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UNIVERSITI
TEKNOLOGI
MARA

KURODA

INDUSTRIAL TRAINING REPORT

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Acknowledgement

First of all, I would like to thank Encik Ama bin Maruf for approving me to Minda Jaya Resources, which is a great company for interns to experience in real work environment in Kuroda Precision Industries (M) Sdn Bhd and guiding me throughout the industrial training by sharing his knowledge and inviting me to site visit. Nevertheless, I would like to thank to everyone in Minda Jaya Resources and Kuroda Precision Industries for their kindness and for knowledge they share. Lastly, I want to thank my beloved intern colleagues which made this experience more memorable. Their warm company and encouragement always keep me safe and makes me excited to come to work. In which also became my major contribution in completing this internship.

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1.0 Introduction

Industrial Training is required to meet the standards of the Board of Engineers Malaysia (BEM) for Engineering Technology Accreditation Council (ETAC) for undergraduate student which is a minimum of 16 weeks. As a result, Industrial Training is required for all students who pursuing a Diploma in Chemical Engineering at Universiti Teknologi MARA (UiTM).

Furthermore, students need work experience to acquire abilities in work ethics, communication and management. Therefore, Industrial Training is the most effective method of learning and experiencing a real-world work environment. Students will receive knowledge through hands-on observation and job execution at the same time. As a result, they are able to see clearer route to their desired employment.

I believe that this opportunity has provided me with many valuable experiences and expertise in the workplace. From March to July 2021, I worked as an internship student at Kuroda Precision Industries (M) Sdn Bhd. It was a memorable experience that I would like to share. I have developed a variety of talents including communication skills, active listening skills, problem solving skills and flexibility which I believe will shape and impact my professional life for the rest of my life while I also promoting my personal growth and development.

2.0 Background of Company

2.1 History of Company



Figure 1: Logo of Kuroda Precision Industries (M) Sdn Bhd

Minda Jaya Resources Sdn Bhd is an organisation that offer trainees or internship students to contribute at the selected companies. One of the companies is called Kuroda Precision Industries (M) Sdn Bhd or its short name KPM. In January 1925, Kuroda Gauge Manufacturing Co., Ltd. was founded by Saburo Kuroda for manufacture and sale of all types of gauges. It was known as the first gauge specialist maker in Japan. Then, Kuroda Precision Industries (M) Sdn. Bhd. was established on December 1996 as a joint venture in Malaysia with Kawasho Corporation and KSPC Co. which is now a consolidated subsidiary. The company started its operation producing dies and mould for Japanese Electronics firm. After six months, they started producing Motor Core Lamination applying Laser Fastec System. During 1997, Kuroda Precision Industries produced motor core lamination core for iPhone vibrate plate. Then, Kuroda Precision Industries started their expansion for Core Coating Plant for Electro deposition in 2005. In 2010, the business is diversify from ED coating process to Barrel Coating process to meet customers' demands. In 2013, they transferred to the new location at Bukit Raja Industrial area Klang in August. Kuroda Precision Industries started partnering with Italian Euro Group, establishing a joint venture in Tennessee, USA in 2014. Kuroda Precision Industries was introduced as a single company of post-war reconstruction at NHK Special. During this present, Kuroda Precision Industries is running model V10 stator product for Dyson vacuum and the products will be sent to Dyson customers.

2.2 Company's Location

Kuroda Precision Industries (M) Sdn Bhd is located at Block C & D, Lot 3, Solok Waja 3, Bukit Raja Industrial Park, 41050, Klang, Selangor, Malaysia.



Figure 2: Location of Kuroda Precision Industries (M) Sdn Bhd based on Google Maps



Figure 3: Building of Kuroda Precision Industries (M) Sdn Bhd

2.3 Organizational Chart

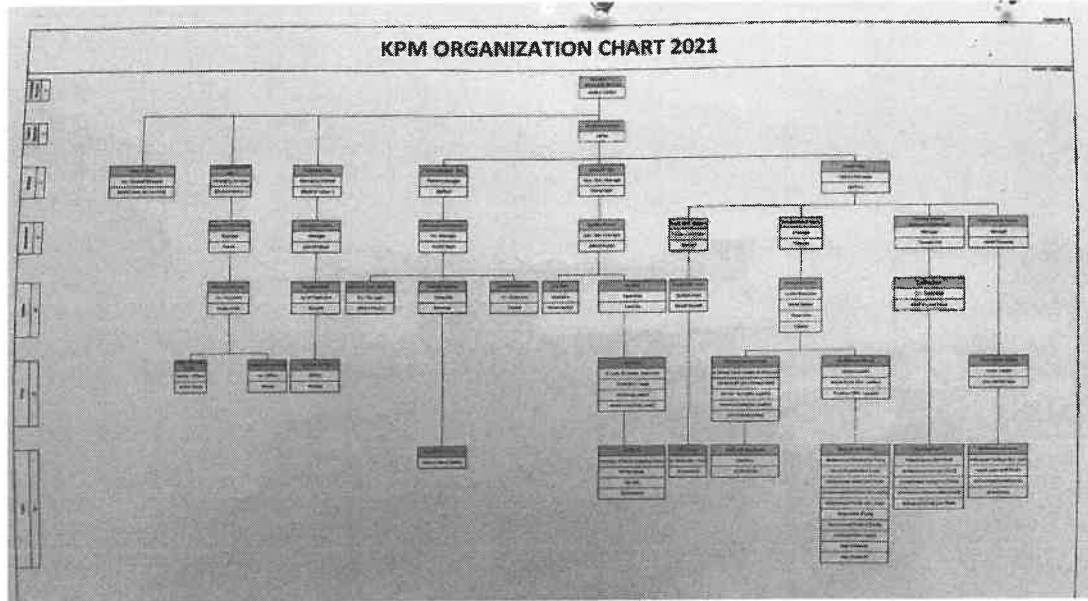


Figure 4: Organizational Chart of Kuroda Precision Industries (M) Sdn Bhd

2.4 Vision

To ensure Customer's Trust by placing priority with The Quality base on unification quality system.

2.5 Mission

1. All function organization fast action for improve customer satisfaction.
2. Internal loss reduction to provide high quality product.
3. Continuously promote and develop quality management system.
4. Compliance to related Regulatory & Statutory.

2.6 Quality Objectives

1. Agent worker attendance control above 85% for Human Resource Department.
2. V10 FG stock minimum 2 million pieces for Sale/Purchasing Department.
3. 15% cost purchasing reduce for budget Year 2021 for Sale/Purchasing Department.
4. Total production defective ratio below 10% for Production Engineering.
5. Zero customer claims (ZCC) for Quality Control Department.
6. Press machine operation ratio above 70% for Production Department.
7. Reduce the Die Maintenance lost time below 3% for Die Maintenance Department.
8. Reduce machine lost time below 1% for Maintenance Department.

3.0 Process Flow

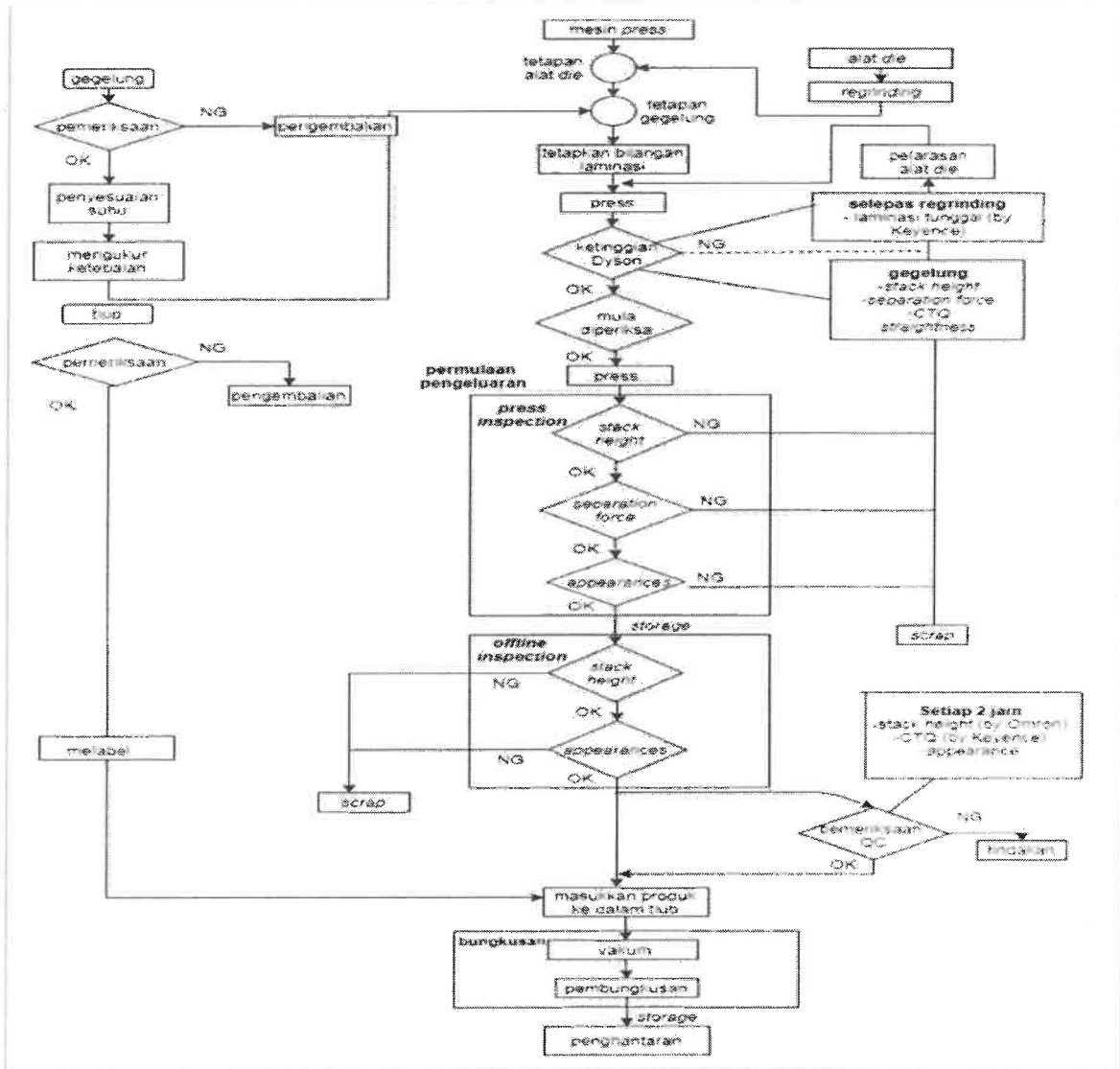


Figure 5: Production Flow

There are several departments of work sections such as press department, offline inspection, quality control department, packing, warehouse and engineering department. The internship tasks conducted at press department and offline inspection department.

The process in producing product must be first through the first department which is press department. This department is the first step of making product after examined the raw material which is coil is in good (OK) condition in terms of temperature adjustment and its thickness. The NG (not good) coil will be returned to the supplier. After that, the OK coil will be transferred to press machine. In order to produce the product, it will through regrinding process and the laser must be properly adjusted by the operator with the help of

technician in charge and also the number of laminations needs to be set so it can achieve the required height of each product. After the product has produced one by one at each row by the machine, the operator will take 1 or 2 sample of product from each row to be checked by quality control department to determine whether the product is in good quality in terms of stack height, separation force and its appearance. After the product is passed, all the product will be put into 4 storage boxes for next process which offline inspection.

In offline inspection, there are several operations such as stack height adjustment, appearance check, visual inspection, CV inspection, and straightness check. The operation is conducted after the product V10 produced. These operations purposely to examine the measurement of the product, defects, straightness and strength of the product. Production line consists of 15 lines. Each line has machine that called V10 Inspection Automation that calculate the measurement of the product. In offline department, the person that in charge in stack height adjustment part is required to write the upcoming V10 product that will be examined and sent to the packaging department. Each line was assigned with given DIE from A to Z. Then, the product will be cut by using a jig and a knife rows by rows. After cut session, all the product will be put into trays by following each row to give to the person that in charge in appearance check part which they will observe products one by one to make sure there is no NG at all for next process which is put into the tube through V10 Inspection Automation machine. All the NGs product will be separated and counted to be filled in the Daily Reject Form at the end of appearance check session. At the machine, the products that have NG (minus, over, straightness) will be separated into specified box. The OK products that have inserted into tube will be check by the person in charge in Visual Inspection part. The roles of this person are to check the products' condition in every tube, calculate the NGs from specified box, and calculate the outgoing product of day in order to know whether the line has achieved the target of the day or not which is 4150 pieces.

Other than that, the person from Quality Control Department will go into Offline Inspection Department to take 5 pieces of products from a tube at each line. After that, they will take them into their department to check whether the products are following the requirement or not. If got any NG on the product, they will take action to the person in charge in the Offline Department in order to prevent the same case happen again. The process will be repeated every two hours which is the QC person will come into Offline Department every two hours to take the products.

After all the process has passed, the product will be sent to the Packing Department for packaging process. In the process, the tubes will be checked again one by one and vacuumed then put into boxes which is each box will have 30 tubes. The products are ready for delivery to customers.

4.0 Description of Weekly Activities

During the 17 weeks of industrial training period, the trainee is assigned into offline department. The trainee was given with various tasks regarding Offline Inspection Department as they were placed in there during the training week. The tasks are Stack Height Adjustment, Appearance Check, Visual Inspection, CV Inspection, Straightness Check and others.

On the first week of industrial training, the student was undergoing orientation week. During this period, student was given a briefing about the company background by one of the HR officers. They were also introduced about Standard Operation Procedure (SOP) and 5S that are practiced by all the staff. At the end of the briefing, the student went to the factory for site visit to introduce the environment around the factory before the training started. After the site visit, they were brought to Offline Inspection Department to begin the training. The first thing they needed to learn was the Stack Height Adjustment part. This part is the most basic part in the department because everyone needs to know how to do it. In this part, student must put the V10 product one by one into a jig then cut the excess layer in order to acquire precise measurement of the product. Then, they were introduced to Appearance Check part that needed to learn how to use microscope and know all the NG products.

The training has ended and then the trainee was put in Offline Inspection Department on the following by given various tasks in there. In this department, there are several operations such as stack height adjustment, appearance check, visual inspection, CV inspection and straightness check. The operations are conducted after V10 product has produced. The main purpose of these operations is to examine the measurement of product, defects, straightness and strength of the product. Production line consists of 12 lines. Each line has machine that called V10 Inspection Automation that calculate the measurement of the product. In this department, trainee was required to write the incoming V10 product that will be examined and sent to the packaging department. Each line was assigned with given different DIE from A to Z.

Every product that has been produced from the press department will be transferred into the 4 different rows container box and kept inside the store which is dry and cool to maintain the temperature around 18°C to 20°C and prevent the product get rusty. The longer the product are exposed to humid air, the faster the coil will corrode. Oldest products will be taken to stack height adjustment based on the information on the press transfer card

(line no, date of production, row number, coil lot, shift, batch product and quantity of product). Each information will be recorded in incoming product form. The total of product will be calculated and it must be more than 4150 pieces due to defected products.

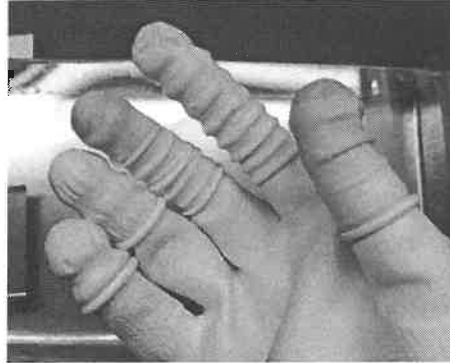


Figure 6: Gloves and Finger Cots

The trainee was expected to dress appropriately, including gloves and finger coats, to avoid injuries and to prevent human sweat from corroding the V10 model product. The item was transferred to the stack height adjustment section. Using a jig and knife, the student must remove the excess layer off the product to get the desired height. This procedure is required in order to obtain exact product measurements.

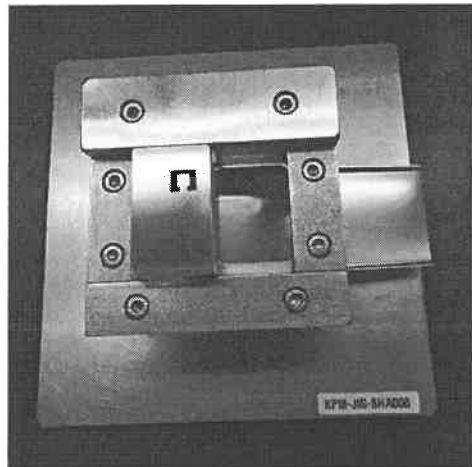


Figure 7: Cutting Jig

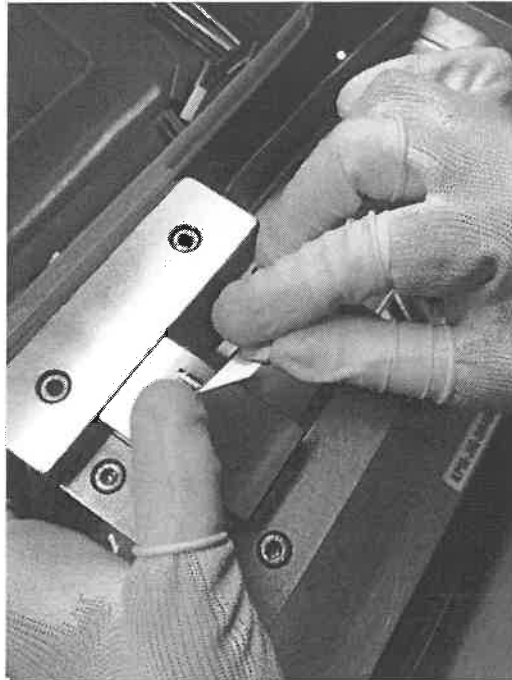


Figure 8: The process of cutting the excess layer of V10 product

Around 4500 pieces of product from Press Department are cut, which are then placed in a container labelled "after stack height adjustment." The daily target for the number of items supplied to customers is 4150 pieces. The trainee was required to cut extra as a backup due to defective items.

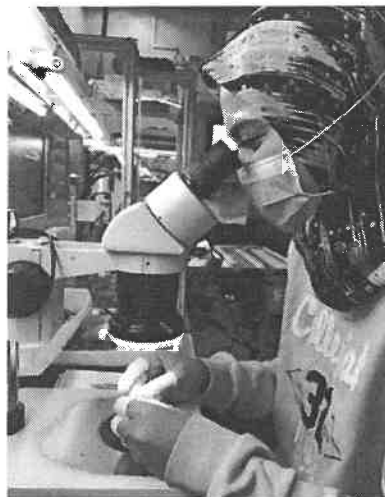


Figure 9: Using SW10X microscope

After that, the V10 product will be proceeded to Appearance Check section. The V10 product will be observed one by one by using SW10X microscope to identify any defect (NG) on the product. The position of lenses and height of microscope can be adjusted according to comfort. There are various types of defect on the product that can be found on it such as:

1. NG twist/bend (uneven product's legs)
2. NG yama (small bump on laser)
3. NG dakon (dent)
4. NG layer gap (gap between layers)
5. NG hagare (crack on laser)
6. NG burr (excess piece on layer)
7. NG sabi (rusty)
8. NG kiho (small hole on laser)
9. NG kajiri (scratch)
10. NG laser brown
11. NG laser gold

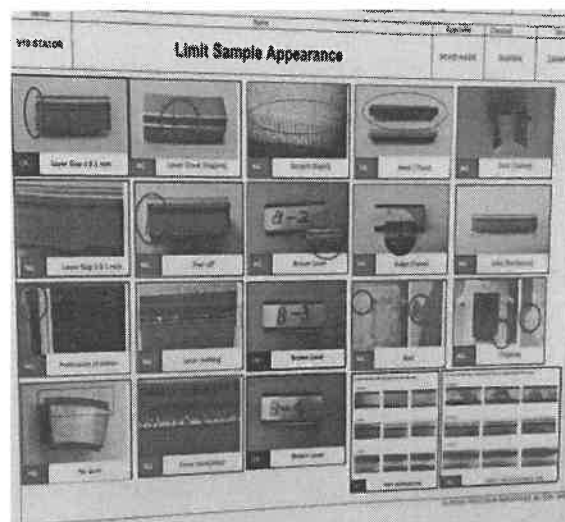


Figure 10: Sample of NG products

Laser brown can be caused of too many oils inside the stamping machine. Rust happens because the products were kept inside the store for a long time or someone hold it without protection (gloves). In addition, laser needed to be adjusted frequently by using laser indicator. Excess pieces on the layer (burr) will be removed with knife properly. The

product then will be inserted into V10 Inspection Automation machine after done the appearance check.

The V10 Inspection Automation machine uses pneumatic system which control the mechanical and automated work by using compressed air. Compressed air from atmosphere which in reduced in volume by compression can increase its pressure. The pressurised air can create the force to push, lift and hold the V10 model product. V10 model product will be measured by stack height Omron.



Figure 11: Stack height Omron (smart sensor)

The stack height Omron uses photoelectric sensor that determine the distance by using light transmitter. The sensor is used to calculate the measurement of the V10 model product. If the product is OK, the machine will lift the product and move to the next stage. The minus (short) and over (long) product will be transferred into stack height NG container. The OK product will be transferred into the tube. If any V10 model product stuck or broken inside the machine, the trainee is required to wear goggles before repairing the machine or remove the product. The trainee is needed to pull the valve to release the pressure, allowing air to release from tank before taking out the product from the machine.

After the sensor recorded the measurement of the product, the product will be lifted by the machine to undergo the next process. If the machine is loose or cannot lift up the product, the screw needed to be adjusted. The screw needed to be adjusted based on the width of the product so the machine can lift up the product. The machine needed to be stopped first before doing the maintenance.



Figure 12: Computer with tool stack height master software and measurement camera

At Visual Inspection section, barcode label needed to prepare beforehand according to die and stamped at each of the tube. The barcode will be printed based on the quantity of the products in each box. However, due to some defected products, quantity of products needed to be estimated around 70% for each row. For example, if one row has 300 products, only 270 products that are approved. If each tube consisted of 30 products, trainee will be required to print nine pieces of barcodes for that row. Barcode will be printed based on the information at press transfer card from the incoming. The V10 model product in the tube will be observed using both eyes under the white lamp to see clearly. Any defected product will be replaced with the new one. The separated defects which is minus (below 21.850mm), over (higher than 22.15mm) and straightness (bend/twist) will be recorded and sent to CV Inspection to undergo the next process.

At CV Inspection section, a computer and a measurement camera are used to identify over and minus product that are still acceptable for the next process. By using 'tool stack height master', the master reading is identified before checking the product to obtain the accurate result. After the machine is mastered, NG product is put in the provided place which is under the camera and the reading will be shown on the screen.

- Reading $<$ or equal to 21.85mm = NG Minus (unacceptable)
- Reading $>$ or equal to 22.15mm = NG Over (unacceptable)
- Reading 21.85mm-22.15mm = OK (acceptable)

The OK product will be sent to Straightness Check section meanwhile the over product will be returned to Stack Height Adjustment section to be cut. The minus product will be separated into NG box.

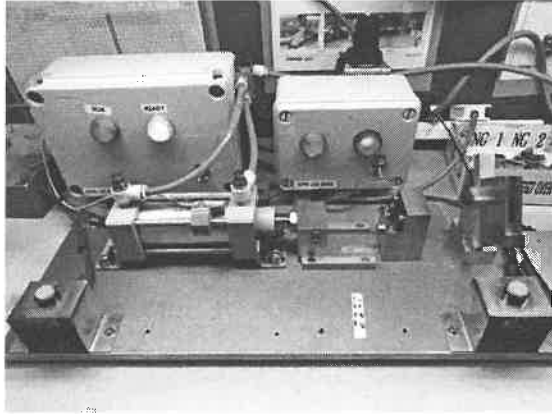


Figure 13: Straightness Jig

The V10 model product from CV Inspection will be put into straightness jig using free fall method (gravity).

- If NG (not straight), red lamp will light up
- If OK (straight), green lamp will light up

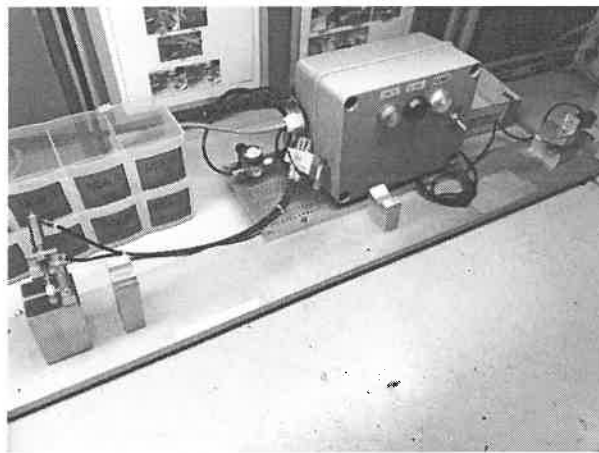


Figure 14: Tube Jig

Tube will be inserted into tube jig. Ensure the barcode and the position of the tube is correct. If the tube is positioned wrongly, the red-light lamp will be lighted up while the

correct position will light up the green lamp. OK product will be inserted into the tube manually meanwhile NG product will be isolated and put into NG box.

Trainee was given a week of break during Hari Raya Aidilfitri without any task. Besides, during Movement Control Order (MCO) the factory can only operate with 60% of staff there meanwhile the others work from home. The trainee worked like usual but by taking turns from a schedule that has been set. When the lockdown was announced by the government which is during week 16 and week 17 of training, the factory was temporarily closed for 3 weeks before get the permission from Ministry of International Trade and Industry (MITI) to operate. The last 2 weeks of training were ended by working from home.

5.0 Work From Home (WFH) Task

Kuroda Precision Industries (M) Sdn Bhd (KPM) got the permit to operate the factory from Ministry of International Trade and Industry (MITI) during Movement Control Order (MCO) 3.0 since they are under essential sector. However, they can only operate the factory with 60% of worker capacity in order to follow the Standard Operating Procedure (SOP). During the internship, trainee only can go to work by following the schedule that has been set by the leader because of the SOP.

The Covid-19 cases kept rising day by day until the government announced that one of the areas in Petaling District which is Bukit Raja, Klang needed to undergo Enhanced Movement Control Order (EMCO/PKPD) for two weeks to control the cases there. Then, Kuroda Precision Industries (M) Sdn Bhd stopped their operation due to the announcement. The internship students needed to stay at home from 2nd July until 16th July 2021 which is on Week 16 and Week 17. During this time, the students were given a task for WFH task.

The task was to find more information regarding the Safety and Environmental implementation that is practiced by the company. Kuroda Precision Industries (M) Sdn Bhd has also got their ISO 14001: 2015 certification after the ISO 9001 respectively on 19th December 2020. With their certification they ensure that they 100% compliance to regulatories and statutory requirements, periodic monitoring of environmental performanc and, reduce their environmental footprint. Other than that, they also continuously to improve their processes and reduce their impact in line with the global sustainability target.

In order to get certified, that had started the project since October 2019. They challenged themselves by made an EMS Project Plan by through few phases which are Master Plan, CB Selection/ committee/ ISO knowledges, Training / Documentation, Continue Training / CB Apply, Documents Review / IQA / MRM, First Stage then Second

Stage audit. These events happened from October 2019 until they officially certified on December 2020.

Furthermore, one of the criteria to get certified they have their own schedule waste area. All the waste area has been labelled one by one in order to practice throwing away the waste in proper ways. As example, in the Press Department and Offline Department have provided their own labelled rubbish bin. All the finger cots, gloves and other general waste will be separated into the specified rubbish bin. Besides that, they also have their own schedule waste area outside of the factory. All the chemicals will be put at the specified place to separate it from other things. Metal scraps which is the BARA and NGs product will be also put at specified place that labelled 'metal scraps' in order to notice the operators to throw in that place at the end of every shift.



Figure 15: Labelled waste area

In order to keep the factory always clean and for creating a comfortable workplace, KPM which is a Japan company also implements 5S activity. Besides, this implement is to improve their safety, quality and productivity. Those 5S are:

1. Seiri (Sisih) – Throw away items you do not need
2. Seiton (Susun) – Decide the item location and placement
3. Seiso (Sapu) – Clean to avoid dust and dirt
4. Seiketsu (Seragam) – Keep Seiri, Seiton and Seiso "3S"
5. Shitsuke (Sentiasa Amal) – Keep determined rules and promises

In addition, the Covid-19 pandemic somehow has affected the factory's production. In order to operate during this pandemic, KPM must follow all of the MITI's rules such as doing swab test to all staff every weekend and only 60% of staff can work physically at the

company while others are working virtually from home (WFH). Regarding to the swab test, every staff needs to do swab test that organized by KPM. Whoever that get negative result can go to work as usual meanwhile the positive one needs to be quarantined first until the next result is negative and also his/her close contact.

Other than that, all the staff need to wear the Personal Protective Equipment during in the factory. Whoever works in the site, they need to wear safety boots, wear gloves and finger cots during handling the product. A safety spectacle should be wearing by technicians whenever they handling the machine whether it is under maintenance or not. In Offline Inspection Department, all the staff in there must be wearing mask all the time during in there even before Covid-19 pandemic happens to maintain the quality of products. In order to follow the SOP during this Covid-19 pandemic, all the staff must follow steps before entering the factory such, wear mask, wash hand, use hand sanitizer, scan and record their temperature and lastly use the thumbprint to make sure the thumbprint section is always clean.

6.0 Conclusion and Recommendation

In conclusion, 17 weeks of internship were kind of short time to learn and gain skill. This internship has helped me identify my strengths and flaws. I obtained useful knowledge, learned new skills and enhanced my ability to interact with new individuals with various personalities and behaviours. I also learned that in order to improve myself, I must be open-minded and accept all criticism. I also discovered that in order for things to work out in my favour, I must make the first move. For example, in order to communicate effectively with the staff, I must be the one to initiate the conversation. Nevertheless, the industrial training is not only improving the skills, but also improving punctuality and attitude-discipline.

In relating to chemical engineering, I am glad to have the chance to be involved in dealing machines, I readily used my safety knowledges that I learnt in campus during I was in Part 4. Thus, it makes me realize how this opportunity has open my mind in seeing the chemical engineering pathway even though the company's major is not chemical engineering but still have the things related to this course.

The company should provide assignment that can increase employment opportunities to students. The Covid-19 has caused negative impact to economy putting at risk the jobs and incomes of people around the world. Unemployment rates during the Covid-19 pandemic is increasing and gives significant effect to many sectors. The company also should provide any form of reward on the work done by them. Most company treated trainee like workers but unlikely grant them a reward or credits that they should supposed to receive. With the reward and pleasant treat from the company can spur the students and attract them to the field and increase their reputation. Last but not least, company should deliver tasks that related to student's course so that student does not deviate from the course because some company does not really understand the scope of some courses.

7.0 Appendices



Figure 16: Offline Inspection Department

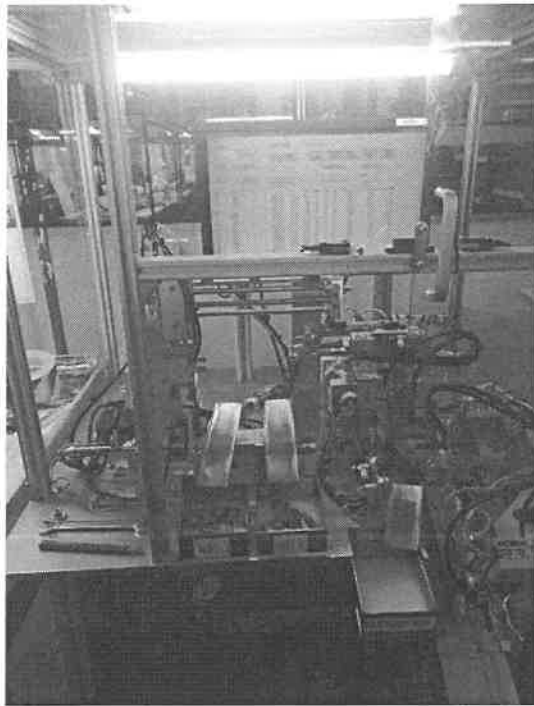


Figure 17: V10 Automation Inspection Machine



Figure 18: Straightness Check (Reconfirm Area)

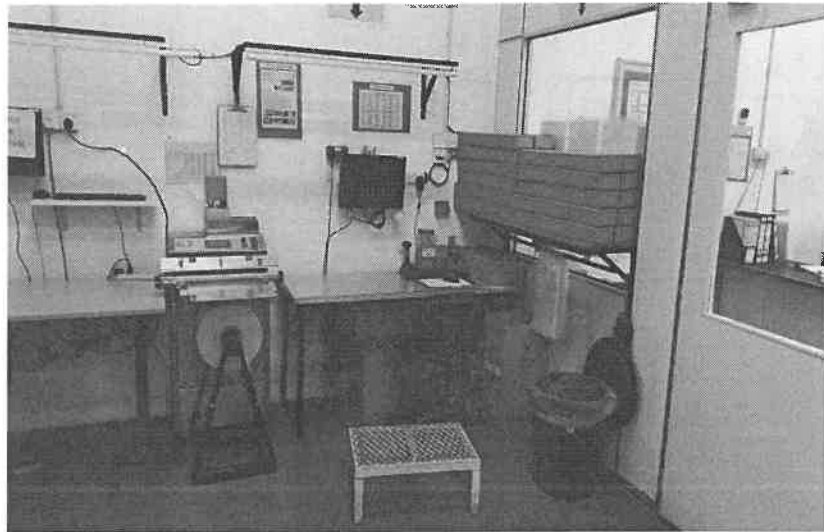


Figure 19: One of area of Packaging Department

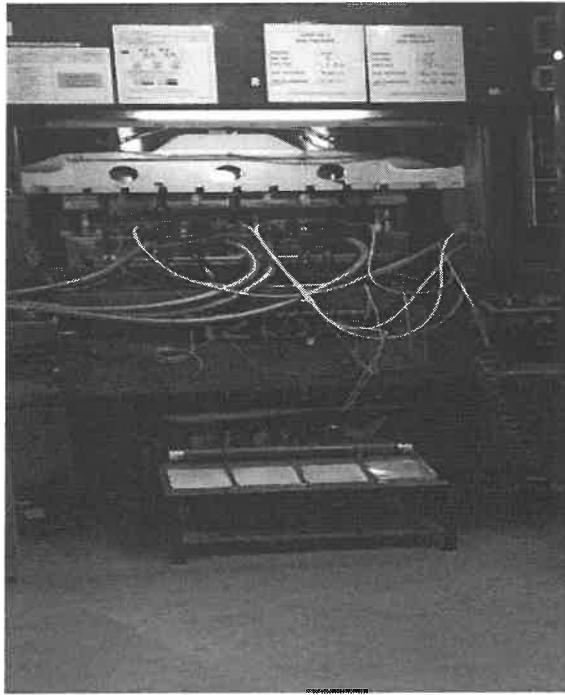


Figure 20: Press Stamping Machine



Figure 21: Product Storing Room