usia atau jangka hayat mesin tersebut dan perkara ini menunjukkan mesin ini memang menjimatkan wang.

## ABSTRACT

Filters offers a broad range of automatic (self-cleaning) and manual (non self-cleaning) filtration systems. Over 99% of all filtration systems sold are of the self-cleaning variety. The self-cleaning filters are the overwhelming choice of consulting engineers, property management companies and building owners because there are a lot of benefits using these self-cleaning filters.

The benefits are requires no regular maintenance, assures optimal filtration efficiency, reduces energy cost because as filter media accumulates suspended contaminants, the pressure drop across the filter increases and flow rate decreases. The filter consumes the same power, but does less work. Another benefit is extends media life, (five to ten years typical) and is cost effective.

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## LIST OF TERMS

<b>TERMS</b>	<b>MEANING</b>
$\mu$	Micron
MTBB	Mean time between backwashes
DPG	Drain per gallon
Settleable Solids	Applied to solids in suspension that will settle, under quiescent conditions
BOD	Biochemical oxygen demand
COD	Chemical oxygen demand
TOC	Total Organic Carbon
lbs	Unit of weight
in	Unit of length
mg/L	Unit of weight per length
gal	Unit of volume
gpm	Unit of mass flow rate
sec	Unit of time
m <sup>3</sup> /h, USgpm	Unit of volume flow rate
bar, psi	Unit of pressure

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## **CHAPTER 1**

### **INTRODUCTION**

#### **1.0 INTRODUCTION**

Fully automatic self-cleaning screen filters provide an economical means of removing suspended solids down to 40 microns from liquid streams. Filters equipped with the efficient suction scanning principle allow the filter cake to be removed completely from the screen surface within seconds without physically touching the cake or screen.

The design of Automatic Self Cleaning Filters is mainly to remove grit, grime, algae, dirt, and rust particles from liquid stream. A range of applications can be handled in the Pharmaceutical, Biotech, Chemical, F&B, Wines and Breweries, Dyes and Dye Intermediates, etc.

Automatic Self Cleaning Filters find use in removing sand, silt and algae from raw water rivers and canals. These give effective pretreatment before membrane filtration systems for process water supply, Pretreatment for reverse osmosis and desalination systems, Industrial wastewater treatment plants use these filters to prepare secondary effluent for reuse in cooling, irrigation.

In steel mills filtering grimy, oily cooling and descaling water are common as are those in the automotive and plastics industries. Cement plants and mining operations use this type of filter for removing solids from tailings. They are found on deep-sea oil platforms for filtering flood water and on ships before portable desalination systems.

## 1.1 PROBLEM STATEMENT

At this moment, there is a lot of new technology in the market using filter membrane which requires high pressure back flow water to clean up the filter screen. For sure, it causes the operating cost very expensive.

Every product has advantage and disadvantage. The specifications to consider is price, benefits, quality of water produced, quantity of water produced, and size of the filter which consider between 3-10 micron for high quality water which automatically fine for human to drink that water after passed the filtering machine.

Another problem to analysis is how to maintenance because the standard screen filter at house must be changed about once in 6 month but when using this automatic self-cleaning filter, no maintenance required and the quality of water remain constant.

## 1.2 SCOPE AND OBJECTIVE

Objective:

- To design an automatic self-cleaning filter machine which can be used to filter water or clean up compounded river water or recreational lake.

Scope:

- Analysis the available which is latest product using method of self-cleaning filtering machine for waste water treatment.
- Then, show the product effectiveness and compare to make decision on upgrading for new product to design.
- Design a new product of self-cleaning filtering machine using best methods and materials.