



**KEMENTERIAN PENDIDIKAN TINGGI
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI**



DEVELOPMENT OF AUTOMATIC SAND SIEVING MACHINE

FULL REPORT

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ABSTRACT

During the sand casting process in the foundry workshop at polytechnic colleges, students must refine the casting sand using a conventional method before performing aluminum casting. However, using a conventional method also has some disadvantages. One of them is that students have to spend energy to manually sieve casting sand. When the fine sand falls on the ground, it mixes with others additional mixture. Therefore, a product that can help students in the workshop was developed. Our main goal in developing the sand sieving machine is to reduce the effort for students who want to sieve casting sand. The machine uses a DC motor that shakes the sieve during operation. The sand is sieved by the subsequent shaking as soon as it is placed on the sieve. A funnel is a feature of a sand sieving machine that allows fine sand to fall through. With a regular sand sieve, the sieved sand falls out and must be placed in a collecting tray that is already placed under the funnel. This requires less student effort and energy. The four convenient wheels on the sieving machine make it portable to move around the workshop, which is very important. Students will find it easier to sieve the sand from one place to another based on where the sand is located.

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ABSTRAK

Semasa proses tuangan pasir di bengkel foundri di kolej politeknik, pelajar hendaklah menapis pasir tuangan menggunakan kaedah konvensional sebelum melakukan tuangan aluminium. Walau bagaimanapun, menggunakan kaedah konvensional juga mempunyai beberapa kelemahan. Salah satunya ialah pelajar terpaksa menghabiskan tenaga untuk menapis tuang pasir secara manual. Apabila pasir halus jatuh ke tanah, ia bercampur dengan campuran tambahan yang lain. Oleh itu, produk yang boleh membantu pelajar dalam bengkel dibangunkan. Matlamat utama kami dalam membangunkan mesin penapis pasir adalah untuk mengurangkan usaha untuk pelajar yang ingin menapis pasir tuang. Mesin menggunakan motor DC yang menggoncang ayak semasa operasi. Pasir di ayak dengan goncangan seterusnya sebaik sahaja ia diletakkan di atas ayak. Corong ialah ciri mesin penapis pasir yang membolehkan pasir halus jatuh. Dengan ayak pasir biasa, pasir yang di ayak akan jatuh dan mesti diletakkan di dalam dulang pengumpul yang telah diletakkan di bawah corong. Ini memerlukan usaha dan tenaga pelajar yang kurang. Empat roda mudah pada mesin penapis menjadikannya mudah alih untuk bergerak di sekitar bengkel, yang sangat penting. Pelajar akan lebih mudah untuk menapis pasir dari satu tempat ke satu tempat berdasarkan lokasi pasir tersebut.

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CHAPTER 1: INTRODUCTION

By: Muhammad Nur Aiman Yusri Bin Mohd Yunos

1.1 INTRODUCTION

Development of an automatic sand sieving machine is the project that we want to carry out for our senior project. We had the idea for this project after observing the challenges faced by children who had to filter the sand on their own. Since the sand must first be filtered before use, both time and energy have been squandered. The manual sand filters also require a lot of energy because students must carry the sand and dump it on the filter nets. The filtered sand would then need to be dug up again using a sand shovel, loaded into a stroller and transported to the location where the fine sand was required.

With that in mind, we consider an innovation to save students' time and energy by developing an automatic sand sieving machine that employs motor power to extract the best qualities of sand. Students who use an existing sand filter do not benefit from the positive aspects of sand because the filter only has one layer of filter net. Furthermore, because there is nothing to line the sand as it falls to the ground, filtered sand with current sand filters will mix with foreign things. Sand will fall onto the tray that has been supplied underneath the machine using the machine that we developed. Sand won't mix foreign items with that, and it can also conserve energy.

Students will benefit from saving time and energy in the workshop thanks to the sand filters we want to make. Utilising this automatic sand sieving machine advancement can save human energy. This equipment has four wheels so that it is portable around the workshop. In order for the sand to swiftly fall into the machine where the net component had been attached within it, we shake the filter section using the DC motor. After the sand has been filtered, it will go through another filtering process inside the machine to produce fine sand.

1.2 BACKGROUND OF STUDY

The goal of this study is to develop a fresh concept for a brand-new automatic sand filter and separation equipment. Due to several issues that commonly arise, a development of an automatic sand sieving machine is being made for a modest project in the workshop. Moreover, to achieve our objective in technical advancements based on contemporary ideas. Explosive concepts based on statements of issues that have been

noted in studies on the workload used and fine sand quality. The creation of this product as our primary project is supported by numerous factors and study. We develop and improve a product that can filter high-quality sand without contaminating it with foreign material, which lessens the labor-intensiveness of sand filtration. Basically, our this development of automatic sand sieving machine have many functions in 1 invention.

1.3 PROBLEM STATEMENT

We came up with the concept for this sand filter after observing kids exerting a lot of energy to obtain fine sand. To filter the sand, they must construct sand filters out of recycled wood. From there, they waste both their own time and energy. Furthermore, since the filtered sand just happens to fall to the ground randomly, we understand that sand filtered with the current sand filter will mix with foreign material. We are unaware that there are numerous alien objects, such as nails, iron, stone, and others, on construction sites. There is no wheel, thus the current sand filters cannot be moved anywhere. It is challenging for students to transport fine sand to the workshop's necessary locations. This is due to the fact that they must first load the sand into the cart before moving it to its proper location.

1.4 OBJECTIVES

- Get the good quality of sands

Our goal to build the sand filter machine is to get the good quality of sands. Our sand filter machine equipped by two nets that where the fine sand will be dropped onto the net and will be filtered. After that, the fine sand will be dropped into the tray that has placed below the sand filter machine. Contrasts with the traditional sand filter where the sand will drop on the ground and the sand will be mixed with the foreign things. But, using our automatic sand filter machine will avoid the sand from be mixed with foreign thing because the fine sand will drop into the tray.

- Reduce student workload

Using the traditional way, the students need to build the sand filter first before them be able to filter the sand. That will use lot of work and waste of energy just to build it. So, we build this sand filter and separator machine to reduce the student workload. Besides, this automatic sand sieving machine uses the DC motor that will shake the net. Users

just need to put the sand on the net of sand filter machine and the sand will be dropped into the tray.

- Easy to move at foundry workshop

This development of automatic sand sieving machine have equipped by 4 wheels that can make this sand sieving machine able to move easily at workshop area. At workshop area, the fine sand might be required at different area so, students just need to bring this sand filter and separator machine at that place and the sand will be filtered there.

1.5 SCOPE

- I. Accommodate below 10 kg of sand - Can accommodate sand below 10 kg at a time.
- II. Can be moveable – The purpose of this sand filter and separator machine is invented is it can be moveable in the workshop site.
- III. Students – This automatic sand sieving machine is suitable for students who are doing sand casting project in foundry workshop.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

One of the most crucial elements in the industrial world is sand material. Today's industries require sand products, or sand substands that have already undergone processing. Sand substands are known to contain a range of different components, such as metal and mud. Sand is often filtered by humans using their hands, which takes a lot of time.

However, we now have some suggestions for how to adapt this sand sieving machine using a DC motor system. It may be overcome and the pupils' work is made more convenient with the invention of this automatic sand sieving machine. It is possible to save more time, energy, and money by using this sand filter machine. Consequently, it will raise the level of work produced in the workshop.

Because this machine is fixed with wheels, it is simple to move and use. It is also simple to use, especially for less experienced students. Additionally, it is simple to use, and the nearby hardware store or neighbourhood shop has all the replacement parts.

As a result, this equipment is appropriate for usage in training facilities like Polytechnic and MARA Training Institutes. Therefore, new technology is required to aid enhance productivity so that the human workforce may be reduced and the cost of the process can be reduced.

2.2 HISTORY OF SAND FILTER MACHINE

From years sand has been the most important thing in human community. Most sediment, including sand, are made up of the fragments that result when rock is broken down by wind and rain (weathering). Generally, they start as larger fragments (gravel), which are broken down as rivers carry them down stream; the finer the particle, the further it has travelled. In other words, large bits of gravel are plentiful on the banks close to the head of a river.

As you travel downstream, gravel becomes finer into cobble, pebble, granule, and eventually turning into sand, and finally flowing into the ocean, where these sediments deposit. That is why, by carefully analysing the mineral content and chemical composition of sand on riverbanks, beaches and ocean floors, we are able to determine which formation, indeed what kind of rock, it originated from. Most sediment, including sand, is made up of the fragments that result when rock is broken down by wind and rain (weathering).

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Most sediments, once formed in the ocean, sub duct to the Earth's interior (mantle) from trench with a sub ducting tectonic plate. However, some pieces tear loose from the whole, and accreted to the hanging wall continental plate, once again becoming part a continent. Geological structures formed in this way are called accretionary bodies (prisms). Accretionary bodies are characteristic to the subduction zone like Japan, which make up a large part of the Japanese islands Formations and rocks form and break down, form and break down, again and again.

During that process minerals also break down and alter, even transform into other minerals, again and again. However, some stubborn minerals simply ride these cycles out, refusing mechanical breakdown or chemical alteration at all. These minerals bear the marks of the processes of geological history. By carefully analysing them, geologists are able to infer the geological history of the earth itself. Most sediments, once formed in the ocean, sub duct to the Earth's interior (mantle) from trench with a sub ducting tectonic plate.

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Figure 2.1 Traditional sand filter

The figure 2.1 above show the process has been use by people before us the ancestor way to sieve the sand. And collect the sand they wanted. This process to filter the sand into it size depending on the size of the net been used. This smooth sand or the product usually uses as main material in construction to build building or house. Smooth sand is required to achieve better quality product example in making sand casting or making any product based on sand.

2.3 SAND

Sand is a quartz-based material. The sand is practiced sized between 4.75mm and 0.15mm are common sand used to produce concrete and plaster. According to research, sand are available from mines or rivers. The sand mining is sand which was excavated from the mine. This sand is widely used and usually divided into two types, namely fine and rough sand. Fine sand which contains little soil is usually used for mixing along with fine sand from rivers and cement. The mix produces a mixture of plastic and easy to attach although its strength is somewhat less. Coarse sand is suitable for use to combine concrete and make blocks and cement bricks. According to research, river's sand its quality is good and does not contain excessive impurities. Concrete mixing using sand the river is harder to work. Therefore, the additives are named facilitators are sometimes used to improve workability. If the mixer is not used, the mix need more cement to get that work pleasures same. Sand obtained from seafront is not suitable for use. The beach sand contains salt that will cause a pelvic event on the building's surface.



Figure 2.2 Sand

2.4 COMPARISON OF PLATES

2.4.1 Aluminium Plate

Aluminium plates are lightweight and strong sheet plates or metal plates. Aluminium plates have anti-corrosion properties, non-flammable and resistant to any kind of weather. This type of plate itself is easily formed, so widely used in industry as in advertising needs. There are two types of aluminium in it, aluminium cast which can transmit electrical and aluminium forged tensile strength. Aluminium also produces electric conductors that can deliver electricity well, so usually for aluminium plates that are used as raw materials in advertising or advertising industries will be carried out anodizing process is the process of making aluminium does not deliver electricity that is then heated to resist heat or heat water.



Figure 2.3 Aluminium Plate

2.4.2 Stainless Steel Plate

Stainless Steel Plates is a type of plate this one is a stainless steel plate is a plate that is often used in the automotive industry as a material of vehicle bodybuilders and is also widely used as a material of household appliances. Many of the advantages of stainless steel plate are one of them is having a high rust endurance. And many industrial manufacturers do combinations or finishing increasing or producing better stainless steel quality. So, we will use this stainless steel for our project.



Figure 2.4 Stainless Steel Plate

2.5 COMPARISONS OF WHEEL

2.5.1 Wheelbarrow wheel



Figure 2.5 Wheelbarrow Wheel

The wheelbarrow wheels can't carry a lot of weight and it's hard to balance the weight on it because it's held by one wheel. So, it will lose balance easily.

2.5.2 Trolley wheel



Figure 2.6 Trolley Wheel

We use trolley wheels as wheels for this sand filter machine moving. We put as much as four trolley wheels to accommodate the load of the sand filter machine as well as facilitate the movement of this machine to move even in unstable area. In the event of damage to the wheels, it is easy to repair. Additionally, trolley wheels are very easy to find at any hardware or local shop.

2.6 DC MOTOR



Figure 2.7 DC Motor

This DC motor use to shake the filter at this sand filter machine. This motor speed is using 12V 5000 to 15000 RPM.

2.7 SAND FILTER NET

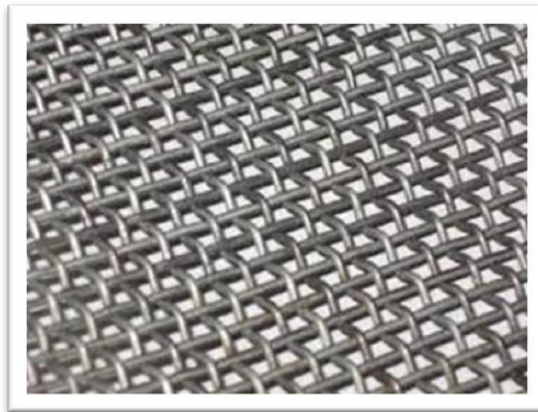


Figure 2.8 Sand Filter Net

This sand filter machine uses the sand filter net with suitable size. The size of the sand filter net's particle hole not too big and not too small. So, the sand might able to go through over the net.

2.8 SUMMARY

In this chapter, we talk about the history of sand, sand, and materials we will use to make our products. A careful study is made to identify the materials used to make our products appropriate into the costs we estimate. The material that we identify is affordable with the cost that will we spend.

CHAPTER 3: METHODOLOGY

By: Muhammad Shary Shazmir Bin Rasap

3.1 INTRODUCTION

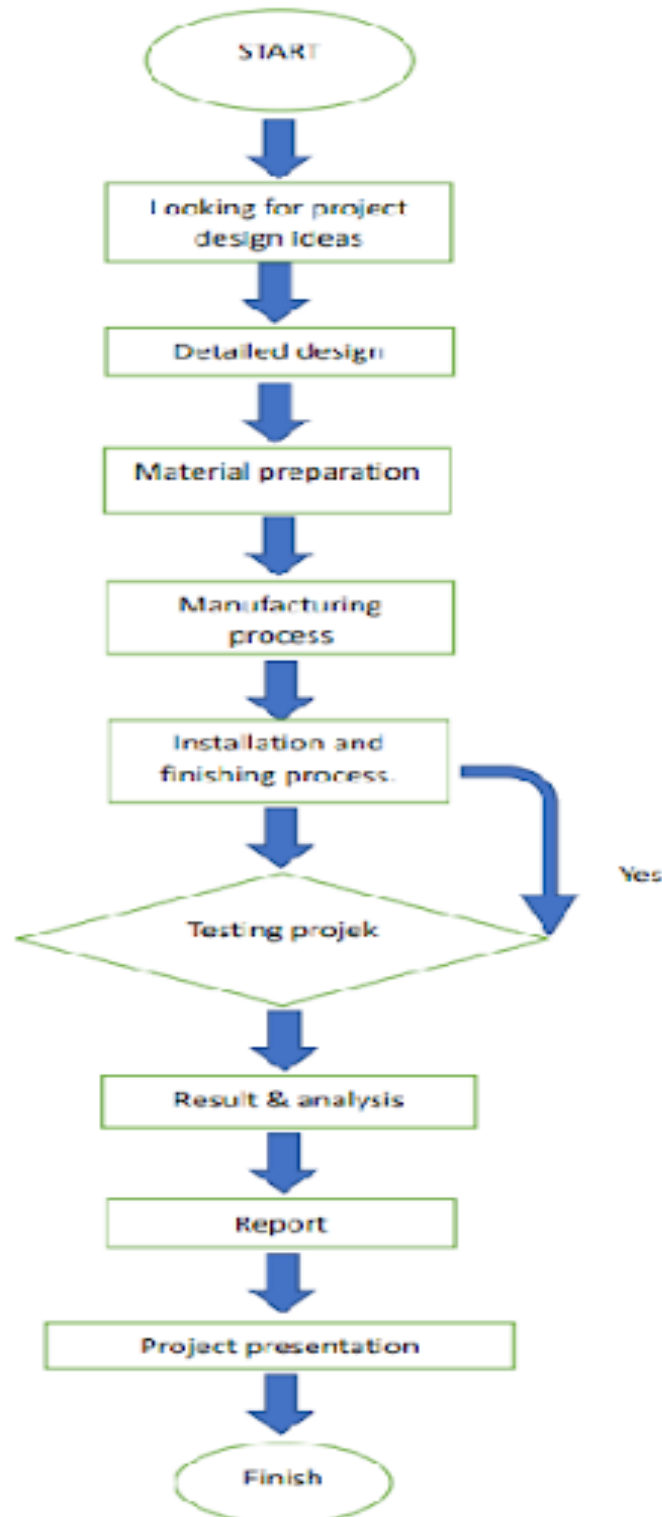
This chapter will provide a through overview of the approach used to complete and successfully complete the project. Many of the discoveries in this discipline came from research conducted by others to advance this effort.

The process of getting ready to start a project is called methodology. One of the strategies used in creating or designing a project is the design methodology. To attain production goals in the finished project, a creative and innovative project is created with the aid of the approach.

This machine's design considers all factors and must also satisfy user requirements for sand sieving in a foundry workshop. Your design is not particularly difficult. The "Modern Sand Filter" project tool's design is also simple to comprehend because it has its own fundamental components. To make the learning session easier, the project's size and balance have also been taken into consideration.

3.2 FLOW CHART

The diagram shows the flowchart of the process for the success of this project. In addition, there are also several steps to be taken as well should be followed in implementing this project. The step is as shown in figure. From the charts of this flow, the activity record for the success of this project can be done smoothly and consistently.



3.3 DESIGN PROCESS

The inventive process is part of the work which needs to be done to create a new project or modifications to a project or better known as process improvements. Some of the necessary steps done in the inventive process are:

- i. Identifying problems.

- ii. Creating ideas

- iii. Design and selection of projects.

- iv. Project planning

3.3.1 Project Selection

In the process of project selection, criteria and certain factors should be emphasized in terms of selection of materials, costs, and security. The material used must match with the product generated.

3.3.2 Project Planning

The process of forming the appropriate framework and manufacturing techniques as well need careful planning and planning because of its structural to be made in line with the product among which review the requirements appropriate equipment and materials, material selection of the economy, and quality and user-friendly. To plan a project-making process this requires a neat plan to be able to confirm to what is required in addition to saving costs so there is no available a faulty execution or purchase of excessive equipment implementation of this project.

3.4 RESEARCH DESIGN

3.4.1 First Design

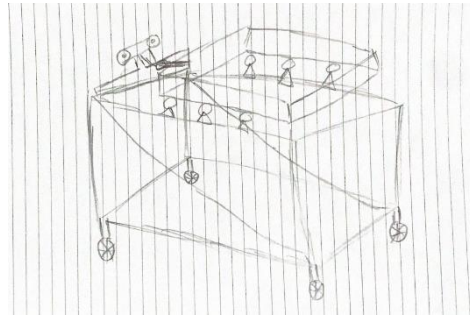


Figure 3.1 First Design

This is the first design of our project. But after having a discussion with our supervisor, this design is irrelevant to being created because this automatic sand sieving machine cannot filter the sand properly. Other than that, the power of the motor is below than the power than be needed to operate our sand filter machine.

3.4.2 Second Design

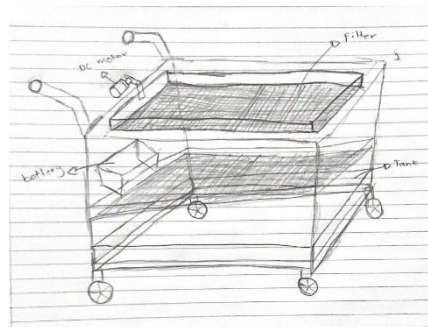


Figure 3.2 Second Design

This is the second design for our project. There have been improvements made for this second design. We add another filter net for the sand filter machine so that it will filter the sand properly. Once we reviewed it carefully, we decide to use this design for our project.

3.4.3 Third Design



Figure 3.3 Third Design

The third design is our final design that we will choose. Based on our discussion with each other and our supervisor, we make decision that we will take this design as our last design.

III.5 DATA COLLECTION METHOD

Data and information collecting When trying to create a great report, the level of collecting data and information at one point is crucial. The project's weakness will be shown by the inability to gather crucial data that will further reinforce the planned outcomes. This will lead to the project producing less-than-satisfactory outcomes. To ensure that the most recent information has been collected and that this final report can be reused, the procedure for collecting this information or crucial data must be done consistently over the course of this investigation.

Early on, we did research to determine the ideal subject and location for the study. Discussions are held to decide the investigation's objectives and scope after the title and location have been decided upon. Problems with procuring fine sand at the construction site are another difficulty.

The early operations in the subsequent stage focused on data research and information collection in order to further support our position and pinpoint actual issues that happened. Primary data and secondary data are the two categories into which collected data can be split. Primary data includes collecting information by observation, interviews with different parties, site visits, and other methods. While secondary data is information that has been found from reports, the internet, or books on sand filters.

We also discuss ways to improve with our supervisors, as well as the data we've collected.

III.6 RESEARCH INSTRUMENT

This research is based on qualitative and quantitative methods. There are some instruments or instruments used to get the data are survey, observation and interview no structured. The selected questionnaire test instrument is to get the data in this research while interviews and observations are to reinforce the findings of the research.

III.6.1 Survey

We have created a questionnaire survey through the internet. We ask a few questions to answer as data that we will use for our project. This questionnaire was conducted on the respondents of the survey to obtain data and information from the public about the existing sand filters as well as the filter machines we will create. The questionnaire instrument is considered appropriate in preparing this project to obtain the perfect data. This questionnaire was created to review the effectiveness of our idea to build a sand filter equipped with a vibrator machine. Questionnaire also facilitates researchers to record data and then analyses the data.

III.6.2 Observation

In addition to the methods described above, we can also to obtain data through the assessment and observation of the researcher in the research area. Some information on how far the effectiveness of existing sand filters used by construction workers. Through observation, we have identified the problems that exist in the process of obtaining fine sand and feedback provided by the respondents throughout this process.



Figure 3.4 Research Area

III.6.3 Interview

This research also got information by using interview method. The purpose of the interview was to measure the reliability of the questionnaire. The items in the questionnaire related to the construction workers' perception of the method for obtaining fine sand are the basis of interview questions. Interview questions are unstructured. An interview sample consists of several students (respondents). These interviews are aimed at gaining insights on how to get fine sand from the existing sand filters they currently use. This friendly interview touches on issues such as the problems that arise and the constraints of the process of sand filtration. In addition, several proposals have been proposed by us as well as by the respondents.

III.7 DATA ANALYSIS

After successfully collecting as much data, we analyse the data we have acquired. Our survey through the website has been done to get the data and views from the public. Some questions have been answered for respondents. Among the questions we are concerned about is the use of our automatic sand sieving machine in the future. Most of those who answered our survey questions seemed to agree when our products were marketed for the future. In this regard, we should improve the effectiveness of our products so that they can be used in the future. After analysing the data, there are also some problems identified. Criticism and suggestions are made and then presented to lecturers. When the presentation is completed, a review of the data and suggestions and criticisms has been given to improve the weaknesses and further strengthen our stance on our projects.



Figure 3.5 Lecture Give Criticism and Suggestions

III.8 PROGRESSION WORK

3.8.1 Design Process

The design of this product was sketched using Autodesk Inventor and the design is being realized. After getting agreement from all team member and supervisor.

3.8.2 Buying Troller Wheel.



Figure 3.6 Troller Wheel

The first material we need to find is the trolley wheel. We bought it at a hardware store at Jelutong Hill. We bought a stroller because we wanted to get a stroller frame and wheels. At the same time, we also bought another trolley wheel.

3.8.3 Cutting Process Base On Measurement



Figure 3.7 Cutting The Steel

In the cutting process, we cut the hollow steel according to size and measurement which has been determined. We use a disc grinder to cut hollow steel.

3.8.4 Welding Process



Figure 3.8 Welding Process

After we cut the hollow steel, we go to welding process to build the automatic sand sieving machine. We combine the part by part according to our design and we are welding it.

3.8.5 Putting Motor System



Figure 3.9 Putting Motor System

We do the wiring work to make sure that the motor can work like what we want. After that, we put the motor to the automatic sand sieving machine.

3.8.6 Finishing

3.8.6.1 Remove rust

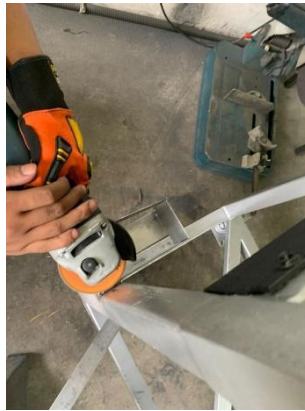


Figure 3.10 Remove Rust

To get the smooth surface of steel, sand paper were used to removing the rust at the steel. It will make the product looks more beautiful and interested.

3.8.6.2 Colouring



Figure 3.11 Sprays / Colouring the product

After we done of removing the rust, we let the sand filter machine get dry first before we proceed to spray the sand filter machine. In a few minutes the sand filter machine have dry. We start our task by colouring the product. We just use two colours in colouring the product. The colour is red and black. We think that colours are suitable for this product and look interested.

III.9 SUMMARY

Overall, for this chapter, we have collected data with various methods to complete us project. The data and information collected must be correct and accurate so that the project. Can run perfectly. For this chapter, we get a lot of data and suggestions from various parties. With that, we can continue our progress for our projects. With the availability of data and information as well as suggestions from various quarters, it can help our project to be perfect.

CHAPTER 4: RESULT

By: Muhammad Saiful Azim Bin Saiful Bahari

4.1 INTRODUCTION

The product that has been produced must be able to give the benefits to the customers or users where the product has its own quality and function. For example, product design must be in term of design either in shape, colour, and design that can give the attractive to the consumer or users.

To ensure the product that from sand filter machine as main material is good and suitable for making a sand sieving machine, the questionnaire was create to know the opinions and views of the consumer of respondents that can give the contribution for positive impact on the product that was produced.

4.2 RATE OF RESPONSE

We have make questionnaire that have distributed using google form. There were 43 people that have response to our questionnaire to know the ability and how far our product can use in construction field. Among our respondents, there were construction workers, contractor, and household. They come in different gender that man and women.

4.3 DEMOGRAPHIC PROFILE OF RESPONDENTS

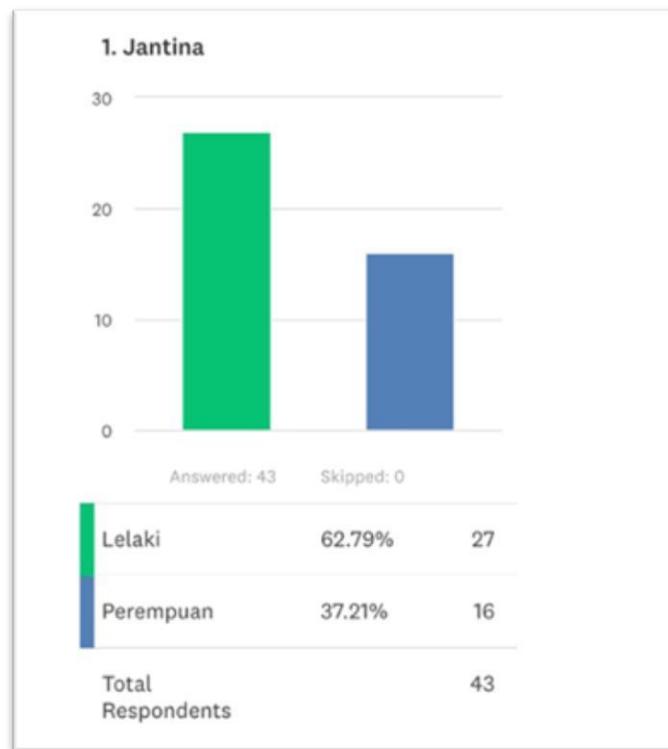


Figure 4.1 Gender of Respondents

Figure 4.1 shows the numbers of respondents that have given their response to our research that we do. There were 62.79% of respondents is come from men that is 27, while 37.21% of respondents come from women that is 16. The amount respondents of men are higher than women.

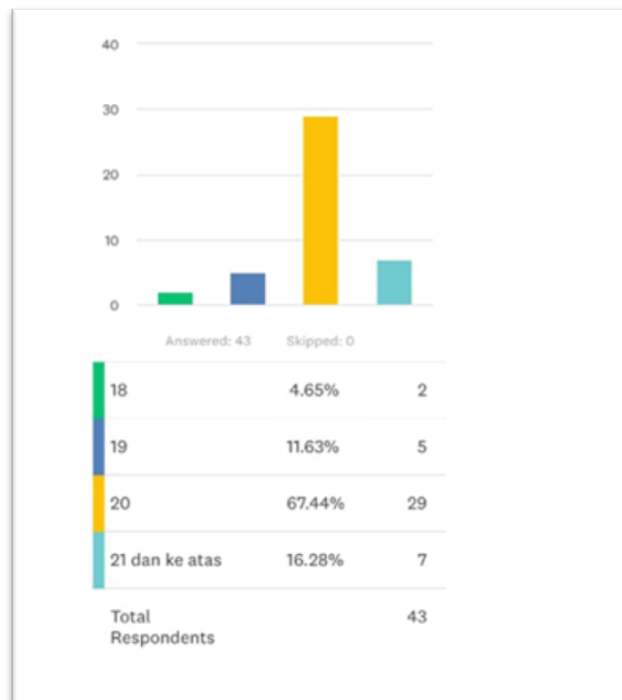


Figure 4.2 Age of Respondents

Next, Figure 4.2 shows the result from research found that 2 respondents is aged 18 years old that is as much 4.65%. Meanwhile, 5 respondents is aged 19 years old that is as much 11.63% and respondents that aged is 20 years old as much 29 persons that is 67.44%. And the rest is aged from 21 years old and above that is 7 respondents from there represent to 16.20%.

4.4 RESEARCH RESULT

4.4.1 Knowledge About Sand Sieving Machine

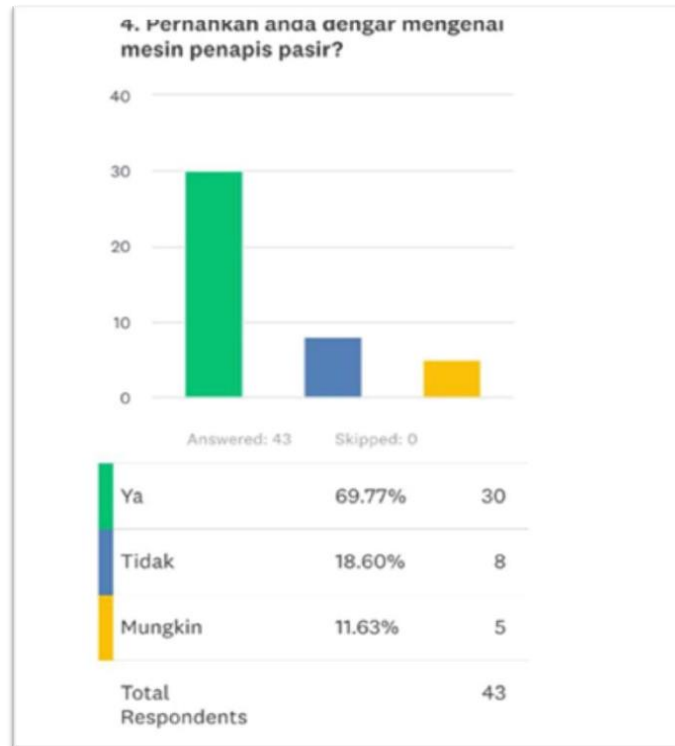


Figure 4.3

Question 1

Based on the research, 69.77% of respondents answered Yes to the question shows that they know about the sand sieving machine that used for filtering the sand to get the good quality of sand. Sand sieving machine should be washed after using that for filtering the sand. Most of respondents give the positive response to our question.

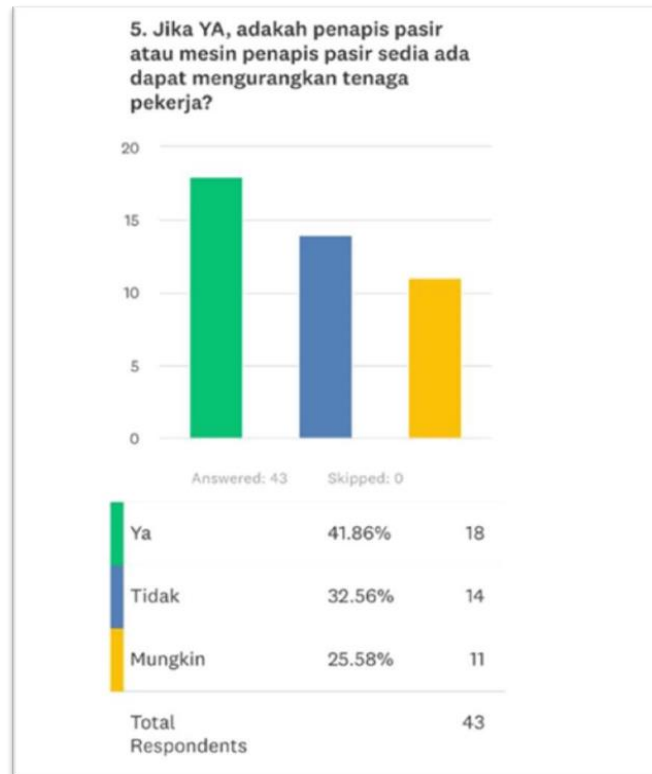


Figure 4.4 Question 2

Based on research, 41.86% from the respondents agree that sand filter machine can reduce the students workload. That is because, the sand filter machine will work to filtered the sand using the shaker system. The electric motor will produce the shaker and sand will be filtered by its own. Furthermore, the automatic sand sieving machine have a funnel as a way for sand throughout and dropped into the wheelbarrow.

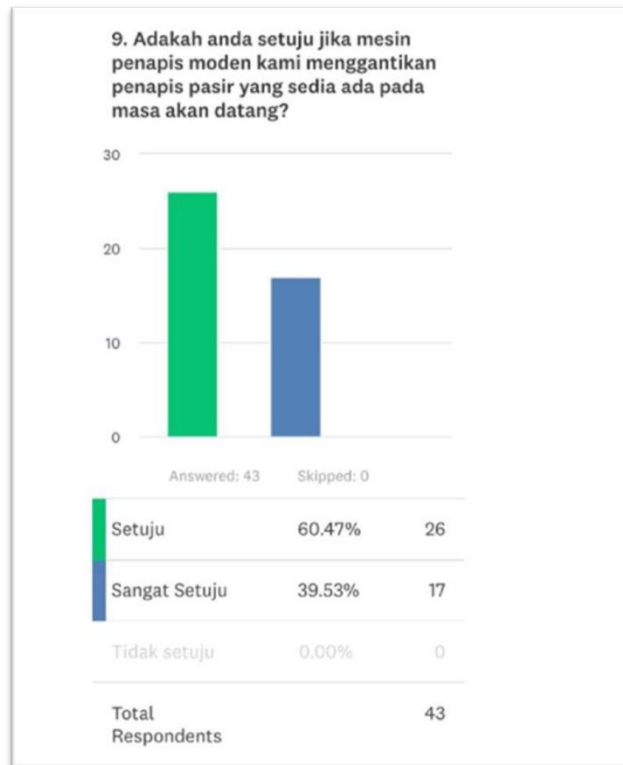


Figure 4.5 Question 3

Based on the research, total 26 respondents with 60.47% seems agree with if our sand sieving machine to replace the existing traditional sand filter in the future. Its mean like our product will acceptable in market. Besides that, looks very agree with our product to be used in future.

4.5 SUMMARY

Overall, our product *Development Of Automatic Sand Sieving Machine* is a great substitute for the manual or conventional methods that have traditionally been employed up to this point.

In addition, this device has accomplished our goal of obtaining high-quality sand, reducing workload, and mobility in the foundry workshop area.

Finally, we discovered that a very high percentage of respondents chose our solution as a result of this research. This demonstrates both the social acceptance of our product and its benefit as a highly innovative product.

CHAPTER 5: DISCUSSION AND CONCLUSION

By: Muhammad Nur Aiman Yusri Bin Mohd Yunos

5.1 INTRODUCTION

This chapter describes a project that was successfully finished in roughly six months, or one semester. In addition, there were several issues we encountered during the installation and testing of our product. As a result, there are some recommendations for future improvements to our product that will benefit the users. The choice made in

this chapter is based on the conclusion we reached after conducting our study and having a debate in the chapter that came before it. In addition, the associated topics that connect to the goal and the recommendations from our research are covered in this chapter as well. The study's conclusion has been reached at this point.

5.2 DISCUSSION

For our project, *Development Of Automatic Sand Sieving Machine*, this product was tested by students in foundry workshop. When our product was tested, it was also able to deliver positive results. Our products help us successfully accomplish the goals we've been given. One of them is that when we use our product to filter sand, we may get good quality sand. Because the fine sand that has been filtered will fall to the ground after usage of the conventional sand filter, it may mix with foreign objects. As far as we know, there were numerous foreign objects on the ground, including nails, stones, and

other things. The funnel on our sand filter machine is how the fine sand gets into the wheelbarrow. In addition, our solution helps lighten students' workloads. This is so that the kids won't have to waste their time trying to construct a conventional sand filter. They can just save their energy for tasks that are more crucial. Additionally, utilising the conventional sand filter will require more work or energy. This is so that the pupils can fill the box with the sand that has been dropped on the ground. Next, it is impossible or difficult to relocate a standard sand filter. Standard sand filters don't have wheels. However, we gave our sand filter machine wheels so that it could be moved throughout the foundry workshop area with ease.

5.3 SUGGESTION

After this research was finished, we learned that it can help consumers because it lessens students' burden compared to traditional sand filters. In addition, compared to conventional sand filters made entirely of scrap wood, our product finishing is cleaner and more effective.

Several recommendations have been made in order to address the shortcomings of this project:-

- Run the motor at a speed of around 1300 rpm.
- Increase the number of filter nets to allow for the most sand to be filtered.
- Make use of the thicker filter net.
- Make the automatic sand sieving machine more sturdy by using wheels from a wheelbarrow that are the same size.

5.4 CONCLUSION

Every project that is undertaken has its own advantages and goals. similar to the *Development Of Automatic Sand Sieving Machine*. There were no issues encountered when working on this project, and we ultimately succeeded in achieving the goal.

With the aid of a DC motor that helps with 4-5 UF and spins at a speed of around 1300 rpm, this project can filter the sands with good sand quality for the intended results. Compared to utilising a standard sand filter, this project succeeds in obtaining the goal of obtaining high-quality sand without mixing it with foreign objects.

In addition, this proposal is more appealing, and the scale is appropriate for the vicinity of a foundry workplace. Additionally, this project is mobile, making it easier to transport it anywhere. Even users with no prior knowledge can easily operate these sand filter machines.

Based on the findings of the research used to develop and complete this project, we determined that the project's goal for this particular product was accomplished. In addition, it can benefit a variety of parties, particularly students and lecturers, by lessening workload utilisation, and it has received approval from lecturers for the product to be sold in other institutions.

Finally, we expect that our research will be fully utilised, accepted, and applicable to current technological advancement. Along with that, we also expect that this product will provide users with the best results and meet all of their needs.

APPENDIX

APPENDIX A

COSTING PROJECT

APPENDIX B

DRAWING AND DESIGN

APPENDIX C

GANTT CHART

APPENDIX A

Cost Project

No.	Materials	Quantity	Price Per Unit	Total (RM)
1.	Trolley 4 inch	4	RM15.60	RM62.40
2.	Trolley 1.5 inch	4	RM13.57	RM54.30
3.	Hollow steel	1	RM300.00	RM300.00
4.	Mosquito net	1	RM8.00	RM8.00
5.	PVC Net (6mm)	1	RM8.50	RM8.50
6.	Dc motor 12v-24v	2	RM95.00	RM190.00
7.	Cable	1	RM10.90	RM10.90
8.	Potential meter	2	RM49.00	RM98.00
9.	Nut/Screw	30	RM0.50	RM15.00
10.	Dual Shaft	1	RM28.00	RM28.00
11.	spray	1	RM11.00	RM11.00
12.	B-Tani l bracket	6	RM1.00	RM6.00
13.	B-Tani flat bracket	3	RM3.00	RM9.00
14.	Battery	1	RM25.00	RM25.00
15.	Iron pipe	1	RM1.50	RM1.50
16.	Dc step down	3	RM17.25	RM51.75
TOTAL				RM879.35

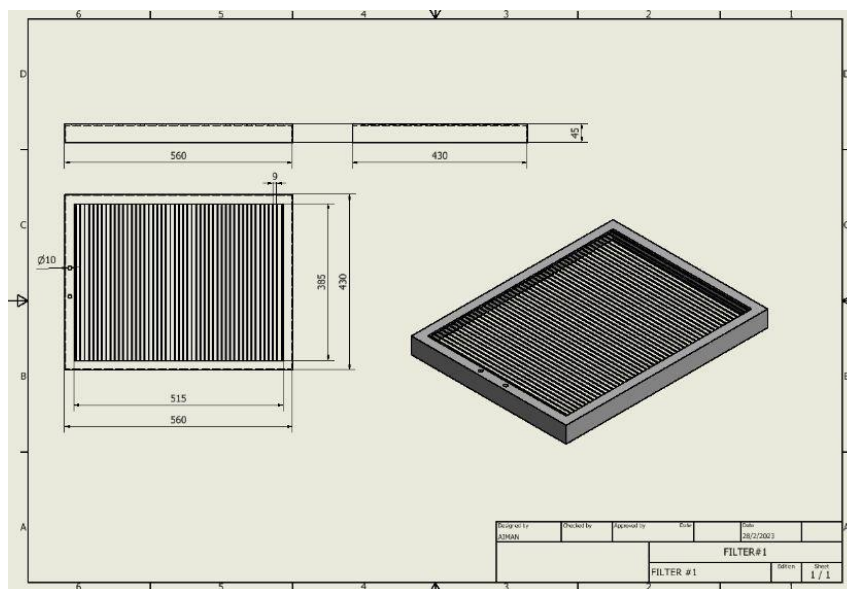
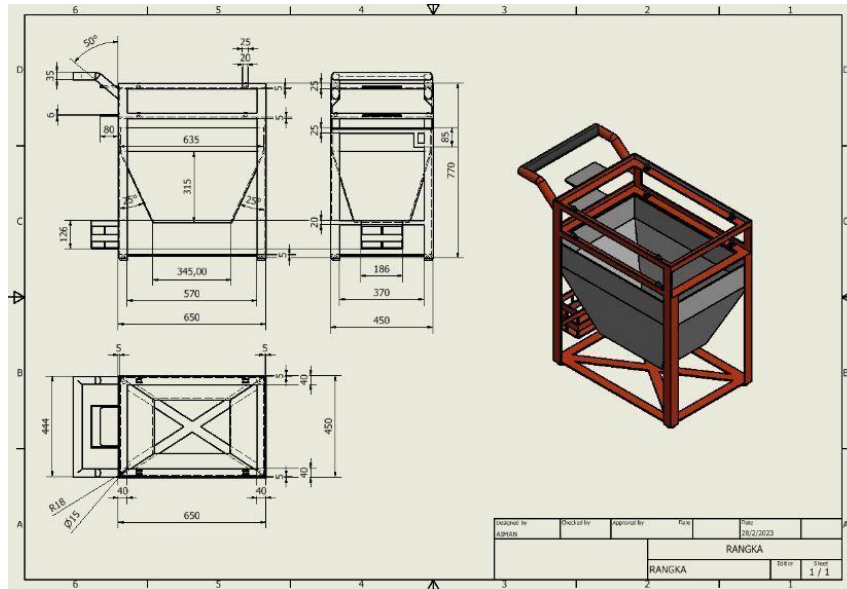
Table 1 Material's Cost

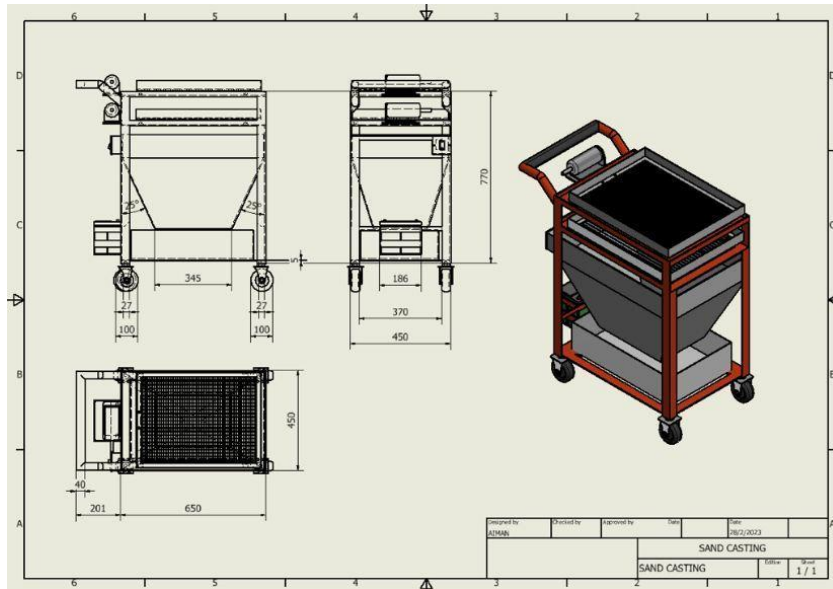
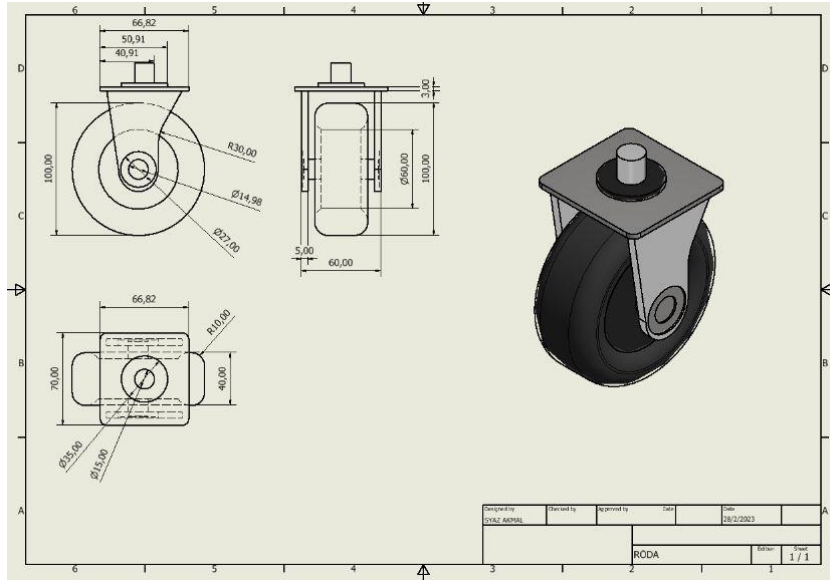
1. List Of Components

- Trolley 4 inch
- Trolley 1.5 inch
- Hollow steel
- Mosquito net
- PVC Net (6mm)
- Dc motor 12v-24v
- Cable
- Potential meter
- Nut/Screw
- Dual Shaft
- spray
- B-Tani l bracket
- B-Tani flat bracket
- Battery
- Iron pipe
- Dc step down

APPENDIX B

1. Technical Drawing





2. Result Design



APPENDIX C

Gantt Chart

Week/ Activities	Status	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	
LITERATURE REVIEW	P	█	█													
	C	█	█													
ASSEMBLING	P		█	█	█	█										
	C		█	█	█	█										
TESTING	P					█	█	█								
	C					█	█	█								
DATA & ANALYSIS	P						█	█	█							
	C						█	█	█							
VIDEO & SLIDE PRESENTATION	P								█	█						
	C								█	█						
TECHNICAL REPORT	P										█	█				
	C										█	█				
POSTER	P											█	█			
	C											█	█			
PRESENTATION	P													█		
	C													█		
SUBMISSION REPORT	P														█	
	C														█	
	P	PLANNING														
	C	COMPLETE														

Table 2 Gantt Chart

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DEVELOPMENT OF AUTOMATIC SAND SIEVING MACHINE

SUPERVISOR: ENCIK SHARIZAN BIN MOHD SHARIF

ABSTRACT



During the sand casting process in the foundry workshop at polytechnic colleges, students must refine the casting sand using a conventional method before performing aluminum casting. However, using a conventional method also has some disadvantages. One of them is that students have to spend energy to manually sieve casting sand. When the fine sand falls on the ground, it mixes with others additional mixture. Therefore, a product that can help students in the workshop was developed. Our main goal in developing the sand sieving machine is to reduce the effort for students who want to sieve casting sand. The machine uses a DC motor that shakes the sieve during operation. The sand is sieved by the subsequent shaking as soon as it is placed on the sieve. A funnel is a feature of a sand sieving machine that allows fine sand to fall through. With a regular sand sieve, the sieved sand falls out and must be placed in a collecting tray that is already placed under the funnel. This requires less student effort and energy. The four convenient wheels on the sieving machine make it portable to move around the workshop, which is very important. Students will find it easier to sieve the sand from one place to another based on where the sand is located.

OBJECTIVE

1. Get the good quality of sands.
2. Reduce student workload.
3. Achieved in designing filters and testing filters.



PROBLEM STATEMENT

1. Students are wasting their energy to get fine sand.
2. Students are wasting their time while sieving the sand manually.



IMPACT OF INNOVATION

RANGE OF INNOVATIONS

This idea came about when we saw the difficulties of students who needed to filter the sand on their own.

MARKET POTENTIAL

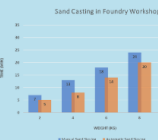
This project target to all foundry workshop



ADVANTAGES

1. Get the quality of sand after using this machine.
2. Save more energy compare with manual sieving.
3. Save time.

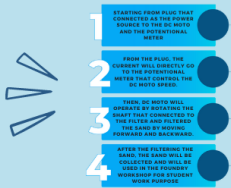
RESULT



TYPES OF SANDS SIEVING	WEIGHT(KG)				
	2	4	6	8	10
MANUAL SAND SIEVING	7	13	18	24	29
AUTOMATIC SAND SIEVING MACHINE	5	8	14	20	25

FLOW CHART / PROJECT IMAGE

OPERATION FLOW CHART



METHODOLOGY



TECHNICAL DRAWING

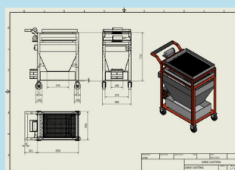


IMAGE PROJECT



MUHAMMAD SAIFUL AZIM
BIN SAIFUL BAHARI
(08DK208F2002)



MUHAMMAD NUR AIMAN
YUSRI BIN MOHD YUNOS
(08DKM20F2017)



MUHAMMAD SHARY
SHAZMIR BIN RASAP
(08DKM20F2025)

