



## **INDUSTRIAL TRAINING FIELD REPORT**

### **KCC PAINT SDN BHD**

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## ACKNOWLEDGEMENT

Assalamualaikum W.B.T, I want to show my deepest gratitude to the almighty Allah SWT for giving me such a bless opportunity and guidance to make this report, complete the task given during my industrial training and complete my diploma studies.

Firstly, I would like to express my deepest gratitude and special thanks to my supervisor, Mr. Amri bin Md Zain, the Quality Control Executive, despite he is busy with all of his duties and works as he still has time to guide me and give advices during this industrial training period. Other than that, he always supported and encouraged me to do the task and project.

Secondly, I also would like to thank KCC staffs especially QC assistant and the others such as worker from packing production whom helped me to gain new knowledge and skills while undergoing the industrial training period. During the process of training, I faced many difficulties together especially in this pandemic. Luckily, the people around me really supportive by giving their moral support and guidance for me throughout this internship.

Finally, I hope that KCC Paint Sdn. Bhd. Can become one the best paint and coating supplier in Malaysia. I also wish their successes in this field.

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## 1.0 INTRODUCTION

Industrial training is one of the important component in engineering curriculum. All the theories learnt in the core and non-core courses will apply into real working experience in chemical industries. Usually industrial training will be in the last semester in Diploma. During industrial training, students are trained to make job applications before stepping into the real working environment. Industrial training really important to expose and give students real working experience. This training really help students to mentally prepare and adapt to work environment especially for students who want to get permanent job after graduation.

Industrial training also the chance for students to get permanent job at their internship place.

For Diploma in Chemical Engineering, duration for industrial training is 14 weeks with 7 credit hours. At the end of the industrial training, students should be able to identify the types of work that chemical engineers do in real engineering world and appreciate the theoretical knowledge learnt. Students also need to perform basic engineering practices, including writing report, communication with colleagues, handling project and generating proposal for betterment of the industries. Students also should have higher level of integrity, ethical and accountability in practicing engineering.

## 2.0 CONTENT

### 2.1 COMPANY BACKGROUND



*Figure 1: KCC Paint Sdn Bhd Logo*

Korea Chemical Company aka KCC started out as Kaumkang State Industries Ltd in 1958. For over half a century KCC has been playing a leading role in technological innovation in building materials such as glass, windows, doors, exterior and interior materials and flooring. Then, KCC moved into silicone business, an area ripe for the creation of high value products in the fields of specialized paints and next generation precision chemical engineering. Nowadays, KCC has been one of the largest chemical company in Korea and expand their business in Malaysia.

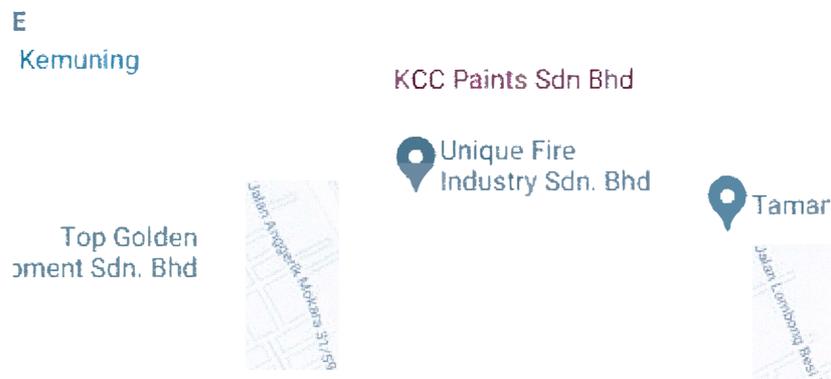
In Malaysia, KCC focus on manufacturing, development, sales of various paint and coating. KCC Malaysia is located and Kota Kemuning, Shah Alam, Selangor. KCC Paint become one of the best paint suppliers in Malaysia other than Kansai Paint and Nippon Paint. KCC Paint always prioritized the quality of the paints. With a well-balanced team of experienced, skilled and professional employees, KCC can produce high quality of paints and coating. Thus, they can attract many customer. KCC Paint also have a good management. They're really take care of their employees' welfare. One of the example is they provide flight ticket for foreign workers to go back to their home.

## 2.2 COMPANY LOCATION



**Figure 2: KCC Paint Factory 1**

Every student at Universiti Teknologi MARA (UiTM) need to seek for companies for their industrial training in order to complete the Diploma in Chemical Engineering. Due to the Covid-19 pandemic, it is really hard to find a placement. Many factory are not open internship placement. However, KCC Paint still open the chance for industrial training but they're not taking many students. Below shows the location of KCC Paint Sdn Bhd which is located at No 1, Jalan Anggerik Mokara 31/55, Seksyen 31, Kota Kemuning, Shah Alam, Selangor.



**Figure 3: KCC Paint Sdn Bhd via Google Maps**

## 2.3 ORGANIZATION CHART

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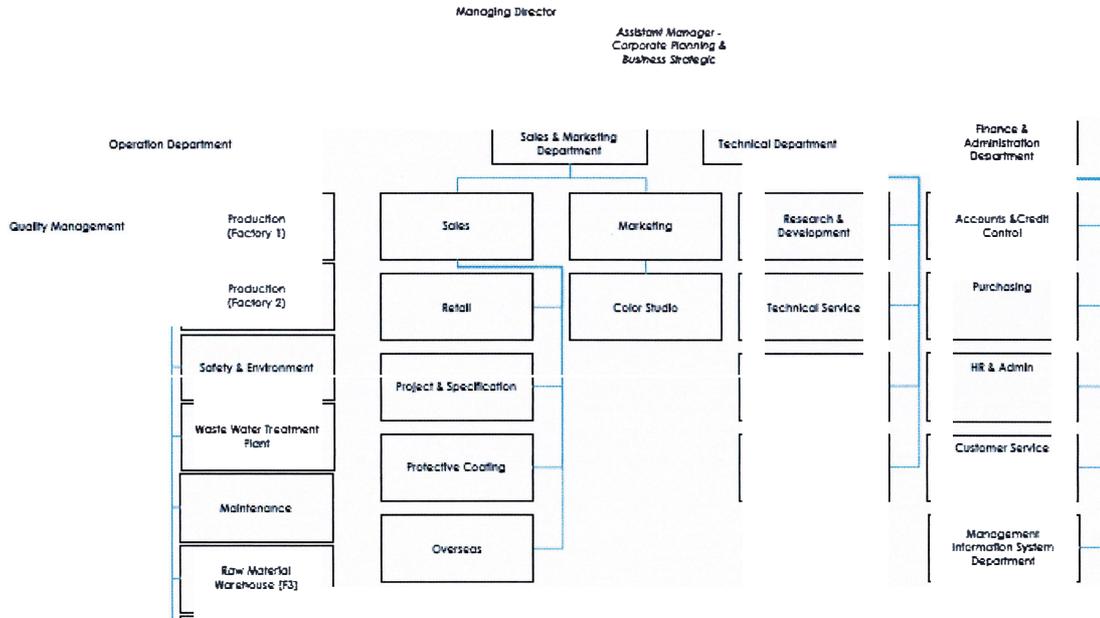


Figure 4: Organization Chart of KCC Paint Sdn Bhd

## 2.4 PROCESS FLOW OF PRODUCTION

### 2.4.1 Planning

In KCC, each product have their own formula. This formula are developed by Research and Development (R&D) Department. R&D is responsible for determining what materials are suitable for use in making the product. R&D will make the product in their lab in small quantity. Then, R&D also will set the specs requirement for the products. Specs requirement are important to determine the quality of the product. Next, after finish develop formula and specs requirement, R&D will write down the formula and specs on paper called work ticket. This work ticket will give to production to start making the product.

### 2.4.2 Production

After production receive the work ticket, paint maker will start to produce the product. First step of the process is grinding. Grinding is mixing the powder materials in mixer. Grinding process take a few minutes. Then, after grinding process finish, paint maker will give sample to Quality Control (QC) department for dispersion checking process. Dispersion process is to check if there any particle in the sample. For solvent-based paint, the sample will mix with a solvent according to work ticket. One of the solvent use is xylene. For water-based paint, the sample will mix with water if the sample too thick. If there any particle during dispersion checking process, the product will be stirred for few minutes. If dispersion process is passed, paint maker continue to next process which is mix with other materials such as solvent or water. When the process of making the product finish, QC will take sample for checking the specs required in work ticket such as viscosity, pH, specific gravity and color. If there any problem with the specs such as viscosity too high, QC will make adjustment based on previous record. If no previous record, QC will refer to R&D about the problem. When all the specs required passed, QC will give to packing department for packing the product.



**Figure 5: Mixer**

#### 2.4.1 Planning

After received the work ticket, packing worker will prepare the cans or drums to pour the product. The will be filtered before poured into the cans or drums. This step really important to avoid any unwanted particle in the product. Then, the cans or drums will be labelled and packed according to their batch before move to warehouse. If the product need to delivered to customer on the same day, the product will loaded to lorry after finish packing.



**Figure 6: One of the KCC Paint product**

## 2.5 WEEKLY ACTIVITY

Working hours at KCC Paint Sdn Bhd is at 8:00 a.m. to 5:30 p.m. every Monday till Friday and lunch break is at 12.00 p.m. until 1.00 p.m. On Friday, the lunch break is at 1.00 p.m. until 2.30 p.m. During fasting month, the working hours and lunch break are same.

**Table 1: Working Hours at KCC Paint Sdn Bhd**

Days	Entering Shift	Lunch Hour	Exiting Shift
Monday - Thursday	8:00 A.M.	12:00 – 1:00 P.M.	5:30 P.M.
Friday	8:00 A.M.	1:00 – 2:30 P.M.	5:30 P.M.

In KCC Paint, internship students are put in Quality Control Department. Within the department, the students involve in the checking the specs required in work ticket. Internship students are not required to make adjustment for product that have problem. This is to avoid students from being blamed or scolded by upper management if customer make a report. The students are also given some mini project during internship.

All the activities done daily or weekly at the company is recorded in a logbook. The logbook is provided by the faculty.

#### Week 1 (22/3/2021 – 26/3/2021)

On the first day, I have been shown QC department, R&D department and production department. I have been put in water-based paint QC department. During this week, I was trained to check specific gravity (SG). To check the SG, the first step is weigh the SG cup and make it weigh to zero. After that, I pour the sample in SG cup until full and closed the cup. Then, I weigh the SG cup that contain the sample. Also on this week I was transfer to solvent-based paint QC department.

#### Week 2 (29/3/2021 – 2/4/2021)

During this week, I was trained to check color. To check color, I pour the sample and the standard (previous batch of the same product) on a bar-down paper and pull it using an iron bar to flatten it. After that, let the paint dry. After dry, the color can be check by using computer. The color will compare with previous record. If the color in the range of the spec, the color can be passed. If the color is not in the range of the spec, QC assistant will make adjustment based on previous record.

#### Week 3 (5/4/2021 – 9/4/2021)

During this week, I was trained to check viscosity (KU). To check KU, firstly let the sample cool down until reach 25 °C. Then, put the sample at the viscometer and let the viscometer read viscosity. Also on this week, I learned spray technique from Kamal (QC assistant).

#### Week 4 (12/4/2021 – 16/4/2021)

During this week, I was trained to check sagging. To check sagging, firstly take a glass board. Put the sagging tester on top of the glass. Then, pour the sample below the sag tester. After that, pull the sagging tester along the glass board. After one minute, take the glass board and check the sagging with sagging tester.

On this week, I got two mini project. First is to determine which drying method is suitable for three type of solvent-based paint. One of the method use is let the paint dry on room temperature for 10 minutes and then put it in oven for one hour. Second project is to determine thickness for three type of solvent-based paint. This is to make sure the equipment for thickness is accurate.

#### Week 5 (19/4/2021 – 23/4/2021)

During this week, I was trained to check dispersion. To check dispersion, I pour the sample on the bar-down paper and pull it using iron bar to flatten it. Then, I check if there any particle on the paper. If there any particle on the paper, I will inform to QC assistant and tell to paint maker to let the product stirred for few minutes. Also on this week, I check the KU, SG and color.

#### Week 6 (26/4/2021 – 30/4/2021)

During this week, I was trained to check non-volatile matter (NVM). To check NVM, I put 350g of the sample in non-volatile matter content tester. Then, let the machine run for few minutes. After the machine stop, check at the meter. If the NVM percentage is in range of the spec, the NVM can be passed. If the NVM percentage is not in the range, I will test again until get the percentage in range. If I still can't get the NVM percentage in range, I will inform to QC assistant. On this week, I also get a mini project which is to determine viscosity in different temperature (pot life).

#### Week 7 (3/5/2021 – 7/5/2021)

During this week, I was trained to check drying time. To check drying time, I pour a little from the sample on a plastic ruler and pull it by using a mini iron block along the ruler. Then, let the ruler on drying time test machine for 24 hour. After 24 hour, I check and mark on the ruler where the line started and stopped. Then, I compared with the timeline at the machine. Also on this week, I check the other specs. On this week, I get a mini project which is to determine viscosity versus time.

#### Week 8 (10/5/2021 – 14/5/2021)

During this week, I was trained to check pH. To check pH, I the use pH meter. For pH, if the pH is too high compare to work ticket, it doesn't need to adjust. And during this week, I check the other specs.

#### Week 9 (17/5/2021 – 21/5/2021)

During this week, I was trained to spray for certain product. To spray, I'll go to a spray room. Then, I pour the paint in spray bottle. After that, I spray on an aluminum plat. I spray for few times. Then, I take sagging tester to check sagging on the plat. If the value in range, the spec for spray can be passed.

Week 10 (24/5/2021 – 28/5/2021)

During this week, I was trained to check color for water-based paint. To color, the step is same like in the solvent-based paint. Also on this week, I check the other specs required in work ticket.

Week 11 – Week 17 (31/5/2021 – 16/7/2021)

During this week, total lockdown was started. KCC don't get permission to open the factory during lockdown. So, my supervisor give me task for work form home.

Schedule task for Inter during MCO 3.0

\*Follow update if MCO continue

Date	Task	Check
1-6 June 2021	Understanding Process of Water based (From Planning to Production & Packing)	
7-13 June 2021	Understanding Process of Water based (QC Process for Colour/White)	
14-20 June 2021	Understanding Process of Water based (QC Process for Based)	
21-27 June 2021	Understanding Process of Solvent Based (From Planning to Production & Packing)	
28 June- 4 July 2021	Understanding Process of Solvent Based (QC Process for Colour/White)	
5-11 July 2021	Understanding Process of Solvent Based (QC Process for Based)	
12-16 July 2021	Review online interview for overall task	

**Figure 7: Task for Work From Home**

## 2.6 MINI PROJECT

### 2.6.1 Determine thickness for 3 product of solvent-based paint

This project I use three solvent-based paint such as Korethane 300 Beidge, Korethane 300 Red Oxide and Korethane 300 Executive Grey. Firstly, I pour the paints on an aluminum plat. Then, I pull the paints along the aluminum plat using an iron bar. This iron bar have thickness 300 $\mu$ m. After the paint dried, I use coating thickness gauge the check the thickness of the paint. The purpose of this project is to check if the iron bar that QC use is accurate or not. This thickness affect the drying time for the paint.

### 2.6.2 Drying methods for 3 product of solvent-based paint

This project, I use three solvent-based paint. This project I need to do the same step as checking color. I pour the paints on bar-down paper then pull the paints using iron bar (300 $\mu$ m). After that I use different drying method. First method is 10 minutes drying on room temperature then in oven for 1 hour. Second method is 15 minutes drying on room temperature then in oven for 1 hour. Third method is 30 minutes drying on room temperature then in oven for 1 hour. The purpose of this project is to determine which method is suitable for drying.

### 2.6.3 Pot life

The purpose of this project is to check if viscosity increase by time. In this project, I use some of solvent-based paint such as Korethane Red Oxide. Firstly, I'll multiple the specific gravity of the paint with ratio given in work ticket. After that, the value will multiple with 500mL (volume of can). Then, mix with hardener. Then, I let the paint expose to surrounding temperature. I will check the viscosity every 15 minutes until the viscometer can't read the viscosity. Basically the maximum read is around 160.

### **3.0 CONCLUSION AND RECOMMENDATION**

As overall throughout this industrial training, I realized that teamwork and communication is really important. With good communication and teamwork, workflow will become smooth and clear. This help to speed up the work in QC. Other than that, the discipline also important in KCC. Employees are not allowed to use phone while working. And KCC always prioritize the safety, KCC provide safety shoes for every employee and every week will have a safety talk by safety officer. Real working environment are really different with environment in college. In workplace, the environment is really challenging especially in mental and physical. From my internship experience in KCC Paint, I gained new experience, useful knowledge and new skill. This is really help me to improve for my working life in the future. I also get an insight in facing working life and be ready for the next step in my career.

In relating to chemical engineering, I learnt how use the equipment to determine viscosity, specific gravity and pH. In college, I learnt the theories how to calculate the viscosity and specific gravity. I'm glad to have a chance to use the equipment. During the internship, I also saw the process to treat water. This is important to avoid water pollution. I also used my safety knowledge to avoid any unwanted incidents. Thus, I realized that all the knowledge I learnt at college really help me in working.

Lastly, I noticed some things that should be improve. First is increase the manpower in QC and packing. This is because manpower for both QC (water-based paint and solvent-based paint) is 2 people per QC. When one of the worker absent, it will inconvenience the other worker especially when the order is too many. And the process to pass the product become slower. It same goes to the packing department. In packing department, they need to packing product such as 3000L in 500mL cans. So, by increasing the manpower, the packing process can become faster and easier to all the packing worker.

## 4.0 APPENDICES



*Figure 8: Viscometer for checking viscosity*



*Figure 9: Specific Gravity cup for checking specific gravity*



*Figure 10: pH Meter for checking pH*

