



اَوْبَهُرْ سِيْتِي بَاتِيكُونِ الْوَلَكِي مَبَارَا  
UNIVERSITI  
TEKNOLOGI  
MARA



## **INDUSTRIAL TRAINING FIELD REPORT**

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LI Duration : 22<sup>th</sup> MARCH 2021 - 15<sup>th</sup> JULY 2021 ( 17 WEEKS )

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## **ACKNOWLEDGEMENT**

Firstly, I want to show my gratitude to Almighty Allah for giving me opportunity, strength and bravery to undertake this internship and complete it despite we currently face a tough pandemic season. This accomplishment would not have been possible without His continuous love and empathy throughout my life, especially during the duration of my internship. I also want to thank my family because they always support me and give many counsel when I face some problems during the internship.

Without them, maybe I can't perform for my industrial training.

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Moreover, I would to thank my colleague in the production team such as En Asyraf, En Firdaus, En Razak, En Zahari and Chew because they always give me moral support and teach me how to work in a real industry. Their cooperation give me passion to keep going for this internship without looking back. I'm also want to thank other colleague because they always treat me as their friend and always help me when I need their help. They also treat me like as sibling because we always share many stories and experience about their life as worker there.

Lastly, I will be immensely grateful to all of these fellows. There is no word can describe on how much they mean to me. As a result, I pray that they will always be under His Blessing and Mercy. And I hope the rest of the world treats them as generously as they once treated me.

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## **1.0 INTRODUCTION**

Industrial training is described as a program that provides high-quality realistic training within a specific time frame. Other than that, industrial training equips students with valuable expertise and practical experience whilst still motivating them to become skilled and effective engineers. During the training process, students can learn both theoretical and practical experience. Under industrial instruction, various courses are taught for the students. In addition, industrial practice includes the need for real-time jobs and career offers.

Students may choose a profession in a variety of job environments that appropriate with their course. It is important to upgrade your current skills through industrial training courses in order to land better career opportunities. Besides that, during the training cycle, students learn about the most significant innovation and how they are currently used in specific and significant industries. When students go to the industrial training, they indirectly can increase their sense of responsibility and good work habits as learning environment is totally different with working environment.

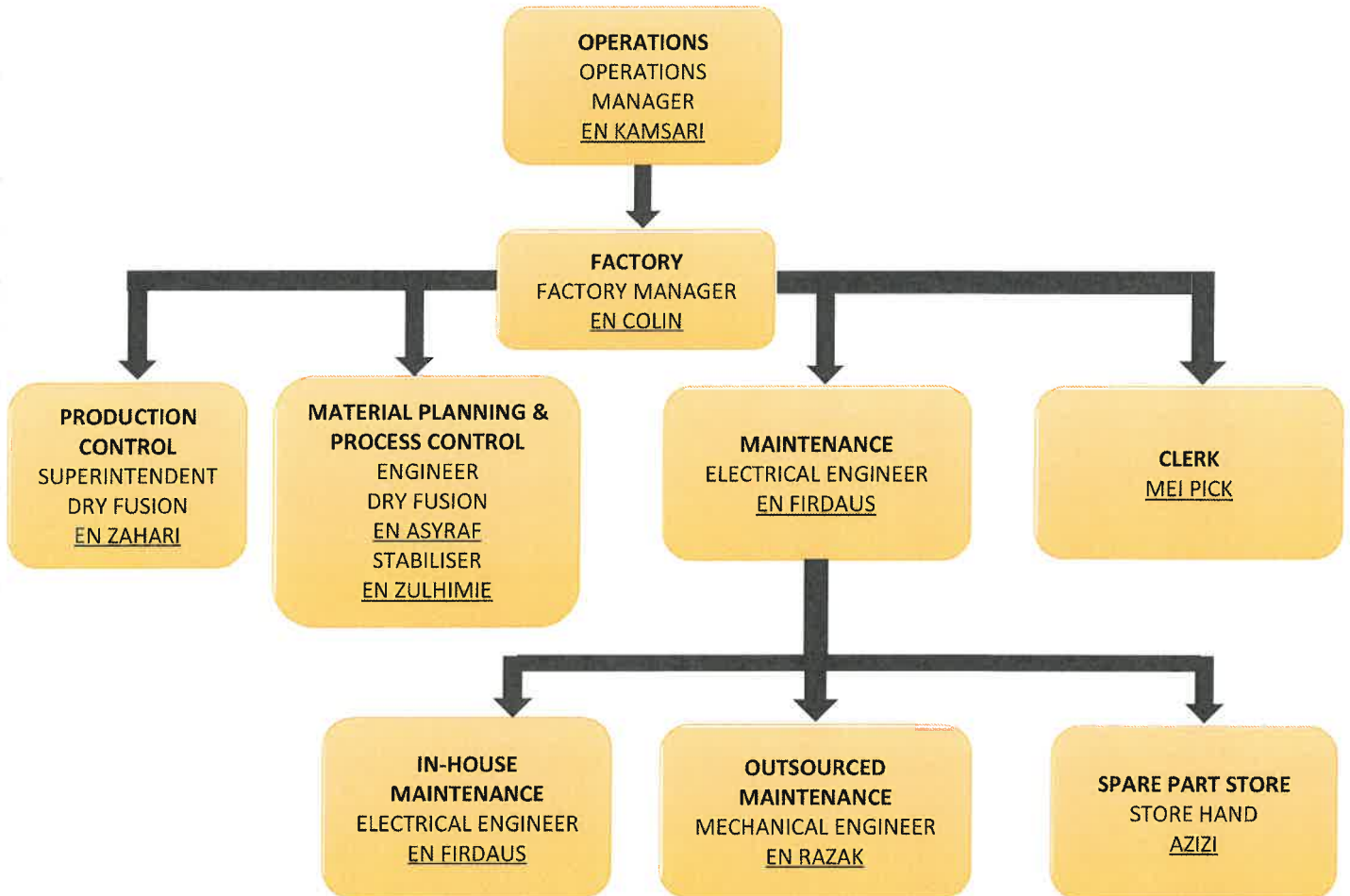
Furthermore, they can also develop strong organizational skills for a group of employees and learn correct corporate strategy in the manufacturing field. Industrial training is an important task as to fulfill Board of Engineers Malaysia (BEM) requirements for Engineering Technology Accreditation Council (ETAC) with a minimum of 17 weeks for undergraduate student. So, Industrial Training is mandatory for every student in Universiti Teknologi Mara (UiTM) taking Diploma in Chemical Engineering.

Lastly, I believe that this training give me many worthwhile experiences and knowledge in chemical industry. During my internship at SUN ACE KAKOH from March 2021 until July 2021, I had gained many skills such as communication skills and problem solving skills that I can use it in my daily life or if I entering the real working environment soon. During internship also it is not wrong for us to keep asking the different layers of workers there because we want learn something new about the actual industry and I also always ask about their working experience.

## 2.0 CONTENT

### 2.1 ORGANIZATION CHART AND HISTORY OF THE COMPANY

#### 2.1.1 ORGANIZATION CHART



### 2.1.2 HISTORY OF THE COMPANY

History of the SUN ACE Company was begin when Shinagawa Chemicals was founded by Mr. Toshio Yoshida in Japan. Shinagawa Chemicals was a manufacturer of polymer additives and specialty chemicals that grew into SUN ACE Corporation. In addition, in the year 1980, SUN ACE Corporation founded SUN ACE Singapore. SUN ACE Singapore is the world's first PVC stabilizer producer to receive the famous ISO 14001 accreditation for building an environmental management system. After its inception in 1980, the SUN ACE Group has expanded to become a leading multinational producer of facilities and offices in Asia Pacific, Africa, the Middle East, and South America and SUN ACE Company was founded in 1991 at Malaysia. The resulting group is made up of multicultural and diverse teams with global experience that rely from one another, allowing SUN ACE to expertly serve the markets in which we work. The group of SUN ACE around the world are Colombia, Brazil, German, Kenya, Malaysia, Singapore, Italy, Saudi Arabia, South Africa, India, China, Japan and Australia.

Furthermore, SUN ACE is a well-known manufacturer of PVC stabilizers and metallic soaps. We manufacture for various individuals worldwide in the petrochemical, food, personal care, pharmaceutical, plastics and rubber, cement, and paint sectors. We recognize that none of this would be possible without the dedication and hard work of all of our workers. They continue to be our most precious asset, and they are responsible for the company's triumphs and further expansion. SUN ACE Kakoh Malaysia has since grown and evolved itself as a leading manufacturer of PVC stabilizer and metallic stearate in this fast increasing field. At SUN ACE Malaysia they produce three different type of metallic stearate such as zinc stearate, calcium stearate and magnesium stearate.



Figure 1: The founder of SUN ACE, Mr Toshio Yoshida.



Figure 2: Map about SUN ACE Company around the world.

SUN ACE KAKOH Malaysia Sdn Bhd was located at LOT PLO 23, Jalan Mahsuri 2, Kluang Industrial Estate, 4 1/2 Miles, Jalan Mersing, 86000, Kluang, Johor.

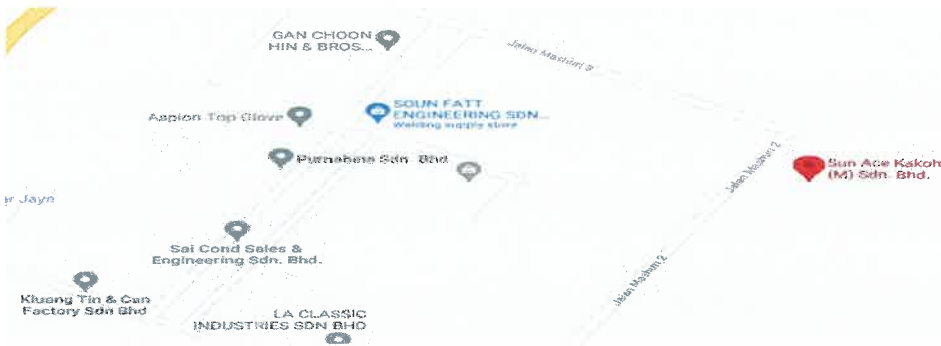


Figure 3: SUN ACE KAKOH Malaysia Sdn.Bhd location on the Google Map.



Figure 4: Main entrance SUN ACE KAKOH Malaysia Sdn Bhd.

### 2.1.3 COMPANY OBJECTIVES

- We overcome their significant problems by offering innovative approaches.
- We understand our clients' necessities and invest in specialized research and development that benefits businesses of all sizes.
- We are continuously creating new product and innovating current ones in order to give our consumers with not just the latest and best, but also cost-effective, consistently high-quality solutions.

### 2.1.4 VISION

- We believe in dynamic growth through our multi-cultural team work and partnership.
- We aim to be a world leading supplier of Speciality Additives and Services by focusing on multi-regional market needs.

### 2.1.5 MISSION

- We strive to satisfy our customer needs by supplying Quality Products and Services.
- Through the process of achieving our business objectives across borders, we aim to grow and enrich our individual lives.
- We believe the growth of SUN ACE as a responsible corporate citizen will contribute to our shareholders as well as to society.



## **2.2 PROCESS FLOW**

At SUN ACE KAKOH Malaysia, there are two main process flow that they had run. The first one is stabilizer process flow(SL) and dry fusion process flow(DF). For the stabilizer process flow. Stabilizer process flow will produce PVC stabilizer while dry fusion process flow will produce metallic stearate which were calcium stearate, magnesium stearate and zinc stearate. For dry fusion process flow, there are also have another two process flow which is manual process flow and automatic process flow where they use robotic equipment to produce metallic stearate. These two products were important in the plastic manufacturing and PVC. For the PVC stabilizer, it was an important ingredient for PVC formulation. This is because, they allow its stable processing, ensure its thermal stability and supply the stabilizer with properties of resistance towards light and bad weather. Moreover, PVC stabilizer also ensure its electrical resistance to high temperatures. Other than that, PVC stabilizer will facilitate easily the shaping of PVC. For the metallic stearate, they were used in a variety of plastic and rubber uses such as plastic packaging. During the production process, they work as lubricants and acid scavengers. These products vary in metal, physical form and fatty acid source. Aqueous stearate dispersions are also available in this manufacturing. Acid scavengers were to neutralize the catalyst residuals that can damage both processing equipment and resin itself during the production. So, in stabilizer process flow they will produce 25 kg of product and 1 tonne of product while in dry fusion process flow, they will produce 10 kg of product, 20 kg of product, 25 kg of product and 1 tonne of product. For the 1 tonne of product, they will use flexible bag because it is big in size and easy for the manufacturer to use it as sometimes certain manufacturer will pour the material all at once. But for the 1 tonne of product, not every day they will produce it because the product is depend on customer's request as production department will wait for instructions from store department.

#### A. Stabilizer Process Flow(SL)

Firstly, they will pour the raw material such as wax, stearic acid into the loading station in amount of 5000 kg. After that, they will pour tennessine(TS)(solid) into storage silo(TA02), calcium carbonate(CaCO<sub>3</sub>) into storage silo(TA03) and lead(ii)oxide(PbO) into storage silo(TA04). The uses of storage silo is to keep the raw material before it is release to another equipment. Next, for tennessine(TS) and calcium carbonate CaCO<sub>3</sub>, its will transfer to weighing hopper(TA05 and TA05-1) while for lead(ii) oxide(PbO), it will transfer to weighing hopper(TA06 and TA06-1). After all the raw material been transferred, so it will move to the tank for the reaction process. During my industrial training, only two tank that they used because another two tank were under maintenance. In this two tank, they will produce same product which is PVC stabilizer. During reaction process, they will add another raw material manually which are N.oleo and palmac fatty acid. This two raw material consists of 500 kg. So, the total of the weight for this two material is 1000 kg or 1 tonne. Before they put N.oleo and palmac fatty acid into the tank, they will discharge stearic acid into the tank from the loading station using a big pipe. After, they pour the stearic acid, they will add manually N.oleo and after the mixture is half complete, the agitator will turn off and they will put palmac fatty acid into the tank and agitator will turn on to mix the mixture at 30Hz by opening the steam because they want melting the mixture. Around 2 until 3 minute, the agitator will up to 50 Hz. When the temperature of tank was 100 C, they will switch off the steam and after that, they will pour the adipic acid in amount of 0.2 kg at temperature of tank was 95 C and they will wait for 45 minute to discharge the lead(ii) oxide in amount of 414 kg at temperature of 100 C. After 5 minute they discharge the PbO, they will pour 2 litre of plain water and after 15 minute, they will pour again 2 litre of plain water and lastly after 30 minute, they will pour 2 litre of plain water. After pour the water, they will switch on again steam and they will switch off steam at temperature of 125 C. Next, they will pour last raw material which is Bis-A in amount of 3.7 kg. After they had pour all raw material, they will go to final stirring for another 35 minutes. After mixing, the mixture will transfer to spray pot. In this equipment, it will spatter the mixture with water to become a flake from a liquid as PVC stabilizer produced in a flake form. After been spattered, it will transfer to overflow weir and transferred to cooling belt. In the cooling belt, they will cool the product by using waterfall beside of the cooling belt so the product will be cooled faster. Next, after been cooled, the product will go to bucket elevator. They use bucket elevator because it was easy to maintain and it was practical for multi-story building as stabilizer plant is smaller compared to dry fusion plant. Last but not least, the product will go to packing silo. In stabilizer plant, the two packing silo had two same product which is PVC stabilizer. Packing silo used for to store the product after been produced. Before the worker packed the PVC stabilizer, the product will pass by to sifter where the sifter will split the desired product and not desired product. This meant as desired product was in flake form while not desired product was in powder form or lumps form. So, the not desired product will go back to bucket elevator to reprocess again the product. Lastly, the worker will pack the product using 25 kg of bag at the packer.



1. LOADING STATION



2. STORAGE SILO (TA02)



2.1 STORAGE SILO (TA03)



2.2 STORAGE SILO (TA04)



3. WEIGHING HOPPER (TA05)



3.1 WEIGHING HOPPER (TA05-1)



3.2 WEIGHING HOPPER (TA06)



3.3 WEIGHING HOPPER (TA06-1)



4. TANK 1



4.1 TANK 2



4.2 TANK 3



4.3 TANK 4





5. SPRAY POT



6. OVERFLOW WEIR



7. COOLING BELT



8. BUCKET ELEVATOR



9. PACKING SILO 1



9.1 PACKING SILO 2





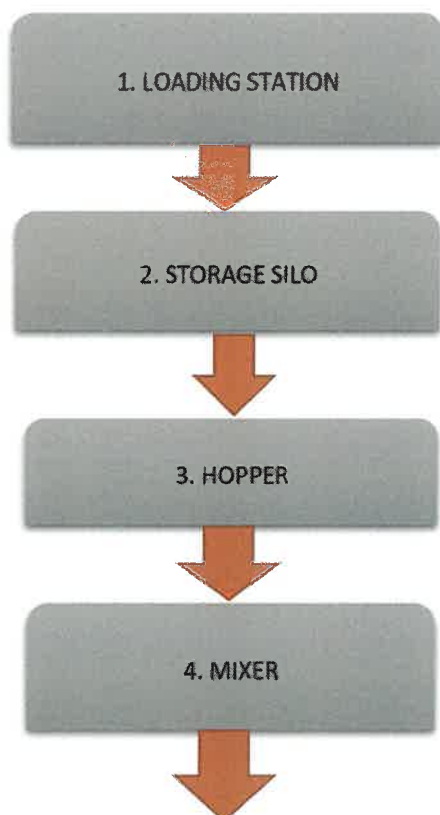
10. SIFTER

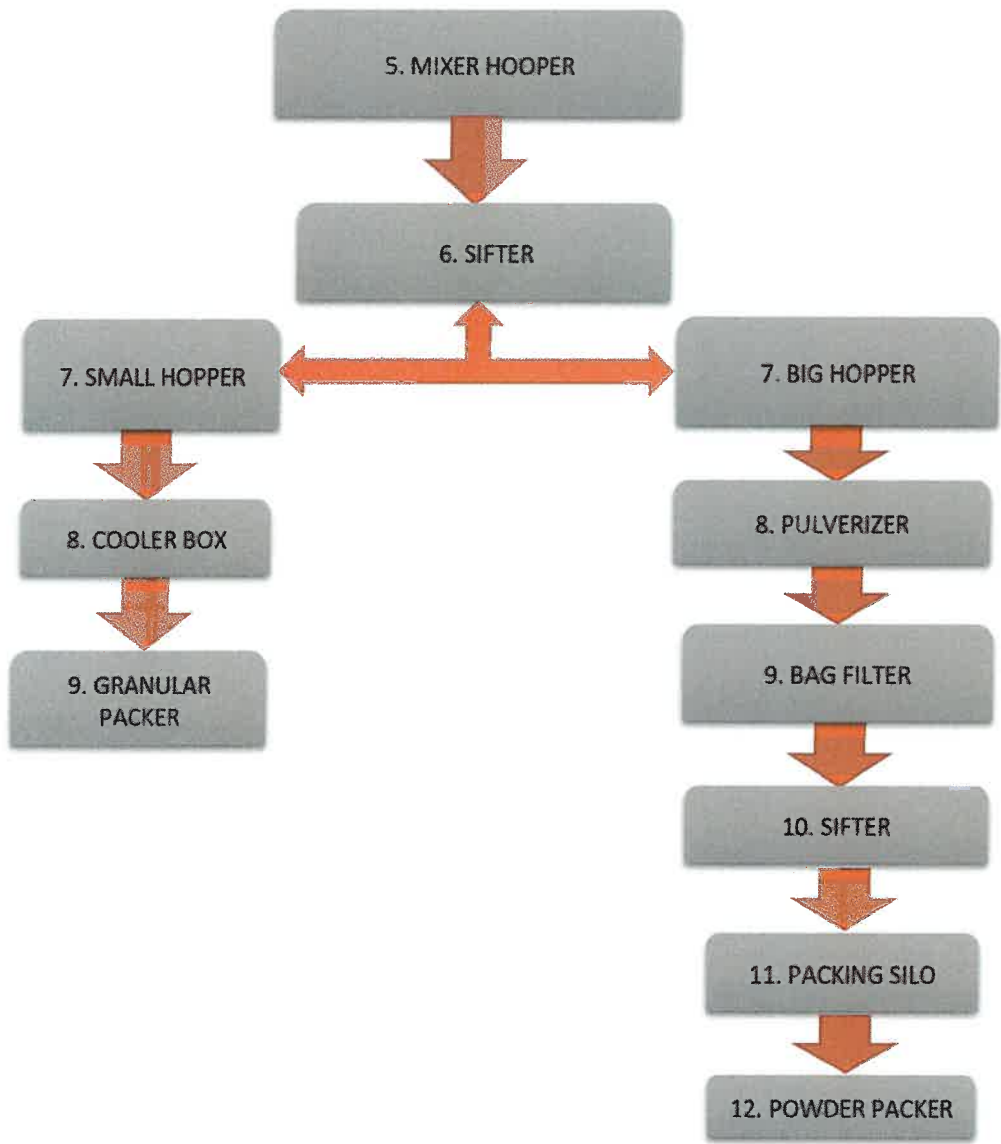


11. PACKER

## B. Dry fusion Process Flow(DF)

First of all, same goes in stabilizer process flow, for dry fusion process flow at the loading station, they will transfer the acid which was liquid stearic acid into storage silo while solid stearic acid they will transfer into hopper or the other name was weighing hopper. After that, all material will go to the mixer for the reaction process. For liquid stearic acid, they will pour with amount of 215 kg or 315 kg while for solid liquid stearic acid, they will pour with amount of 100 kg. In the mixer, stearic acid will mix together in high speed with alkaline which was calcium hydroxide,  $\text{Ca}(\text{OH})_2$  if they want to produce calcium stearate, zinc hydroxide,  $\text{Zn}(\text{OH})_2$  if they want to produce zinc stearate and magnesium hydroxide,  $\text{Mg}(\text{OH})_2$  if they want to produce magnesium stearate. The alkaline will be poured manually by the workers in amount of 50 kg/s in low speed. During mixing, they will add catalyst to make the reaction efficient which was acetic acid or lactic acid or sodium hydroxide. Furthermore, it will change to auto stir with electric motion below 120 amp. After the mixing was done, the product will left for a while for 60 minute with temperature set to below  $75^\circ\text{C}$  and it transfer to mixer hopper. After that, it will transfer to sifter. In the sifter, the product will be separated in two ways which were granule form and powder form. If the product was in lower than specification needed so it will transfer to big hopper while if the product was in specification needed, it will transfer to small hopper. During the product was kept in the big hopper, it will transfer to pulverizer for grinding the product into the powder form. Then, it will go to the bag filter to filter the product which was suitable for the product and it will move to the sifter and it will keep in a packing silo before the workers packed the powder product using a packer. Besides that, during the product was kept in the small hopper, the product will go to the cooler box. The function of the cooler box was to cool down the granule at temperature of  $70^\circ\text{C}$  before the worker packed the product using a packer. In addition, granular product was an unreactive product so it will take some time to cool it but it such of waste time because the customer will keep waiting for the product so the customer's request for this product was unfavorable.





### **2.3 BRIEF DAILY/ WEEKLY ACTIVITY**

On the first day for my internship, I had reported myself at SUN ACE KAKOH headquarter in front of the main gate. Once I entered the main lobby, I met Puan Rohana, administrative assistant of Administration and Human Resources Department. At there, she explained to me about my working time schedule, company rules and basic safety regulations at the workplace. After that, she brought me to walk around the factory and show me every single department. Before that, she assigned me in the production department where located at back of factory.

As soon I arrived at my department, I was introduced to my supervisor, En Mohd Zulhimie Bin Talib who is the engineer for stabilizer process flow plant. After that, he gave me one table for me to do any work regarding toward my task. After I put my belonging, my supervisor brought me and showed the stabilizer plant. He also showed and explained every equipment that located in the plant. In the office, I met many staff from different department such as En Firdaus, he was electrical engineer for in-house maintenance department, En Razak, he was mechanical engineer for outsourced maintenance department, En Asyraf who sat beside me was chemical engineer same as my supervisor but he was engineer for dry fusion plant and lastly, Chew was a clerk for store department.

For the first week of my internship, En Zulhimie ask me to redraw again the new one plant drawing by using Excel because the plant drawing that he already have was not updated according to the actual plant. So, I used my basic drawing skills to redraw again the plant drawing. That was my first time drawing plant using Excel and I thought with Excel we can use it in many different ways. For me, this is new knowledge that I gained during my internship. On the next day, En Zulhimie ordered me to do calculation of volume, litre and mass for the overhead tank at the beside of stabilizer plant. On the next week on Monday, my supervisor ordered me to do another same calculation for another overhead tank because on the plant there were two overhead tank.

Starting from the second week, my supervisor ordered me to record pressure reading and compressed air pressure reading on every bag filter and dust collector in stabilizer and dry fusion plant and always monitor it. For the record of the pressure and compressed air pressure reading, I must do weekly monitoring report for every ten equipment for put in the file. The weekly monitoring will be done at every end of the working day which at Friday.

Sometimes, if I had finished my task, my supervisor will call me to do some drawing for the equipment or for any project at the plant. Moreover, he also call me to draw equipment for the future project in the company. I always draw the plant equipment in the process flow such as tank, mixer and packer. Besides that, my factory manager, Mr Colin also keep ask me to draw something for the plant such as hole lid and workbench. After that, I always record the weight value of product at dry fusion plant at line packaging 3 DF and line 2 DF because dry fusion plant engineer, En Asyraf ordered me to record it for inserting into his report and sometimes he will use my data for the meeting with the operation manager, En Kamsari.

In a nutshell, I am very pleased because they believed me for doing different task even it was out of my field. For example, my electrical engineer, Encik Firdaus had once instructed me to mark Earth Chamber around the factory by using Earth Chamber plan on the desktop and built a table report for all Earth Chamber around the factory. As a result, I can learn many things that differ from university life.

## **2.4 DESCRIPTION OF TASK ASSIGNED**

### **2.4.1 Record pressure drop reading and compressed air pressure reading**

For this task, I must record everyday the pressure drop reading and compressed air pressure reading at every dust collector(DC) and bag filter(BF) at stabilizer and dry fusion process flow plant. There were ten equipment that I must record and monitor the performance of the equipment. Ten equipment were DC 2 SL, DC 3 SDL, DC 4 SL, DC 1&2 DF, DC 3 DF, HS 1 DF, HS 2 DF, HS 3 DF, DF 5 DC and Transfer silo DF 5. The purpose of this task was to monitor the performance of the dust collector and bag filter at the plant. So, I will go to every equipment by bringing my notebook and read the pressure reading and jotted in the notebook. After recording all the equipment, I will write in the typical file that contained all the pressure reading record for every equipment. If there is any problem regarding for the equipment, I will report to my engineer or my supervisor, Encik Zulhimie and they will inform to chargehand and they will repair it. For example, for bag filter if there any dust that went out of the chimney, it shown that performance of bag filter was not good because the performance of bag filter was good if there was no dust came out of the chimney.

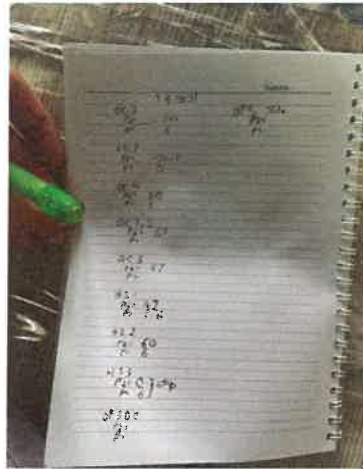


Figure 5: I record the reading. Figure 6: The pressure drop reading and compressed air pressure reading.

### **2.4.2 Do weekly monitoring report for dust collector, bag filter and transfer silo**

My supervisor, Encik Zulhimie instructed me to do weekly monitoring report for every dust collector and bag filter that I recorded. Usually I will do this task on every Friday on the last week. The report just a simple data sheet that production team provided for the inspection of dust collector and bag filter. This report was consists of recording date, name of equipment and criteria inspection. I must fill the report and my supervisor will check the report and signed it. Moreover, there were inspection criteria that I must confirm it such as if the damper was okay, I will write 'okay'. Sometimes, Encik Zulhimie will look for it if the supplier wanted to know about the equipment.



RECORD OF PACKER PERFORMANCE ON BAG FACTORY

Form No. 17  
Rev. No. 01

Machine No. **823 36**

Frequency Monitoring	Date	Responsibility Operator	Note	Checked by Supervisor			Description Report		
				Name	Sign	Date	Name	Sign	Date
Weekly	7/5/21	<ul style="list-style-type: none"> <li>• Walk through machine, looking for operator operation</li> <li>• Check for movement of components in machine</li> <li>• Observe product pallet distribution</li> <li>• Check Alarm</li> </ul>	<ul style="list-style-type: none"> <li>- Excessing</li> <li>- Normal</li> <li>- Good condition</li> <li>- Okay</li> </ul>	Fadhil	[Signature]	7/6/21			
Monthly		<ul style="list-style-type: none"> <li>• Inspect timing, air compressor</li> <li>• Check fluid for dust (oil/dust)</li> <li>• Air Filter (oil/air)</li> <li>• Check gauges oil/dust</li> </ul>							
Quarterly		<ul style="list-style-type: none"> <li>• Inspect panel, electrical, etc</li> <li>• Check bag size</li> </ul>							
Yearly		<ul style="list-style-type: none"> <li>• Check bag size</li> </ul>							

Figure 7: Weekly monitoring report for the equipment.

### 2.4.3 Record the packer value and actual value for product at line DF

For this task, Encik Asyraf, chemical engineer for dry fusion(DF) plant instructed me to record packer value and actual value for product at line DF. The purpose of this task was to record every product bag after the operators filled the bag with the powder or granule. Every pallet contained 25 bag for 25 kg while 50 bag for 10 kg. The products that I always record were calcium stearate and zinc stearate. In this task I no need to record it every time as Encik Asyraf told me that if I had a free time, just go to the packing area and collected the packer value and actual value. Every day, I will collect until 50 bag from different packaging line which were line 2 DF and line 3 DF. This task was important as we wanted to see the performance of the packer. Every packer had the weight range that powder will come out from the hole. For 25 kg of product, the weight range that company set was 25.05 kg until 25.10 kg while for 10 kg of product the weight range was 10.05 kg until 10.10 kg. What I had learned from this task was when the operator weighed the bag and it exceed the range that company had set it, it showed that the packer was not accurate or the performance of it was not very good. I will bring my notebook to record the value and at the office, I will insert it into the Excel as my record. In addition, Encik Asyraf will take my data for him to present it in front of operation manager, Encik Kamsari in the meeting.

RECORD OF PACKER LINE 3 - Excel

PACKER VALUE(KG)		ACTUAL VALUE(KG)		NO	PACKER VALUE(KG)	ACTUAL VALUE
1	24.98	24.87	1			
2	24.78	25.02	2			
3	25.2	25.7	3			
4	25.05	25.08	4			
5	24.98	24.96	5			
6	25.22	25.33	6			
7	25.02	24.99	7			
8	25.1	25	8			
9	25.08	25.09	9			
10	25.07	25.04	10			
11	24.89	24.81	11			
12	25.01	25	12			
13	25.12	25.12	13			
14	25.03	25.04	14			
15	25.11	24.98	15			
16	25	25.04	16			
17	24.91	24.97	17			

DATE	23/1/2021
PRODUCT	CALCIUM STEARATE
LET NO	412155-1, 412156-1
PRODUCT WEIGHT(KG)	25

Figure 8: The data of the packer in the Excel.

#### 2.4.4 Learning the procedure of packaging product

During my industrial training, aside I recorded the weight value for the product at dry fusion plant, I also learn how to pack the product at dry fusion plant after the reaction process. I learn it from Encik Asyraf and the workers at there. So the procedure of the packaging were:

- I. After the product is mixed and kept in the packing silo, take the bag and put the nozzle of the bag into the hole of packer and push the start button. Make sure the auto mode of packer is on because if use manual mode, we must refill it manually.
- II. During filling, tap the bag so the powder can enter without stick onto the wall of the bag. Make sure to tap the bag if the weight of the product still below 20 kg because if we tap after the weight is 20 kg, the weight of the bag will not accurate.
- III. After refill the powder, pull out the nozzle of the bag and weighed the bag. If the weight was not satisfied which meant not followed the weight standard by the company, we must refill it with the top up product at the side of the weighing balance. Besides that, take the sample of the product into the small packet for lab department checked and tested the product if the product was acceptable or rejected. The sample was taken for fifth bag and twenty fifth bag. After that, put the product sample in the wardrobe at the beside of the packaging line.
- IV. After top up the powder, record the weight of the bag and brought it to the hydraulic baling press machine to compress the vacuum inside the bag around 5 minutes.
- V. Before put the bag onto the pallet, compress again the bag by using our body to make sure the powder inside the bag was put neatly.
- VI. Lastly, after arranging all the bag, wrapped the bag by using plastic wrap repeatedly and paste the product name card with its lot number to notify the operator to carry it to the housewares.



Figure 9: Packer at line packaging DF 2.

#### 2.4.5 Drawing the plant and equipment

During my industrial training, I always do drawing for the plant and some equipment. Many drawing that I had been drawn such as the plant, tank and hopper. In the first week, my supervisor Encik Zulhimie ordered me to redraw again stabilizer process flow in the Excel as the drawing that company provided was a previous version. So he wanted me to redraw again as the plant had added another tank and other new equipment. After that, I also draw the new cooling tank because the old cooling tank was leaked so he wanted to build a new one. So,



I will measure the dimension of the tank by using measuring tape provided by production department before I drew the tank by using Autocad. Moreover, mechanical engineer, Encik Razak once instructed me to draw a mixer hopper at line DF 5 because he wanted to know the dimension of the mixer hopper as he wanted to propose a pyramid model in the mixer hopper. So, the product will go down easily in the mixer hopper. Furthermore, my supervisor Encik Zulhimie also instruct me to draw a new tank for a new SL process flow by using dimension from old tank and changed the dimension from the drawing. From doing this, I can refresh again my drawing skills as I had left it for a long time. As an engineer, drawing was important in daily life as we always want to draw any equipment or plant for the future project in the company. Other than that, my manager Mr Colin also ask me to draw the equipment which was main hole lid for his project and I was involved together with my supervisor and Encik Razak.



Figure 10: I am drawing using an Autocad.

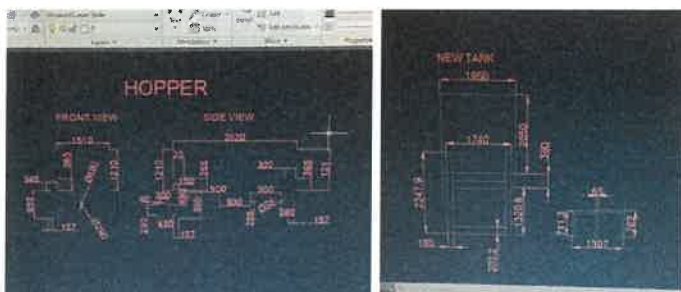


Figure 11: Several drawings that I drew using Autocad.

#### **2.4.6 Learning about reaction process at SL process flow and DF process flow**

Sometimes if I had finished my task early, I will go to SL plant and DF plant to learn about the reaction with other workers. During sitting in the plant, I will bring my notebook to jot down the material that used for the reaction to produce the product. Besides that, I always ask the workers there how the reaction occur because the plant already has the operator in-charge so my supervisor let me to learn the reaction process with them. From that, I can know when we will put the raw material into the tank, the procedure for putting the material into the tank and when we must put the water into the tank to make it easily mix together. Furthermore, I also learn about the name of product as DF plant there were three different product which were calcium stearate, magnesium stearate and zinc stearate. In addition, I had known that for magnesium stearate, they rarely produced it because of less customer's request so if they wanted to produced it, they will just produce it by using flexible bag.

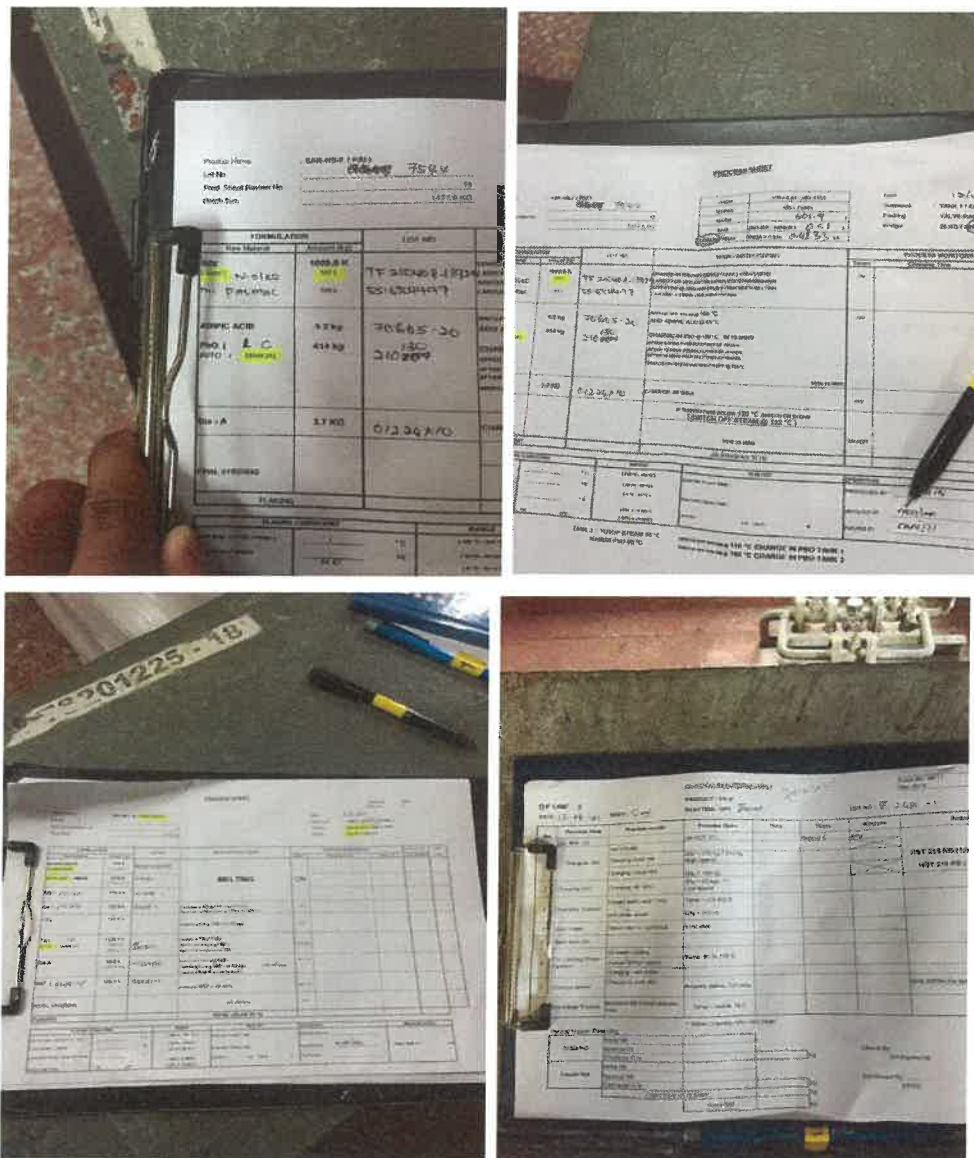


Figure 12: The reaction sheet.

#### 2.4.7 Changing the manometer liquid for U-tube manometer

For this task, I need to change the green dye inside the U-tube manometer because if the dust collector and bag filter keep operating, the color of green dye will become faded. So, my supervisor Encik Zulhimie instructed me to keep looking to the green dye whether it became faded or not. If the color became faded, I will pull out the U-tube from the tube glove and replace it with new green dye. I can get the green dye at the office that provided by production department. This task was important because I can calculate the difference of the pressure level for U-tube manometer as the green dye was clear compared if we fill with plain water. I also need to make sure that the U-tube was clean from dust as the green dye cannot enter the tube if the dust was collected inside the tube.



Figure 13: Changing the manometer liquid.

#### 2.4.8 Work from home

During our Prime Minister announced that the country had a full lockdown, I can't enter the company as my manager said that only 60% staff can enter the factory. As a result, I just stay at home and me request from Encik Zulhimie to work from home and propose the task that related to the company.

##### 1. Plotting the graph performance of packer at line packaging DF

Before that, I had asked Encik Asyraf about the graph for the performance of the packer. This is because during my industrial training, he said that he wanted to show me how to plot the graph. So, during me work from home, he sent me the graph example and from that I studied the graph and always ask him regarding to the graph. After that, I tried to plot my own graph using the data that been collected before. After plotting the graph, I will check if the graph that I plotted same as the graph example. After I been confident with my work, I will ask permission from Encik Asyraf if he willing to check my task. If he gave me a green light, then I will give it to him by using email because it was easy and quick.

##### 2. Dust explosion incident in the factory

Moreover, because I had training in the factory, so I want to propose any task that related to the safety and health as it was important when we worked in the industrial area. During work from home, I had proposed about the dust explosion in the factory as dust explosion had occur in my factory. But I just take the incident at the factory in general because I cannot write down the dust explosion chronology at my factory in the report because it was private and confidential. In this task, I describe the meaning of dust explosion in general. I also describe the dust fire and explosion pentagon that needed for dust explosion to happen. Other than that, I describe the type of dust explosion that some people may do not know about this which was primary dust explosion and secondary dust explosion. Besides that, I also list all the materials that can be a combustible hazard and list the condition for dust explosion to occur. From that, I explained how the factory should handle the dust explosion after it happened. Lastly, I listed down some prevention that can apply in the industrial area such as hierarchy control that well-known among the industrial area.

##### 3. Propose about safety control for equipment in the factory

I also propose about safety control for equipment in the factory. Because my company produce two product so that meant it had two process flow. From that, I studied again my process flow and know every equipment in the process flow. After that, I searched on the Internet the safety control for every equipment in the two process flow. Furthermore, I also describe about the safety control for equipment in general because we as operator and engineer should know the safety control for the equipment so we can know how to handle the

equipment without any mistake and we can teach it to the newcomers. Besides that, after I finished compiled all the safety control in a one report, I will send it to Encik Zulhimie for checking by using email.

#### 4. Propose about SOP COVID-19 in the factory

Nowadays coronavirus had been spread to many area including industrial area. This is because this virus had no symptom or it just common symptom such as fever and coughing. So many people always ignore this matter as they just assume that they still healthy but in their body the coronavirus already stayed in. So, I want to propose it and conclude if my company had follow all SOP rules that Kementerian Kesihatan Malaysia already stated. From that, I will describe what is the coronavirus and how the virus spread among the people and human body. I also list down the effect of coronavirus on the many aspect such as human body, economy and social. Other than that, I also explain about 3C's which are confined space, close conversation and crowded place. Last but not least, I had listed the prevention that company can follow to prevent the COVID-19 disease in the factory area. Lastly, I will compile it together in one report and send it to Encik Zulhimie for checking by using email.

#### 5. Doing research about the product in the company

As my company produced two product so I want to do some research about the product which were PVC stabilizer and metallic stearate. From that I search about the name of the product, function of the product, the reason why the product is important in the specific industry and the application of the product. After I list down all the information day by day, I will do a simple mind map and list down the information in a simple word so I can understand easily about the product. Lastly, I will send it to Encik Zulhimie for checking.

#### 6. Propose about safety operation procedure (SOP) in workplace

Lastly, I do about safety operation procedure (SOP) in workplace because my company is an industrial sector so we must concern about the safety and health of all the workers as they always work in dangerous area every time and they will face any hazard in the workplace. So, in this task, I describe about SOP in general and the content that needed for the SOP. Other than that, I also describe example of disaster from the result of non-compliance of SOP. Next, I list down several potential hazard that always happen in industrial sector and list down the hazard control that company can implement it. After finalize all the task, I send it to Encik Zulhimie for checking using email.



## 2.5 MINI PROJECT

During the industrial training, there are several mini project that had been done such as proposal of new cooling tank, proposal of holes lid SGP and proposal of workbench. However, only one mini project that been successful which is holes lid SGP.

### 2.5.1 Proposal of holes lid SGP

This mini project needed me to draw the hole lid. Factory manager, Mr Colin once ask my supervisor, Encik Zulhimie to build hole lid for the hole at sifter line DF 5 because the dust powder keep coming out of the hole at sifter. By that, Mr Colin call me and my supervisor, Encik Zulhilmie to discuss together about the hole lid. Firstly, Mr Colin asked us to go and measured every hole at sifter line DF 5 to know the height and diameter of each hole. There were six holes which must been drawn.



Figure 14 : Measure the hole with supervisor.

After measuring the holes together, En Zulhimie instructed me to draw every hole according to the height and diameter which has been written down by using an Autocad and showed it to Mr Colin.

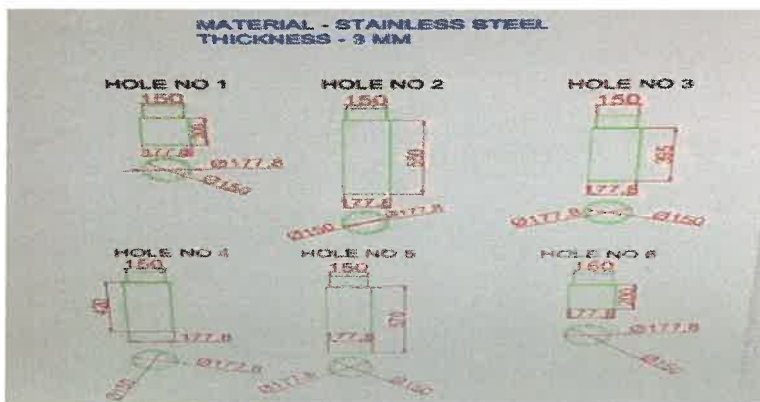


Figure 15 : 6 holes sifter that been drawn.

After the drawing been approved by Mr Colin, he let me to discuss with my supervisor, Encik Zulhimie the material used, height, thickness and diameter for the proposed holes lid. The material used for the holes lid that we been decided is SGP because it was cheapest and easier to get. Other than that, if we want to build holes lid with our own measurement, the supplier can't built it because they don't have the measurement that

we wanted it. As a result, Mr Colin let us to follow the original specification for the holes SGP. For the thickness for the lid, my supervisor let to put 5.3 mm and the diameter for the lid is 191 mm as it can fit to every hole at the sifter. Later, I drew the proposed holes lid and showed to the manager. During the discussion with manager, there are some sort of mistake in the drawing which was missing the flat. Flat was a kind of key place that we can put the padlock because manager wants it as the lid will put together with the bottom holes without moving here and there.

Next, I redraw again the hole lid and the drawing been showed to the Mr Colin again. During the discussion with the him, he wants to propose the handle on top of the lid so the worker or the charge hand can carry it easily. So, we brainstorming together the height, thickness and the length for the handle. After go through every suggestion together, the final result are for height of the handle is 100 mm, the thickness of the handle is 10 mm and length of the handle is 191 mm according to the diameter of the holes lid. From the height of 100 mm, 20 mm of the handle will be welding on the side of the lid. Then, I drew again the final drawing and showed it to Mr Colin.

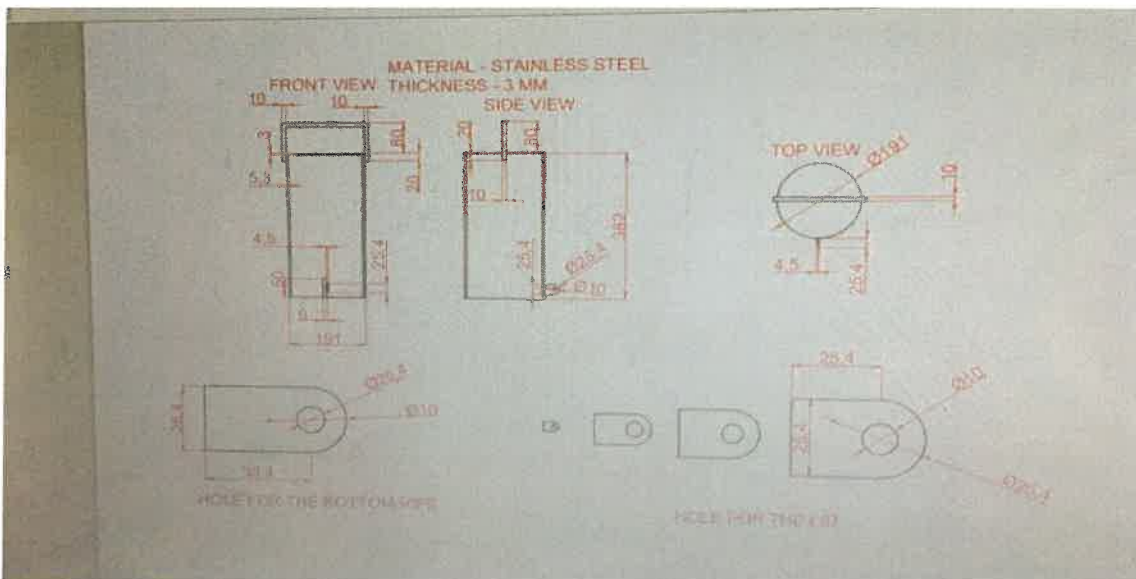


Figure 16: Drawing of holes SGP.

After the drawing been approved by the manager, the drawing had been given to the supplier and we showed the drawing and explain more detail about the drawing to them and after that, they will build it. From that, I learned we must be confident to speak to the other people and try to explain the task carefully to make them understand what we been talking about. In a week, they gave the sample of the lid to the Encik Razak, the person in-charge and let he tested the lid at the sifter DF 5 whether the lid is fit into the hole or not. So he asked me to come with him to test the sample. After that, we went together to line DF 5 to test the sample of the holes lid. Finally, it was fit into the every six hole of the sifter and the mini project of holes lid SGP had been done successfully.



Figure 17: Sample of the holes lid.

### 2.5.2 Proposal of new tank

For this mini project, my supervisor, Encik Zulhimie wanted to build new tank for his new stabilizer plant. This is because, in front of my company, there was new stabilizer plant. So, he called me and he instructed me to measure the old tank at old stabilizer plant. After that, we went to workshop to borrow measurement tape. In the plant, me and Encik Zulhimie started to measure the tank. From that, I jotted down all the diameter and height of the tank.



Figure 18: Measure the tank with supervisor.

After measuring all the tank, I went back to office and started to draw the tank by using an Autocad. After submitting the drawing to Encik Zulhimie, he noticed that he wanted to change the height of the tank as the height of the old tank was too high as the workers or mechanics may face problem to repair it. So, from the drawing, he wanted me to decrease the height of the tank from the bottom of floor. After correcting the drawing, I submitted again the drawing to Encik Zulhimie and he satisfied with my drawing and he took my drawing as his reference soon.

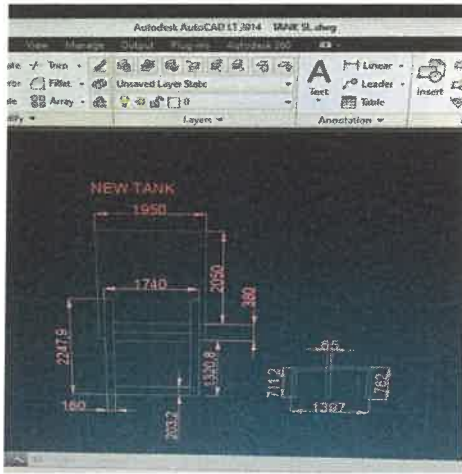


Figure 19: Drawing of new tank.

### 2.5.3 Proposal of new workbench

After the mini project for holes lid SGP was done, Mr Colin once again called me to draw a workbench for the workshop. The purpose of this project because of he wanted to rearrange the workshop to a new workshop with a proper workbench so the workers can keep easily their tools without leafleted everywhere. From that, I must measure the workshop so we can know how much workbench can fit into the workshop. After measuring the workshop, Mr Colin and I discussed together the total of workbench that can fit into the workshop. As a result, there were six workbench that can fit into the workshop. Next, Mr Colin instructed me to propose and find the suitable workbench for the workers. He wanted the workbench that can place many tools inside it. Therefore, I searched through Internet the perfect workbench and try to modify by myself. I had put all the dimension for the proposed workbench.

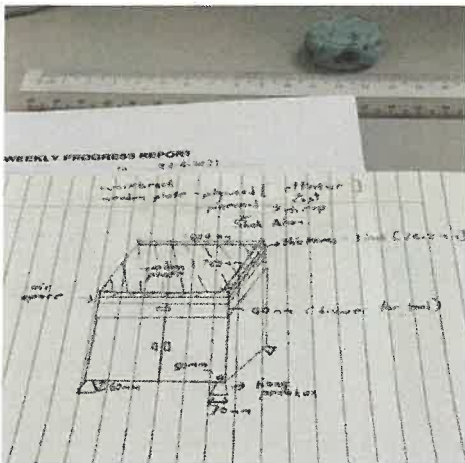


Figure 20: Proposal of new workbench.



### **3.0 CONCLUSION/RECOMMENDATION**

In a nutshell, what I had learned throughout this internship was a good communication among team members and other colleagues. This is because, me as a practical student sometimes involve in the discussion with other engineers. As a result, if we had a good communication skill, we can share some ideas for the project. Moreover, aside good communication skill, during internship, I learned to be more brave to speak with other staff because of my shyness. I felt grateful to other staff because they treated me as their part of the company not as a practical student. Frankly, I can throw away my shyness to speak more with them and listening to their experience working at SUN ACE KAKOH. Furthermore, what I had learned during the internship was a perfect time management. This is because, when we work at the factory, we must quick doing something and we can't waste the precious time just like that. For example, if my manager ordered me to do something, I must do it quickly so he no need to keep waiting for me because I do not want him gave a bad impression towards me as it will affect my internship. However, for me it was same during me studying at the university because we must quick finished the assignment in the time allotted, but working environment was more challenging because we worked with human of different characters and personalities.

Last but not least during this internship, I gained many new skills and knowledge about the chemical engineering even sometimes my task was out of my field but I felt grateful because I can learn it. Besides that, I also learn that I must be independent which was I must keep ask the engineers if there something that I can lend a hand for them without keep waiting the task will come to me because from that they can see I had a good attitude towards them. Other than that, I can learn we must be open minded to other people and accept their opinion and critiques because different human, different characteristic. But, for me it was actually very useful because I can apply it when go to the real working environment after graduating soon.

Regarding to the chemical engineering, I'm glad that I can still remember how to use Autocad for drawing. Drawing was the common task that every engineer must know and apply it. Although on the first time, I can't remember how to use it, but when I searched throughout Internet I can use it for drawing. Encik Zulhimie also feel grateful as I can draw using Autocad so he can just pass the task to me. Besides that, I can learn how the product was made by going into the plant and asked the workers there about the reaction process as it was a part of chemical engineering.

Lastly, for the recommendation, the company should give approval to internship student for working at the factory even it is lockdown as sometimes student has no work to do when they stay at home so they will propose any task that related to the company. So, the result of their practical training may not good at all. Secondly, the production department should do housekeeping in the working area once every two weeks to avoid any incident that may occur such as dust explosion. This is because, my company only do housekeeping in once every month so it not practical at all.

#### 4.0 APPENDICES



Figures 21: Pictures about the equipment (From top left to right- DC 2 SL, DC 3 SL, DC 4 SL), ( From middle left to right- DC 1&2 DF, DC 3 DF, HS 1 DF), ( From middle left to right- HS 2 DF, HS 3 DF, DF 5 DC), ( Bottom- Transfer silo DF 5)

JIS G3452 (1988) SGP

Nominal size	Outside Diameter		Thickness		Unit Weight (plate width)	
	A	B	mm	in	kg/m	kg/m
6	5.6	76.5	0.473	2.0	0.079	0.282
8	7.6	10.8	0.543	2.3	0.096	0.419
10	9.6	17.3	0.661	2.6	0.096	0.662
15	1/2	21.7	0.854	2.8	0.096	0.951
20	3/4	27.2	1.07	2.8	0.110	1.31
25	1	34.0	1.34	3.2	0.110	1.68
32	1 1/4	42.7	1.68	3.5	0.128	2.43
40	1 1/2	48.6	1.91	3.5	0.136	3.36
50	2	60.5	2.38	3.8	0.160	3.99
63	2 1/2	76.3	3.00	4.2	0.165	5.31
80	3	89.1	3.81	4.2	0.188	7.47
90	3 1/2	102	4.50	4.2	0.195	8.79
100	4	114	4.50	4.5	0.177	10.1
125	5	140	5.50	4.5	0.177	12.2
150	6	165	6.50	5.0	0.197	15.0
175	7	191	7.51	5.3	0.208	18.5
200	8	216	8.52	5.8	0.228	24.2
225	9	242	9.52	6.2	0.244	30.1
250	10	267	10.5	6.8	0.260	36.6
300	12	319	12.5	6.8	0.272	42.4
350	14	356	14.0	7.9	0.311	53.0
400	16	406	16.0	7.9	0.311	67.7
450	18	457	18.0	7.9	0.311	77.6
500	20	508	20.0	7.9	0.311	97.5

Tensile Strength : 290N/mm<sup>2</sup>

Figure 22: Diameter and thickness of hole.

Flat

Section Size	Unit Weight		Section Area	
	Thickness	Width	M	A
mm	mm	kg/m	cm <sup>2</sup>	cm <sup>2</sup>
3	12	0.263	0.360	
3	16	0.377	0.480	
3	18	0.447	0.570	
3	25	0.589	0.750	
3	32	0.754	0.960	
3	38	0.895	1.14	
3	50	1.18	1.50	
3	65	1.53	1.95	
3	75	1.77	2.25	
3	100	2.36	3.00	
4.5	32	0.883	1.13	
4.5	37	1.13	1.44	
4.5	35	1.24	1.58	
4.5	38	1.34	1.71	
4.5	44	1.55	1.98	
4.5	50	1.77	2.25	
4.5	65	2.30	2.93	
4.5	75	2.65	3.38	
4.5	100	3.52	4.50	

Figure 23: Flat for the holes lid.



Figure 24: Holes lid at the sifter.



Figure 25: Sample of product at packer.



Figure 26: Wardrobe for product sample.

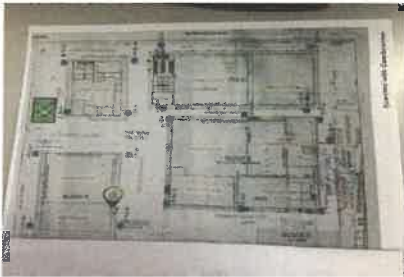


Figure 27: Master plan for Earth Chamber.