INDUSTRIAL TRAINING FINAL REPORT

SESSION : FEBRUAURY – AUGUST 2022

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Supervisor Name	: Mr. Jacky Chan and Madam Liza Abu Bakar
Department During Attachment	Process Optimization Intern
Duration (Date)	6 months (21st February 2022 – 4th August 2022)
Lecturer Evaluation	Nor Fadilah Mohamad

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ACKNOWLEDGEMENT

All accolades are due to Allah, the Most Generous and Most Merciful, and blessings and peace be upon His Messenger. Above all, I want to thank Him for giving me the perseverance and patience necessary to finish the internship report. It is without a doubt a crucial necessity for a recognised diploma, and I have fantastic assistance from many sources, which I would like to mention here with great joy and sincere thanks.

I'd want to start by thanking and praising my industrial training instructor, Mr. Jacky. He is quite kind in person and eager enough to give any newcomer, including me, his complete attention. I wouldn't have made any clear progress or understood the significance of being an intern at all without his unending kindness and wit. Most sincere gratitude for his assistance, suggestions, and all the valuable teachings. I also would thank Madam Liza as my second supervisor, she is very helpful when my main supervisor is not in the office. She also helps a lot when I have any questions during my internship period.

Not to mention a supporting parent that always pray for me and helps me during my industrial training term. I would also want to express my gratitude to dear lecturers who guided me and other companions throughout the internship program from the very beginning till its completion.

ABSTRACT

This industrial training report of Muhammad Naufal bin Faris to undergo an industrial training for duration of 6 months which consist of 24 weeks before completing the Diploma courses. Starting industrial training on 21st February 2022 until August 4th 2022 at Teknos (M) Sdn Bhd which guided by Mr Jacky Chan Won Hee.The purpose of this program is to fulfill the course in order to complete the Diploma as well as graduate from the university. The training refers to work experience that is relevant to professional development prior to graduate. In first chapter this report is defining the term of industrial training and description on industrial training objectives. This part explains the details of objectives of industrial training report and industrial report. In second chapter of report is overview of the company and departments. The duties that were assigned to me is is about documentation about process in the factory, also the process of technical skill. Secondly, my duties during my internship period is quality control check where check the product according to the specs. This training gives me a lot of experience on working in real life situation. I also learn on how to solve a problem in a certain situation. This training is good opportunity for students to learn about real-life working situation.

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CHAPTER 1: Introduction of Industrial Training

1.1 Overview

Students in specified programs at all levels of higher education in Institutions of Higher Learning are required to complete Industrial Training (IT) (IHL). Industrial training programmes were created to strengthen the necessary competencies in order to increase the number of graduates qualified for employment. Industrial Training (IT) is the process of exposing students to engineering work in the real world and involving them in Chemical Engineering projects before they graduate. One of the conditions for the award of a diploma in chemical engineering is that the student complete at least twenty-four (24) weeks and twelve (12) credit hours of industrial training within semester six (6) OR after passing all of the courses studied from semester one to semester five.

The goal of Industrial Manship is to introduce UiTM students to industrial culture and the workplace while also improving student employability by developing their industrial abilities. They will also attend several briefings that serve as training for the trainee. This internship will be for 24 weeks, beginning on February 21 and ending on August 4, 2022.

Courses in industrial training (IT) provide students with learning chances in the workplace so they can gain real-world experience and increase market trustworthiness. The industrial training aids in producing chemical engineering technician graduates with excellent technical skill and soft skill competency when it comes to preparing the students as engineering technicians. Since all core and elective theories can be utilised in industrial training, it is expected that students would be able to approach problems and projects given to them by supervisors in original and creative ways. Additionally, the industrial training boosts students' self-confidence and enhances their collaboration and communication abilities. Students are also required to practise engineering with a high degree of integrity, ethics, and accountability.

1.2 Objective Industrial Training

The main objective of Industrial Training (IT) is to give students learning opportunities in the world of work to receive practical experience to improve the reliability of the market. In preparing the students as an engineering technician, the industrial training helps to produce chemical engineering technician graduates with excellent technical skill and soft skill competency. The
other objectives are:

1.3 Industrial Training Placement

Address: PLO 577, Jalan Keluli 8, Kawasan Perindustrian Pasir Gudang

- Tel: +60-072515115
- Website: www.teknos.com/en-my
- Business Segment: Coating for wood, Paint

1.3.1 Industrial Schedule

Working Hours	Monday to Thursday 8:00 AM-12:00 PM 12:00 PM-1:00 PM 1:00 PM – 5:00 PM Friday 8:00 AM-12:00 PM 12:00 PM-1:00 PM 1:00 PM – 5:00 PM
Holiday	Saturday and Sunday

Table 1.3.1.1 Industrial training schedule

1.3.2 Company Supervisor Information

- Name: Mr Jacky Chan Won Hee and Madam Liza Abu Bakar
- Position: Process Optimization Manager
- Contact number: 012-7006248 and 019-7508655
- Email address: jacky.chan@teknos.com and liza.abubakar@teknos.com

CHAPTER 2: COMPANY PROFILE

2.1 Company Background

Figure 2.1.1Teknos logo

Teknos (M) Sdn Bhd was founded in March 1997. Their main office is located in Finland, the company produced paint and coating. Their coating is used in many applications such as Machinery, construction, energy. For furniture, they were use in interior and exterior design, kitchens, flooring and flat panels. In 2021, they produced 5029 tons of product including 1,405 batches and 65% of capacity utilization. In Teknos (M) Sdn Bhd They mainly produced water-based an UV coating with a revenue of RM 23.88 million where distributing manufacturing and industry is the highest in the revenue which is 51% followed by interior design and exterior which is 24% and flat panels which is 13%. They have 4 main distributors fform Indonesia, Japan, Thailand and Vietnam.

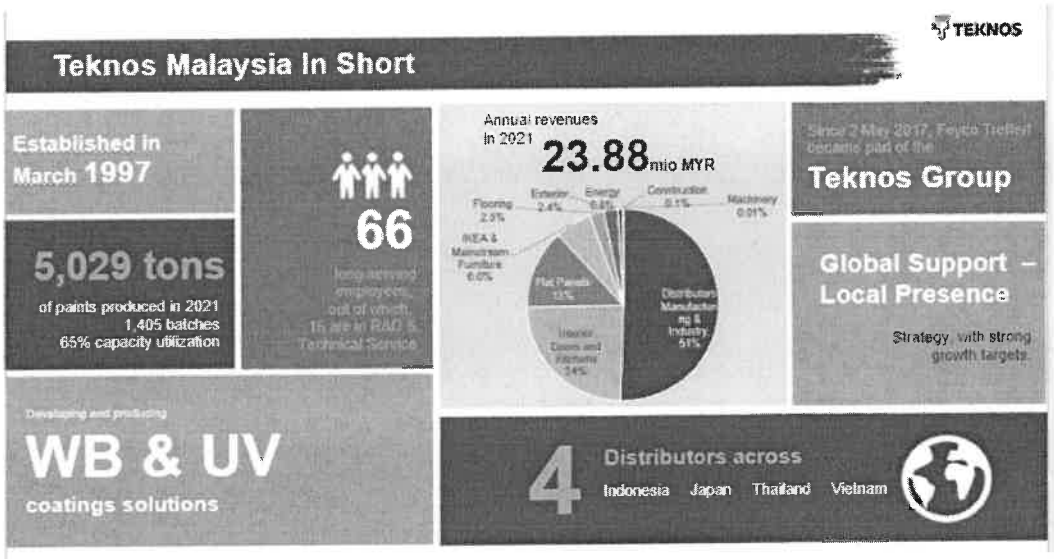


Figure 2.1.2 Teknos Malaysia In short

2.2 Company History

In year 1948, an old farm in Tuomarila, Espoo, including a hen house was rented for the purpose of manufacturing paint (Finland). After renovation, the hen house was converted to use as a laboratory. After then, production began using a pan mill and the power of one man. The caseine paint Tuomo, which bears the name of the town of Tuomarila, was Teknos's first offering. Their emblem, which features a cockerel and a paintbrush, pays homage to the roots of their business.

In 1949, Ferrex anticorrosive paint was developed as the result of several distinct factors. It is sufficient to say that curiosity, solution-based thinking, and an inventive approach were key factors, reflecting the fact that Teknos has always placed a high priority on product development.
The paint that slowed down corrosion on surfaces was popular in Finland and many other nations since it served various industrial demands.

Conquests were accomplished in various places in addition to Ferrex's triumph. Numerous novel and cutting-edge goods have been created over the years, some of them even being firsts in the world. Sometimes, our solutions may seem extremely counterintuitive, such as when Ferrex Aqua, a water-based product, slows the corrosion process. However, these situations simply serve to emphasise the inventiveness of our product development process.

The company that began its operations in a small hen house grew into an international concern, nonetheless staying as a family business. Our growth story continues conducted by the third generation of Kiikka family.

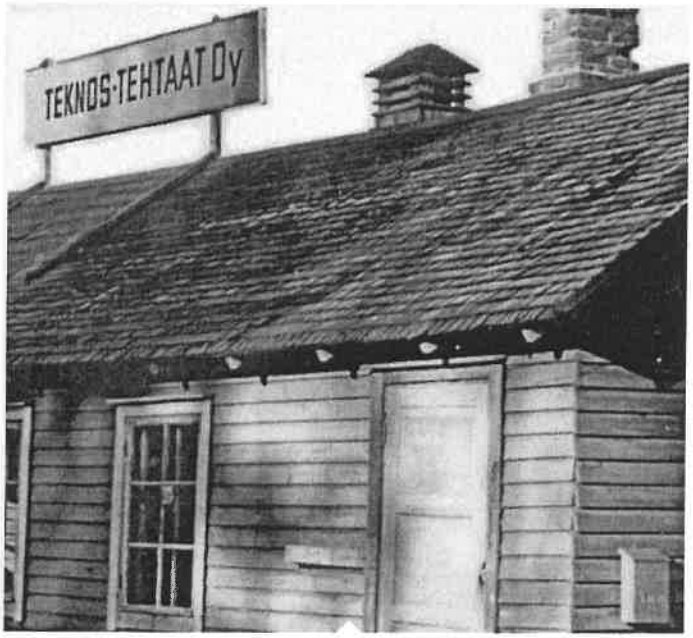


Figure 2.2.1 Teknos in 1948

2.3 Vision and Mission

- Vision- Sustainable coating solution provider close to customers
- Mission - Protect & prolong by providing unique coating solutions and services which also make the surfaces beautiful

2.4 Organization Chart

Teknos (M) Sdn Bhd is directed by Wanda Smith. She is the Managing Director for Teknos(M) Sdn Bhd. she has many subordinates below her including the Operational Director, IT executive, R&D Director, and other executive. For the student, he is supervised under the supervision of Mr. Jacky Chan as the main supervisor, he also guided by Madam Liza Abu Bakar.

Figure 2.4.1 Organization chart from Operational Director

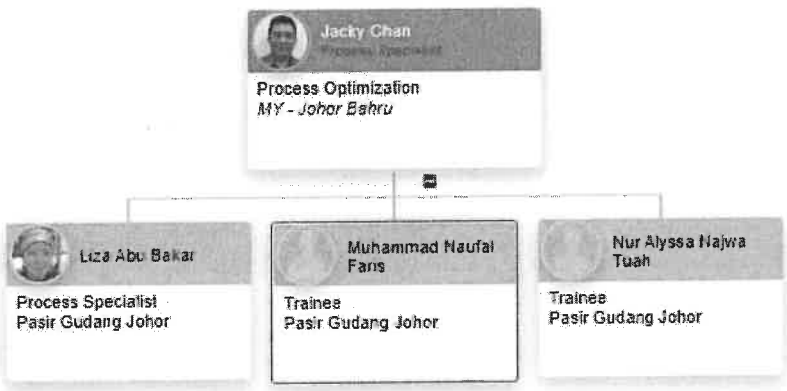


Figure 2.4.2 Organization chart during industrial training

2.5 Main Product/Service Provided to the Client

Teknos (M) Sdn Bhd mainly produced Water-based coating and UV paint and coating. In paint it has four main components.

The first one is binders. The term binder describes the materials that keep the pigment particles of paint together. Since the binder holds the pigment in place when the paint dries, all paints contain some form of binder. The synthetic binder used in acrylic painting media is typically intended to create a film after water has evaporated. The second one is solvent, Solvent-based coatings have larger quantities of organic components than water-based coatings and are sometimes referred to as "Oil-based" or "Alkyd" paints. These compounds or solvents make it easier to apply paint, let it dry, and build a regular, long-lasting paint coating. The third one is pigment. Finely ground colorants known as pigments are insoluble. By using wavelength-selective absorption, a pigment alters the color of light that is reflected or transmitted. Pigments can be made of natural or artificial materials. They serve as coloring agents, corrosion inhibitors, and water barriers in paints and coatings. The last component is additive. Paint additives are used to either give the paint particular attributes that would otherwise be difficult to accomplish, such as better slip, flame retardance, or UV stability, or to prevent faults in the coating, such as foam bubbles, poor levelling, flocculation, or sedimentation.

A waterborne coating is an environmentally acceptable surface treatment that disperses the resin used to create the coating or paint using water as a solvent: 80 percent of the solvent is dissolved in water. Its purpose is to make the paint or coating simple to use and environmentally friendly. A UV coating or more generally, a coating that has been exposed to radiation to cure it is a surface treatment that either uses ultraviolet radiation to cure it or shields the underlying material from its damaging effects.

The benefits of water base coating is where: -

• Water is main carrier and also as a diluent
• Small quantity of coalescing agent (propylene glycol and alcohol)
• Do not contain harmful solvent (toluene, MEK, xylene and etc..)
• It has low VOC emit when drying
• Non-flammable & lower odor
• It is getting more popular and attention due to stricter environmental and health regulation around the world.

Whereas for UV: -

- 100% solid, No VOC, safe, less

- Hazards and compliance to
- Environmental regulation
- Consistent finishing and speed of
- Production; higher productivity

Speed of curing Instant curing; immediate reaction withpolymers with use of photoinitiators High solid system; high build finishing, Less amount paint used to achievehigh build finishing.

Most of the coating in Teknos (M) Sdn Bhd is mainly for woods coating. In Southeast Asia (SEA). Their target customers is mainly for furniture such as interior and exterior design, kitchen furniture, flooring and flat panels.

CHAPTER 3: OVERVIEW OF THE TRAINING

3.1 Introduction

During 24 weeks of the training, variety of jobs are provided by Teknos (M) Sdn Bhd includes Documentation for International for Standardized Operation (ISO) certificate. An organization can obtain an ISO certification as proof that it adheres to one of the global standards created and disseminated by the International Organization for Standardization (ISO). Furthermore, the student did some quality control check on products based on their specification. Next, the student help the company to setup a kaizen system by preparing a team board, Plan, Do, Check, Act (PDCA) table.

3.2 Summary Of The Training And Experience Gained

Task 1: Documentation for ISO certificate

During the industrial training, the student is needed to prepare a document for ISO certificate, the certificate consist of ISO 14001, ISO9001, A globally recognised standard known as ISO 14001 outlines the specifications for an environmental management system. Through more effective resource utilisation and waste reduction, it aids organisations in improving their environmental performance, giving them a competitive advantage and the confidence of stakeholders. Whereas ISO 9001 can be described as The internationally accepted benchmark for quality management systems is ISO 9001. (QMS). With more than 1 million certifications granted to enterprises in 178 countries, it is the QMS standard with the greatest adoption rate worldwide.

Task 2: Quality control check for product and retained sample

A company's efforts to maintain or raise product quality are achieved through the quality control (QC) process. Units are tested as part of quality control to see if they meet the requirements for the finished product. After a product was produced, the product needs to undergo a quality control check to confirm the product can be filled into pail or IBC totes. If the product did not past the quality control check, an adjustment is needed by the Quality Control Department until the product succeeds the QC spec test. Each of the product has different QC specs depending on the type of product that are being produced. The QC check is consist of water-based and UV product.

Task 3: Kaizen System

A continuous improvement strategy known as kaizen is founded on the notion that tiny, continual beneficial changes can have a big impact. It typically relies on commitment and cooperation in contrast to methods that rely on drastic or top-down changes to bring about transformation. The student needs to prepare a PDCA table and kaizen team board in the office.

Task 4: Indirect duties

During training, indirect clerical tasks such taking phone calls, copying documents, printing,and applying stamps were also completed.

3.2.1 Weekly Activity

Week 1

- Under quarantine for Covid-19 close contact (due to company policy)

Week 2

- Introduction to paint making process.
- Observe paint making process

Week 3

Monitor batches to make documentation

Week 4

- Monitor small production batches for documentation
- Monitor filling process
- Monitor UV production (small batch)

Week 5

- Monitor QC department for documentation
- Monitor UV production (big batches)

Week 6

- Prepare draft presentation
- Having discussion with supervisor
- Monitor color matching process
- Kaizen system training

Week 7

- Receive new task from supervisor to monitor IBC tub washing
- Monitor IBC tub washing
- Take videos and pictures

Week 8

- Having discussion with supervisor
- Receive new task to prepare a document for maintenance, contractor management

Week 9

- Continue to monitor IBC tub washing
- Complete slide presentation

Week 10

- Slide presentation is completed
- Transfer IBC tub washing to HSEQ department to register

Week 11

- Hari Raya Aidilfitri leave

Week 12

- Transfer to QC department
- Learn about QC specs and how to operates apparatus

Week 13

- Continue to learn in QC department

Week 14

- Continue to learn in QC department

Week 15

- Check product quality based on specs

Week 16

- Check product quality based on specs

Week 17

- Check product quality based on specs

Week 18

- Positive Covid-19 (under quarantine due to company policy, proof letter is included in logbook report)

Week 19

- Positive Covid-19 (under quarantine due to company policy, proof letter is included in logbook report)

Week 20

- Positive Covid-19 (under quarantine due to company policy, proof letter is included in logbook report)

Week 21

- Positive Covid-19 (under quarantine due to company policy, proof letter is included in logbook report)

Week 22

- Positive Covid-19 (under quarantine due to company policy, proof letter is included in logbook report)

Week 23

- Prepare kaizen team board
- Check product quality based on specs

Week 24

- Handover jobs to new trainee
- Prepare final report submission
- Return company belongings
- End of internship program

CHAPTER 4: DETAILS OF EXPERIENCES

4.1 Introduction

Teknos (M) Sdn Bhd offers a variety of vocations over the 24-week training period, including Documentation for International for Standardized Operation (ISO) certification. To demonstrate compliance with one of the international standards developed and disseminated by the International Organization for Standardization, a company can receive an ISO certification (ISO). Additionally, depending on their specifications, the student performed certain quality control checks on the products. The student then aids the business in establishing a kaizen system by setting up a team board and a Plan, Do, Check, Act (PDCA) table.

4.2 Details of experience gained

4.2.1 Documentation for ISO certificate.

The student must prepare a document for an ISO certificate during industrial training. The certificate includes ISO 14001, ISO9001, The requirements for an environmental management system are laid forth in the widely accepted standard known as ISO 14001 It helps organisations improve their environmental performance through more efficient resource utilisation and waste reduction, offering them a competitive advantage and the trust of stakeholders. In contrast, ISO 9001 is known as The internationally recognised benchmark for quality management systems (QMS). It is the QMS standard with the highest adoption rate globally, with more than 1 million certifications awarded to businesses in 178 countries. The student needs to prepare a document for production process, and IBC tub washing process. Each of the needs to be monitored before doing a proper documented report. The monitoring process will take about 2-14 days depends on the process that are being monitored. For the report, the student needs to include all the details of the process and details including safety issues, critical step, documents that are needed for the process. The student also needs to prepare a flowchart of the process. Also, the student needs to take a visual media such as video or pictures to make it easier to understand by the auditor. After all the details of the process is complete, the student needs to prepare a PowerPoint presentation as a report. Then after all the information is confirmed, the report will be passed to Health, Safety and Environment (HSEQ) department to register in the server of the company.

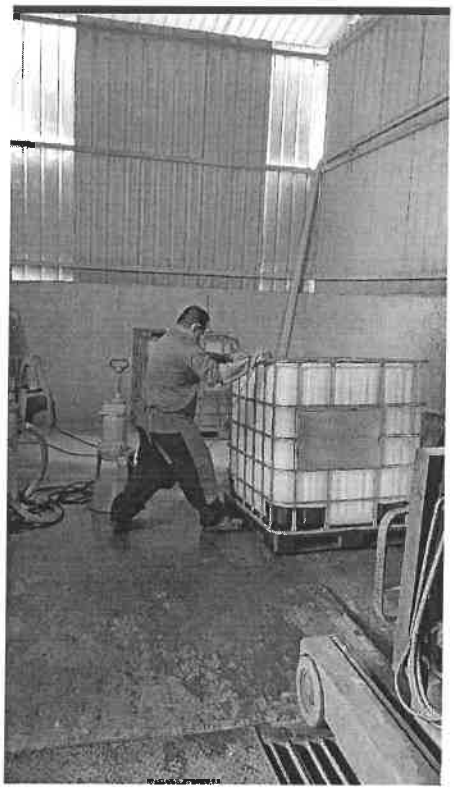


Figure 4.2.1.1 Monitoring IBC tub washing

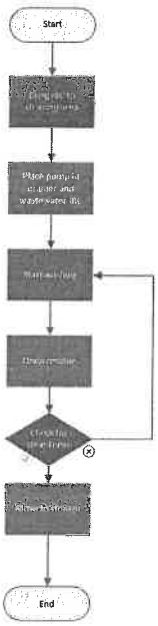


Figure 4.2.1.2 Example of process flowchart

Pre Washing Process

TEKNOS

Instructions	Remarks	Visual Media
1. Bring IBC tub to cleaning area. [1] 2. Open the lid of the IBC and the drainage valve [1] [1] 3. Degreaser [2] a) **Using degreaser** i. Transfer degreaser using siphon pump into degreaser pump [2] ii. Lean the IBC tub about 45° to put in degreaser. [3] iii. Apply degreaser inside and outside of the IBC [4] b) **Not using degreaser** [3] i. Start washing IBC 4. Turn on pump at the drainer and insert the outlet pump in wastewater IBC tank and drainer. [1]	Operation personnel. [1]Make sure the drainage valve is facing the drain. [1]Operate forklift with cautious and care. [2]Wear appropriate PPE when handling degreaser. [3]When leaning IBC, make sure to lean it not more than 45°. [4]Handle degreaser with care to avoid spillage. [1]Waste water treatment IBC [1]IBC facing the drain [2]Degreaser [3]Using Degreaser vs Not Using Degreaser	

Figure 4.2.1.3 Example of report presentation

4.2.2 Quality Control Check

The student needs to check the quality control based on the specification that are provided by Teknos (M) Sdn Bhd. The test contains viscosity test, pH test, semi-mercury test, color test, density test, and many more. The detail is explained below: -

VISCOSITY - DIN Cup

Equipment and Apparatus

1. DIN Cup 4, 6 & 8mm
2. Water-bath
3. Thermometer
4. Spatula/ Tongue depressor
5. Stopwatch
6. Tripod stand

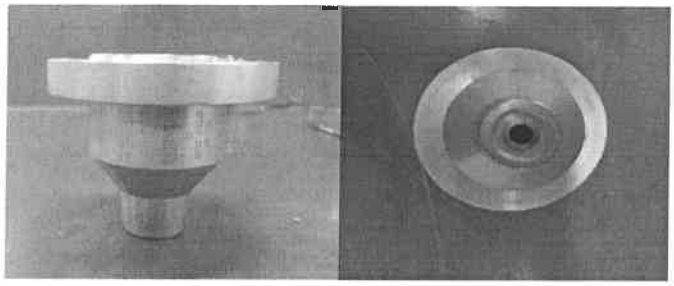


Figure 4.2.2.1 DIN Cup 8mm and its orifice

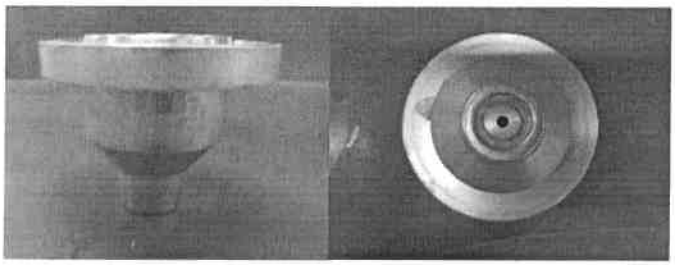


Figure 4.2.2.2 DIN Cup 6mm and its orifice

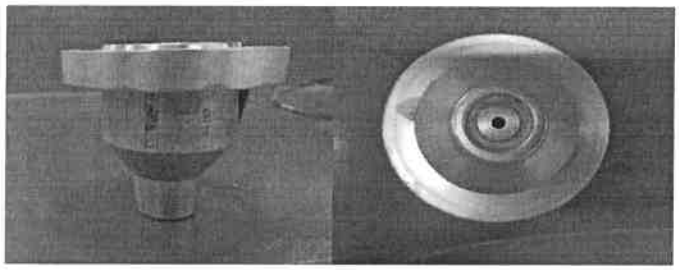


Figure 4.2.2.3 DIN Cup 4 and its orifice

Procedure

1. Adjust temperature of sample in water-bath according to QC specification.

2. Choose DIN cup orifice size based on the requirement in the QC spec sheet.

3. Place flow cup on stand.

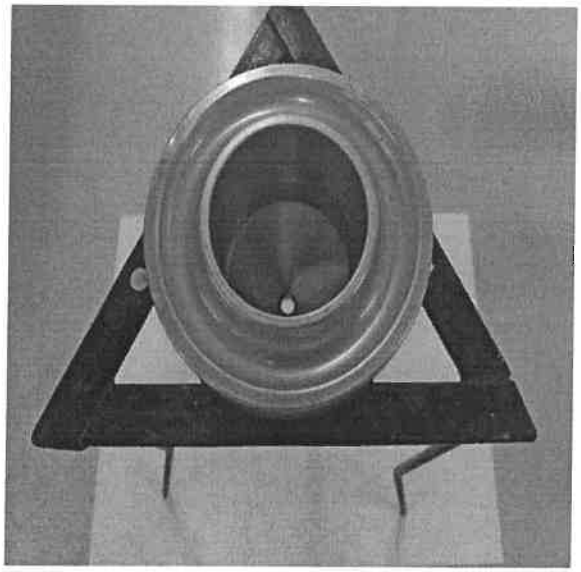


Figure 4.2.2.4 Orifice on its stand

4. Close orifice with finger and fill cup with sample slowly to prevent air bubbles until it overflows over rim into gallery.

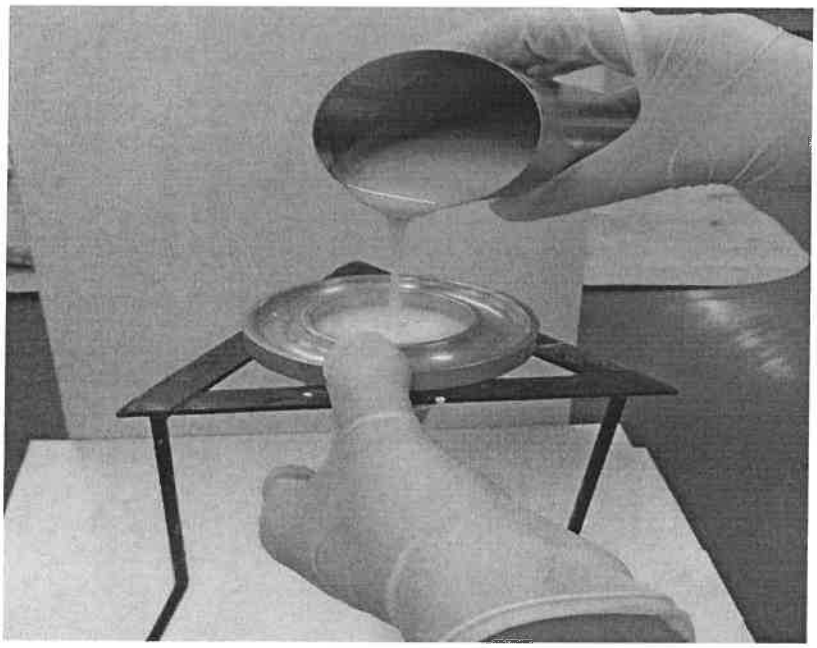


Figure 4.2.2.5 Example of pouring sample in DIN cup

5. Slide off the top of cup with thin glass to scrap of meniscus. Then remove finger from orifice.

Figure 4.2.2.6 Example of glass on the DIN cup

6. Start the stopwatch and simultaneously slide off the glass.

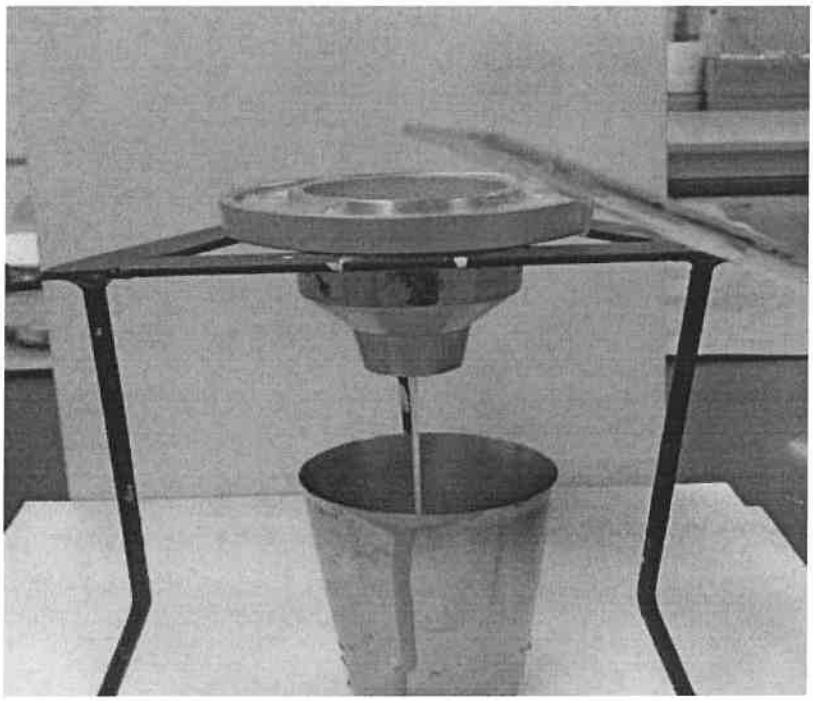


Figure 4.2.2.7 Example of viscosity test

7. Stop timing after 1st break of stream and record flow time in seconds.

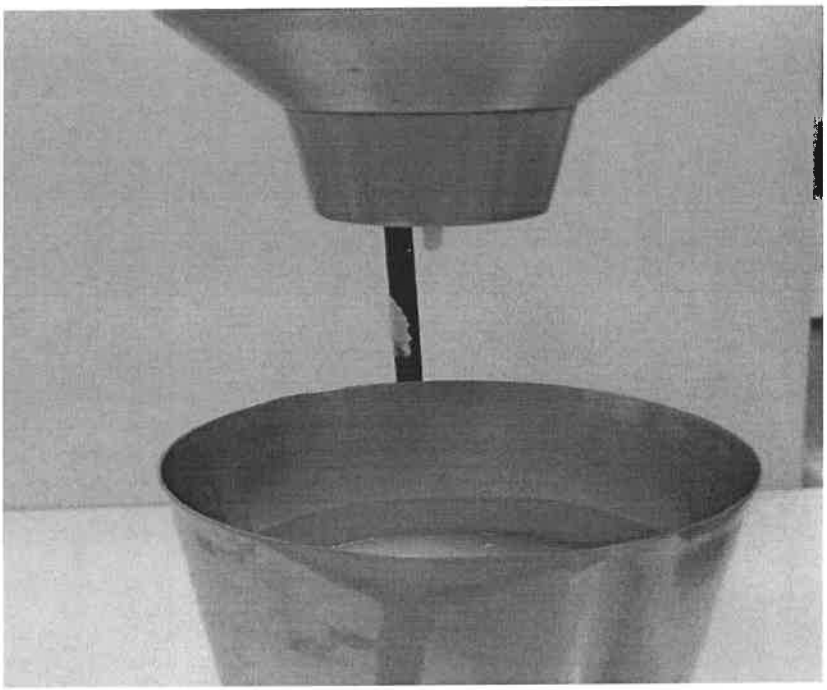


Figure 4.2.2.8 Example of 1st break of flow.

8. Read viscosity (s) on stopwatch.

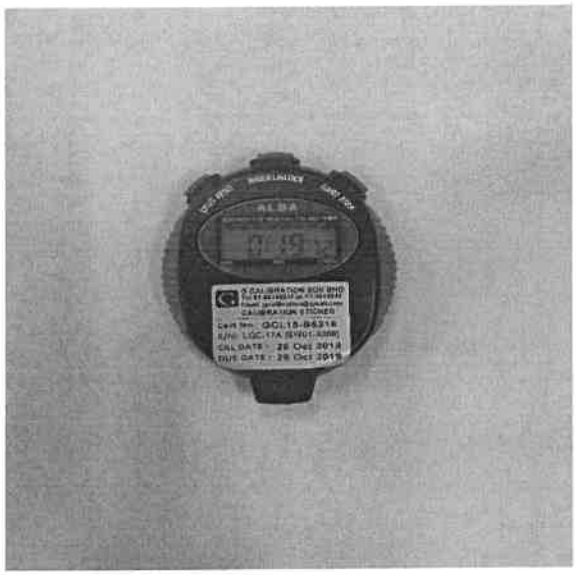


Figure 4.2.2.9 Stopwatch reading

VISCOSITY - Dynamic Viscotester

Equipment and Apparatus

1. Viscotester, with 3 spindles
2. (Model: RION Viscotester VT-06)
3. (Spindle 3 → 0.3 – 13 dPas, Spindle 1 → 3 - 150 dPas, spindle 2 → 2 – 4000 dPas)

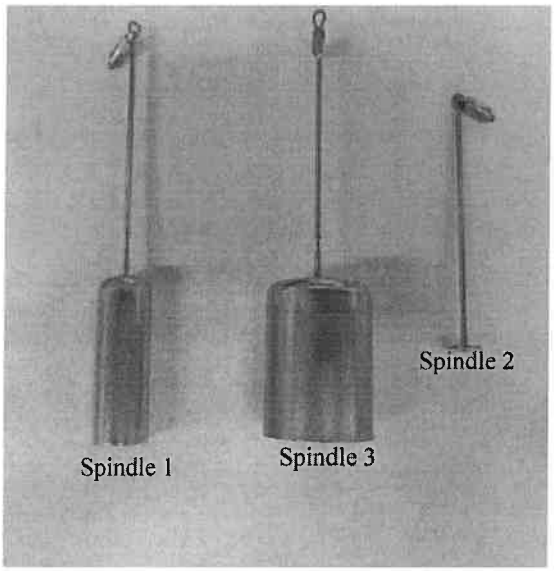


Figure 4.2.2.10 Spindle

4. Water-bath
5. Thermometer
6. Wooden tongue depressor
7. Steel Cup 300ml

Procedure

1. Fill cup until it's almost full.

2. Adjust temperature of sample in water-bath according to QC specification.

3. Attach the appropriate spindle by firmly holding the upper shaft to avoid pointer movement.

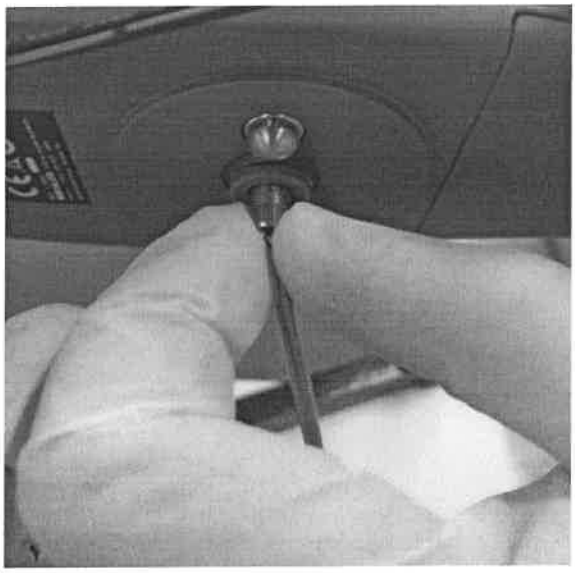


Figure 4.2.2.11 attaching spindle to viscotester

4. Slowly lower spindle until immersion mark on shaft is touched in the middle.

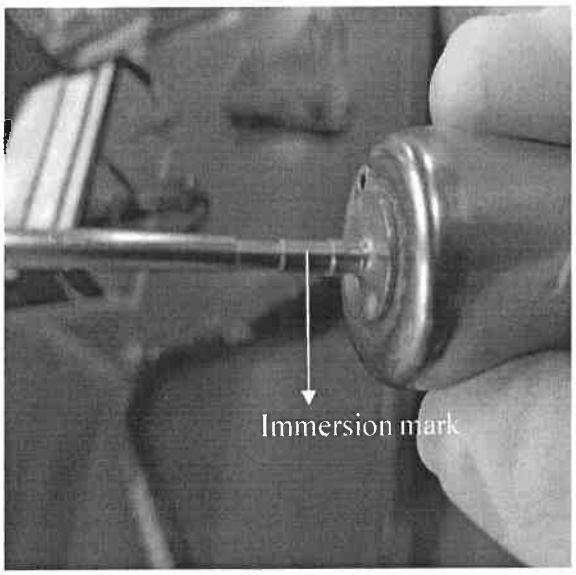


Figure 4.2.2.12 immersion mark

5. Ensure the spindle position is at the centre.

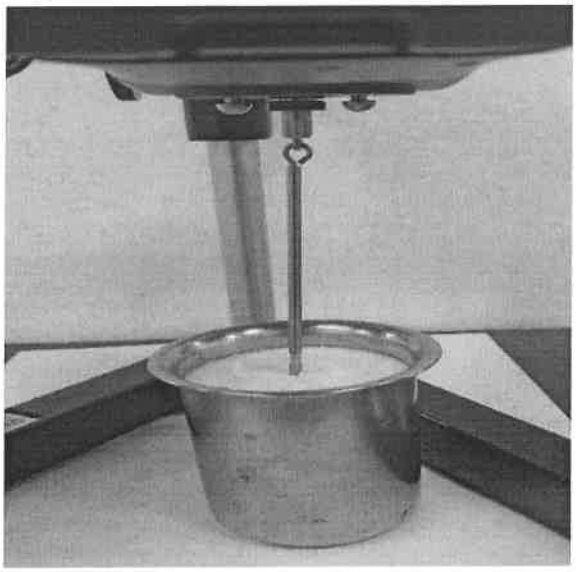


Figure 4.2.2.13 spindle position

6. Switch on the viscotester with the power button. Set the spindle number on the viscotester according to the spindle number used by pressing the "NO." button.

Figure 4.2.2.14

7. Start the viscotester with the START button. Repeat the viscosity test thrice.

8. Read the dPa· s on the LCD screen.

Figure 4.2.2.15 viscotester reading

FINENESS OF GRAIN

Equipment and Apparatus

1. Fineness (Grind) gauge
2. (Model #232)
3. Scrapper
4. Dropper/Wooden tongue depressor

Procedure

1. Place gauge on flat, non-slippery surface and wipe clean before testing.

2. Stir sample well before placing in deep end of path. Sample must be free of air bubbles to obtain an accurate grind reading. Place sample on gauge using a dropper or a wooden tongue depressor.

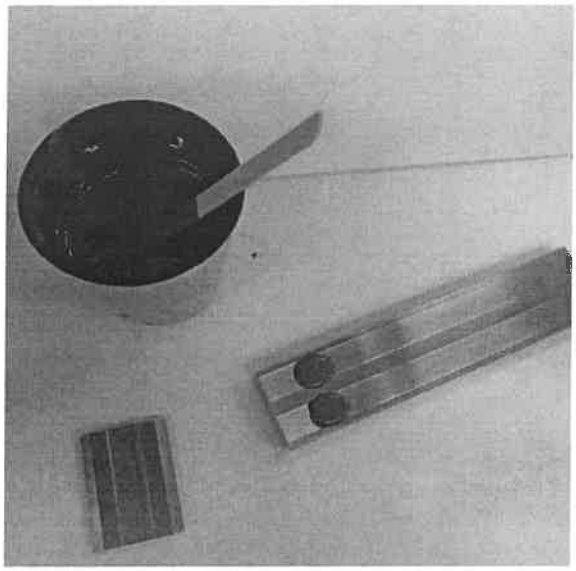
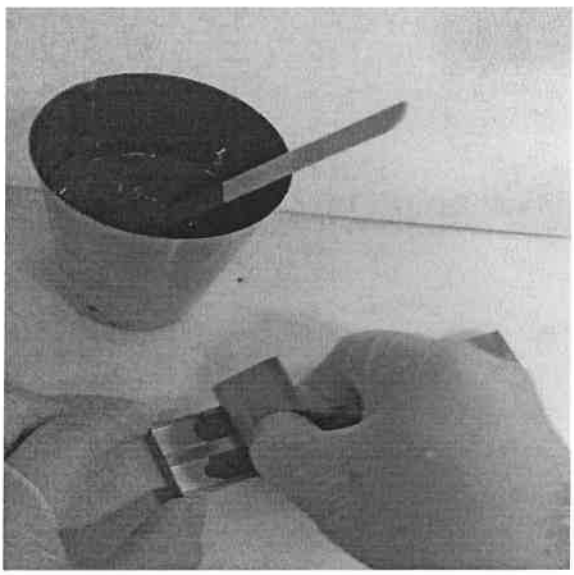


Figure 4.2.2.16 sample on grain gauge

3. Hold gauge in one hand and the scrapper in the other and draw sample down towards the shallow end of gauge with a uniform motion in 1 to 2 seconds with the scrapper.



4.2.2.17 drawing sample down

4. View gauge from side held at eye level. Reading must be done within 10 seconds after drawdown.

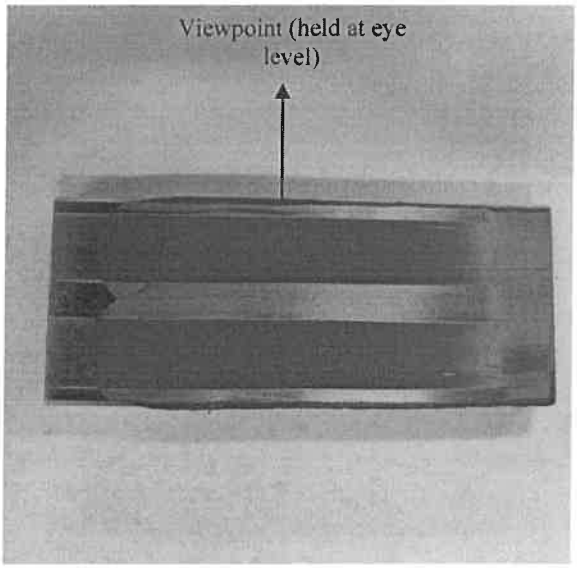


Figure 4.2.2.18 FOG viewpoint

5. Observe point of gauge where material first shows a definite speckled pattern (finely dispersed particles), not just isolated specks.

6. Repeat the test thrice for final confirmation.

7. Clean gauge and scraper immediately after use. Clean with water if the sample is water-based and clean with cleaning solvent if the sample is UV-based.

DENSITY – Specific Gravity cup

Equipment and Apparatus

1. Specific gravity cup 100cc/ml
2. Analytical scale to 0.01 gram
3. Water-bath
4. Thermometer
5. Tissue

Procedure

1. Adjust temperature of sample in water-bath according to QC specification.

2. Weigh accurately the clean and dry specific gravity cup on analytical scale. Tare the scale to reset the reading to 0.00 g.

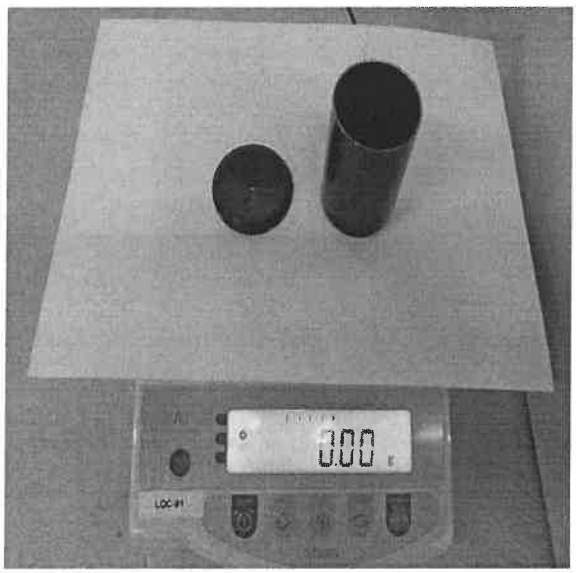


Figure 4.2.2.19 specific gravity cup taring

3. Fill up the specific gravity cup with sample and close the cup (let the orifice open). Pour slowly to avoid bubbles.

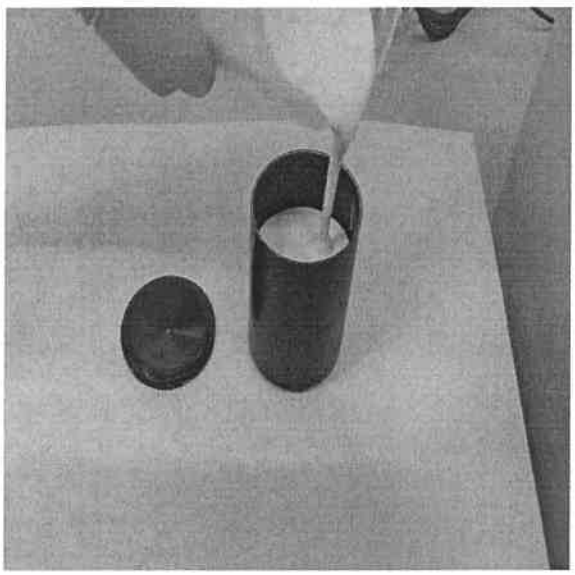


Figure 4.2.2.20 pouring sample in specific gravity cup

4. Wipe the excess sample off with a tissue/cloth when holding the opening (orifice) closed by applying pressure with thumb.

5. Re-weigh the filled of specific gravity cup on same scale, get the reading straight from the scale.

Figure 4.2.2.21 re weigh specific gravity cup

DENSITY – Hydrometer

Equipment and apparatus

1. Weighted hydrometer glass tube (used to test the specific gravity of liquid or the density of the liquid in ratio to water)
2. Cylinder 250ml
3. Water-bath
4. Thermometer
5. Filter funnel

Procedure

1. Adjust temperature of sample in water-bath according to QC specification.

2. Pour a sample into cylinder using a filter funnel and spin it slightly.

3. Insert the hydrometer into the liquid sample just below the point at which it would float naturally. Make sure the hydrometer bulb does not touch the sides or bottom of the cylinder when it settles.

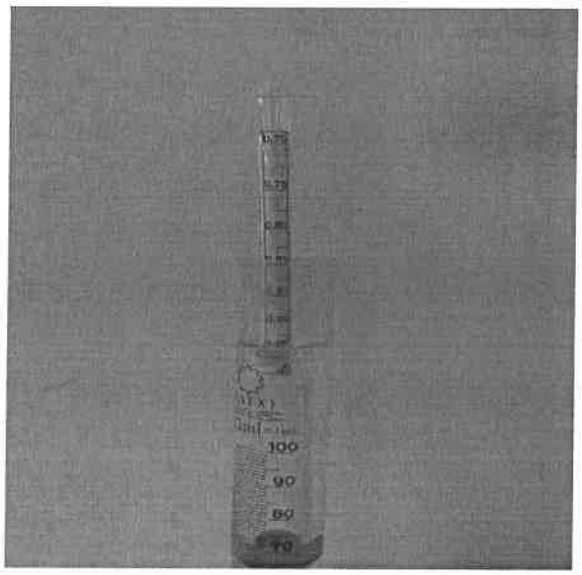


Figure 4.2.2.22 hydrometer in a sample

4. Wait for the hydrometer and the liquid sample to stop moving and for bubbles to dissipate.

5. Read the scale at the bottom of the curve formed by the liquid sample touching the sides of the hydrometer

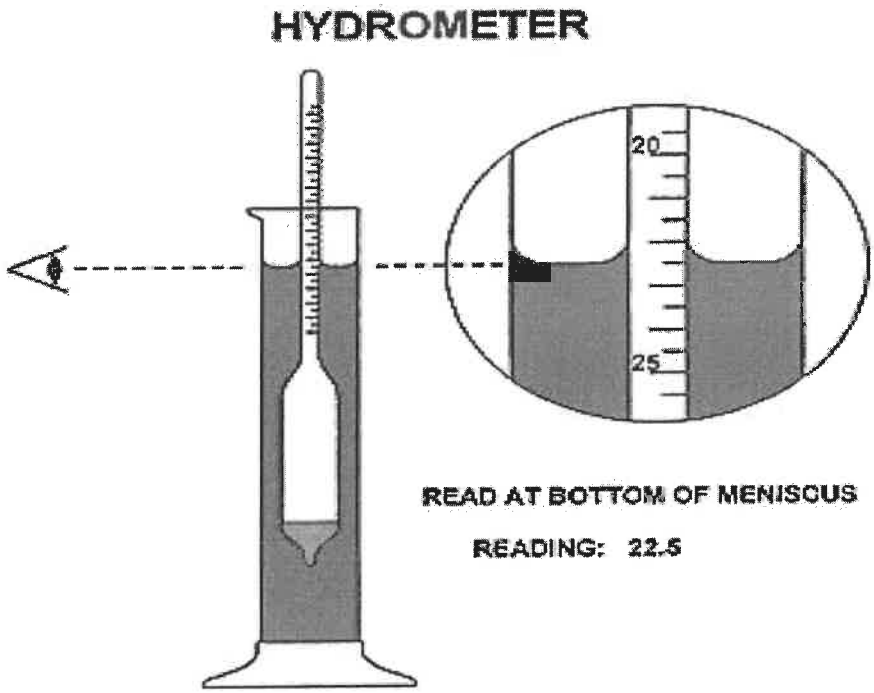


Figure 4.2.2.23 reading meniscus

SOLID CONTENT

Equipment and Apparatus

1. HB 43-S halogen moisture analyser
2. HC103 moisture analyser
3. Standard aluminium sample pan Ø 90mm
4. Aluminium foil
5. Plastic dropper

A- Solid content determination using HB 43-S halogen moisture analyser

Procedure

1. Switch the instrument on with the on/off button.

2. Position the empty aluminium sample pan in the pan handler (make sure the sample pan is laid flat in the pan holder).

Figure 4.2.2.25 adding sample

6. Close the lid of the moisture analyser for the instrument to start drying and measuring. The start of the drying process is indicated by the glowing of the oven.

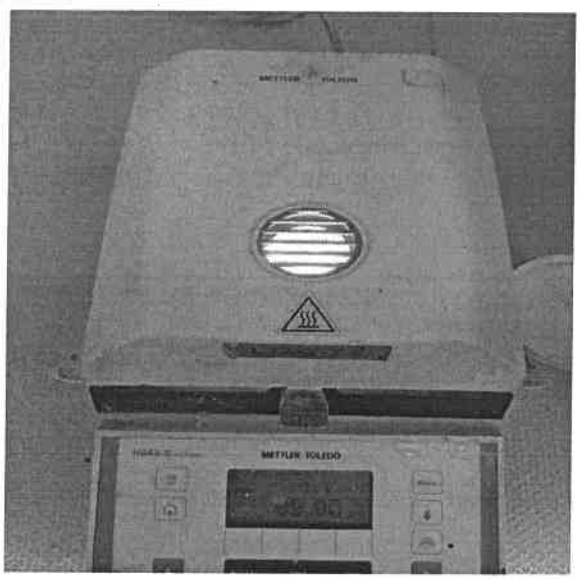


Figure 4.2.2.26 drying sample started

7. can follow the measurement process in the display.

8. The measurement process is ended when an audio signal is heard.

9. Open the lid of the moisture analyser and discard the used aluminium foil.

GLOSS

Equipment and Apparatus

1. Gloss meter
2. Substrate with coatings to be measured

Procedure

1- Press the on/off button until XX° of calibrated gloss showed statistic appears.

2- Calibrate the gloss meter to 95.6% before use.

Note: Gloss meter is calibrated internally using BYK gloss meter. Different gloss meters have different calibration points.

Figure 4.2.2.27 calibrating gloss meter

3- Place the gloss meter vertically on the substrate with coatings to be measured.

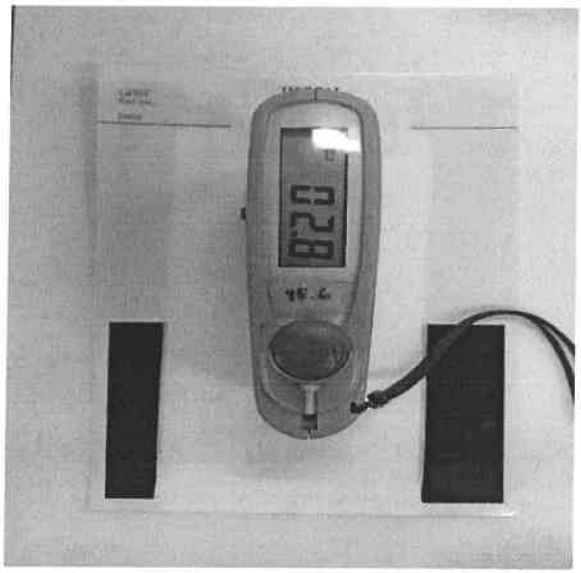


Figure 4.2.2.28 placing gloss on a sample

4- The value shows the gloss grade in %.

5- Testing should be done on coated substrate at 3 different points.

6- Gloss checking on coated bare wood substrate should be done along the wood grain at 3 different points too.

7- Take the average of three readings.

Calculation Example:

Average = (Reading 1 + Reading 2 + Reading 3)/3

Average = (5.8 + 3.5 + 2.8)/3

Average = 4.03

pH VALUE

Equipment, Chemicals and Apparatus

1. pH meter
2. (Mettler-Toledo FiveEasy F20)
3. Buffer solution pH 7 (calibration)
4. Buffer solution pH 10 (calibration)
5. Beakers
6. Cleaning water
7. Tissue
8. Electrode cleaner
9. Storage solution HI 70300

Procedure

A- Calibration of pH meter

1. Turn on the pH meter.

2. Transfer the buffer solutions to separate beakers.

Figure 4.2.2.29 buffer solutions From left to right: KCl storage solution, buffer solution pH 7 and buffer

solution pH 10

3. Wash the electrode with cleaning water and wipe dry with a tissue .

4. Insert the electrode into the beaker containing the buffer pH 7 solution. Click on 'Cal' button and wait until the reading on the pH meter stabilises

5. Pour in buffer solution pH 10 and repeat steps 3-5.

B- Taking readings with pH meter.

1. Adjust temperature of sample in water-bath according to QC specification.

2. Put the electrode in your wet sample press <<read>> and wait until the pH value is stabilized.

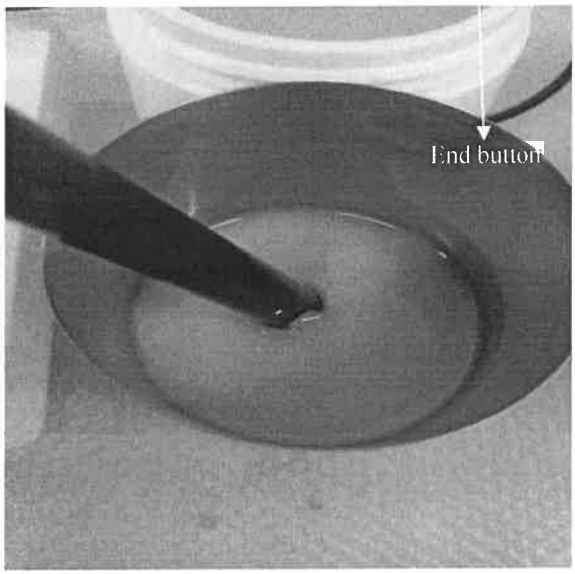


Figure 4.2.2.31 electrode in wet sample

Figure 4.2.2.32 pH meter reading

3. After the measurement clean the electrode immediately and carefully with water, wipe it dry and put it back into the storage solution after measurement.

REACTIVITY - UV

Equipment and Apparatus

1. Glass plate
2. Drawdown pad
3. Meyer Bar applicator – 15 µm
4. UV Integrator
5. (KÜHNAST UV-INTEGRATOR 140)
6. UV light machine
7. (Cefla Finishing UV Curing Oven)
8. Dropper/Wooden tongue depressor

Procedure

1. Draw down the UV coating (master sample and batch sample side by side) with stated Meyer Bar applicator on QC specification sheet on dry and clean glass plate

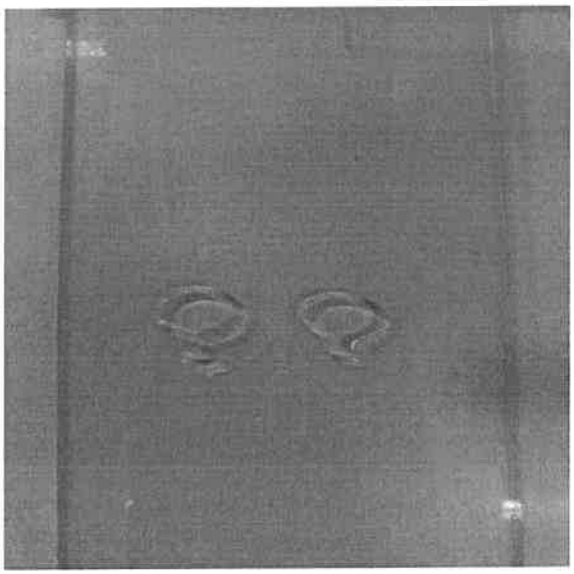


Figure 4.2.2.33 sample on glass plate

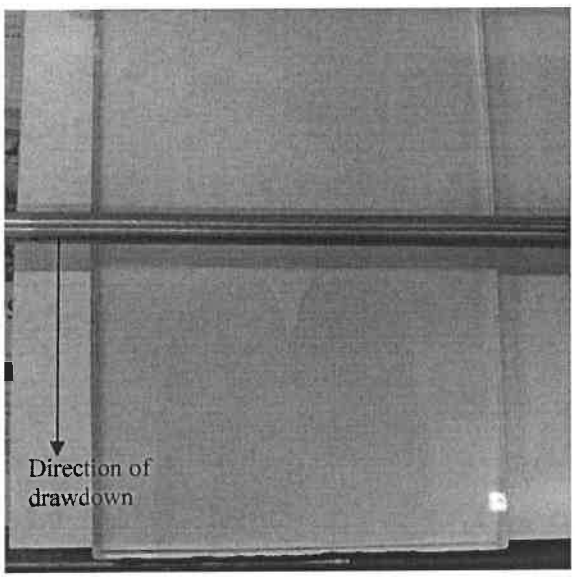


Figure 4.2.2.34 direction of drawdown.

Note: The master sample should be on the left side and the batch sample should be on the right.

2. Set the UV light machine at full power (1 lamp @ 80 W/cm)

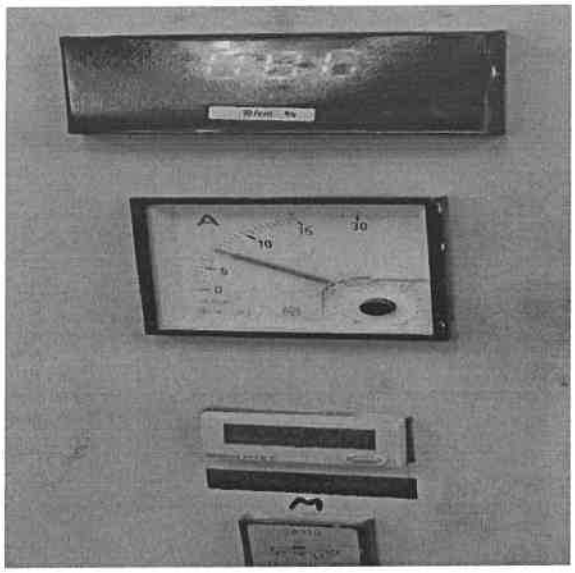


Figure 4.2.2.35 UV light machine

3. Adjust the conveyor speed at 80 W/cm according the energy stated on the QC specification sheet.

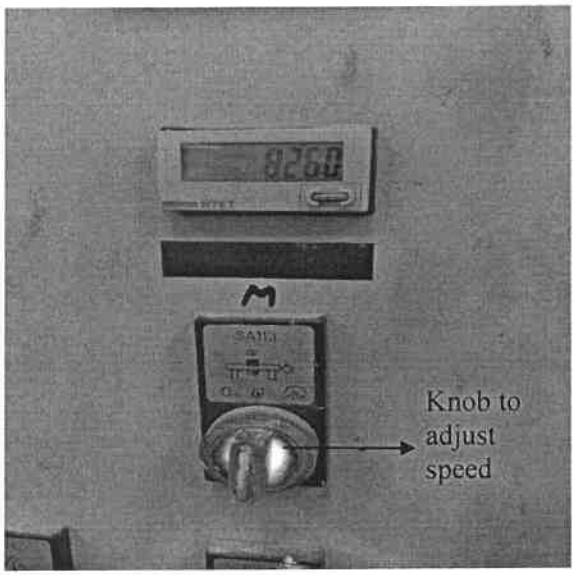


Figure 4.2.2.36 adjusting uv light machine knob

4. Turn on the UV integrator and make sure initial reading on the LCD screen is zero.

5. Run the UV integrator through the UV light machine and check the energy reading after it goes through the machine. If the reading is within the range specified on QC specification sheet,

proceed to the next step. Otherwise, adjust the conveyor speed until the reading on the integrator falls in the range stated in the QC specification sheet.

6. Cure the UV coating through UV light machine at stated QC specification

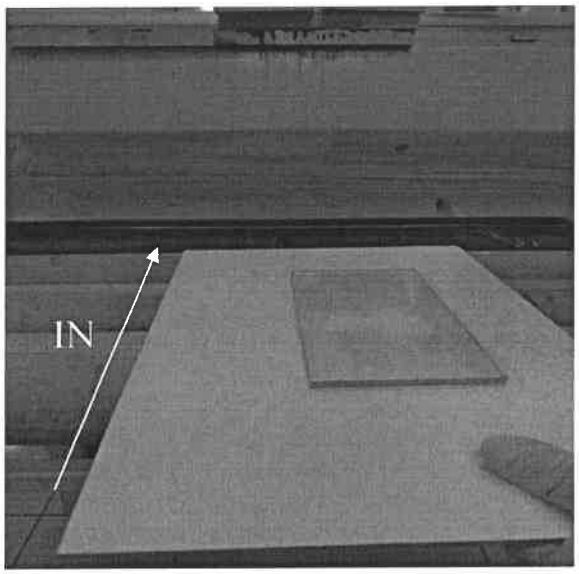


Figure 4.2.2.37 inserting sample in uv light machine

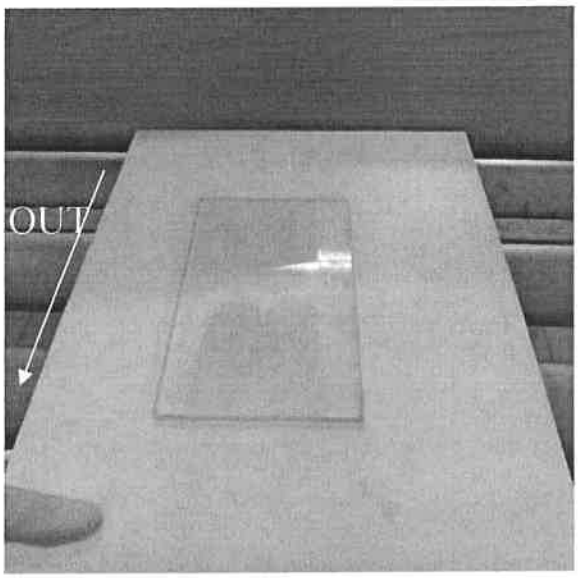


Figure 4.2.2.38 move out sample from uv light machine

7. After curing, touch the coating with fingers to feel any differences in texture. Scratch the UV coating with finger nail cross side by side with master.

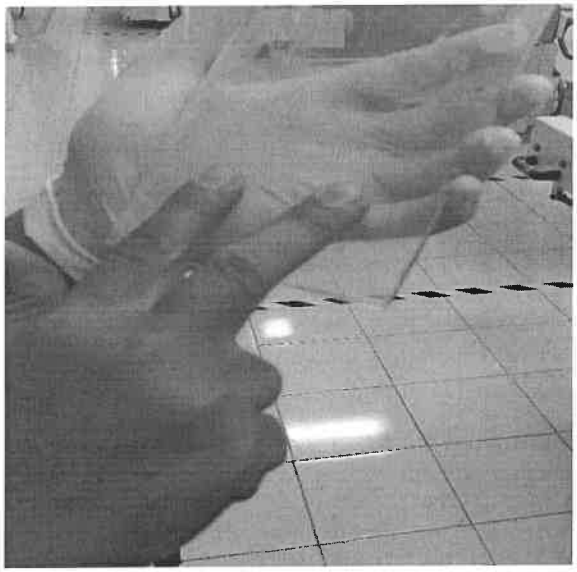
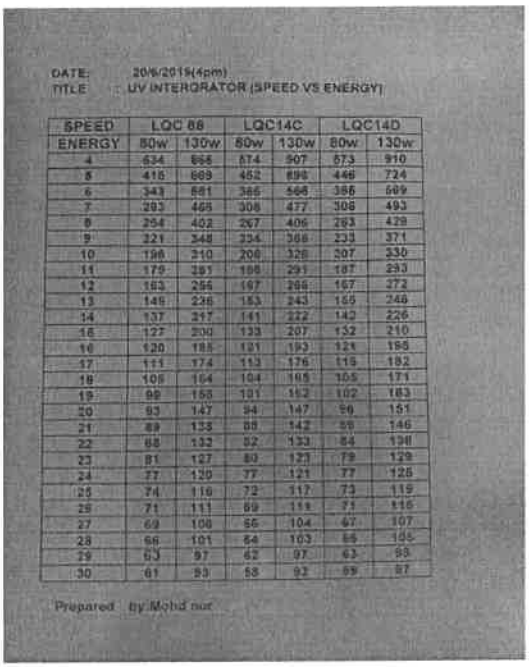


Figure 4.2.2.40 testing appearance of sample

8. Observe if there are any sign of differences in texture or scratching marks.

9. When there are same performances then the batch passed the test.



DATE: 20/6/2019(4pm)
TITLE: UV INTERGRATOR (SPEED VS ENERGY)

SPEED	LQC 68		LQC14C		LQC14D	
ENERGY	80w	130w	80w	130w	80w	130w
4	534	868	574	907	573	910
5	415	669	452	696	446	724
6	343	561	386	566	368	609
7	293	465	308	477	308	493
8	254	402	267	406	263	429
9	221	348	234	366	233	371
10	196	310	206	326	207	330
11	179	281	186	291	187	293
12	163	256	167	266	167	272
13	149	236	153	243	155	246
14	137	217	141	222	142	226
15	127	200	133	207	132	210
16	120	188	121	193	121	195
17	111	174	113	176	115	182
18	105	164	104	165	105	171
19	99	158	101	152	102	163
20	93	147	94	147	96	151
21	89	133	88	142	88	146
22	85	132	82	133	84	138
23	81	127	80	123	79	129
24	77	120	77	121	77	125
25	74	116	72	117	73	119
26	71	111	69	113	71	116
27	69	108	66	104	67	107
28	66	101	64	103	65	105
29	63	97	62	97	63	99
30	61	93	58	92	59	97

Prepared by Mohd nor

Figure 4.2.2.41 Energy of the UV lamp and the corresponding conveyor speed.

APPEARANCE - Wet

Equipment

1. Glass plate or
2. Black/White card or Substrate
3. Beaker 250ml
4. Meyer Bar applicator – 30 µm

Procedure

A- To check opacity

1- Observe against master. Draw down on black/ white card with a 30 µm Meyer Bar

Figure 4.2.2.42 batch vs master comparison

B- Wet appearance in beakers. To observe clarity and purity.

1- Pour batch sample against master into 2 beakers 250ml side by side.

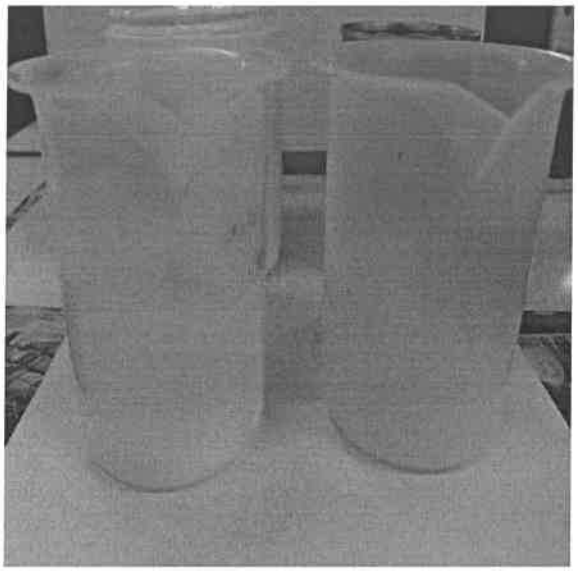


Figure 4.2.2.43 side by side sample

C- To check transferability and appearance after pumping. To observe coverage and leveling.

1. Run application (Roller or spray system depends on QC specification) and on specified substrate (Stated in QC specification).

D- To observe surface smoothness and leveling

1. Observe against master. Draw down on a glass plate with a 30 µm Meyer Bar.

APPEARANCE - Dry

Equipment and apparatus

1. Glass plate or
2. Black/White card or
3. Substrate

4. Meyer Bar applicator – 15 µm
5. Oven 60°C, 80°C or 180mj

Procedure

1. Dry appearance on thin layer surface. To observe abnormal particles, flow and leveling
2. Dry appearance on transferability or after pumping process

4.2.3 Kaizen System

For kaizen system the student need to setup a team board for the Process Optimization Department as part of the system, Teknos (M) sdn Bhd is targeting to run this system fully on 2025.

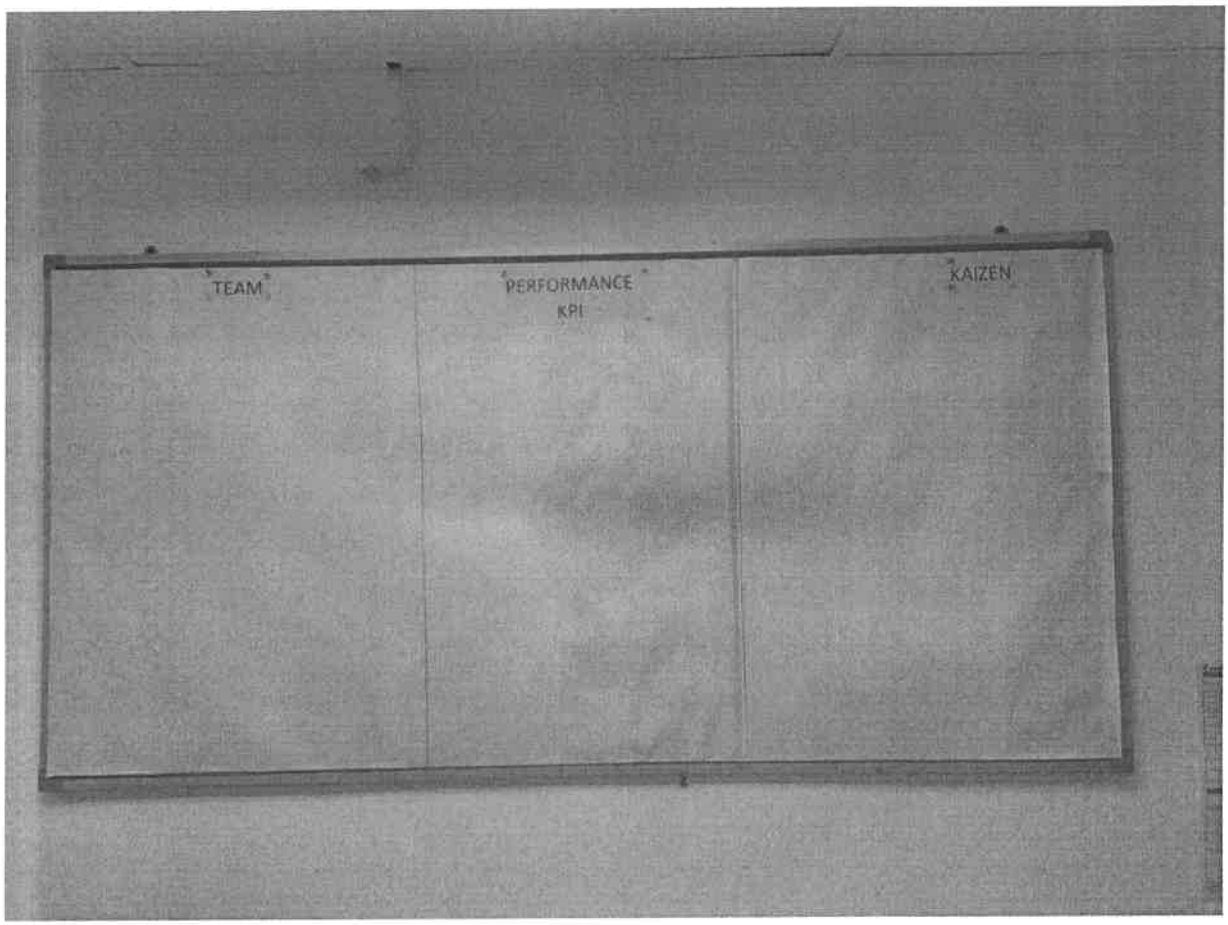


Figure 4.2.3.1 kaizen team board setup

4.3 Problem encountered and approach adopted for solving problem

In the real world, we cannot avoid problems in our daily. Same goes to the industrial training experience, there are several problems that are encountered during the industrial training. The first one is, during monitoring one of the process, there is not enough visual media for certain processes, so to solve this problem, the student needs to re-do the monitoring and take enough detail during monitoring. Also, when completing the report presentation, te supervisor is not satisfied enough with the report and the student needs to discuss thoroughly with their supervisor and exchange opinion on how to make the report better and full with details.

Second one is, during doing the QC check on a certain product, the product did not meet the qualification of the specs. For example, the student runs a viscosity test, the viscosity did not meet the specification of of the product that were set. So, to overcome this problem, the product needs to add water until it meets the specification.

4.3 Professional and ethical issues

Every corporation has an ethical code that serves as a decision-making framework to guarantee efficient productivity and uphold the reputation of the business. Professional ethics are a set of guidelines that employees in a corporation are expected to voluntarily follow when performing their jobs in a professional capacity, absent any external obligations or instances of violation. The people will face legal sanctions for breaking all the laws and regulations. Unprofessional behaviour could result in unethical behaviour. The individuals' professional careers will be impacted by this unethical behaviour. The performance and reputation of the organisation may be impacted by a lack of professionalism. People who lack professionalism will be less likely to put up their best effort in their task.

As for Teknos(M) Sdn Bhd, they have four policies that need to be followed, which is health, safety, environment and quality. They describe their policy as their commitment in work. The scope of the policy is product development, supply chain and sales of paints and coating and related services. This means action such as: -

1. They always comply with laws, regulation, standards, Code of Conduct.
2. Favor sustainable solutions in all their action.
3. Committed to improving on their ways of work.

4.4 Health, Environments and Sustainable Aspects.

In term of Occupational safety and health. Teknos (M) Sdn Bhd takes it seriously such as Covid-19 countermeasure. If a colluge is infected with Covid-19. They need to be quarantined at home for 14 days, after thet need to tak PCR test until the result is negative. If the staff is still positive for Covid-19, they need to be quarantined at home until the result is negative. As for safety, they take it seriously by doing continuous assessment to minimize the accident and improving their safety policies. They utilize their guidelines and the competence of their personnel to minimize risk and hazards.

As for environment, Teknos (M) Sdn Bhd invest constantly in their manufacturing facilities. They also implement LEAN throughout the company and seek innovative technologies to minimize the environmental impact of their operation. A concept known as

"lean manufacturing" aims to increase productivity while eliminating waste in industrial systems. Anything that buyers do not think adds value to and are not prepared to pay for is considered waste. They also invest heavily in research an development and analyze life cycle impacts and develop innovative products that are longer lasting and sustainable.

They systematically run improvement projects to learn and improve processes in all countries and functions by developing our knowledge and expertise. They guarantee customers specified quality through systematic quality assurance. They monitor and measure the expectations of our customer, employees, and other relevant interested parties to improve their performance. Employees contribute to developing the operations and are encouraged to make observations and improvement proposals.

CHAPTER 5: CONCLUSIONS

5.1 Conclusions

In conclusion, the industrial training programme is a useful one for students who want to advance their professional careers before earning a degree in chemical engineering. It was a great opportunity to complete the industrial training atTeknos (M) Sdn Bhd. This kind organisation at the business, in particular the Process Optimization division, is always ready to help students and share its knowledge. When a student has trouble completing the major project or task that has been assigned, the industrial supervisor always offers advice and help. The student can then recognise their weaknesses and talents. Various technical knowledge and abilities have been adopted in carrying out the primary project and work that is being delivered during the industrial training time. All of the knowledge was priceless and linked to the subjects that were covered in semesters 1 through 5. The student also learned how to apply professional, ethical, and soft skills when delivering the task, all of which are helpful for the advancement of their careers.

5.2 Suggestions and Recommendation

One of the recommendations is students can stay in hostel while doing Industrial Training. During 24 weeks of training, the student needs to travel from Skudai to Pasir Gudang everyday for 40 to 120 minutes. It would be easier if the student can stay in college because the distance between the students' workplace and the hostel is not far. So the student can save more time during industrial training and manage their time efficiently. Also, the students can have an easy access with the lecturer if the student is allowed to stay in campus.

REFERENCES

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2. Individual- Mr. Jacky Chan

3. Invidual- Madam Liza Abu Bakar

4. Teknos (M) Sdn Bhd Public File Server (confidential)