



STANDARD KEMAHIRAN PEKERJAAN
KEBANGSAAN
(NATIONAL OCCUPATIONAL SKILL STANDARD)

STANDARD PRACTICE & STANDARD CONTENT
FOR

PLASTICS PRODUCTION OPERATION

LEVEL 3



JABATAN PEMBANGUNAN KEMAHIRAN
KEMENTERIAN SUMBER MANUSIA, MALAYSIA

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STANDARD PRACTICE
(SP)

STANDARD PRACTICE

NATIONAL OCCUPATIONAL SKILLS STANDARD (NOSS) FOR; PLASTICS PRODUCTION OPERATION LEVEL 3

1. INTRODUCTION

Plastic product manufacturing industry consisting of manufacturing intermediate or final products from plastics resins, using processes such as injection moulding, compression moulding, extrusion moulding, blow moulding and rotational moulding. The various production processes allow manufacturing of wide variety of products. The plastics resins used by these establishments may be new or recycled. Plastics can be divided into thermoplastics and thermosets. Thermoplastics are plastics that soften, melt and flow as thick fluids when heated above a certain temperature. In this state, the material is often referred to as a plastic melt and is usually formed or shaped into a product. Upon cooling, thermoplastics harden and behave as a solid state. After a thermoplastic product is formed, it can be reheated and softened to be shaped again. Thus, thermoplastics can be processed several times and this is what makes them suitable for recycling. Examples of thermoplastics are polyethylene, polypropylene, and polycarbonate. Thermosets are plastics that harden when heated above a certain temperature. A thermoset cannot be softened again like thermoplastic. As a result, it is more difficult to recycle a thermoset than a thermoplastic. Examples of thermosets are phenolics, ureas, certain polyesters, melamines and epoxies.

Plastics are inexpensive, lightweight, strong, durable, corrosion-resistant materials, with high thermal and electrical insulation properties. Plastics are carbon-based molecule materials and also called as polymers. The diversity of polymers and the versatility of their properties are used to make a vast array of products that facilitate medical and technological advances, energy savings and numerous other societal benefits.

Almost all aspects of daily life involve plastics, in transport, telecommunications, clothing, footwear and as packaging materials that facilitate the transport of a wide range of food, drink and other goods. Plastic materials have the potential to bring scientific and medical advances. For instance, plastics are likely to play an increasing role in medical applications, including tissue and organ transplants; lightweight components, such as those in the new Boeing 787, reduce fuel usage in transportation; components for generation of renewable energy and insulation will help reduce carbon emissions and smart plastic packaging will no doubt be able to monitor and indicate the quality of perishable goods (Andrady & Neal 2009).

A person who is competent in Plastic Production Operation (Level 3) is an individual who is trained in practising the core businesses of plastic manufacturing which specializes in operating various plastics production operation processes. This NOSS document shows the structured career path of personnel in Plastics Production Operation (Level 3). It provides structured set of activities that enable a person who

aspires to achieve competency in this particular occupation, ultimately enables him or her to embark on a career in the Plastic Production industry.

Standard Practise and Standard Content are part of NOSS document. The job areas being develop are based on the Occupational Area Analysis (OAA). This document covers the competency standard of Plastics Production Operation (Level 3) that is currently gaining priority in the plastic production industry. There is a high demand for skilled personnel in this field as the industry is developing rapidly. Based on the Manufacturing Sector Policy that aims to propel Malaysia to become a world-class plastic processing manufacturing, the need for skilled personnel from the plastic industry is in demand. The job area for this profession is mostly significant in the industries such as automotive, oil and gas and fasteners.

Pre-requisite

Based on the workshop findings, it is decided that the minimum requirements for those interested to enrol in this course are as below:

- i. Be able to calculate (basic), read and write in Bahasa Malaysia or English and;
- ii. At least passes two (2) subjects in Sijil Pelajaran Malaysia (SPM) or its equivalent e.g. Sijil Pelajaran Vokasional Malaysia (SPMV) or;
- iii. Candidates who failed Sijil Pelajaran Malaysia (SPM) or its equivalent with two (2) years' experience in plastic related industry will be considered and;
- iv. Attain the age of seventeen (17) at the time of application and must be physically and mentally fit and not colour blind.

These pre-requisite is also in line with the Plastic Association needs and requirements of Safety, Health and Environmental set by Department of Occupational Safety and Health (DOSH).

Malaysian Plastics Manufacturers Association (MPMA)

The Malaysian Plastics Manufacturers Association (MPMA), established in 1967, is a progressive trade association providing leadership and quality service to its members and the plastics industry. MPMA is the official voice of the Malaysian plastics industry, representing its members and the industry in Government interaction, spearheading the plastics industry's growth and providing the platforms to assist members to be globally competitive. MPMA currently has about 900 members comprising Ordinary Members, which represent about 60% of plastics manufacturers in the country and account for 80% of the country's total production of plastics products. The vision of the association is to be a progressive trade association providing leadership to the plastics industry and the mission is to provide direction and leadership to upgrade the plastics industry through effective government liaison, strategic alliances, specialised training and industry studies and to promote the usage of plastics with due care to the environment and the community (<http://www.mpma.org.my/>- dated:2/8/2012).

The roles and objectives of the association are as follows:

- To promote the use, manufacturing and processing of plastics;
- To protect, assist and enhance the interest of manufacturers of plastics;
- To organise and provide various means of training to help upgrade the technological level of the plastics industry;
- To encourage co-operation among manufacturers of plastics products both within and outside Malaysia;
- To gather, analyse and provide statistical and technical data as well as other information of interest;
- To provide a platform for members to interact and to foster closer rapport among members;
- To co-operate with other trade associations, non-governmental organisations and other bodies of common interest to ensure the healthy growth of the plastics industry;
- To collaborate with the government in the promotion of the plastics industry towards achieving the country's vision of becoming a developed nation by 2020; and
- To promote the growth of the plastics industry and transform it into a global player taking into cognisance its social responsibility towards the environment and community.

Department of Occupational Safety and Health (DOSH)

As a regulatory body which enforces the occupational safety and health aspects in Malaysia, the role of DOSH is to study and review the policies and legislations of occupational safety and health. In regard of the plastic production industry, the following acts are enforced by DOSH:

- a) Occupational Safety and Health Act 1994 and its regulations.
- b) Factories and Machinery Act 1967 and its regulations.
- c) Part of Petroleum Act 1984 (Safety Measures) and its regulations.
- d) Guidelines, codes of practice, circulars.

With regard to the respective acts, DOSH comes forward to apply the functions as to:

- Conduct research and technical analysis on issues related to occupational safety and health at the workplace;
- Carry out promotional and publicity programs to employers, workers and the general public to foster and increase the awareness of occupational safety and health; and
- Become a secretariat for the national council regarding occupational safety and health.

2. OCCUPATIONAL STRUCTURE

Plastics Production Operation (Level 3) personnel come under sub-sector Metal Machining Technology. Figure 1.1 and 1.2 show the structured career path and area of Plastics Production Operation (Level 3) personnel.

EXISTING OCCUPATIONAL ANALYSIS (OA)

SECTOR	PEMESINAN DAN PERALATAN (MACHINERY AND EQUIPMENT)					
SUB SECTOR	TEKNOLOGI PEMESINAN LOGAM (METAL MACHINING TECHNOLOGY)					
AREA / SUB AREA	Termoplastik (<i>Thermoplastic</i>)				Termoset (<i>Thermoset</i>)	
	<i>Extrusion</i>	<i>Rotational</i>	<i>Injection</i>	<i>Blow</i>	<i>Injection</i>	<i>Compression</i>
L5	<i>Plastic Production Manager (Thermoplastic)</i>				<i>Plastic Production Manager (Thermoset)</i>	
L4	<i>Plastic Production Assistant Manager (Thermoplastic)</i>				<i>Plastic Production Assistant Manager (Thermoset)</i>	
L3	<i>Plastic Extrusion Production Senior Technician (Thermoplastic)</i>	<i>Plastic Rotational Moulding Production Senior Technician</i>	<i>Plastic Injection Moulding Production Senior Technician (Thermoplastic)</i>	<i>Plastic Blow Moulding Production Senior Technician (Thermoplastic)</i>	<i>Plastic Injection Moulding Senior Technician (Thermoset)</i>	<i>Plastic Compression Moulding Production Senior Technician (Thermoset)</i>
L2	<i>Plastic Extrusion Production Technician (Thermoplastic)</i>	<i>Plastic Rotational Moulding Production Technician</i>	<i>Plastic Injection Moulding Production Technician (Thermoplastic)</i>	<i>Plastic Blow Moulding Production Technician (Thermoplastic)</i>	<i>Plastic Injection Moulding Technician (Thermoset)</i>	<i>Plastic Compression Moulding Production Technician (Thermoset)</i>
L1	<i>Plastic Extrusion Production Junior Technician (Thermoplastic)</i>	<i>Plastic Rotational Moulding Production Junior Technician</i>	<i>Plastic Injection Moulding Production Junior Technician (Thermoplastic)</i>	<i>Plastic Blow Moulding Production Junior Technician (Thermoplastic)</i>	<i>Plastic Injection Moulding Junior Technician (Thermoset)</i>	<i>Plastic Compression Moulding Production Junior Technician (Thermoset)</i>

Figure 1.1 Occupational Framework matrix of Plastics Production for Sector Machinery & Equipment – Sub sector of Metal Machining Technology in Malaysia

OCCUPATIONAL AREA ANALYSIS (OAA)

SECTOR	PEMESINAN DAN PERALATAN (MACHINERY AND EQUIPMENT)					
SUB SECTOR	TEKNOLOGI PEMESINAN LOGAM (METAL MACHINING TECHNOLOGY)					
AREA / SUB AREA	Termoplastik (<i>Thermoplastic</i>)				Termoset (<i>Thermoset</i>)	
	<i>Extrusion</i>	<i>Rotational</i>	<i>Injection</i>	<i>Blow</i>	<i>Injection</i>	<i>Compression</i>
L5	PLASTICS PRODUCTION MANAGEMENT					
L4	PLASTICS PRODUCTION TECHNOLOGY					
L3	PLASTICS PRODUCTION OPERATION					
L2	NO LEVEL					
L1	NO LEVEL					

Figure 1.2 Occupational Area Framework matrix of Plastics Production Operation for Sector Machinery and Equipment – Sub sector of Metal Machining Technology in Malaysia)

3. DESCRIPTION OF COMPETENCY LEVEL

The NOSS is developed for various occupational areas. Candidates for certification must be assessed and trained at certain levels to substantiate competencies. Below is a guideline of each NOSS Level as defined by the Department of Skills Development, Ministry of Human Resources, Malaysia.

Malaysia Skills Certificate:
Level 1

Competent in performing a range of varied work activities, most of which are routine and predictable.

Malaysia Skills Certificate:
Level 2

Competent in performing a significant range of varied work activities, performed in a variety of contexts. Some of the activities are non-routine and required individual responsibility and autonomy.

Malaysia Skills Certificate:
Level 3

Competent in performing a broad range of varied work activities, performed in a variety of contexts, most of which are complex and non-routine. There is considerable responsibility and autonomy and control or guidance of others is often required.

Malaysia Skills Diploma:
Level 4

Competent in performing a broad range of complex technical or professional work activities performed in a wide variety of contexts and with a substantial degree of personal responsibility and autonomy. Responsibility for the work of others and allocation of resources is often present.

Malaysia Skills Advanced Diploma:
Level 5

Competent in applying a significant range of fundamental principles and complex techniques across a wide and often unpredictable variety of contexts. Very substantial personal autonomy and often significant responsibility for the work of others and for the allocation of substantial resources features strongly, as do personal accountabilities for analysis, diagnosis, planning, execution and evaluation.

4. MALAYSIAN SKILL CERTIFICATION

Candidates after being assessed and verified and fulfilled Malaysian Skill Certification requirements shall be awarded with Malaysia Skills Certificate for Level 3.

5. JOB COMPETENCIES

The Plastic Production Operation (Level 3) personnel are competent in performing the following core competencies:

- Plastics Injection Moulding Production
- Plastics Extrusion Production
- Plastics Blow Moulding Production
- Plastics Compression Moulding Production
- Plastics Rotational Moulding Production
- Plastics Production Quality Control
- Plastics Production Machinery And Mould / Die Preventive Maintenance
- Plastics Production Supervision

Optionally, the Plastic Production Operation (Level 3) personnel are competent in performing the following elective competencies:-

- Plastics Thermoforming Operation
- Plastics Product Secondary Process Customization
- *Child Parts Assembly*

6. WORKING CONDITIONS

Generally they work indoors in plastic manufacturing factories, under similar operating hours of the organisation / company which may also in outside normal working hours or work during weekends. The personnel should be able to concentrate on detailed work long periods of production hours. They work in plastic production industry locally or overseas as a team to ensure operations are successfully executed. Since this is plastic based manufacturing oriented industry, they need to have effective process and product knowledge, positive attitude and effective communication to deal with various related functions in the organization. The work areas will usually be noisy and may be smelly and hot. Personnel in this field of work also required to adhere to safety, health and environment procedures because the working place may lead to accidents and injuries. Protective ear muffs and other personal protective equipment (PPE) will be worn as necessary.

7. EMPLOYMENT PROSPECTS

7.1 Malaysian Market

The plastics and plastic product industry is one of the most dynamic and vibrant growth sectors within the Malaysian manufacturing sector. In fact, Malaysia is one of the largest plastics producers in Asia, with over 1,550 manufacturers, employing some 99,100 people. The country's plastic products are exported worldwide including the EU, China, Hong Kong, Singapore, Japan and Thailand. The Malaysian plastics industry has developed into a highly diversified sector producing an array of products including automotive components, electrical and electronic parts, and components for the telecommunications industry, construction materials, household goods, acrylic sheets, bags, bathroom accessories, battery casings, bottles, containers, toys, games and packaging materials. (Malaysian Plastic Processing Machinery Market Report, December 2010)

The plastics industry registered a total sales turnover of RM16.1 billion in 2011, of which 62% or RM10 billion of production was exported. Exports of Malaysian plastic products have been increasing over the years as they have a competitive edge over other Asian countries in terms of quality, reliability in delivery and pricing. There are currently some 1,500 plastics manufacturing companies in Malaysia that employ approximately 86,000 workers. About 70% of the companies are small and medium enterprises (SMEs). Plastics have excellent properties in terms of being light-weight, easy to be produced and economical to use. The TDP's primary objective is to upgrade the skills level of the Malaysian plastics industry as envisioned in the government's Strategic Reform Initiatives (SRI) for human resource development as outlined in the New Economic Model (NEM) for Malaysia. Together with this, the programme also aims to create a pool of knowledge-based technicians/engineers who would fulfil the needs of the industry to drive product innovation and through OBM. (MPC Productivity Report 2010/2011)

Ensuring opportunities for participation in equitable economy will enable all Malaysians to be involved in economic activity based on the needs. It involves improving capacity and capability, improve access to jobs and adopt a more specific to encourage entrepreneurship driven innovation. A key feature of the plastic industry is people, competitiveness and its services. The "success" is largely determined by these factors. It is therefore important to ensure that a strategic approach to planning and development is undertaken to ensure that the industry has the right human resources, technical and hand-on skills approach to function effectively in servicing and delivering to the needs of the industry.

This NOSS is developed focusing on the Plastics (Thermoplastic or Thermoset). The experts in this field can also pursue careers in similar plastic industries in Malaysia or internationally. The demand for qualified and experienced Plastics Production Operation is important as of now and would increase in the near future. Hence, the development of this

NOSS is essential for the industry to have certain guidelines and standards based on the level of competencies that have been set by the industry experts in this field.

The knowledge and skills gained by the Plastics Production Operation (Level 3) personnel in handling machine and equipments and the ability to work independently would be advantageous for employment in other related manufacturing industries such as Oil and Gas agencies, Toys and Children game facilities, fasteners industries, Electronic and Mechatronic, etc.

Other related occupation with respect to employment opportunities are:

- Mould and Die Setter
- Machine Setter
- Machine Handler
- Product Assembler
- Quality Inspector
- Machine Maintenance
- Production Supervisor
- Company Trainer
- Process Technician

Other related industries with respect to employment opportunities are:

- Automotive
- Audio Visual
- Electronic and Mechatronics
- Telecommunication
- Wire Harness
- Plastic based Handcraft Industry
- Aviation
- Ship Fabrications Industries
- Fastener Industries
- Oil and Gas Industries
- Water Industries
- Toys and Children game facilities
- Garment and Textile Industries
- Training Institutions
- Public Sector
- Private Sector
- Medical Devices

7.2 International Market

The demands of plastics production is everywhere in the world. For example, Germany is Europe's leading plastics industry and it becomes Europe's largest producer of chemicals and plastics. The country's plastics industry includes polymer manufacturers, converters and machine manufacturers alike. And with turnover of over EUR 90 billion, the domestic plastics industry counts as one of Germany's most important industry sectors. The industry plays a major role in providing new and innovative products and solutions to a number of key industries including the automotive, mechanical engineering, packaging, electrical engineering, and construction industries. Germany is setting the international standard as a plastics industry location, with the country's leading-edge network of chemical parks and unique cluster concept providing industry actors with swift and easy access to all parts of the plastics industry value chain (The Plastic Industry in Germany 2010/2011).

If the industry hopes to be globally competitive, it would require companies to have a workforce that is thorough and well-rounded in skills. Such talent must be able to integrate the various multi-disciplines needed for product development to provide total/complete engineering solutions. This is important so that manufacturers have the opportunity to improve their existing competencies and shift from original equipment manufacturing (OEM) or lower value-added activities to original design manufacturing (ODM) and if possible, achieve original brand manufacturing (OBM) via new competencies and higher skills.

8. TRAINING, INDUSTRIAL/PROFESSIONAL RECOGNITION, OTHER QUALIFICATIONS AND ADVANCEMENT

As for career advancement, most competent Plastic Production personnel learn their craft on the job. They are trained On-The Job in the workplace in the factory. They usually begin as machine operator and gradually learn their new skills as they gain experience. Further certification may increase their chances of career advancement. Thus with additional formal training/education and certification, this experience competent plastic production operators can be advanced to become plastics production technologist, engineer and manager. For example, under Malaysian Plastics Manufacturers Association (MPMA) initiatives, there is a higher skills training for the Malaysian plastics industry. The skill training for Talent Development Programme (TDP) would be executed with the primary objective to upgrade the skills level of the Malaysian plastics industry as envisioned in the Government's Strategic Reform Initiatives (SRI) for human resource development as outlined in the New Economic Model (NEM) for Malaysia.

9. SOURCES OF ADDITIONAL INFORMATION

9.1 Local

- Federation of Malaysian Manufacturing (FMM)
Wisma FMM, No. 3
Persiaran Dagang, PJU 9
Bandar Sri Damansara
52200 Kuala Lumpur
Phone Number : +(6)03 – 6286 7200
Website : www.fmm.org.my
- Persatuan Pengilang Plastik Malaysia (MPMA)
37 Jalan 20/14
Paramount Garden
46300 Petaling Jaya
Selangor
Phone Number : +(6)03 – 7876 3027
Fax Number : +(6)03 – 7876 8352
Website : www.mpma.org.my
- The Plastic and Rubber Institute of Malaysia (PRIM)
20 Jalan U5/28
Mah Sing Integrated Industrial Park
40150 Shah Alam
Selangor
Phone Number : +(6)03 – 7847 1034
Fax Number : +(6)03 – 7847 1610
Website : www.prim.org.my
- SIRIM Berhad
No.1, Persiaran Dato' Menteri, Section 2
P.O.Box 7035
40700 Shah Alam
Selangor
Phone Number : +603 – 5544 6000
Fax Number : +603 – 5544 6694
Website : <http://www.sirim.my>

- Malaysian Employment Federation (MEF)
 3A06-3A07 Block A
 Pusat Dagangan Phileo Damansara II
 No.15 Jalan 16/11
 Off Jalan Damansara
 46350 Petaling Jaya
 Selangor
 Phone Number : +(6)03 – 7955 7778
 Fax Number : +(6)03 – 7955 6808 / 7955 9008
 Website : <http://www.mef.org.my>
- PetroliaM Nasional Berhad (PETRONAS)
 Tower 1, PETRONAS Twin Towers
 Kuala Lumpur City Centre
 50088 Kuala Lumpur
 Phone Number : +(6)03 – 2051 5000 / 2026 5000
 Fax Number : +(6)03 – 2026 5050 / 5055
 Website : www.petronas.com.my
- Department of Occupational Safety and Health (DOSH)
 Ministry of Human Resource
 Level 2,3 & 4 Block D3, Complex D
 Federal Government Administrative Centre
 62530 W.P. Putrajaya
 Phone Number : +(6)03 – 8886 5000
 Fax Number : +(6)03 – 8889 2443
 Website : www.dosh.gov.my

9.2 International

- Plastics Europe Headquarters
 Avenue E. Van Nieuwenhuysse 4, Box 3
 Auderghem, B - 1160 Brussels
 Belgium
 Telephone : +32 (2) 675 32 97
 Fax Number : +32 (2) 675 39 35
 Website : <http://www.plasticseurope.org/>
- Canadian Plastics Industry Association
 5955 Airport Road, Suite 125
 Mississauga, Ontario, Canada L4V 1R9
 Telephone : 905.678.7748
 Fax Number : 905.678.0774
 Website : <http://www.plastics.ca/>

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**11. COMMITTEE MEMBERS FOR DEVELOPMENT OF STANDARD PRACTICE (SP),
COMPETENCY PROFILE CHART (CPC), COMPETENCY PROFILE (CP) AND
CURRICULUM OF COMPETENCY UNIT (CoCU)**

PLASTIC PRODUCTION OPERATION LEVEL 3

PANEL EXPERTS		
1.	En. Mohamed Fahlavei Bin Abdul Karim	Factory Manager Zer Plastic Sdn. Bhd
2.	En. Norjamalullail Bin Tamri	Senior Manager Malaysian Automotive Institute Sdn. Bhd
3.	En. Mohamad Yaakub bin Tugiron	Senior Superitendant Teck See Plastic Sdn. Bhd
4.	En. Hasnul Hamzah Bin Amirudin	Manager Cantuman Bistari
5.	En. Mohd Nabawi Bin Yusoff	Production Technical Assistant Teck See Plastic
6.	En. Iskandar Meeza Bin Zulkifli	Production Manager EP Polymers Sdn. Bhd
7.	En. Sariman Bin Salim	Senior Manager Sunningdale Tech Ltd.
8.	En. Khairuddin Bin Shuib	Trainer Perak Enterpruneur And Human Resources Development Agency (PEHRDA)
9.	En. Mohd Nizam Bin Hussain	Trainer Perak EnterpruneurAnd Human Resources Development Agency (PEHRDA)
10.	En. Mohd Sharmizi Bin Abu Bakar	Trainer (Plastic Technology) Institut Latihan Perindustrian Bukit Katil Melaka
FACILITATOR		
11.	Pn. Siti Salmah Binti Mohd Nor	Adimega Sdn. Bhd
DOCUMENTOR		
12.	Pn. Siti Noor Ashraf Binti Basharudin	Adimega Sdn. Bhd

COMPETENCY PROFILE CHART
(CPC)

COMPETENCY PROFILE CHART (CPC)

SECTOR	MACHINERY AND EQUIPMENT		
SUB SECTOR	METAL MACHINING TECHNOLOGY		
JOB AREA	PLASTICS PRODUCTION OPERATION		
JOB LEVEL	THREE (3)	JOB AREA CODE	

← **COMPETENCY** → ← **COMPETENCY UNIT** →



ELECTIVE

**PLASTICS
THERMOFORMING
OPERATION**

MC-100-3:2012-E01

**PLASTICS PRODUCT
SECONDARY
PROCESS
CUSTOMIZATION**

MC-100-3:2012-E02

***CHILD PARTS
ASSEMBLY***

MC-100-3:2012-E03

COMPETENCY PROFILE
(CP)

COMPETENCY PROFILE (CP)

Sub Sector	METAL MACHINERY TECHNOLOGY			
Job Area	PLASTICS (THERMOPLASTIC OR THERMOSET) (PLASTICS PRODUCTION OPERATION)			
Level	THREE (3)			
CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
1. Plastics Injection Moulding Production	C01	Plastics Injection Moulding Production is the moulding process for producing plastic parts from both thermoplastic and thermoset plastic material by heating the moulding material to a fluid state and injecting it into a mould. The injection moulding process need injection mould and injection machine. For thermoplastic, material is fed into a heated barrel, mixed / decomposition, and forced into a mould cavity where it cools and solidification to the configuration of the mould cavity. For thermoset, the material is injected into a hot mould which has been clamped shut under enough force to keep the mould together while the material is forced into the cavity under high pressure. The plastic flows through a runner system in the mould to reach all the cavities. When the mould cavities are filled, the parts cure to a solid form.	1. Identify Plastics Injection Moulding Production requirements	<p>1.1 Job order / instructions, product specification, delivery date and quantity interpreted according to the approved customer requirements / needs.</p> <p>1.2 Production process differentiated based on type of materials according to customer requirements.</p> <p>1.3 Type of mould and materials to be used listed based on job process and product specification.</p> <p>1.4 Type of machine, capacity (tonnage), functionality and its auxiliary equipment differentiated specially for Plastics Injection Moulding process.</p> <p>1.5 Product finish requirements (roughness – height and width, diameter, appearance) interpreted from drawing specification and customer</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
		<p>The person who is competent in this competency unit shall be able to interpret customer requirements from the job order, differentiates and match the machine, auxiliary equipment and materials to be used and confirm production mould and machine setup correctly, execute pre-production and production activities according to work requirements and process procedure.</p> <p>The outcome of this competency is to produce a variety of plastic parts from the smallest component to entire body panels of cars, household such as plates, cup, spoon and forks and cover for electronic gadgets. Example of thermoset products are such as electrical connector housings, automotive ashtrays, and cookware appliance handles and knobs. All product are produced in accordance with Product Specification, Standard Operating Procedure and customer requirements,</p>	<p>2. Coordinate Plastics Injection Moulding Production activities</p>	<p>requirement.</p> <p>1.6 Finished goods packaging specification determined according to product specification and customer requirements / needs.</p> <p>2.1 Mould, machine, auxiliary equipment, materials, manpower availability and production schedule confirmed according to job order.</p> <p>2.2 Materials (plastic resin), colour (mixing / compounding, packaging items obtained according to job process and quantity.</p> <p>2.3 Trimming tools (cutter, knives, scissors, and plastic nipper), tumbler (for thermoset product only), and auxiliary equipment to be used selected correctly to avoid product defect.</p> <p>2.4 Quantity of machine and manpower coordinated according to product requirements, schedule, machine manual / specification and job process.</p> <p>2.5 Production workplace / line setup checked according to job order /</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>3. Carry out Plastics Injection Moulding Production mould setup</p>	<p>instructions and residual materials removed / purged to ensure the production area ready for production.</p> <p>2.6 Production workplace / line setup evaluation check sheet completed according to Documentation procedure.</p> <p>2.7 Machine barrels and materials pre-heated confirmed according to heats parameter based on type of materials and job order.</p> <p>3.1 Type of mould and machine obtained and confirmed according to job order / instructions.</p> <p>3.2 Mould fixed / positioned to the machine according to installation procedure and product specification.</p> <p>3.3 Mould checked to confirm clear from water blockage (for thermoplastic only) according to process requirements.</p> <p>3.4 Additional requirements such as 'hot runner connected", mould temperature controller, hydraulic core function, limit switch for mould safety installed according</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>4. Carry out Plastics Injection Moulding Production machine setting</p>	<p>to process requirements.</p> <p>3.5 The correct water channel fixed according to machine / manufacturers manual.</p> <p>3.6 Cartridge heater assembled and preheated before machine starts (for thermoset mould only) according to injection process flow</p> <p>3.7 Position of ejector fixed according to mould standard.</p> <p>4.1 Heat up machine barrel by parameter setting confirmed according to product requirements.</p> <p>4.2 Machine parameter set according to parts parameter standard (process parameter/customer requirements) /approved guidelines.</p> <p>4.3 Barrel temperature controller adjusted according to product specification and type of materials.</p> <p>4.4 Hooper dryer temperature set according to type of materials</p> <p>4.5 Materials purged manually based</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>5. Carry out pre-production process</p>	<p>on job process.</p> <p>4.6 Trial shot / shot short and sample of parts produced according to process requirements.</p> <p>4.7 Machine operation monitored continuously until completion of production job order/instructions or when necessary the machine is shutdown according to production requirements and company standard practice.</p> <p>5.1 Materials (thermoplastic or thermoset) loaded in to hopper manually / automatically according to process requirement.</p> <p>5.2 Materials injected from barrel into mould exit observed according to specification.</p> <p>5.3 Sufficient amount of materials plastic injected into the mould to create a part within specification.</p> <p>5.4 Physical appearance of Molten / Melted plastics produced (colour, form of material, thickness) checked according to specification.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>6. Carry out Plastics Injection Moulding Production process</p> <p>7. Carry out product finishing process</p>	<p>6.1 Valve opened for water circulation (for Thermoplastic only) according to injection process flow.</p> <p>6.2 Mould positioned and accelerated according to parameter setting.</p> <p>6.3 Molten / melted materials injected into mould according to parameter setting.</p> <p>6.4 Parts removed from mould (automatic/manually) according to mould design and product ejected checked according to product specification.</p> <p>7.1 Types of finishing process (cleaning, trimming, buffing, and cutting) and tools to be used confirmed according to process requirements.</p> <p>7.2 Finished goods appearance (roughness, surface cracking, flashing, burr, wave, warping) confirmed according to drawing specification and approved product sample.</p> <p>7.3 Method and Technique of product finishing process applied according to determined production process.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>8. Report Plastics Injection Moulding Production activities</p>	<p>7.4 Product finishing process executed according to process requirements.</p> <p>7.5 Product packed into suitable packaging according to packaging standards instructions.</p> <p>8.1 Production output confirmed according to required specifications (dimension (length, diameter, and thickness), weight, appearance).</p> <p>8.2 Production output status / results documented (rejected rate, quantity and quality (type of defects)) according to product sample and Documentation procedure.</p> <p>8.3 Reporting format (manually or electronically) completed according to documentation procedure.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
2. Plastics Extrusion Production	C02	<p>Plastics Extrusion Production is the processes of shaping the plastic parts from thermoplastic materials by forcing the materials through a heated barrel and die. Molten / melted plastic are forced by the sufficient pressure through die exit. The pressure needed to force a material through the die depends on the geometry of the die, the flow properties of the material and the flow rate. A machine that is used to extrude a material is called an extruder.</p> <p>The person who is competent in this competency unit shall be able to interpret customer requirements from the job order, differentiates and match the machine, auxiliary equipment and materials to be used, confirm production die and machine (barrel) setup correctly, execute pre-production and production activities according to work requirements and process procedure.</p> <p>The outcome of this competency is to produce tube, pipes, sheet, profile, film extrusion and resin / granule in accordance with product specification, and customer requirements.</p>	<p>1. Identify Plastics Extrusion Production requirements</p> <p>2. Coordinate Plastics Extrusion Production activities</p>	<p>1.1 Job order / instructions, product specification, delivery date and quantity interpreted based on the approved customer requirements / needs.</p> <p>1.2 Type of die and materials to be used listed based on job process and product specification.</p> <p>1.3 Type of machine, screw diameter, functionality and its auxiliary equipment differentiated specifically for Plastics Extrusion Production process.</p> <p>1.4 Product finish requirements (roughness – thickness and width, diameter, appearance) interpreted from drawing specification and customer requirements.</p> <p>1.5 Finished goods packaging specification determined based on product specification and customer requirements / needs.</p> <p>2.1 Die, machine, auxiliary equipment (water bath, puller, cutter, etc.), materials, manpower availability and production schedule confirmed based on job order.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
				<p>2.2 Materials (plastic resin / granule) mixed / compounded with fibre, silicon, mica, colour / pigment, etc. according to process requirement.</p> <p>2.3 Packaging items obtained based on job process and quantity.</p> <p>2.4 Type of materials (palette, powder) determined according to product specification.</p> <p>2.5 Trimming tools (cutter, knives, and scissors) and auxiliary equipment to be used selected correctly to avoid product defect.</p> <p>2.6 Quantity of machine and manpower coordinated according to product requirements, schedule, machine manual / specification and job process.</p> <p>2.7 Production workplace / line setup checked based on job order / instructions and remove / purge residual materials to ensure the production area ready for production.</p> <p>2.8 Production workplace / line setup evaluation check sheet completed according to documentation procedure.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>3. Carry out Plastics Extrusion Production die setup</p> <p>4. Carry out Plastics Extrusion Production machine setting</p>	<p>2.9 Machine barrel and materials pre-heated according to heats parameter based on materials used and job order.</p> <p>3.1 Type of die, machine and auxiliary equipment (such as water bath, puller, cutter etc.) confirmed according to job order / instructions.</p> <p>3.2 Die, machine and auxiliary equipment (such as water bath, puller, cutter etc.) obtained according to job order / instructions.</p> <p>3.3 Die fixed / positioned to the machine according to installation procedure and product specification.</p> <p>4.1 Temperature controller adjusted according product specification.</p> <p>4.2 Machine heated according to heats parameter and type of materials.</p> <p>4.3 Sample materials purged from die exit according to job specification and job process.</p> <p>4.4 Tractor / haul off height adjusted according to machine setting</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>5. Carry out pre-production process</p>	<p>4.5 Machine operation monitored continuously until completion of production job order / instructions or when necessary the machine is shutdown according to production requirements and company standard practice.</p> <p>5.1 Materials loaded in to hopper manually / automatically according to process requirement.</p> <p>5.2 Molten/Melted plastic produced physical appearance (colour, surface, thickness) checked according to specification.</p> <p>5.3 Extruded materials observed and transferred to vacuum chamber / water bath according process requirements.</p> <p>5.4 First shot of extruded part pulled manually according to process requirements.</p> <p>5.5 First extruded product checked and confirmed with the customer requirements / approved products.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>6. Carry out Plastics Extrusion Production process</p>	<p>6.1 DC motor operated according to machine manual.</p> <p>6.2 Screw speed adjusted gradually according operation manual.</p> <p>6.3 Material exited from die exit confirmed according to operation manual.</p> <p>6.4 Molten materials handled according to product requirements and job process as follows / which covers:</p> <ul style="list-style-type: none"> • Joined with dummy pipe and inserted into vacuum spray chamber / tank (for pipe production) or • Hand drawn tubed into water bath (for tube production) or • Joined and flatten to dummy sheet (for sheet production) or • Form into granule (for recycle resin / colour resin production) or • Blow to the top through guided rollers and coiler for rolling the film (for film extrusion production) <p>6.5 Semi-product loaded into haul off / takes off / cutting machine / coiler according to product requirements and process</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>7. Carry out product finishing process</p>	<p>procedure.</p> <p>6.6 Semi-product (tube / pipe / sheet / profile / film extrusion / granules) formed according to required specifications (dimension (length, diameter and thickness), weight, and appearance).</p> <p>7.1 Types of finishing process (cleaning, trimming and cutting) confirmed according to product specification and packaging requirements and tools to be used.</p> <p>7.2 Finished goods appearance (roughness, surface cracking, wave, and warping and fish eye) confirmed according to drawing specification.</p> <p>7.3 Method and Technique of packaging for finished product applied according to company/customer requirement.</p> <p>7.4 Product finishing process executed according to process requirements.</p> <p>7.5 Product packed into suitable packaging according to packaging standards instructions.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>8. Report Plastics Extrusion Production activities</p>	<p>8.1 Production output confirmed according to required specifications (dimension (length, diameter and thickness), weight, appearance).</p> <p>8.2 Production output status / results documented (rejected rate, quantity, quality (type of defects) according to documentation procedure.</p> <p>8.3 Reporting format (manually or electronically) completed according reporting procedure.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
3. Plastics Blow Moulding Production	C03	<p>Plastics Blow Moulding Production is the blow moulding processes for the fabrication of plastic parts from thermoplastic material by heating the material to a fluid state and extruding it into a mould. The extruded materials will be flowed downwards and caught by the moved mould. Then the air injection will be blown to form the required product shape.</p> <p>The blow moulding machine unit comprises of Extrusion die, blow mould, blow pin, parison control and air injector pressure based on the blow technology and product requirements.</p> <p>The person who is competent in this competency unit shall be able to interpret customer requirements from the job order, differentiates and match the machine and materials to be used, confirm production mould and machine setup correctly, execute pre-production and production activities according to work requirements and process procedure.</p> <p>The outcome of this competency is to produce a variety of plastic parts such as bottle, container and jerry can in accordance with Product</p>	<p>1. Identify Plastics Blow Moulding Production requirements</p> <p>2. Coordinate Plastics Blow Moulding Production activities</p>	<p>1.1 Job order/instructions, product specification, delivery date and quantity interpreted based on the approved customer requirements / needs.</p> <p>1.2 Type of mould and materials to be used listed based on job process and product specification.</p> <p>1.3 Type of machine and functionality determined and differentiated according to product specification.</p> <p>1.4 Product finish requirements (roughness – height and width, diameter, appearance) interpreted from drawing specification.</p> <p>1.5 Finished goods packaging specification determined according to customer requirements / needs and packaging standards instructions.</p> <p>2.1 Mould, machine, materials, manpower availability and production schedule confirmed based on job order.</p> <p>2.2 Materials (plastic resin) / colour</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
		Specification, Standard Operating Procedure and customer requirements.		<p>(mixing / compounding / master batch, pigment) and packaging items obtained based on job process and quantity.</p> <p>2.3 Trimming tools (cutter, knives, and plastic nipper) to be used selected correctly to avoid product defect.</p> <p>2.4 Quantity of machine and manpower coordinated according to product requirements, schedule, machine manual / specification and job process.</p> <p>2.5 Production workplace / line setup checked based on job order / instructions and residual materials removed / purged to ensure the production area ready for production.</p> <p>2.6 Production workplace / line setup evaluation check sheet completed according to Documentation procedure.</p> <p>2.7 Machine barrel and materials pre-heated according to heats parameter based on materials used and job order.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>3. Carry out Plastics Blow Moulding Production mould / die setup</p> <p>4. Carry out Plastics Blow Moulding Production machine setting</p>	<p>3.1 Type of mould /die and machine obtained and confirmed according to job order / instructions.</p> <p>3.2 Mould / die fixed / positioned to the machine according to installation procedure and product specification.</p> <p>4.1 Temperature controller adjusted according to product specification.</p> <p>4.2 Machine timer adjusted accurately according to machine manual and product specification in order to avoid product defect.</p> <p>4.3 Machine barrel heated according to heats parameter and type of materials.</p> <p>4.4 Extruded materials flowed downwards and caught by the moved mould according to job process.</p> <p>4.5 Air blown into the closed mould and trial shot / sample of parts produced according to approved product / customer requirement.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>5. Carry out pre-production process</p> <p>6. Carry out Plastics Blow Moulding Production process</p>	<p>4.6 Machine operation monitored continuously until completion of production job order / instructions or when necessary the machine shutdown according to production requirements and company standard practice.</p> <p>5.1 Materials (thermoplastic) loaded in to hopper manually / automatically according to process requirement.</p> <p>5.2 Physical appearance of Molten / Melted plastic produced (colour, surface) checked according to product specification</p> <p>6.1 Materials extruded from barrel through die exit observed and flowed downwards smoothly according to machine parameter setting.</p> <p>6.2 Blow moulding method and technique applied according to process requirement.</p> <p>6.3 Product such as containers, bottles, jerry can formed according to required specifications (dimension (length, diameter and thickness), weight, appearance).</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>7. Carry out product finishing process</p> <p>8. Report Plastics Blow Moulding Production activities</p>	<p>6.4 The product removed / ejected (drop) from mould when the mould open after cooling time according to machine parameter.</p> <p>7.1 Types of finishing process (cleaning, trimming, buffing, and cutting) and tools to be used confirmed.</p> <p>7.2 Finished goods appearance (roughness, surface cracking, flashing, burr, wave, fish eye) confirmed according to drawing specification and customer requirement.</p> <p>7.3 Method and Technique of product finishing process applied according to production requirement.</p> <p>7.4 Product finishing process executed according to process requirement.</p> <p>7.5 Product packed into suitable packaging according to packaging standards instructions.</p> <p>8.1 Production output confirmed according to required specifications (dimension (length,</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
				<p>diameter and thickness), weight, appearance).</p> <p>8.2 Production output status / results documented (rejected rate, quantity, quality (type of defects) according to documentation procedure.</p> <p>8.3 Reporting format (manually or electronically) completed according to reporting procedure.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
4. Plastics Compression Moulding Production	C04	<p>Plastics Compression Moulding Production is a forming process in which a plastic material is placed directly into a heated metal mould, then is softened by the heat, and and forced to conform to the shape of the mould as the mould closes by a hydraulic ram. This process is to fabricate plastic parts from both of thermoplastic or thermosetting plastics material.</p> <p>The hydraulic press compresses the pliable plastic against the mould, resulting in a perfectly moulded piece, retaining the shape of the inside surface of the mould. After the hydraulic press releases, an ejector pin in the bottom of the mould quickly ejects the finish piece out of the mould. The excess materials on the mould are depends on the type of plunger used in the press.</p> <p>Compression moulding is a high-volume, high-pressure method suitable for moulding complex. Compression-moulding is suitable for ultra-large basic shape production in sizes beyond the capacity of extrusion techniques. Materials that are typically manufactured through compression</p>	<p>1. Identify Plastics Compression Moulding Production requirements</p> <p>2. Coordinate Plastics Compression Moulding Production activities</p>	<p>1.1 Job order/instructions, product specification, delivery date and quantity interpreted based on the approved customer requirements / needs.</p> <p>1.2 Type of mould and materials to be used listed based on job process and product specification.</p> <p>1.3 Type of machine, hydraulic ram, capacity (tonnage), functionality and its auxiliary equipment differentiated specifically for Thermoplastic or Thermoset compression moulding process.</p> <p>1.4 Product finish requirements (roughness – height and width, diameter, appearance) interpreted from drawing specification.</p> <p>1.5 Finished goods packaging specification determined according to customer requirements / needs.</p> <p>2.1 Mould, machine, auxiliary equipment, materials, manpower availability and production schedule confirmed according to job order.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
		<p>moulding are composite materials such as carbon fibre and KEVLAR.</p> <p>The person who is competent in this competency unit shall be able to interpret customer requirements from the job order, differentiates and match the machine, auxiliary equipment and materials to be used confirm production mould and machine setup correctly, execute pre-production and production activities according to work requirements and process procedure.</p> <p>The outcome of this competency is to make larger flat or moderately curved parts. This method of moulding is greatly used in manufacturing automotive parts such as hoods, fenders, scoops, spoilers, as well as smaller more intricate parts. in accordance with Product Specification, Standard Operating Procedure and customer requirements.</p>	<p>3. Carry out Plastics Compression Moulding Production mould setup</p>	<p>2.2 Materials (plastic granule, bullet) and packaging items obtained based on job process and quantity.</p> <p>2.3 Trimming tools (cutter, knives, scissors and plastic nipper) and auxiliary equipment to be used selected correctly to avoid product defect.</p> <p>2.4 Quantity of machine and manpower coordinated according to product requirements, schedule, machine manual / specification and job process.</p> <p>2.5 Production workplace / line setup checked according to job order / instructions and removes / purge residual materials to ensure the production area ready for production.</p> <p>2.6 Production workplace / line setup evaluation check sheet completed according to documentation procedure.</p> <p>3.1 Type of mould and machine obtained and confirmed according to job order / instructions</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>4. Carry out Plastics Compression Moulding Production machine setting</p>	<p>3.2 Mould fixed / positioned to the machine according to installation procedure and product specification.</p> <p>4.1 Temperature controller adjusted according product specification.</p> <p>4.2 Machine timer and heater adjusted accurately according to machine parameter and product specification in order to avoid product defect.</p> <p>4.3 Mould preheated by using machine platen according to process requirements.</p> <p>4.4 Materials in various form (palette, sheet, gelatine) placed into heated mould cavity and pressure applied to force the material into contact with all mould areas according to job process.</p> <p>4.5 Trial shot / sample of parts produced according to product drawing and process requirements</p> <p>4.6 Machine operation monitored continuously until completion of production job order / instructions or when necessary the machine</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>5. Carry out pre-production process</p> <p>6. Carry out Plastics Compression Moulding Production process</p>	<p>shutdown according to production requirements and company standard practice.</p> <p>5.1 Materials (thermoplastic or thermoset) positioned and observed into heated moulded cavity according to process requirements.</p> <p>5.2 Sufficient amount of materials plastic positioned into the heated mould to create a part is within specification.</p> <p>6.1 Thermoplastic / Thermosetting resins in a partially cured stage (the form of granules, putty-like masses, or preforms) obtained and confirmed to be employed in the Plastics Compression Moulding production process according to production requirements.</p> <p>6.2 Heated mould cavity confirmed before switching on the hydraulic ram according to job/work instructions.</p> <p>6.3 Completion of the process observed and monitored until the finished good injected out according to required</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>7. Carry out product finishing process</p> <p>8. Report Plastics Compression Moulding Production activities</p>	<p>specifications (dimension (length, diameter and thickness), weight, appearance).</p> <p>7.1 Types of finishing process (cleaning, trimming, buffing, and cutting) and tools to be used confirmed based on job order.</p> <p>7.2 Finished goods appearance (roughness, surface cracking, flashing, burr, wave, warping) confirmed according to drawing specification and customer requirements.</p> <p>7.3 Product finishing process executed and appropriate method and technique applied according to process requirements.</p> <p>8.1 Production output confirmed according to required specifications (dimension (length, diameter and thickness), weight, appearance).</p> <p>8.2 Production output status / results documented (rejected rate, quantity, quality (type of defects)) according to documentation procedure.</p> <p>8.3 Reporting format (manually or electronically) completed according to reporting procedure.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
				<p>2.2 Packaging items obtained based on job process and quantity.</p> <p>2.3 Type of materials (powder / liquid) and cooling system (fan / water spray and auxiliary equipment to be used selected correctly to avoid product defect.</p> <p>2.4 Quantity of machine and manpower coordinated according to product requirements, schedule, and machine manual / specification and job process.</p> <p>2.5 Production workplace / line setup checked based on job order / instructions and residual materials removed to ensure the production area ready for production.</p> <p>2.6 Production workplace / line setup evaluation check sheet completed according to documentation procedure.</p> <p>2.7 Mould pre-heated according to heats parameter based on materials used and job order.</p> <p>2.8 Cooling fan / water spray placed in the cooling station according to job process.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>3. Carry out Plastics Rotational Moulding Production mould setup</p> <p>4. Carry out Plastics Rotational Moulding Production machine setting</p> <p>5. Carry out pre-production process</p>	<p>3.1 Type of mould and machine obtained and confirmed according to job order/instructions</p> <p>3.2 Mould fixed / positioned to the machine according to installation procedure and product specification.</p> <p>4.1 Heat up mould confirmed according to process requirements.</p> <p>4.2 Electrical instruments (Thermocouple, temperature controller) and heater adjusted according product specification.</p> <p>4.3 Machine operation monitored continuously until completion of production job order/instructions or when necessary the machine shutdown according to production requirements and company standard practice.</p> <p>5.1 Compound materials prepared to produce parts according to product specification.</p> <p>5.2 A measured quantity of materials in a form of powder / liquid loaded into the mould to create a part is within specification.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>6. Carry out Plastics Rotational Moulding Production process</p> <p>7. Carry out product finishing process</p>	<p>6.1 Mould heated in the oven until fully melt and coalesce on the mould wall according to required length of time setting and process requirements.</p> <p>6.2 Hollow part rotated through two or more axes within required speed in order to avoid the accumulation of polymer powder.</p> <p>6.3 Cooling fan functionality confirmed for cooling the mould.</p> <p>6.4 The materials solidified by cooling system (fan / water spray) within a certain range of cooling rate in order to avoid part defect (warping).</p> <p>6.5 Part removed from the mould according process flow.</p> <p>7.1 Types of finishing process (cleaning, trimming, buffing, and cutting) and tools to be used confirmed according to job order.</p> <p>7.2 Finished goods appearance (roughness, surface cracking, flashing, wave, warping) confirmed according to drawing specification.</p> <p>7.3 Method and Technique of product finishing process applied</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>8. Report Plastics Rotational Moulding Production activities</p>	<p>according to determined production process.</p> <p>7.4 Product finishing process executed according to customer requirement and process requirements.</p> <p>8.1 Production output confirmed according to required specifications (dimension (length, diameter and thickness), weight, appearance).</p> <p>8.2 Production output status / results (rejected rate, quantity, quality (type of defects) documented according to documentation procedure.</p> <p>8.3 Reporting format (manually or electronically) completed according to reporting procedure.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
6. Plastics Production Quality Control	C06	<p>Plastics Production Quality Control is a procedure or set of procedures intended to ensure that a plastics product adheres to a defined set of quality criteria or meets the requirements of the client or customer. The quality of the plastic products produced will be maintained and a product under development meets specified requirements.</p> <p>The person who is competent in this competency unit shall be able to carry out product inspection during the production process. The inspection methods are followed job/work order and product specifications. Measuring instrument and measuring equipment are utilised during the process. Suitable testing such as Destructive Test (DT) shall be applied according to product requirements.</p> <p>The outcome of this competency is to ensure the quality of the product according to job/work order, parts drawing, and product quality requirements. All the related documents (QC inspection sheet, recording formats, job/work order sheet etc.) shall be complied and</p>	<ol style="list-style-type: none"> 1. Assess plastics production quality control requirements 2. Coordinate plastics production quality control activities 	<ol style="list-style-type: none"> 1.1 Work order, quality standards product specifications and requirements interpreted according to product drawing/approved sample/any relate part assembly trial. 1.2 Inspection activities identified according to customer requirements, product drawing and inspection procedure. 1.3 Previous similar product history record obtained according to work requirements. 2.1 Inspection measuring instrument and equipment for geometrical, dimensional & tolerance (GDT) - micrometre, venire calliper gauge, inspection jig, comparator, coordinate measuring machine (CMM) etc.) and equipment for material properties (tensile tester, Charpy Tester, Melt Flow index Tester) prepared according to process requirements and product specification. 2.2 Recording format (Work-In-Progress, check sheet, control chart etc.) obtained according to company standard practice.

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
		<p>completed to record the quality status adhered to safety requirements and Company Standard Operating Procedure (SOP).</p> <p>The personnel who are to be competent in this competency must in prior have the following competencies:</p> <ol style="list-style-type: none"> 1. Plastics Injection Moulding Production and/or 2. Plastics Extrusion Production and/or 3. Plastics Blow Moulding Production and / or 4. Plastics Compression Moulding Production and / or 5. Plastics Rotational Moulding Production 	<ol style="list-style-type: none"> 3. Carry out plastics production quality control activities 	<ol style="list-style-type: none"> 2.3 Inspection methods and techniques determined according to quality control requirements. 2.4 Parts quality (dimension, profile etc.) listed based on quality control standards. 3.1 Existing production processes implemented and adjustments made as necessary to produce products within specifications. 3.2 Parts quality inspection material properties and material strength confirmed tested by using Destructive Test according to quality procedure. 3.3 Parts quality inspection (geometrical, dimensional & tolerance (GDT)) process executed according product specification. 3.4 Recording format (Work-In-Progress, inspection results, etc.) completed according to Documentation procedure. 3.5 Quality status reported to superior according to reporting procedure and company policy.

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>4. Carry out quality control activities assessment</p> <p>5. Report quality control activities</p>	<p>4.1 Quality standards parts specifications and requirements reviewed according to customer requirement and quality control procedure.</p> <p>4.2 Quality control activities confirmed from the recording format according to Quality standards parts specifications and requirements.</p> <p>5.1 Quality inspection status compiled according to customer requirement and documentation procedure.</p> <p>5.2 Reporting format (Inspection checklist, check sheet, etc.) completed according to reporting procedure.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
<p>7. Plastics Production Machinery and Mould / Die Preventive Maintenance</p>	<p>C07</p>	<p>Plastics Production Machinery and Mould / Die Preventive Maintenance is an activity to maintain the performance of production machines and mould/die in order to prevent faults from occurring. The maintenance activities are not including the major breakdown services and all maintenance activities assigned for the maintenance personnel/ department.</p> <p>The person who is competent in this competency unit shall be able to execute the preventive maintenance activities such as cleaning and replacing faulty machine and mould/die part by using lubricants (grease, oil etc.) and tools (air gun, grease gun, pump, etc.), consumable item (cotton rag, brush, etc.) and equipment (vacuum cleaner, dryer etc.). The personnel responsible for the completion of daily, monthly and yearly or scheduled preventive maintenance activities of production machines and mould/die.</p> <p>The outcome of this competency is to ensure every machine and mould / die in a production process</p>	<ol style="list-style-type: none"> 1. Identify plastics production preventive maintenance requirements 2. Coordinate plastics production preventive maintenance activities 	<ol style="list-style-type: none"> 1.1 Machine and Mould / Die condition function and maintenance requirements interpreted according to machine and mould / die specification. 1.2 Types of maintenance tools and lubricants listed according to job/work requirements. 2.1 Standard parts (Guide post, Guide Bush slides, bearings, etc.) identified according to process requirements and machine specification 2.2 Mould / Die parts (Cutting Die, Punch, and Die Base etc.) to be maintained identified according maintenance requirements. 2.3 Production preventive maintenance activities scheduled according to company standard practice. 2.4 Spare part for both mould and machine prepared according to maintenance requirement and scope of maintenance work.

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
		<p>always functions in good condition and performs its required task and its output rate is never disrupted according to machine manual, job/work instructions, Health Safety and Environmental (HSE) requirements as well as company Standard Operating Procedure (SOP).</p> <p>The personnel who are to be competent in this competency must in prior have the following competencies:</p> <ol style="list-style-type: none"> 1. Plastics Injection Moulding Production and/or 2. Plastics Extrusion Production and/or 3. Plastics Blow Moulding Production and/or 4. Plastics Compression Moulding Production and/or 5. Plastics Rotational Moulding Production 	<ol style="list-style-type: none"> 3. Carry out plastics production machinery preventive maintenance 	<ol style="list-style-type: none"> 3.1 Tools and lubricants obtained according to machine specification and preventive maintenance schedule. 3.2 Preventive maintenance of machine performed according to maintenance procedure and machine manual. 3.3 Machine cleaning carried out according to maintenance check list and housekeeping practices ensured according to maintenance procedure. 3.4 Faulty machine part replacement applied according to machine specification and scope of preventive maintenance works under production operation. 3.5 Maintenance record updated upon completion of the job according to documentation procedure.

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>4. Carry out plastics production mould/die maintenance</p>	<p>4.1 Tools and lubricants obtained according to job/work requirement.</p> <p>4.2 Maintenance of Mould / Die performed according to preventive maintenance procedure.</p> <p>4.3 Mould / Die dismantled for maintenance according to job/work requirements and scope of preventive maintenance works.</p> <p>4.4 Mould or Die cleaning carried out according to preventive maintenance procedure.</p> <p>4.5 Defective items serviced / replaced/rectified or reported for further action according to maintenance procedure.</p> <p>4.6 Mould or Die condition verified and assembled according to mould or die specification.</p> <p>4.7 Maintenance record updated upon completion of the job according to documentation procedure.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			5. Verify plastics production machine and mould/die condition and function status	5.1 Machine / mould and Die functionality tested according to machine specification. 5.2 Defective item service / replacement / rectification recorded for further action according to preventive maintenance procedure. 5.3 Preventive maintenance details (Machine, Mould or die condition, name, date, time, etc) recorded according to documentation procedure.

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
8. Plastics Production Supervision	C08	<p>Plastics Production Supervision is an activity to supervise and coordinate the production activities including monitoring the timeliness, cost effectiveness, quality and safety practices of all aspects of plastics production.</p> <p>The person who is competent in this competency unit shall be able to carry out activities such as inspection of product inventory, determine availability of resources (manpower, machines, materials) assessment of production output using systematic production process (work schedule, filing system, job/work instructions, etc.) and verification of finished goods quality and status.</p> <p>The outcome of this competency is to ensure the production runs smoothly and the output of production meets company target according to job/work order requirements, regulatory / authority bodies compliances and company Standard Operating Procedure.</p> <p>The personnel who are to be competent in this competency must in prior have the following</p>	1. Assess production supervision requirements	<p>1.1 Production schedule confirmed according to production planning and customer requirements.</p> <p>1.2 Stock balance, place order, job/work order instruction, etc. listed according to production plan.</p> <p>1.3 Production process stage determined according to production requirement.</p> <p>1.4 Raw Materials (Pellet / coil), Equipment and facilities identified according to production requirement.</p> <p>1.5 Sources of raw materials (such as supplies of raw material, specifications) and Tools (Allen key, calliper, micro meter, colour meter/ comparator.) and equipment (forklift, stacker, container, pallet truck) identified based on job order.</p> <p>1.6 Quantity of products with lead time, type of process, type of packaging listed according to production process requirements.</p> <p>1.7 Production materials handling activities listed and method of delivery systems such as forklift,</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
		competencies: 1. Plastics Injection Moulding Production and/or 2. Plastics Extrusion Production and/or 3. Plastics Blow Moulding Production and/or 4. Plastics Compression Moulding Production and/or 5. Plastics Rotational Moulding Production 6. Plastics Production Quality Control 7. Plastics Production Machinery and Mould/Die Preventive Maintenance	2. Monitor plastics production Safety, Health and Environmental (SHE) compliance	batches, hand jack and trolley etc. identified according to inventory procedure and Safety, Health and Environment requirements. 1.8 Percentage rejection rate identified according to previous and production record company standard. 1.9 Defects rework, waste and disposal activities classified according production requirements. 1.10 Production inventory status, incoming and outgoing goods checked according to company inventory procedure. 2.1 Safe work station, waste disposal, Personal Protection Equipment (PPE) etc. interpreted and identified according to safety policy. 2.2 Personal, machinery, workplace health, safety and environment enforcement procedure followed and adhered to Occupational Safety and Health Act. (OSHA) requirements.

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
				<p>2.3 Rules and regulation, regulatory/authority bodies etc. identified according to safety, health and environmental (HSE) policy.</p> <p>2.4 Current personal, machinery and workplace health, safety and environment implementation status observed.</p> <p>2.5 Safety briefing, signage of danger/hazardous area exercise evacuation plan and fire drills participated according to regulatory / statutory bodies requirements.</p> <p>2.6 Workplace health, safety and environment implementation feedbacks provided to respective party (Safety and Health Officer, superior, etc.) according to regulatory/statutory bodies requirements.</p> <p>2.7 Effectiveness of personal, machinery and workplace health, safety and environment activities assessed according to regulatory/statutory bodies requirements.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>3. Supervise plastics production operation</p> <p>4. Carry out production materials handling activities</p>	<p>2.8 Findings, planning, level of compliance (checklist, logbook, database, etc.) documented according to documentation procedure.</p> <p>3.1 Production planning (schedule, manpower, type of machine, raw materials) obtained according to production requirements.</p> <p>3.2 Production process stage determined according to production requirements.</p> <p>3.3 Working methods based on job/work order, process flow, production schedule and procurement and inventory system selected.</p> <p>3.4 Production process flow followed according job order/instructions.</p> <p>4.1 Raw materials for the plastic production availability / readiness confirmed according to job/work order.</p> <p>4.2 Tools (knife, cutter, etc.) and equipment (forklift, wheel barrow, stacker, container, etc.) identified according to job order.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
				<p>4.3 Production inventory status, incoming and outgoing goods checked according to inventory system.</p> <p>4.4 Inventory status (incoming materials, stock & balance, etc.) and finished goods status assessed.</p> <p>4.5 Test sampling of materials and finish products (tensile strength, hardness, impact, melt flow etc.) coordinated based on job process.</p> <p>4.6 Production materials handling activities executed according to production requirements.</p> <p>4.7 Quality and quantity of finished goods evaluated according to production specification.</p> <p>4.8 Production inventory results and data, rejected items, scrap and materials waste properly stored and documented according to company standard practice.</p> <p>4.9 Company inventory filing system (manual, electronic, etc.) utilised according to documentation procedure.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>5. Coordinate new or existing employees training</p>	<p>4.10 Regulatory / authority body requirements on waste management complied according to company standard practice.</p> <p>4.11 Facilities, equipment, or procedures to improve safety, quality, and efficiency in materials handling recommended according to company standard practice.</p> <p>5.1 Training needs requirement and duration identified according to company policy.</p> <p>5.2 Employees to be trained selected according to employees training needs.</p> <p>5.3 Skill/Training gap analysis identified according to company policy.</p> <p>5.4 Type of training program such as safety and skills training identified and scheduled program proposed according to training plan.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
				<p>5.5 Employee development program is scheduled (date, venue, type of program, training providers, objective) confirmed and matched with the company plan.</p> <p>5.6 Training to subordinate delivered according to company training program.</p> <p>5.7 All other training order from management / department attended according to company policy.</p> <p>5.8 Employee development program accomplished according to schedule and training duration hours completed.</p> <p>5.9 On job training module prepared according to employee training requirements.</p> <p>5.10 Responsible party / departments acknowledged and documented on the completion/ achievements of program.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>6. Prepare report of production supervision activities</p>	<p>6.1 Production supervision activities adopted based on production requirements.</p> <p>6.2 Results of production output (finished goods, raw materials, waste, etc.) documented according to documentation procedure.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
<p>9. Plastics Thermoforming Operation</p>	<p>E01</p>	<p>Plastics Thermoforming Operation is a process where a plastic sheet is heated to a pliable forming temperature, formed to a specific shape in a mold, and trimmed to create a usable product. The sheet, or "film" when referring to thinner gauges and certain material types, is heated in an oven to a high-enough temperature that it can be stretched into or onto a mould and cooled to a finished shape.</p> <p>The person who is competent in this competency unit shall be able to assess the product requirements based on job order and client needs, plan and execute the thermoforming processes and verifying the output according to product specification.</p> <p>The outcome of this competency is to produce the product in a desired shape/mould using the thermoforming technology.</p>	<p>1. Assess the product requirements</p> <p>2. Coordinate thermoforming process</p>	<p>1.1 Job order / Product specification determined based on the approved customer needs / requirements.</p> <p>1.2 Delivery date and quantity noted according to customer requirements.</p> <p>1.3 Type of mould, machine (heater and timer, hydraulic arm cylinder) and materials identified based on job process (forming) and product specification.</p> <p>2.1 Mould, machine and auxiliary equipment, materials and manpower readiness identified according to job order.</p> <p>2.2 Production workplace / line setup checked according to job order / instructions.</p> <p>2.3 Materials (sheet), packaging items, obtained according to job process and quantity requirements.</p> <p>2.4 Tools (air / spray gun, trimming tools (knives, scissors) selected according to process requirements.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>3. Carry out thermoforming process</p> <p>4. Conduct finished good output verification</p>	<p>2.5 Machine manual / setup assured according to product and process requirements.</p> <p>2.6 Thermo product sample confirmed according to customer requirement/ approved product.</p> <p>3.1 Mould, machine, materials and manpower readiness confirmed according to process requirement.</p> <p>3.2 Mould heated according heats parameter and type of materials.</p> <p>3.3 Temperature controller and heater adjusted according product specification.</p> <p>3.4 Line setup readiness check sheet completed according to documentation procedure.</p> <p>4.1 Production status / results (rejected rate, quantity, quality (type of defects)) confirmed according to production requirement.</p> <p>4.2 Verification record updated according to documentation procedure.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
10. Plastics Product Secondary Process Customization	E02	<p>Plastics Product Secondary Process Customization is a process to customize or alter the appearance, surface of a product for aesthetic or functional purposes.</p> <p>The personnel who is competent in this competency unit shall be able to analyse secondary process customisation requirements, prepare tools, machines and materials for colour application or assembly process in the secondary process, carry out activities such as spraying, cutting, printing, slitting, drilling, sonic welding etc., and prepare plastic product secondary process report according to drawing, product specification and customer requirements.</p> <p>The outcome of this competency is to complete and customize all the processes of work piece into the desired output. The processes must comply with Company Standard Operating Procedure (SOP), Health, Safety and Environmental (HSE) requirements.</p>	<ol style="list-style-type: none"> 1. Identify secondary process customization requirements 2. Prepare tools, machines and materials to be used for colour application 	<ol style="list-style-type: none"> 1.1 Product specification interpreted according to customer requirement. 1.2 Type of customization identified according to product specification. 1.3 Clean room procedures determined according to product specification and customer requirements. 2.1 Tools (spray gun, mixing tumbler, stencil, Squeegee) obtained according to process requirements. 2.2 Machines (tempo printing, weight machine, silk screen printer, spray booth and oven) confirmed according to product specifications. 2.3 Oven for drying heated accordingly to Standard Operating Procedure. 2.4 Jigs and fixtures selected according to product specifications.

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
		<p>The personnel who are to be competent in this competency must in prior have the following competencies:</p> <ol style="list-style-type: none"> 1. Plastics Injection Moulding Production and/or 2. Plastics Extrusion Production and/or 3. Plastics Blow Moulding Production and/or 4. Plastics Compression Moulding Production and/or 5. Plastics Rotational Moulding Production 	<ol style="list-style-type: none"> 3. Prepare tools, machines and materials to be used for assembly process 	<ol style="list-style-type: none"> 2.5 Suitable colour mixing executed according to the colour slide (approve by customer) for spray processing. 2.6 Suitable ink mixing executed according to the colour slide (approve by customer) for tempo printing and silk screen). 2.7 Finished products verified according to customer requirement and product specification. 3.1 Tools (cutter, scissor, knives, screw driver) obtained according to process requirements. 3.2 Machines (ultra-sonic, conveyor, motor screwdriver, torque) confirmed according to product specifications. 3.3 Jigs, fixtures and child parts selected according to product specifications or/and assembly process layout. 3.4 Layout of assembly follow in order assured in order to ensure parts assembled correctly.

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>4. Carry out plastic production secondary process customization</p>	<p>3.5 The assembly process such as screwing, snatching, drilling, ultra sonic, sticking label etc. monitored in order to avoid defect product.</p> <p>3.6 Working environment area (Clean rooms/assembly area) criteria confirmed based on type of product and customer requirements.</p> <p>3.7 Finished products verified accordingly to customer approval product.</p> <p>4.1 Plastic production secondary process confirmed according to drawing and product specification.</p> <p>4.2 Secondary process executed according to job order /instructions.</p> <p>4.3 Working environment area (Clean room / Assembly area) procedure followed according to product requirements, company work instructions or customer requirements.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
			<p>5. Prepare plastic product secondary process customization reports</p>	<p>4.4 Finished product quality evaluated based on approved sample and customer requirements.</p> <p>5.1 Plastics product secondary process customization process data compiled according to process requirements.</p> <p>5.2 Reporting format (Inspection checklist, logbook, check sheet, database, etc.) completed according to reporting procedure.</p>

CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Criteria
11. <i>Child Parts</i> Assembly	E03	<p><i>Child Parts</i> Assembly is a process of putting together of manufactured parts or work in progress (WIP) parts to make a complete product based on the client/customer requirements.</p> <p>The person who is competent in this competency unit shall be able to assess child parts in process assembly requirements such as in the injection process or after the injection process, coordinate parts assembly process activities, carry out assembly process activities involving selection of assembly tools, machines, jigs and fixtures and according to assembly drawing and product specification.</p> <p>The outcome of this competency is to make a complete product/finished parts according to product specification and Health, Safety and Environmental (HSE) requirements and Company Standard Operating Procedure (SOP).</p> <p>The personnel who are to be competent in this competency must in prior have the following competencies:</p>	<ol style="list-style-type: none"> 1. Assess <i>child parts</i> assembly process requirements 2. Coordinate parts assembly process activities 	<ol style="list-style-type: none"> 1.1 Job/work order, assembly drawing and specification and parts to be assembled determined according to customer requirements. 1.2 Assembly process requirements interpreted according to job/work order. 1.3 Type of assembly process, assembly tools, machines, jigs, and fixture and hand tools, standard parts to be used determined according to product specification and customer requirement. 2.1 Parts assembly checklist reviewed according to production requirements. 2.2 Assembly process stages arranged based on job/work order 2.3 Assembly tools, machines, jigs, fixture, hand tools and standard parts selected according to process requirements. 2.4 Assembly method and technique selected according to process requirements.

CURRICULUM of COMPETENCY UNIT

(CoCU)

- CORE

CURRICULUM of COMPETENCY UNIT (CoCU)

Sub Sector	METAL MACHINING TECHNOLOGY						
Job Area	PLASTICS PRODUCTION OPERATION						
Competency Unit Title	PLASTICS INJECTION MOULDING PRODUCTION						
Learning Outcome	<p>The person who is competent in this competency unit shall be able to produce a variety of plastic parts from the smallest component to entire body panels of cars, household such as plates, cup, spoon and forks and cover for electronic gadgets. Example of thermoset products are such as electrical connector housings, automotive ashtrays, and cookware appliance handles and knobs. Upon completion of this competency unit, trainees will be able to:-</p> <ul style="list-style-type: none"> • Identify Plastics Injection Moulding Production requirements • Coordinate Plastics Injection Moulding Production activities • Carry out Plastics Injection Moulding Production mould setup • Carry out Plastics Injection Moulding Production machine setting • Carry out pre-production process • Carry out Plastics Injection Moulding Production process • Carry out product finishing process • Report Plastics Injection Moulding Production activities 						
Competency Unit ID	C01	Level	3	Training Duration	450 Hours	Credit Hours	45.0
Work Activities	Related Knowledge	Related Skills		Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
1. Identify Plastics Injection Moulding Production requirements	i. Fundamental of Plastics Injection Moulding production ii. Job order / instructions: <ul style="list-style-type: none"> • Product specification / parts drawing / customer product / limit / master sample 				60 hours	Lecture and Discussion	i. Fundamental of Plastics Injection Moulding production defined according to production requirements. ii. Job order / instructions listed

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> • Colour • Delivery date • Quantity iii. Type of injection process: <ul style="list-style-type: none"> • In process insert / over mould • After process insert • Multiple colours • Multiple layers iv. Type of mould: <ul style="list-style-type: none"> • Two plate mould • Three plate mould • Stack mould • Split mould • Hot runner system v. Type of plastics materials: <ul style="list-style-type: none"> • Thermoplastic • Thermoset vi. Colour processing method: <ul style="list-style-type: none"> • Compounding vii. Colorant form: <ul style="list-style-type: none"> • Powdered (dye / pigment) • Master batch (solid/liquid) viii. Type of machine / 					<p>and defined according to the approved customer needs / requirements.</p> <p>iii. Jobs requirement defined according to product specification / parts drawing / customer product / limit / master sample.</p> <p>iv. Differences of injection moulding production described according to related process / product requirement.</p> <p>v. Type of mould, materials and colour listed according to product and customer</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	injection unit: <ul style="list-style-type: none"> • Vertical • Horizontal • Multi plug ix. Type of clamping unit: <ul style="list-style-type: none"> • Toggle • Fully hydraulic • Hybrid x. Component of injection moulding machine: <ul style="list-style-type: none"> • Electric motor <ul style="list-style-type: none"> ▪ AC and DC motor ▪ Servo motor • Pump <ul style="list-style-type: none"> ▪ Water pump ▪ Hydraulic pump • Pilot valves • Limit switch /sensor • Pressure gauge/ regulator • Central processing unit (CPU)/ Programmable Logic Control (PLC) • Temperature Controller xi. Machine tonnage xii. Machine functionality					requirements. vi. Mould and materials differentiated according to their product / mould specification and customer requirement. vii. Machine identified according to their product / mould design. viii. Type of machine and its related equipment defined according to customer requirement ix. Finished goods packaging defined according to parts safety during handling

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	xiii. Auxiliary equipment: <ul style="list-style-type: none"> • Mould temperature controller • Chiller • Granulator • Hopper loaders • Mixers • Conveyor • Robotic Arm • Gas assistant unit xiv. Finished product requirements: <ul style="list-style-type: none"> • Roughness • Dimension • Appearance • Colour • Weight xv. Finished goods packaging specification xvi. Statutory bodies requirement such as <ul style="list-style-type: none"> • Occupational Safety & Health Act (OSHA) • Department of Environment (DOE) xvii. Work Place Organization Method (5S)					

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<ul style="list-style-type: none"> i. Interpret fundamental of Plastics Injection Moulding production ii. Interpret job order / instructions iii. Differentiate injection production process iv. Determine type of mould ,materials and colours to be used v. Differentiate type of machine, capacity (tonnage), functionality and auxiliary equipment vi. Interpret finished product requirements vii. Determine finished goods packaging specification 	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Thorough and precise in interpreting production and customer requirements ii. Resourceful and 	90 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			<p>meticulous in identifying finished product requirements</p> <p><u>Safety:</u></p> <p>i. Aware of 5S and safety requirement at all time</p>			
2. Coordinate Plastics Injection Moulding Production activities	<p>i. Production schedule:</p> <ul style="list-style-type: none"> • Production date • Manpower availability • Machine and auxiliary equipment • Mould • Materials <p>ii. Trimming tools:</p> <ul style="list-style-type: none"> • cutter • knives • scissors • plastic nipper • tumbler (for thermoset product only) • Special tools: 			30 hours	Lecture and Discussion	<p>i. Mould, machine and auxiliary equipment, materials and manpower readiness confirmed according to job order / instructions.</p> <p>ii. Production workplace / line setup checked according to job order / instructions.</p> <p>iii. Materials colour (mixing /</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> ▪ Hot cutter ▪ Blower ▪ Ultrasonic cutter ▪ Deburring tools ▪ Jig cutter ▪ Gas burner iii. Production workplace / line setup checking procedure iv. Production workplace / line setup evaluation check sheet v. Pre-heated parameter of machine barrels and materials: <ul style="list-style-type: none"> • Temperature setting • Sequence / Cycle Time • Machine quantity vi. Pressure (Hydraulic, injection)					compounding), packaging items, obtained according to job process and quantity requirements. iv. Trimming tools selected according to process requirements. v. Machine manual / setup assured according to product requirements and process. vi. Pre-heated parameter of machine barrels and materials confirmed according to customer requirement / approved product.
		i. Determine production schedule, mould, machine, auxiliary equipment , materials and		30 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<p>manpower availability</p> <p>ii. Obtain materials, colour (mixing / compounding) and packaging items</p> <p>iii. Select trimming tools</p> <p>iv. Arrange quantity of machine and manpower</p> <p>v. Check production workplace / line setup</p> <p>vi. Complete production workplace / line setup evaluation check sheet</p> <p>vii. Determine pre-heated parameter of machine barrels and materials</p>	<p><u>Attitude:</u></p> <p>i. Efficient and well organized in coordinating activities</p> <p>ii. Adhere to coordination technique</p>			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			<u>Safety:</u> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace / machinery safe to be used			
3. Carry out Plastics Injection Moulding Production mould setup	i. Mould identification: <ul style="list-style-type: none"> • Code number/ product name • Size • Mould weight • Mould auxiliary (chiller, dryer, granulators) ii. Type of mould and machine iii. Position of mould to the machine iv. Additional auxiliary requirement: <ul style="list-style-type: none"> • Hot runner connection 			18 hours	Lecture and Discussion	i. Type of mould and machine specified according to process / product requirements. ii. Mould confirmed clear from water blockage (for thermoplastic only). iii. Additional auxiliary requirements installed according to

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> • Mould temperature controller • Hydraulic core function • Limit switch <p>v. Water channel system</p> <p>vi. Cartridge heater (for thermoset mould only)</p> <p>vii. Special quality control equipment :</p> <ul style="list-style-type: none"> • Ruler • Calliper • Dial indicator <p>viii. Clamping unit</p> <p>ix. Tools for setup / refitting and down / removal:</p> <ul style="list-style-type: none"> • Hand tools <ul style="list-style-type: none"> ▪ Allen keys ▪ Shifting spanner ▪ Screwdrivers ▪ Pliers and multi-grips ▪ Knife ▪ Spanners ▪ Short length of pipes 					<p>product specification.</p> <p>iv. Water channel system confirmed clear from blockage.</p> <p>v. Cartridge heater condition and functionality confirmed and preheated before machine starts (for thermoset mould only).</p> <p>vi. Various size of ejector (diameter and length) positioned according process requirements.</p> <p>vii. Tools for setup / refitting and down / removal mould utilised.</p> <p>viii. Mould positioned to the machine according to machine specification and</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> ▪ Spare host connectors • High temperature grease for lifting the machine nozzle • Measuring tape • Thread tape x. Post moulding equipment: <ul style="list-style-type: none"> • Jig • Fixture • Trimming tools • Robotic arm xi. Equipment / mould accessories: <ul style="list-style-type: none"> • Ejector rod • Various machine nozzle • Lifting gear (slings, eye bolts, shackles) • Clean up gear (rags and rubbish bins) xii. Procedure of mould setup xiii. Mould setup / refitting and mould down/ removal method 					<p>procedure.</p> <p>ix. Mould setup / refitting and mould down / removal method employed.</p> <p>x. Mould setup records completed according to documentation procedure.</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	xiv. Mould checking method xv. Mould setup records: <ul style="list-style-type: none"> • Check sheet • Checklist 					
		i. Determine type of mould and machine ii. Check mould to confirm clear from water blockage (for thermoplastic only) iii. Install additional auxiliary requirements for mould safety iv. Check water channel system from blockage v. Check cartridge heater condition and functionality vi. Preheat cartridge heater before machine starts (for thermoset mould only) vii. Setup suitable size of ejector (diameter		30 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<p>and length)</p> <ul style="list-style-type: none"> viii. Utilise tools for setup / refitting and down / removal of mould ix. Align clamping unit x. Follow mould setup procedure xi. Apply mould setup / refitting and mould down / removal method xii. Update mould setup record 	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Precise and focus in mould setting ii. Adhere to mould setting procedure ii. Handle production mould with care <p><u>Safety:</u></p> <ul style="list-style-type: none"> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) 			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			ii. Ensure workplace / machinery safe to be used			
4. Carry out Plastics Injection Moulding Production machine setting	i. Machine setup information sheet: <ul style="list-style-type: none"> • Type of materials • Colour • Drying information • Weight of shot • Production rate / cycle time ii. Process parameter setting: <ul style="list-style-type: none"> • Injection speed / injection pressure (limit) • Switch over to holding • Holding pressure / holding time (holding pressure release) • Screw rotation / back pressure (dosing delay) • Dosing stroke or volume/ screw 			18 hours	Lecture and Discussion	i. Machine setting specified according to process requirements. ii. Injection moulding machine setting executed according to mould / product specification and process sequences. iii. Materials purged manually according to machine manual. iv. Trial shot / Shot short and sample of parts produced according to job order / instructions,

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	retract <ul style="list-style-type: none"> • Residual (cooling time) • Cycle time monitor (time to switch off and pause time) iii. Sequence of Injection moulding machine movement setting: <ul style="list-style-type: none"> • Injection unit : <ul style="list-style-type: none"> ▪ Temperature setting ▪ Strokes, speed, pressure setting ▪ Nozzle contact position setting ▪ Checking on movement in manual mode / dry cycle • Clamping unit : <ul style="list-style-type: none"> ▪ Mould setting ▪ Strokes, speed, forces for mould / close and open movements setting 					customer approval sample and machine setting procedure.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> ▪ Undercut/core set sequence setting ▪ Mould height setting ▪ Connecting of the ejector, set, strokes, speeds, pressures (set ejector zero datum) <p>iv. Materials purging method</p> <p>v. Trial shot / short shot and sample of parts</p> <p>vi. Machine setting procedure</p>					
		<p>i. Determine machine setting (setup and shutdown)</p> <p>ii. Setup Injection moulding machine</p> <p>iii. Apply machine setting technique</p> <p>iv. Execute materials purging</p> <p>v. Execute production</p>		30 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		of trial shot/ shot short and sample of parts vi. Follow machine setting procedure	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Precise and focus in handling machine/ parameter setting ii. Handle production machine with care <p><u>Safety:</u></p> <ul style="list-style-type: none"> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace / machinery safe to be used 			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
5. Carry out pre-production process	<ul style="list-style-type: none"> i. Job order / instructions ii. Materials loading method into hopper iii. Injected materials from barrel into mould exit iv. Amount of plastic materials into the mould to create a part within specification v. Demoulding process vi. Physical appearance of molten / melted plastics produced (colour, form of material, thickness) 			12 hours	Lecture and Discussion	<ul style="list-style-type: none"> i. Materials (thermoplastic or thermoset) transferred in to hopper manually / automatically. ii. Injected materials from barrel into mould exit confirmed. iii. Sufficient amount of plastic materials moulded within specification. iv. Parts demoulding processes confirmed according to process requirements.
		<ul style="list-style-type: none"> i. Determine job order / instructions ii. Load materials in to hopper manually / automatically iii. Observe injected materials from barrel into mould exit iv. Inject sufficient amount of plastic 		12 hours	Demonstration and Observation	<ul style="list-style-type: none"> v. Physical appearance of molten / melted plastics inspected according to parts specification and

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		materials into the mould. v. Check parts demoulding process vi. Check physical appearance of molten / melted plastics	<u>Attitude:</u> i. Focus and observant in executing pre-production process ii. Adhere to pre production process procedure <u>Safety:</u> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace / machinery safe to be used			customer approval sample.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
6. Carry out Plastics Injection Moulding Production process	<ul style="list-style-type: none"> i. Water circulation (for Thermoplastic only) ii. Heater cartridge / rod setting (for thermoset only) iii. Stages / cycle / sequence of injection moulding process iv. Plastics Injection Moulding production procedures 			30 hours	Lecture and Discussion	<ul style="list-style-type: none"> i. Valve for water circulation functioned. ii. Materials purged according to process requirements. iii. Two halves of the mould closed, matched and balanced. iv. Injected materials from barrel into mould exit confirmed. v. Sufficient amount of plastic materials moulded within specification.
		<ul style="list-style-type: none"> i. Ensure valve open for water circulation (for Thermoplastic only) ii. Execute purging process iii. Ensure two halves of the mould close (core and cavity side) iv. Inject molten / melted materials into mould manually or automatically v. Comply to Standard Operating Procedure 		30 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Focus and observant in executing injection moulding production ii. Handle production machine and mould with care <p><u>Safety:</u></p> <ul style="list-style-type: none"> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace / machinery safe to be used 			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
7. Carry out product finishing process	i. Types of finishing process and tools: <ul style="list-style-type: none"> • cleaning • trimming • buffing • cutting ii. Finish goods appearance: <ul style="list-style-type: none"> • roughness • surface cracking • flashing • burr • wave • warping iii. Method and technique of product finishing process iv. Product finishing process v. Product packaging standard instructions			24 hours	Lecture and Discussion	i. Types of finishing process and tools specified according to process requirements. ii. Finished goods appearance examined according to product specification. iii. Method and technique of product finishing process employed. iv. Product packaging demonstrated according to packaging standard instructions.
		i. Determine types of finishing process and tools ii. Check finished goods appearance iii. Apply method and		24 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		technique of product finishing process iv. Execute product finishing process v. Follow procedure of product finishing process and product packaging standard instructions	<u>Attitude:</u> i. Focus and observant in executing product finishing process ii. Handle production machine and tools with care <u>Safety:</u> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace / machinery safe to be used			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
8. Report Plastics Injection Moulding Production activities	i. Production output status / results: <ul style="list-style-type: none"> • rejection rate, • quantity, • quality (type of defects) • wastage ii. Product acceptance criteria: <ul style="list-style-type: none"> • Appearance • Dimension • Functional iii. Reporting format (verbally/written) iv. Reporting medium (manually or electronically) v. Organizational hierarchy / charts vi. Standard Operating Procedure			6 hours	Lecture and Discussion	i. Production output status / results reviewed and confirmed according to product acceptance criteria. ii. Reporting format completed and submitted to superior according to reporting procedure and company policy.
		i. Compile production output status / results ii. Determine product acceptance criteria iii. Complete reporting		6 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		format (manually or electronically) iv. Utilise reporting medium v. Acknowledge status to superior/ authorised party	<u>Attitude:</u> i. Focus and observant in executing product finishing process ii. Handle production machine and tools with care			

Employability Skills

CORE ABILITIES	SOCIAL SKILLS
<p>01.01 Identify and gather information.</p> <p>01.02 Document information procedures or processes.</p> <p>02.01 Interpret and follow manuals, instructions and SOP's.</p> <p>02.03 Communicate clearly.</p> <p>02.04 Prepare brief reports and checklist using standard forms.</p> <p>02.05 Read / Interpret flowcharts and pictorial information.</p> <p>03.01 Apply cultural requirement to the workplace.</p> <p>03.02 Demonstrate integrity and apply practical practices.</p> <p>03.03 Accept responsibility for own work and work area.</p> <p>03.04 Seek and act constructively upon feedback about work performance.</p> <p>03.05 Demonstrate safety skills.</p> <p>03.06 Respond appropriately to people and situations.</p> <p>06.01 Understand systems.</p> <p>06.02 Comply with and follow chain of command.</p> <p>06.03 Identify and highlight problems.</p> <p>06.04 Adapt competencies to new situations / systems.</p> <p>01.04 Analyse information.</p> <p>01.06 Utilize word processor to process information.</p> <p>02.07 Utilize Local Area Network (LAN) / Intranet toexchange information.</p> <p>02.08 Prepare pictorial and graphic information.</p> <p>03.08 Develop and maintain a cooperation within work group.</p> <p>04.01 Organize own work activities.</p> <p>04.02 Set and revise own objectives and goals.</p>	<ol style="list-style-type: none"> 1. Communication skills 2. Conceptual skills 3. Interpersonal skills 4. Multitasking and prioritizing 5. Leadership skills 6. Self-discipline 7. Teamwork 8. Integrity

CORE ABILITIES	SOCIAL SKILLS
<p>04.03 Organize and maintain own workplace.</p> <p>04.05 Demonstrate initiative and flexibility.</p> <p>06.05 Analyse technical systems.</p> <p>06.06 Monitor and correct performance of systems.</p> <p>01.07 Utilize database applications to locate and process information.</p> <p>01.08 Utilizespreadsheets applications to locate and process information.</p> <p>01.09 Utilize business graphic application to processinformation.</p> <p>01.10 Apply a variety of mathematical techniques.</p> <p>01.11 Apply thinking skills and creativity.</p> <p>02.10 Prepare reports and instructions.</p> <p>03.09 Manage and improve performance of individuals.</p> <p>03.15 Liaise to achieve identified outcomes.</p> <p>03.16 Identify and assess client / customer needs.</p> <p>04.07 Negotiate acceptance and support for objectives and strategies.</p> <p>05.01 Implement project / work plans.</p> <p>05.02 Inspect and monitor work done and/or in progress.</p>	

Tools, Equipment and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1. Computer	1:5
2. Plant Layout / Workplace / Shop Floor	1:25
3. Safety Handbook	1:1
4. Equipment Safety Manual, Emergency and Hazardous Signage	1:25
5. Standard Operating Procedure	1:25
6. Manual Operation	1:25
7. Organization Chart	1:25
8. Application of Information Technology (word processor, data sheet, database, etc.)	1:25
9. Thermoplastic Injection Moulding Machine (min 30 tons) with machine working table (min size 4' x4' x 4') and mould clamping device	1:5
10. Thermoset Injection Moulding Machine (min 30 tons) with machine working table (min size 4' x4' x 4') and mould clamping device	1:5
11. 2 plate mould - thermoplastic	1:3
12. 3 plate mould - thermoplastic	1:3
13. Colour agent (compounding, master batch and powder with minimum 3 different colour)	3kg:1(per type per colour)
14. Hot runner mould with hot runner temperature controller	1:10
15. Mould – thermoset	1:3
16. Injection grade thermoplastic material (ABS, PP, HDPE, PVC, Acrylic) – pallet form type	3kg:1(per type)
17. Injection grade thermoset material (Melamine, Phenolic, Bakelite)	3kg:1(per type)
18. Mould Hand Tools (min size 2 mm ~ 14mm, bsf 1/8 “ ~ 2”), Common Spanner Set, Screw driver (flat min size = 6”), 1 feet 1/2” steel pipe, Copper Rod (min= diameter 3 “ x 6”), mallet , plier, cutter, multi-grips, knife, high temperature and normal grease, thread tape, apron and tools box).	1:1
19. Auxiliary equipment (Hooper dryer, Tumbler / Mixed Material,	1:20

ITEMS	RATIO (TEM : Trainees)
<p>Granulator, Mould temperature controller, auto loader, pick up robot (min-swing type), cooling tower) –to be install to the machine (suitable water channel and approval wiring system),</p> <p>20. Measurement Equipment set (Ruler, calliper, dial indicator and measurement tape)</p> <p>21. Weight Machine (min size 0.01 kg ~ 20 kg)</p> <p>22. Trimming tools set (cutter, knives, scissors, plastic nipper, tumbler (for thermoset product only).</p> <p>23. Special tools set (Hot cutter, Blower, Ultrasonic, Deburring tools Jig cutter and Gas burner</p>	<p>1:5</p> <p>1:20</p> <p>1:3</p> <p>1:10</p>

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CURRICULUM of COMPETENCY UNIT (CoCU)

Sub Sector	METAL MACHINING TECHNOLOGY						
Job Area	PLASTICS PRODUCTION OPERATION						
Competency Unit Title	PLASTICS EXTRUSION PRODUCTION						
Learning Outcome	<p>The person who is competent in this competency unit shall be able to produce tube, pipes, sheet, profile, film extrusion and resin / granule. Upon completion of this competency unit, trainees will be able to:-</p> <ul style="list-style-type: none"> • Identify Plastics Extrusion Production requirements • Coordinate Plastics Extrusion Production activities • Carry out Plastics Extrusion Production die setup • Carry out Plastics Extrusion Production machine setting • Carry out pre-production process • Carry out Plastics Extrusion Production process • Carry out product finishing process • Report Plastics Extrusion Production activities 						
Competency Unit ID	C02	Level	3	Training Duration	540 Hours	Credit Hours	54.0
Work Activities	Related Knowledge	Related Skills		Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
1. Identify Plastics Extrusion Production requirements	i. Fundamental of Plastics Extrusion production ii. Job order / instructions: <ul style="list-style-type: none"> • Product specification / parts drawing / customer product / limit / master sample • Delivery date • Quantity iii. Type of extrusion process: <ul style="list-style-type: none"> • Sheet extrusion 				60 hours	Lecture and Discussion	i. Fundamental of Plastics Extrusion production defined according to production requirements. ii. Job order / instructions listed and defined according to the approved customer needs /

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> • Pipe / Tube • Film • Profile • Granule <p>iv. Type of extrusion die :</p> <ul style="list-style-type: none"> • T-die (for sheet) • Round / in line die (pipe / tube / rod) • Cross head die(for wire cable) • Co-extrusion (multilayer plastic with same / different colour and / or materials) <p>v. Post extrusion process:</p> <ul style="list-style-type: none"> • Cooling/curing • Printing • Hauling off • Coiling • Cutting <p>vi. Post extrusion equipment:</p> <ul style="list-style-type: none"> • Cooling: <ul style="list-style-type: none"> ▪ Vacuum and Spray Tank (for pipe and profile) ▪ Water bath/trout (for tube) ▪ Roller (for sheet 					<p>requirements.</p> <p>iii. Jobs requirement defined according to product specification / parts drawing / customer product / limit / master sample.</p> <p>iv. Differences of extrusion moulding production described according to related type of process / product requirement.</p> <p>v. Type of die and materials differentiated and listed according to customer requirements.</p> <p>vi. Finish good packaging defined according to parts safety during handling.</p> <p>vii. Type of extrusion</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> film) <ul style="list-style-type: none"> ▪ Calibrator (for thick sheet) vii. Type of plastic materials: <ul style="list-style-type: none"> • Thermoplastic (Resin) viii. Colour processing procedure and method: <ul style="list-style-type: none"> • Compounding ix. Colorant form: <ul style="list-style-type: none"> • Powdered (Dye / pigment) • Master batch (solid/liquid) x. Material mixing process: <ul style="list-style-type: none"> • Filler • Additive • Stabilizer • Impact modifier • Lubricant • Pigment xi. Type of machine: <ul style="list-style-type: none"> • Single screw • Twin screw xii. Machine capacity (Length over diameter of screw barrel) xiii. Component of extrusion machine: <ul style="list-style-type: none"> • Barrel • Screw 					<ul style="list-style-type: none"> process identified according to their product / die design. viii. Material selected according to their product / die specification and customer requirement. ix. Type of machine and its related equipment defined according to customer requirement.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> • Main drive motor • Gearbox • Doser • Thrust assembly • Ventilation system • Heater • Thermocouple • Pumps <ul style="list-style-type: none"> ▪ Water ▪ Vacuum xiv. Component of die: <ul style="list-style-type: none"> • Torpedo • Spider (3,5,7,9 blades) • Central Core • Extruder pin xv. Machine functionality xvi. Auxiliary equipment : <ul style="list-style-type: none"> • Water bath • Water/vacuum/gear pump • Chiller • Puller / Tractor / Haul Off • Cutter • Printer • Guided roller • Coiler • Belling / Socketing 					

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> • Online Measurement • Pelletiser • Dehumidifier xvii. Finished product requirements: <ul style="list-style-type: none"> • Roughness • Dimension • Appearance • Colour • Weight xviii. Finish goods packaging specification xix. Statutory bodies requirement such as: <ul style="list-style-type: none"> • Occupational Safety & Health Act (OSHA) • Department of Environment (DOE) xx. Work Place Organization Method (5S)					
		i. Interpret Fundamental of Plastics Extrusion production ii. Interpret job order / instructions, product specification,		60 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		delivery date and quantity iii. Differentiate production process iv. List type of die and materials xxi. Identify colour processing procedure and method and colorant form: v. Differentiate type of machine , screw diameter, functionality and its auxiliary equipment specifically for Plastics Extrusion Production process vi. Interpret finished product requirements vii. Determine finished goods packaging specification	<u>Attitude:</u> i. Thorough and precise in interpreting production and			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			customer requirements ii. Resourceful and meticulous in identifying finished product requirements <u>Safety:</u> i. Aware of 5S and safety requirement at all time			
2. Coordinate Plastics Extrusion Production activities	i. Production schedule: <ul style="list-style-type: none"> • Production date • Manpower availability • Machine and auxiliary equipment • Die • Materials ii. Procedure, method and technique of compounding iii. Mixing materials (resin / granule with fibre, silicon, mica, colour / pigment/conductive/ uv			30 hours	Lecture and Discussion	i. Die, machine and auxiliary equipment, materials and manpower readiness confirmed according to job order / instructions. ii. Production workplace / line setup checked according to job

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	stabilizer) iv. Type of materials form (palette, powder) v. Trimming tools <ul style="list-style-type: none"> • Cutter • Knives • Scissors • Deburring tools • Jig cutter vi. Production workplace / line setup checking procedure vii. Production workplace / line setup evaluation check sheet viii. Machine barrels, die and materials pre-heated parameter: <ul style="list-style-type: none"> • Temperature setting • Time to pre heat • Quantity of machine to use 					order / instructions. iii. Materials colour (mixing / compounding) identified according to job process and quantity requirements. iv. Trimming tools selected according to process requirements. v. Machine manual / setup assured according to product requirements and process. vi. Machine barrels and materials pre-heated parameter confirmed according to customer requirement / approved product.
		i. Confirm die, machine, auxiliary equipment (water bath, puller, cutter, etc.), materials, manpower		42 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		availability and production schedule ii. Obtain packaging items iii. Determine type of mixing materials and form (palette, powder) iv. Determine procedure, method and technique of compounding v. Select trimming tools (cutter, knives, scissors) and auxiliary equipment vi. Coordinate quantity of machine and manpower Check production workplace / line setup vii. Complete production workplace / line setup evaluation check sheet				

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		viii. Confirm machine barrel, die and materials pre-heated parameter	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Efficient and well organized in coordinating activities ii. Adhere to coordination technique <p><u>Safety:</u></p> <ul style="list-style-type: none"> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace / machinery safe to be used 			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
3. Carry out Plastics Extrusion Production die setup	i. Die identification <ul style="list-style-type: none"> • Code number / product name • Size (diameter /width) • Spider and torpedo • Calibration or sizing equipment, • Die auxiliary ii. Type of die and machine iii. Tools for assembly and fittings for removal and refitting of a die and calibration or sizing equipment setup / refitting and down / removal iv. Procedure of removal and refitting die and calibration or sizing equipment v. Die setup / refitting and die changeover / removal method vi. Die checking method vii. Die setup check sheet viii. Die heating parameter			30hours	Lecture and Discussion	i. Type of die and machine specified according to process requirements. ii. Additional auxiliary requirements installed according to product type. iii. Cartridge / band heater condition and functionality confirmed and preheated before machine starts. iv. Tools for setup / refitting and down / removal die utilised. v. Die positioned to the machine according to machine specification and procedure. vi. Die setup records completed

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<ul style="list-style-type: none"> i. Confirm type of die, machine and auxiliary equipment (such as water bath, puller, cutter etc.) ii. Obtain die, machine and auxiliary equipment (such as water bath, puller, cutter etc.) iii. Fix / position die to the machine iv. Utilize tools for assembly and fittings for removal and refitting of a die and calibration or sizing equipment setup / refitting and down/removal v. Follow procedure of removal and refitting die and calibration or sizing equipment vi. Apply method of 		60 hours	Demonstration and Observation	according to documentation procedure.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		die setup / refitting and die changeover / removal vii. Apply method of die checking viii. Complete die setup check sheet ix. Heat extrusion die	<u>Attitude:</u> i. Precise and focus in mould setting ii. Adhere to mould setting procedure ii. Handle production die with care <u>Safety:</u> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace /			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			machinery safe to be used.			
4. Carry out Plastics Extrusion Production machine setting	i. Machine setup information sheet: <ul style="list-style-type: none"> • Type of material / colour / mixing • Type of die • Previous production information ii. Process parameter setting: <ul style="list-style-type: none"> • Screw rotation / back pressure (dosing delay) / speed • Dosing stroke or volume / screw retract • Temperature controller iii. Extrusion machine movement of: <ul style="list-style-type: none"> • Extrusion and co-extrusion unit • Auxiliary equipment iv. Machine barrel and die heating parameter			30 hours	Lecture and Discussion	i. Machine setting specified according to process requirements. ii. Machine heated according to heat parameter and type of materials. iii. Machine setting executed according to machine specification. iv. Materials purged according to machine manual.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<ul style="list-style-type: none"> i. Determine machine setting ii. Execute machine heating iii. Adjust temperature controller iv. Adjust tractor / haul off height (gap) v. Execute materials purging 	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Precise and focus in handling machine / parameter setting ii. Handle production machine with care <p><u>Safety:</u></p> <ul style="list-style-type: none"> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective 	30 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			Equipment (PPE) ii. Ensure workplace / machinery safe to be used			
5. Carry out pre-production process	i. Job order / instruction requirements ii. Method of materials loading in to hopper iii. Extruded materials specification: <ul style="list-style-type: none"> • Physical appearance (colour, surface, no pin hole, homogenization) • Hollow pipe / tube uniform thickness across the circumferences of the diameter or • Profile - across the square of profile section or • Sheet and film - equally thickness xxii. Colour processing procedure and method:			18 hours	Lecture and Discussion	i. Materials transferred in to hopper manually / automatically. ii. Extruded materials from barrel into die exit confirmed. i. First extruded material aligned and positioned into vacuum chamber / water bath / calibration according to operation standards. ii. Colour compounding process readiness determined according to

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> • Compounding xxiii. Colorant form: <ul style="list-style-type: none"> • Powdered (Dye / pigment) • Master batch (solid/liquid) iv. Checking method of extruded materials / products 					<p>formula and customer requirements.</p> <p>iii. Physical appearance of molten / melted plastics inspected according to parts specification.</p>
		<ol style="list-style-type: none"> i. Confirm job order / instructions ii. Check plastic raw materials iii. Load materials in to hopper manually / automatically iv. Observe extrude materials v. Transfer first extruded material manually into vacuum chamber / water bath / calibration vi. Check colour compounding formulation vii. Check and confirm 		24 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<p>first extrude product with the customer requirements / approved products</p>	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Focus and observant in executing pre-production process ii. Adhere to pre production process procedure <p><u>Safety:</u></p> <ul style="list-style-type: none"> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace / machinery safe to be used 			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
6. Carry out Plastics Extrusion Production process	i. Machine / equipment operation ii. Functionality of auxiliary equipment iii. Extruded materials specifications iv. Materials (plastic resin / granule) mix with fibre, silicon, mica, colour / pigment, etc. v. Compounding process vi. Stages / cycle / sequence of extrusion process: <ul style="list-style-type: none"> • Join with dummy pipe and insert into vacuum spray chamber / tank (for pipe production) or • Hand drawn tubed into water bath (for tube production) or • Join and flatten to dummy sheet (for sheet production) or • Form into granule (for recycle resin / colour resin production) or • Blow to the top through guide rollers 			36 hours	Lecture and Discussion	i. Valve for water circulation functioned according to process requirements. ii. Materials purged according to process requirements. iv. Colour compounding formulated and demonstrated according to compounding process. iii. Parts demoulding processes confirmed according to process / product requirements.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<p>and coiler for rolling the film (for film extrusion production)</p> <p>vii. Colour processing procedure and method:</p> <ul style="list-style-type: none"> • Compounding <p>viii. Colorant form:</p> <ul style="list-style-type: none"> • Powdered (Dye / pigment) • Master batch (solid/liquid) <p>ix. Plastics extrusion production procedures</p> <p>x. Semi-Product specifications :</p> <ul style="list-style-type: none"> • Dimension - length, • Thickness, width • Weight • Appearance 					
		<p>i. Operate extrusion machine / auxiliary equipment</p> <p>ii. Confirm materials specification</p> <p>ix. Execute materials (plastic resin / granule) with fibre, silicon, mica,</p>		60 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		colour / pigment, etc.) compounding iii. Execute extrusion processes iv. Load semi-product into haul off / take off / cutting machine / coiler v. Verify semi-product form (Tube / pipe / sheet / profile / film extrusion / granules)	<u>Attitude:</u> i. Focus and observant in executing extrusion production ii. Handle production machine, auxiliary equipment and die with care <u>Safety:</u> i. Adhere to safety rules and regulation			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			at all time ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace / machinery safe to be used			
7. Carry out product finishing process	i. Types of finishing process : <ul style="list-style-type: none"> • Cleaning • Trimming • buffing • Cutting ii. Trimming tools: <ul style="list-style-type: none"> • Cutter • Knives • Scissors • Deburring tool iii. Finish goods appearance: <ul style="list-style-type: none"> • Roughness • Surface cracking • Flashing • Burr • Wave • Warping/bending iv. Method and technique of			18 hours	Lecture and Discussion	i. Types of finishing process and tools usage for trimming specified according to process / product requirements. ii. Finished goods appearance examined according to product specification. iii. Method and technique of product finishing process employed. iv. Product

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	product finishing process v. Product finishing process procedure vi. Product packaging specification vii. Standard Operating Procedure (SOP)					packaging executed according to packaging standard instructions.
		i. Determine types of finishing process ii. Obtain trimming tools iii. Check finished goods appearance iv. Apply method and technique of product finishing process v. Execute product finishing process vi. Follow procedure of product finishing process vii. Pack product into suitable packaging viii. Comply to Standard Operating Procedure		18 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Focus and observant in executing product finishing process ii. Handle production machine and tools with care <p><u>Safety:</u></p> <ul style="list-style-type: none"> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace / machinery safe to be used 			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
8. Report Plastics Extrusion Production activities	i. Production output status / results: <ul style="list-style-type: none"> • rejection rate, • quantity, • quality (type of defects) • wastage ii. Product acceptance criteria: <ul style="list-style-type: none"> • Appearance • Dimension • Functional iii. Reporting format (verbally/written) iv. Reporting medium (manually or electronically) v. Organizational hierarchy / charts vi. Standard Operating Procedure			12 hours	Lecture and Discussion	i. Production output status / results reviewed and confirmed according to product acceptance criteria. ii. Reporting format completed and submitted to superior according to reporting procedure and company policy.
		i. Compile production output status / results ii. Determine product acceptance criteria iii. Complete reporting		12 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		format (manually or electronically) iv. Utilise reporting medium v. Acknowledge status to superior/ authorised party	<u>Attitude:</u> i. Meticulous in producing report ii. Adhere to company reporting procedure			

Employability Skills

CORE ABILITIES	SOCIAL SKILLS
<p>01.01 Identify and gather information.</p> <p>01.02 Document information procedures or processes.</p> <p>02.01 Interpret and follow manuals, instructions and SOP's.</p> <p>02.03 Communicate clearly.</p> <p>02.04 Prepare brief reports and checklist using standard forms.</p> <p>02.05 Read/Interpret flowcharts and pictorial information.</p> <p>03.01 Apply cultural requirement to the workplace.</p> <p>03.02 Demonstrate integrity and apply practical practices.</p> <p>03.03 Accept responsibility for own work and work area.</p> <p>03.04 Seek and act constructively upon feedback about work performance.</p> <p>03.05 Demonstrate safety skills.</p> <p>03.06 Respond appropriately to people and situations.</p> <p>06.01 Understand systems.</p> <p>06.02 Comply with and follow chain of command.</p> <p>06.03 Identify and highlight problems.</p> <p>06.04 Adapt competencies to new situations/systems.</p> <p>01.04 Analyse information.</p> <p>01.06 Utilize word processor to process information.</p> <p>02.07 Utilize Local Area Network (LAN)/Intranet to exchange information.</p> <p>02.08 Prepare pictorial and graphic information.</p> <p>03.08 Develop and maintain a cooperation within work group.</p> <p>04.01 Organize own work activities.</p> <p>04.02 Set and revise own objectives and goals.</p>	<ol style="list-style-type: none"> 1. Communication skills 2. Conceptual skills 3. Interpersonal skills 4. Multitasking and prioritizing 5. Leadership skills 6. Self-discipline 7. Teamwork 8. Integrity

CORE ABILITIES	SOCIAL SKILLS
<p>04.03 Organize and maintain own workplace.</p> <p>04.05 Demonstrate initiative and flexibility.</p> <p>06.05 Analyse technical systems.</p> <p>06.06 Monitor and correct performance of systems.</p> <p>01.07 Utilize database applications to locate and process information.</p> <p>01.08 Utilizespreadsheets applications to locate and process information.</p> <p>01.09 Utilize business graphic application to processinformation.</p> <p>01.10 Apply a variety of mathematical techniques.</p> <p>01.11 Apply thinking skills and creativity.</p> <p>02.10 Prepare reports and instructions.</p> <p>03.09 Manage and improve performance of individuals.</p> <p>03.15 Liaise to achieve identified outcomes.</p> <p>03.16 Identify and assess client/customer needs.</p> <p>04.07 Negotiate acceptance and support for objectives and strategies.</p> <p>05.01 Implement project/work plans.</p> <p>05.02 Inspect and monitor work done and/or in progress.</p>	

Tools, Equipments and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1. Computer	1:5
2. Plant Layout / Workplace / Shop Floor	1:25
3. Safety Handbook	1:1
4. Equipment Safety Manual, Emergency and Hazardous Signage	1:25
5. Standard Operating Procedure	1:25
6. Manual Operation	1:25
7. Organization Chart	1:25
8. Application of Information Technology (word processor, data sheet, database, etc.)	1:25
9. Extrusion machine type (Sheet extrusion or Pipe / Tube or Film or Profile or Granule) with single or twin screw extrusion	1:5
10. Extrusion die type (T-die (for sheet) or Round / in line die (pipe / tube / rod) or Cross head die (for wire cable) or Co-extrusion or profile)	1:3
11. Component of die (Torpedo, Spider (3, 5, 7, 9 blades), Central Core and Extruder pin).	1:20
12. Extrusion equipment (Cooling equipment or Vacuum and Spray Tank (for pipe and profile) or Water bath/trout (for tube) or Roller (for sheet film) or Calibrator (for thick sheet).	1:5
13. Material colour processing :((Pigment and Master batch)	3kg:1 (per type per colour)
14. Material mixing process (Filler, Additive, Stabilizer and Impact modifier)	3kg/1 (each type)
15. Auxiliary equipment (Water bath, Water pump, Puller / Tractor / Haul Off, Cutter, Printer, Guided roller, Coiler, Belling / Socketing, Online Measurement , Pelletiser and Dehumidifier)	1:5
16. Trimming tools (cutter, knives, scissors, Deburring tools and Jig cutter)	1:1
17. Extrusion grade thermoplastic material (ABS, PP, HDPE, PVC, LDPE)	10kg:1(per type)
18. Die Hand Tools (min size 2 mm ~ 14mm, bsf 1/8 " ~ 2"), Common Spanner Set, Screw driver (flat min size = 6"), 1 feet 1/2" steel pipe,	1:1

ITEMS	RATIO (TEM : Trainees)
Copper Rod (min= diameter 3 “ x 6”), mallet , plier, cutter, multi-grips, knife, high temperature and normal grease, thread tape, apron and tools box).	
19. Measurement Equipment set (Ruler, calliper, dial indicator and measurement tape)	1:3
20. Weight Machine (min size 0.01 kg ~ 20 kg)	1:20

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CURRICULUM of COMPETENCY UNIT (CoCU)

Sub Sector	METAL MACHINING TECHNOLOGY						
Job Area	PLASTICS PRODUCTION OPERATION						
Competency Unit Title	PLASTICS BLOW MOULDING PRODUCTION						
Learning Outcome	<p>The person who is competent in this competency unit shall be able to produce a variety of plastic parts such as bottle, container and jerry can. Upon completion of this competency unit, trainees will be able to:-</p> <ul style="list-style-type: none"> • Identify Plastics Blow Moulding Production requirements • Coordinate Plastics Blow Moulding Production activities • Carry out Plastics Blow Moulding Production mould/die setup • Carry out Plastics Blow Moulding Production machine setting • Carry out pre-production process • Carry out Plastics Blow Moulding Production process • Carry out product finishing process • Report Plastics Blow Moulding Production activities 						
Competency Unit ID	C03	Level	3	Training Duration	340 Hours	Credit Hours	34.0
Work Activities	Related Knowledge	Related Skills		Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
1. Identify Plastics Blow Moulding Production requirements	i. Fundamental of Plastics Blow moulding production ii. Job order/ instructions: <ul style="list-style-type: none"> • Product specification / parts drawing / customer product / limit / master sample • Delivery date • Quantity iii. Type of Blow process:				30 hours	Lecture and Discussion	i. Fundamental of Plastics Blow Moulding production defined according to production requirements. ii. Job order / instructions listed and defined according to the approved

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> • Intermittent Extrusion blow moulding • Continues extrusion blow moulding: <ul style="list-style-type: none"> ▪ Parison transfer ▪ Rotaring Mould • Injection blow moulding <p>iv. Type of Blow mould and extrusion die</p> <p>v. Process cycle / stage / sequence:</p> <ul style="list-style-type: none"> • Extrusion • Clamping • Cutting • Blowing • Cooling • Opening <p>vi. Type of materials:</p> <ul style="list-style-type: none"> • Thermoplastic (Resin) <p>vii. Type of material colour processing:</p> <ul style="list-style-type: none"> • Pigment • Master batch • Compounding <p>viii. Type of machine:</p> <ul style="list-style-type: none"> • 1 barrel – 1 screw 					<p>customer requirements.</p> <p>iii. Jobs requirement defined according to product specification / parts drawing / customer product / limit / master sample.</p> <p>iv. Differences of blow moulding production described according to related process / product requirement.</p> <p>v. Type of mould and materials differentiated and listed according to customer requirements.</p> <p>vi. Finished good packaging defined according to parts safety during handling.</p> <p>vii. Machine identified</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> • 2 barrel - 2 screw • Single barrel with co- extrusion unit ix. Machine capacity (liter) x. Component of blow machine: <ul style="list-style-type: none"> • Barrel • Screw • Die head • Extrusion die • Blow pin • Mould clamping • Hot/normal cutter • Cooling system • Heater • Thermocouple • Doser unit • Calibrator unit • Deflashing unit xi. Machine functionality xii. Parison control: <ul style="list-style-type: none"> • Central Torpedo • Spider (3,5,7,9 blades) • Central Core • Extruder pin xiii. Auxiliary equipment: <ul style="list-style-type: none"> • Leak tester 					<ul style="list-style-type: none"> according to their product / mould design. viii. Material selected according to their product / mould specification and customer requirement. ix. Type of machine and its related equipment defined according to customer requirement.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> • Mould temperature controller • Chiller • Granulator • Hopper loaders • Mixers • Conveyor/ Walking beam • Printer / Label sticker • Robotic Arm <p>xiv. Finished products requirements:</p> <ul style="list-style-type: none"> • Dimension • Appearance • Color • Weight • Leaking • Strength <p>xv. Finish goods packaging specification</p> <p>xvi. Statutory bodies requirement such as:</p> <ul style="list-style-type: none"> • Occupational Safety & Health Act (OSHA) • Department of Environment (DOE) <p>xvii. Work Place</p>					

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	Organization Method (5S)	<ul style="list-style-type: none"> i. Interpret fundamental of Plastics Blow moulding production ii. Interpret job order / instructions, product specification, delivery date and quantity iii. List type of mould and materials iv. Determine and differentiate type of machine and functionality v. Interpret finished products requirements vi. Determine finished goods packaging specification 	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Thorough and precise in interpreting production and customer requirements 	30 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			ii. Resourceful and meticulous in identifying finished product requirements <u>Safety:</u> i. Aware of 5S and safety requirement at all time			
2. Coordinate Plastics Blow Moulding Production activities	i. Production schedule: <ul style="list-style-type: none"> • Production date • Manpower availability • Machine and auxiliary equipment • Mould and extrusion die • Materials ii. Procedure, method and technique of: <ul style="list-style-type: none"> • Compounding materials plastic resin / granule with fibre, silicon, etc. • Colour / pigment 			24 hours	Lecture and Discussion	i. Mould, machine and auxiliary equipment, materials and manpower readiness confirmed according to job order / instructions. ii. Production workplace / line setup checked based on job order / instructions.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> • Master batch iii. Type of materials <ul style="list-style-type: none"> • Palette • Preform (injection process blow only) iv. Trimming tools: <ul style="list-style-type: none"> • Cutter • Knives • Scissors • Deburring tools • Jig cutter v. Production workplace/ line setup checking procedure vi. Production workplace/ line setup evaluation check sheet vii. Machine barrels, die head, mould (for injected blow process only)and materials pre-heated parameter: <ul style="list-style-type: none"> • Temperature setting • Time • Quantity 					<ul style="list-style-type: none"> iii. Materials colour (mixing / compounding), packaging items, obtained according to job process and quantity requirements. iv. Trimming tools selected according to process requirements. v. Machine manual / setup assured according to product requirements and process. vi. Machine barrels and materials pre-heated parameter confirmed according to customer requirement / approved product.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<ul style="list-style-type: none"> i. Determine mould / die, machine, materials, manpower availability and production schedule ii. Obtain materials (plastic resin) / Colour (mixing / compounding / master batch, pigment) and packaging items, iii. Select trimming tools (cutter, knives, plastic nipper) iv. Coordinate quantity of machine and manpower v. Check production workplace / line setup clear from residual materials vi. Evaluate production workplace / line setup ion check sheet vii. Pre-heat machine barrel, die head and mould (for injected blow process only) 		30 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		materials	<u>Attitude:</u> i. Efficient and well organized in coordinating activities ii. Adhere to coordination technique <u>Safety:</u> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) iii. Ensure workplace / machinery safe to be used			
3. Carry out Plastics Blow Moulding Production mould/die setup	i. Mould / die identification: <ul style="list-style-type: none"> • Code number / product name • Size • Blow pin 			22 hours	Lecture and Discussion	i. Type of mould and machine specified according to process / product requirements.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> • Mould auxiliary • (chiller, dryer, granulators) ii. Type of mould/die and machine iii. Tools for assembly and fittings for removal and refitting of a mould / die iv. Procedure of removal and refitting mould v. Mould / die setup / refitting and changeover / removal method vi. Mould / die checking method vii. Mould / die setup check sheet viii. Mould heating parameter					ii. Mould confirmed clear from water blockage (for thermoplastic only). iii. Additional auxiliary requirements installed according to product requirement. iv. Water channel system confirmed clear from blockage. v. Various size of blow pin positioned according product mould entering. vi. Tools for setup / refitting and down / removal mould utilised.
		i. Determine type of mould / die and machine ii. Check mould / die to confirm clear from water blockage (for thermoplastic only)		24 hours	Demonstration and Observation	vii. Mould positioned to the machine according to machine specification and

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<ul style="list-style-type: none"> iii. Install additional auxiliary requirements for mould safety iv. Check mould water channel system from blockage v. Check blow pin size vi. Setup selected size of ejector (diameter and length) vii. Utilise tools for setup / refitting and down / removal of mould/die viii. Align clamping unit ix. Follow mould/die setup procedure x. Apply mould/die setup / refitting and mould down / removal method xi. Heat extrusion die xii. Update mould setup record 	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Precise and focus in mould setting ii. Adhere to mould setting procedure 			<ul style="list-style-type: none"> viii. Mould setup / refitting and mould down / removal method employed. ix. Mould setup records completed according to documentation procedure.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			ii. Handle production mould with care <u>Safety:</u> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace / machinery safe to be used			
4. Carry out Plastics Blow Moulding Production machine setting	i. Machine setup information sheet: <ul style="list-style-type: none"> • Type of mould and material • Colour • Drying information • Weight of shot / liter • Production rate / cycle time ii. Process parameter			16 hours	Lecture and Discussion	i. Machine setting specified according to process requirements. ii. Blow moulding machine setting executed according to mould / product specification.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	setup: <ul style="list-style-type: none"> • Screw rotation / back pressure (dosing delay) • Dosing stroke or volume / screw retract iii. Blow machine movement of: <ul style="list-style-type: none"> • Blow unit • Auxiliary iv. Machine barrel heating parameter					iii. Materials purged manually according to machine manual. iv. Trial shot / Shot short and sample of parts produced according to job order / instructions and machine setting procedure.
		i. Adjust temperature controller ii. Adjust machine timer accurately iii. Adjust die head position for straight profile iv. Adjust cutting process v. Heat machine barrel vi. Set position of the blow pin at the center of two halve mould vii. Confirm extruded materials are flowed		24 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<p>downwards and caught by the moved mould</p> <p>iii. Confirm air are blown into the closed mould and production of trial shot / sample of parts</p>	<p><u>Attitude:</u></p> <p>i. Precise and focus in handling machine / parameter setting</p> <p>ii. Handle production machine with care</p> <p><u>Safety:</u></p> <p>i. Adhere to safety rules and regulation at all time</p> <p>ii. Wear Personal Protective Equipment (PPE)</p> <p>ii. Ensure work place /</p>			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			machinery safe to be used			
5. Carry out pre-production process	i. Job order / instruction requirements ii. Method of materials loading in to hopper iii. Blow materials specification: <ul style="list-style-type: none"> • Physical appearance • Parison thickness uniformly across the circumferences of the diameter iv. Mould and parison suitability / matching v. Checking method of blow materials / products			16 hours	Lecture and Discussion	i. Materials transferred into hopper manually / automatically. ii. Injected materials from barrel into mould exit confirmed. iii. Sufficient amount of plastic materials moulded within specification. iv. Parts demoulding processes confirmed according to process.
		i. Determine job order/instructions requirements ii. Load materials in to hopper iii. Conduct trial run of preform parts for		24 hours	Demonstration and Observation	v. Physical appearance of molten / melted plastics inspected according to parts specification and customer specification.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		injection process only iv. Conduct trial run of blow process sequencing v. Apply checking method of blow materials / products	<u>Attitude:</u> i. Focus and observant in executing pre-production process ii. Adhere to pre production process procedure <u>Safety:</u> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE)			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			iii. Ensure workplace / machinery safe to be used			
6. Carry out Plastics Blow Moulding Production process	i. Machine / equipment operation ii. Technique of Parison control (programming / manually) iii. Functionality of auxiliary equipment iv. Blow materials or preform (for injected process only) specifications v. Stages / cycle / sequence of blow moulding process vi. Plastics Blow production procedures vii. Semi-Product specifications: <ul style="list-style-type: none"> • Dimension - length • Thickness, width • Weight • Appearance 			16 hours	Lecture and Discussion	i. Molten tube of plastics flowing downwards within the die head (parison) observed according to process requirement. ii. Technique of parison control applied. iii. Blow moulding method and technique employed Job order / instructions listed and defined according to the approved customer needs / requirements.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<ul style="list-style-type: none"> i. Observe molten tube of plastics flowing downwards within the die head (parison) ii. Apply technique of parison control iii. Apply Blow moulding method and technique iv. Monitor formation of product such as containers, bottles, jerry can v. Follow plastics blow moulding procedures vi. Ensure removal / ejection of the product (drop) from mould when the mould open after cooling time 	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Focus and observant in executing blow moulding production ii. Handle production machine, 	42 hours	Demonstration and Observation	<ul style="list-style-type: none"> iv. Formation of product observed according to product specification. v. Plastics blow moulding procedures followed. vi. Removal / ejection of the product (drop) from mould when the mould open after cooling time confirmed according to process flow.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			auxiliary equipment and mould with care <u>Safety:</u> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace / machinery safe to be used			
7. Carry out product finishing process	i. Types of finishing process: <ul style="list-style-type: none"> • Cleaning, • Trimming • Buffing • Cutting ii. Trimming tools iii. Finish goods appearance: <ul style="list-style-type: none"> • Roughness • Surface cracking 			6 hours	Lecture and Discussion	i. Type of finishing process and trimming tools specified according to process requirement. ii. Finished goods appearance examined according to

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> • Flashing • Burr • Wave • Warping iv. Method and Technique of product finishing process v. Product finishing process procedure vi. Product packaging standard instructions vii. Standard Operating Procedure (SOP)					product specification. iii. Method and technique of product finishing process employed according to process requirement. iv. Product packaging executed according to packaging standard instructions.
		i. Confirm type of finishing process ii. Confirm finished product appearance iii. Apply Method and Technique of product finishing process iv. Execute product finishing process v. Pack product into suitable packaging	<u>Attitude:</u> i. Focus and observant in executing product	18 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			finishing process ii. Handle production machine and tools with care <u>Safety:</u> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace / machinery safe to be used			
8. Report Plastics Blow Moulding Production activities	i. Production output status / results: <ul style="list-style-type: none"> • rejection rate, • quantity, • quality (type of defects) • wastage ii. Product acceptance			6 hours	Lecture and Discussion	i. Production output status / results reviewed and confirmed according to product acceptance criteria.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	criteria: <ul style="list-style-type: none"> • Appearance • Dimension • Functional iii. Reporting format (verbally/written) iv. Reporting medium (manually or electronically) v. Organizational hierarchy / charts vi. Standard Operating Procedure					ii. Reporting format completed and submitted to superior according to reporting procedure and company policy.
		i. Compile production output status / results ii. Determine product acceptance criteria iii. Complete reporting format (manually or electronically) iv. Utilise reporting medium v. Acknowledge status to superior / authorised party	<u>Attitude:</u> i. Meticulous in producing	12 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			report ii. Adhere to company reporting procedure			

Employability Skills

CORE ABILITIES	SOCIAL SKILLS
<p>01.01 Identify and gather information.</p> <p>01.02 Document information procedures or processes.</p> <p>02.01 Interpret and follow manuals, instructions and SOP's.</p> <p>02.03 Communicate clearly.</p> <p>02.04 Prepare brief reports and checklist using standard forms.</p> <p>02.05 Read/Interpret flowcharts and pictorial information.</p> <p>03.01 Apply cultural requirement to the workplace.</p> <p>03.02 Demonstrate integrity and apply practical practices.</p> <p>03.03 Accept responsibility for own work and work area.</p> <p>03.04 Seek and act constructively upon feedback about work performance.</p> <p>03.05 Demonstrate safety skills.</p> <p>03.06 Respond appropriately to people and situations.</p> <p>06.01 Understand systems.</p> <p>06.02 Comply with and follow chain of command.</p> <p>06.03 Identify and highlight problems.</p> <p>06.04 Adapt competencies to new situations/systems.</p> <p>01.04 Analyse information.</p> <p>01.06 Utilize word processor to process information.</p> <p>02.07 Utilize Local Area Network (LAN)/Intranet to exchange information.</p> <p>02.08 Prepare pictorial and graphic information.</p> <p>03.08 Develop and maintain a cooperation within work group.</p> <p>04.01 Organize own work activities.</p> <p>04.02 Set and revise own objectives and goals.</p>	<ol style="list-style-type: none">1. Communication skills2. Conceptual skills3. Interpersonal skills4. Multitasking and prioritizing5. Leadership skills6. Self-discipline7. Teamwork8. Integrity

CORE ABILITIES	SOCIAL SKILLS
<p>04.03 Organize and maintain own workplace.</p> <p>04.05 Demonstrate initiative and flexibility.</p> <p>06.05 Analyse technical systems.</p> <p>06.06 Monitor and correct performance of systems.</p> <p>01.07 Utilize database applications to locate and process information.</p> <p>01.08 Utilizespreadsheets applications to locate and process information.</p> <p>01.09 Utilize business graphic application to processinformation.</p> <p>01.10 Apply a variety of mathematical techniques.</p> <p>01.11 Apply thinking skills and creativity.</p> <p>02.10 Prepare reports and instructions.</p> <p>03.09 Manage and improve performance of individuals.</p> <p>03.15 Liaise to achieve identified outcomes.</p> <p>03.16 Identify and assess client/customer needs.</p> <p>04.07 Negotiate acceptance and support for objectives and strategies.</p> <p>05.01 Implement project/work plans.</p> <p>05.02 Inspect and monitor work done and/or in progress.</p>	

Tools, Equipments and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1. Computer	1:5
2. Plant Layout / Workplace / Shop Floor	1:25
3. Safety Handbook	1:1
4. Equipment Safety Manual, Emergency and Hazardous Signage	1:25
5. Standard Operating Procedure	1:25
6. Manual Operation	1:25
7. Organization Chart	1:25
8. Application of Information Technology (word processor, data sheet, database, etc.)	1:25
9. Blow Moulding Machine (min 1 liter tons) with Machine working table (min size 4' x4' x 4') and mould clamping device	1:5
10. Blow mould	1:3
11. Colour agent (Compounding, master batch and powder with minimum 3 different colour)	3kg:1 (per type per colour)
12. Blow grade thermoplastic material (ABS, PP, HDPE, PET (for inject blow)) with type of pallet.	3kg:1 (per type)
13. Preform (for inject blow process only)	30:1
14. Mould Hand Tools (min size 2 mm ~ 14mm, bsf 1/8 " ~ 2"), Common Spanner Set, Screw driver (flat min size = 6"), 1 feet 1/2" steel pipe, Copper Rod (min= diameter 3 " x 6"), mallet , plier, cutter, multi-grips, knife, high temperature and normal grease, thread tape, apron and tools box).	1:1
15. Measurement Equipment set (Ruler, calliper, dial indicator and measurement tape)	1:5
16. Weight Machine (min size 0.01 kg ~ 20 kg)	1:20
17. Auxiliary equipment (Cooling Tower, Leak tester, Mould temperature controller, Chiller, Granulator, Hopper loaders, Mixers, Conveyor/	1:5

ITEMS	RATIO (TEM : Trainees)
Walking beam, Printer / Label sticker and Robotic Arm) 18. Trimming tools (cutter, knives, scissors, Deburring tools and Jig cutter)	1:1

References

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<ol style="list-style-type: none"> 1. Baird, Donald, G., Collias, Dimitris I. (1988), Polymer Processing Principles and Design, Canada, John Wiley & Sons, Inc., ISBN: 0-471-25453-3 2. Callister, William D., Jr. (2003), Materials Science and Engineering, United States of America, John Wiley & Sons, Inc., ISBN: 0-471-22471-5 3. Crawford, R. J (PhD, CEng, FIMechE , FPRI), (1981), Plastics Engineering, Oxford, New York, Beijing, Frankfurt, Sao Paulo, Sydney, Tokyo, Toronto, Pergamon Press, ISBN: 0-08-032627-7(hardcover), ISBN: 0-08-032626-9 (flexicover) 4. Hensen, Friedhelm, Potente,H., Knappe,W. (1988) Plastic extrusion Technology, Munich, Vienna, New York, Hanser Publishers, ISBN: 0-19-620760-2 5. Imai, Masaaki (1991), Ky'Zen (The Key to Japan's Competitive Success), Singapore, McGraw-Hill, ISBN: 0-394-55186-9 6. Kalpakjian, Serope, Schmid, Steven (2006), Manufacturing Engineering and Technology, Singapore, Prentice Hall, ISBN: 0-13-197639-7 7. Rauwendaal, Chris (2001), Polymer Extrusion, Munich, Hanser Publishers, ISBN: 1-56990-321-2 8. Strong, A. Brent (2006), PLASTIC Material and Processing, Atlantic Highlands, GGs Book Services, ISBN: 0-13-114558-4 9. Feigenbaum, Armand V. (1991), Total Quality Control, Singapore, McGraw-Hill, ISBN: 0-07-020354-7

CURRICULUM of COMPETENCY UNIT (CoCU)

Sub Sector	METAL MACHINING TECHNOLOGY						
Job Area	PLASTICS PRODUCTION OPERATION						
Competency Unit Title	PLASTICS COMPRESSION MOULDING PRODUCTION						
Learning Outcome	<p>The person who is competent in this competency unit shall be able to make larger flat or moderately curved parts. This method of moulding is greatly used in manufacturing automotive parts such as hoods, fenders, scoops, spoilers, as well as smaller more intricate parts. Upon completion of this competency unit, trainees will be able to:-</p> <ul style="list-style-type: none"> • Identify Plastics Compression Moulding Production requirements • Coordinate Plastics Compression Moulding Production activities • Carry out Plastics Compression Moulding Production mould setup • Carry out Plastics Compression Moulding Production machine setting • Carry out pre-production process • Carry out Plastics Compression Moulding Production process • Carry out product finishing process • Report Plastics Compression Moulding Production activities 						
Competency Unit ID	C04	Level	3	Training Duration	280 Hours	Credit Hours	28.0
Work Activities	Related Knowledge	Related Skills		Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
1. Identify Plastics Compression Moulding Production requirements	i. Fundamental of Compression Moulding production ii. Job order / instructions: <ul style="list-style-type: none"> • Product specification / parts drawing / customer product / limit / master sample • Delivery date • Quantity iii. Type of compression				24 hours	Lecture and Discussion	i. Fundamental of Plastics Compression Moulding production defined according to production requirements. ii. Job order / instructions listed and defined according to the

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	moulding process: <ul style="list-style-type: none"> • Sheet Moulding Compound (SMC) • Bulk Moulding Compound (BMC) • Insert Compression Moulding iv. Type of mould: <ul style="list-style-type: none"> • Positive mould • Landed positive mould • Flash-type mould • Semi positive mould v. Type of materials : <ul style="list-style-type: none"> • Thermoplastic • Thermoset vi. Type of machine:: <ul style="list-style-type: none"> • Straight Compression Moulding • Hydraulic Transfer Presses • Hydraulic Vacuum Press vii. Component of compression moulding machine: <ul style="list-style-type: none"> • Hydraulic Ram • Heated Plate • Knockout Plate 					approved customer requirements. iii. Jobs requirement defined according to product specification / parts drawing / customer product / limit / master sample. iv. Differences of compression moulding production described according to related process requirement. v. Type of mould and materials differentiated and listed according to customer requirements. vi. Finish good packaging defined according to parts safety during handling. vii. Machine identified according to their

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> • Hydraulic Piston • Hydraulic Unit viii. Machine tonnage ix. Machine functionality x. Auxiliary equipment <ul style="list-style-type: none"> • Granulator • Hopper loaders • Mixers • Conveyor • Robot xi. Finished product requirements: <ul style="list-style-type: none"> • Roughness • Dimension • Appearance • Colour • Weight xii. Finish goods packaging specification xiii. Statutory bodies requirement such as: <ul style="list-style-type: none"> • Occupational Safety & Health Act (OSHA) • Department of Environment (DOE) xiv. Work Place Organization Method (5S) 					<p>product / mould design.</p> <p>viii. Material selected according to their product / mould specification and customer requirement.</p> <p>ix. Type of machine and its related equipment defined according to customer requirement.</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<ul style="list-style-type: none"> i. Interpret Fundamental of Plastics Compression Moulding production ii. Interpret job order / instructions, product specification, delivery date and quantity iii. Differentiate compression moulding process iv. List type of mould and materials to be used v. Differentiate type of machine , capacity (tonnage) ,functionality and its auxiliary equipment specially for Compression Moulding process vi. Interpret finished product requirements vii. Determine finished goods packaging 		24 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		specification	<u>Attitude:</u> i. Thorough and precise in interpreting production and customer requirements ii. Resourceful and meticulous in identifying finished product requirements <u>Safety:</u> i. Aware of 5S and safety requirement at all time			
2. Coordinate Plastics Compression Moulding Production activities	i. Production schedule: <ul style="list-style-type: none"> • Production date • Manpower availability • Machine and auxiliary equipment • Mould • Materials ii. Type of materials			24 hours	Lecture and Discussion	i. Mould, machine and auxiliary equipment, materials and manpower readiness confirmed according to job order / instructions.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> • Powder <ul style="list-style-type: none"> ▪ Plug ▪ Preform ▪ Putty likes mass ▪ Granules • Liquid <p>iii. Amount of materials</p> <p>iv. Minimum amount of energy to heat the material</p> <p>v. Minimum time required to heat the material</p> <p>vi. Trimming tools</p> <ul style="list-style-type: none"> • Cutter • Knives • Scissors • Deburring tools • Jig cutter <p>vii. Production workplace / line setup checking procedure</p> <p>viii. Production workplace / line setup evaluation check sheet</p> <p>ix. Machine platen pre-heated parameter:</p> <ul style="list-style-type: none"> • Temperature setting • Time 					<p>ii. Production workplace / line setup checked based on job order / instructions.</p> <p>iii. Materials, packaging items, obtained based on job process and quantity requirements.</p> <p>iv. Trimming tools selected according to process requirements.</p> <p>v. Machine manual / setup assured according to product requirements and process.</p> <p>vi. Machine platen pre-heated parameter confirmed according to customer requirement / approved product.</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<ul style="list-style-type: none"> i. Confirm Mould, machine, auxiliary equipment , materials, manpower availability and production schedule ii. Obtain materials (Powder and Liquid) and packaging items iii. Select trimming tools and auxiliary equipment iv. Coordinate quantity of machine and manpower v. Check production workplace / line setup vi. Evaluate production workplace / line setup check sheet 	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Efficient and well organized in coordinating activities ii. Adhere to coordination 	24 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			technique <u>Safety:</u> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) iii. Ensure workplace / machinery safe to be used			
3. Carry out Plastics Compression Moulding Production mould setup	i. Mould identification: <ul style="list-style-type: none"> • Code number/ product name • Size ii. Type of mould and machine iii. Tools for assembly and fittings for removal and refitting of mould and equipment setup / refitting and down / removal iv. Procedure of removal			24 hours	Lecture and Discussion	i. Type of mould and machine specified according to process requirements. ii. Tools for setup / refitting and down / removal mould utilised. iii. Mould positioned to the machine according to machine

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	and refitting mould and equipment v. Mould setup / refitting and Mould changeover / removal method vi. Mould checking method vii. Mould setup check sheet					specification and procedure. iv. Mould setup / refitting and mould down / removal method employed. v. Mould setup record completed according to documentation procedure.
		i. Determine type of mould and machine ii. Install additional auxiliary requirements for mould safety iii. Check cartridge heater condition and functionality iv. Setup suitable size of ejector (diameter and length) v. Utilise tools for setup / refitting and down / removal of mould vi. Align clamping unit vii. Follow mould setup procedure		24 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<ul style="list-style-type: none"> viii. Apply mould setup / refitting and mould down / removal method ix. Update mould setup record 	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Precise and focus in mould setting ii. Adhere to mould setting procedure iii. Handle production die with care <p><u>Safety:</u></p> <ul style="list-style-type: none"> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) iii. Ensure workplace / machinery safe to be used 			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
4. Carry out Plastics Compression Moulding Production machine setting	i. Machine setup information sheet: <ul style="list-style-type: none"> • Type and size of material • Colour • Weight of shot • Production rate / cycle time ii. Compression Moulding Process iii. Machine parameter setting and machine platen preheat			12 hours	Lecture and Discussion	i. Machine setting specified according to process requirements. ii. Compression moulding machine setting executed according to mould specification. iii. Trial shot / shot short and sample of parts produced according to job order / instructions and machine setting procedure and customer approval.
		i. Adjust temperature controller ii. Adjust machine timer and heater accurately iii. Preheat mould by using machine platen iv. Place applied materials in various form (palette, sheet, gelatine) into heated mould cavity and pressure to force the		16 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<p>material into contact with all mould areas</p> <p>v. Monitor compression moulding process</p> <p>vi. Produce trial shot / sample of parts</p>	<p><u>Attitude:</u></p> <p>i. Precise and focus in handling machine/ parameter setting</p> <p>ii. Handle production machine with care</p> <p><u>Safety:</u></p> <p>i. Adhere to safety rules and regulation at all time</p> <p>ii. Wear Personal Protective Equipment (PPE)</p> <p>iii. Ensure workplace / machinery safe to be used.</p>			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
5. Carry out pre-production process	<ul style="list-style-type: none"> i. Job order / instructions requirements ii. Materials prepared for production iii. Physical appearance of molten / melted plastics produce (colour, form of material, thickness) iv. Heating technique v. Compression moulding force vi. Checking method of compression products 			6 hours	Lecture and Discussion	<ul style="list-style-type: none"> i. Thermoplastic / Thermosetting resins in a partially cured stage (the form of granules, putty-like masses, or preforms) to be employed in the plastics compression moulding production process obtained. ii. Sufficient amount of plastic materials positioned into mould within specification.
		<ul style="list-style-type: none"> i. Measure amount of materials (dough/charge) to be used ii. Confirm thermoplastic / thermosetting resins in a partially cured stage (the form of granules, putty-like masses, or preforms) iii. Check injected materials from barrel 		18 hours	Demonstration and Observation	<ul style="list-style-type: none"> iii. Injected materials from barrel into mould exit checked according to part specification. iv. Physical appearance of molten / melted plastics produce examined according to

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<p>into mould exit (for injected type of compression moulding)</p> <p>iv. Inject sufficient amount of plastic materials into the mould to create a part within specification ((for injected type of compression moulding)</p> <p>v. Apply heating techniques</p> <p>vi. Estimate compression moulding forces</p> <p>vii. Check parts demoulding process</p> <p>iii. Check physical appearance of Molten / Melted plastics produce (colour, form of material, thickness) within specification.</p>	<p><u>Attitude:</u></p> <p>i. Focus and observant in</p>			<p>product specification.</p> <p>v. Compression moulding forces and heating technique applied in order to attain proper shape shot.</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			<p>executing pre-production process</p> <p>ii. Adhere to pre production process procedure</p> <p><u>Safety:</u></p> <p>i. Adhere to safety rules and regulation at all time</p> <p>ii. Wear Personal Protective Equipment (PPE)</p> <p>iii. Ensure workplace / machinery safe to be used.</p>			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
6. Carry out plastics compression Moulding Production process	<ul style="list-style-type: none"> i. Machine platen heating performance ii. Stages / cycle / sequence of compression moulding process iii. Plastics compression moulding production procedures 			18 hours	Lecture and Discussion	<ul style="list-style-type: none"> i. Materials (thermoplastic or thermoset) positioned on the open mould. ii. Heated mould cavity matching on the hydraulic ram confirmed. iii. Completion of the process described according to production process flow.
		<ul style="list-style-type: none"> i. Load materials or charge in to heated fix lower mould halve manually ix. Check heated mould cavity matching on the hydraulic ram x. Monitor completion of the process until the finish good ejected out 	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Focus and observant in executing compression moulding production ii. Handle 	30 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			<p>production machine, auxiliary equipment and mould with care</p> <p><u>Safety:</u></p> <p>i. Adhere to safety rules and regulation at all time</p> <p>ii. Wear Personal Protective Equipment (PPE)</p> <p>iii. Ensure workplace / machinery safe to be used.</p>			
7. Carry out product finishing process	<p>i. Types of finishing process:</p> <ul style="list-style-type: none"> • Cleaning • Trimming • Buffing and cutting <p>ii. Trimming tools</p> <p>iii. Finish goods appearance:</p>			6 hours	Lecture and Discussion	<p>i. Types of finishing process and tools specified according to process requirements.</p> <p>ii. Finish goods appearance examined</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> • Roughness • Surface cracking • Flashing • Burr • Wave • Warping iv. Method and Technique of product finishing process v. Product finishing process procedure vi. Product packaging specification vii. Standard Operating Procedure (SOP)					according to product specification and customer standard. iii. Method and technique of product finishing process employed. iv. Product packaging executed according to packaging standard instructions.
		i. Confirm types of finishing process (cleaning, trimming, buffing, and cutting) and tools ii. Confirm finished goods appearance (roughness, surface cracking, flashing, burr, wave, warping). iii. Execute product finishing process		12 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		iv. Apply method and technique	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Focus and observant in executing product finishing process ii. Handle production machine and tools with care <p><u>Safety:</u></p> <ul style="list-style-type: none"> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) iii. Ensure workplace / machinery safe to be used. 			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
8. Report plastics compression moulding production activities	i. Production output status / results: <ul style="list-style-type: none"> • rejection rate, • quantity, • quality (type of defects) • wastage ii. Product acceptance criteria: <ul style="list-style-type: none"> • Appearance • Dimension • Functional iii. Reporting format (verbally / written) iv. Reporting medium (manually or electronically) v. Organizational hierarchy / charts vi. Standard Operating Procedure			6 hours	Lecture and Discussion	i. Production output status / results reviewed and confirmed according to product acceptance criteria. ii. Reporting format completed and submitted to superior according to reporting procedure and company policy.
		i. Compile production output status / results ii. Determine product acceptance criteria iii. Complete reporting		12 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		format (manually or electronically) iv. Utilise reporting medium v. Acknowledge status to superior/ authorised party	<u>Attitude:</u> i. Meticulous in producing report ii. Adhere to company reporting procedure			

Employability Skills

CORE ABILITIES	SOCIAL SKILLS
<p>01.01 Identify and gather information.</p> <p>01.02 Document information procedures or processes.</p> <p>02.01 Interpret and follow manuals, instructions and SOP's.</p> <p>02.03 Communicate clearly.</p> <p>02.04 Prepare brief reports and checklist using standard forms.</p> <p>02.05 Read/Interpret flowcharts and pictorial information.</p> <p>03.01 Apply cultural requirement to the workplace.</p> <p>03.02 Demonstrate integrity and apply practical practices.</p> <p>03.03 Accept responsibility for own work and work area.</p> <p>03.04 Seek and act constructively upon feedback about work performance.</p> <p>03.05 Demonstrate safety skills.</p> <p>03.06 Respond appropriately to people and situations.</p> <p>06.01 Understand systems.</p> <p>06.02 Comply with and follow chain of command.</p> <p>06.03 Identify and highlight problems.</p> <p>06.04 Adapt competencies to new situations/systems.</p> <p>01.04 Analyse information.</p> <p>01.06 Utilize word processor to process information.</p> <p>02.07 Utilize Local Area Network (LAN)/Intranet to exchange information.</p> <p>02.08 Prepare pictorial and graphic information.</p> <p>03.08 Develop and maintain a cooperation within work group.</p> <p>04.01 Organize own work activities.</p> <p>04.02 Set and revise own objectives and goals.</p>	<ol style="list-style-type: none">1. Communication skills2. Conceptual skills3. Interpersonal skills4. Multitasking and prioritizing5. Leadership skills6. Self-discipline7. Teamwork8. Integrity

CORE ABILITIES	SOCIAL SKILLS
<p>04.03 Organize and maintain own workplace.</p> <p>04.05 Demonstrate initiative and flexibility.</p> <p>06.05 Analyse technical systems.</p> <p>06.06 Monitor and correct performance of systems.</p> <p>01.07 Utilize database applications to locate and process information.</p> <p>01.08 Utilizespreadsheets applications to locate and process information.</p> <p>01.09 Utilize business graphic application to processinformation.</p> <p>01.10 Apply a variety of mathematical techniques.</p> <p>01.11 Apply thinking skills and creativity.</p> <p>02.10 Prepare reports and instructions.</p> <p>03.09 Manage and improve performance of individuals.</p> <p>03.15 Liaise to achieve identified outcomes.</p> <p>03.16 Identify and assess client/customer needs.</p> <p>04.07 Negotiate acceptance and support for objectives and strategies.</p> <p>05.01 Implement project/work plans.</p> <p>05.02 Inspect and monitor work done and/or in progress.</p>	

Tools, Equipments and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1. Computer	1:5
2. Plant Layout / Workplace / Shop Floor	1:25
3. Safety Handbook	1:1
4. Equipment Safety Manual, Emergency and Hazardous Signage	1:25
5. Standard Operating Procedure	1:25
6. Manual Operation	1:25
7. Organization Chart	1:25
8. Application of Information Technology (word processor, data sheet, database, etc.)	1:25
9. Compression moulding machine (Sheet Moulding Compound (SMC) or Bulk Moulding Compound (BMC) or Insert Compression Moulding)	1:5
10. Compression mould (positive mould or landed positive mould or flash-type mould or semi positive mould)	1:3
11. Auxiliary equipment (Granulator, Hopper loaders, Mixers, Conveyor and Robot)	1:5
12. Compression grade thermoplastic material (ABS, PP, HDPE, PVC, Acrylic) – with type of material (type of materials, Powder, Plug, Preform, Putty likes mass, granules and Liquid)	3kg/10 sheet:1 (per type)
13. Compression grade thermoset material (Melamine,, Phenolic, Bakelite) – with type of material (Type of materials, Powder, Plug, Preform, Putty likes mass, granules and Liquid)	3kg/10 sheet:1 (per type)
14. Trimming tools (cutter, knives, scissors, Deburring tools and jig cutter)	1:1
15. Mould Hand Tools (min size 2 mm ~ 14mm, bsf 1/8 “ ~ 2”), Common Spanner Set, Screw driver (flat min size = 6”), 1 feet ½” steel pipe, Copper Rod (min= diameter 3 “ x 6”), mallet , plier, cutter, multi-grips, knife, high temperature and normal grease, thread tape, apron and tools box).	1:1

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1. Aquilano, Nicholas J, Chase, Richard B. (1991), Fundamental of Operations Management, Boston, Library of Congress Cataloging, ISBN: 0-256-02830-3
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CURRICULUM of COMPETENCY UNIT (CoCU)

Sub Sector	METAL MACHINING TECHNOLOGY						
Job Area	PLASTICS PRODUCTION OPERATION						
Competency Unit Title	PLASTICS ROTATIONAL MOULDING PRODUCTION						
Learning Outcome	<p>The person who is competent in this competency unit shall be able to create metal artillery shells and other hollow vessels such as oil tanks, road barrier, water tank, fishing box, etc. Upon completion of this competency unit, trainees will be able to:-</p> <ul style="list-style-type: none"> • Identify Plastics Rotational Moulding Production requirements • Coordinate Plastics Rotational Moulding Production activities • Carry out Plastics Rotational Moulding Production mould setup • Carry out Plastics Rotational Moulding Production machine setting • Carry out pre-production process • Carry out Plastics Rotational Moulding Production process • Carry out product finishing process • Report Plastics Rotational Moulding Production activities 						
Competency Unit ID	C05	Level	3	Training Duration	270 Hours	Credit Hours	27.0
Work Activities	Related Knowledge	Related Skills		Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
1. Identify Plastics Rotational Moulding Production requirements	i. Fundamental of Rotational Moulding production ii. Job order / instructions: <ul style="list-style-type: none"> • Product specification/ parts drawing/customer product /limit/master sample • Delivery date • Quantity 				24 hours	Lecture and Discussion	i. Fundamental of Rotational Moulding production listed and defined according to the production requirements. ii. Job order / instructions listed and defined according to the

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> iii. Rotational mould structure: <ul style="list-style-type: none"> • Aluminium base mould • Stainless steel mould • Mild Steel Mould iv. Type of plastics materials: <ul style="list-style-type: none"> • Thermoplastic v. Colorant form: <ul style="list-style-type: none"> • Powdered (Dye / pigment) vi. Type of rotational moulding machine: <ul style="list-style-type: none"> • Shuttle or swing arm Machine • Carousel Machine • Rock and roll machine • Clamshell machine • Vertical or up and over rotational machine vii. Component of Rotational moulding machine: <ul style="list-style-type: none"> • Cooling Chamber • Oven • Load-unload 					<ul style="list-style-type: none"> approved customer requirements. iii. Jobs requirement defined according to product specification / parts drawing / customer product / limit / master sample. iv. Differences of rotation moulding production described according to related process / product requirement. v. Type of mould and materials differentiated and listed according to customer requirements. vi. Finish good packaging defined according to parts safety during handling.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> station • Rotation System • Turret arms • Spindle • Mould holder • Primary axis of rotation • Secondary axis of rotation viii. Mould size ix. Auxiliary equipment <ul style="list-style-type: none"> • Extruder • Blender • Grinder • Boom Crane • Mixer • Weight machine x. Finished product requirements: <ul style="list-style-type: none"> • Roughness • Dimension • Appearance • Colour • Weight xi. Finished goods packaging specification xii. Statutory bodies requirement such as: <ul style="list-style-type: none"> • Occupational Safety 					<ul style="list-style-type: none"> vii. Machine identified according to their product / mould design. viii. Type of machine and its related equipment defined according to customer requirement.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	& Health Act (OSHA) • Department of Environment (DOE) xiii. Work Place Organization Method (5S)					
		i. Interpret fundamental of Rotational Moulding production ii. Interpret job order / instructions, product specification, delivery date and quantity iii. List type of mould and materials to be used iv. Determine type of colour processing v. Differentiate type of machine , capacity (tonnage), functionality and its auxiliary equipment vi. Determine finished product requirements		24 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		vii. Determine finished goods packaging specification	<p><u>Attitude:</u></p> <p>i. Thorough and precise in interpreting production and customer requirements</p> <p>ii. Resourceful and meticulous in identifying finished product requirements</p> <p><u>Safety:</u></p> <p>i. Aware of 5S and safety requirement at all time</p>			
2. Coordinate Plastics Rotational Moulding Production activities	<p>i. Production schedule:</p> <ul style="list-style-type: none"> • Production date • Manpower availability • Machine and auxiliary equipment • Mould 			12 hours	Lecture and Discussion	<p>i. Mould, machine and auxiliary equipment, materials and manpower readiness confirmed</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> • Materials ii. Trimming tools: <ul style="list-style-type: none"> • Cutter • Knives • Special tools <ul style="list-style-type: none"> ▪ Router ▪ Jigsaws ▪ Band/Table Saw ▪ Circular saw ▪ Drill Machine ▪ Cutting / trimming ▪ Jig iii. Production workplace / line setup checking procedure iv. Production workplace / line setup evaluation check sheet v. Oven pre-heated parameter: <ul style="list-style-type: none"> • Temperature setting • Time • Quantity 					according to job order / instructions. ii. Production workplace / line setup checked according to job order / instructions. iii. Materials obtained according to job process and quantity requirements. iv. Trimming tools selected according to process requirements. v. Machine manual / setup assured according to product requirements and process. vi. Machine barrels and materials pre-heated parameter confirmed according to
		i. Determine production schedule		18 hours	Demonstration and	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		and resources availability ii. Obtain materials (powder) compounding and packaging items iii. Select trimming tools iv. Coordinate quantity of machine and manpower v. Check production workplace / line setup vi. Complete production workplace / line setup evaluation check sheet vii. Confirm oven pre-heated	<u>Attitude:</u> i. Efficient and well organized in coordinating activities ii. Adhere to coordination technique <u>Safety:</u>		Observation	customer requirement / approved product.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace / machinery safe to be used			
3. Carry out Plastics Rotational Moulding Production mould setup	i. Mould identification: <ul style="list-style-type: none"> • Code number / product name • Size • Mould size ii. Size of mould according to the turret arm of the machine iii. Position of mould to the machine iv. Machine equipment requirement : <ul style="list-style-type: none"> • Cooling Chamber • Oven v. Tools for setup / refitting and			18 hours	Lecture and Discussion	i. Type of mould and machine specified according to process requirements. ii. Additional auxiliary requirements installed for mould safety. iii. Tools for setup / refitting and down / removal mould are utilised. iv. Mould positioned

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	down/removal: <ul style="list-style-type: none"> • Allen keys • Shifting spanner • Screwdrivers • Pliers and multi-grips • knife • spanners • scarper vi. Procedure of mould setup vii. Mould venting system using Vent Tube viii. Mould setup/ refitting and mould down / removal method ix. Mould checking method x. Mould setup sheet					to the machine according to machine specification and procedure. v. Mould setup / refitting and mould down / removal method employed. vi. Mould setup records completed according to documentation procedure.
		i. Confirm type of mould and machine ii. Position mould to the machine iii. Pre-heat oven before machine starts. iv. Utilise tools for setup /refitting and		24 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		down/removal and clamping unit v. Fix/position mould to the turret / arm machine vi. Update mould setup check sheet	<u>Attitude:</u> i. Precise and focus in mould setting ii. Adhere to mould setting procedure iii. Handle production mould with care <u>Safety:</u> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) iii. Ensure workplace / machinery safe			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			to be used			
4. Carry out Plastics Rotational Moulding Production machine setting	<ul style="list-style-type: none"> i. Machine setup information sheet: <ul style="list-style-type: none"> • Type of material • Colour • Drying information • Weight of shot • Production rate / cycle time ii. Process parameter setting: <ul style="list-style-type: none"> • Oven Temperature • Cooling Chamber iii. Rotation moulding machine process: <ul style="list-style-type: none"> • Mould charging <ul style="list-style-type: none"> ▪ Mould cleaning ▪ Correct powder resin into the mould. • Mould Closing <ul style="list-style-type: none"> ▪ The two half clamp using manual clamp. • Mould Heating and rotating <ul style="list-style-type: none"> ▪ Mould is rotated 			12 hours	Lecture and Discussion	<ul style="list-style-type: none"> i. Machine setting specified according to process requirements. ii. Rotation moulding machine setting executed according to mould specification. iii. Materials positioned manually according to parameter. iv. Trial shot / Shot short and sample of parts produced according to job order / instructions and machine setting procedure.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> ▪ Mould heated by oven or open flame burner's • Cooling and rotate <ul style="list-style-type: none"> ▪ The two half keep close ▪ Cooled by air /or water. iv. Trial shot / shot short and sample of parts production v. Machine setting procedure 					
		<ul style="list-style-type: none"> i. Setup oven temperature ii. Confirm machine setting (setup and shutdown) iii. Conduct rotational moulding machine setting iv. Apply machine setting technique v. Produce trial shot/shot short and sample of parts 	<u>Attitude:</u> i. Precise and	18 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			focus in handling machine/ parameter setting ii. Handle production machine with care <u>Safety:</u> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace / machinery safe to be used			
5. Carry out pre-production process	i. Weight of powdered resin ii. Materials loading into the extruder / mixer (fine mixing)			12 hours	Lecture and Discussion	i. Powdered resin weighted and compounded according to product

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> iii. Physical appearance of compounded materials (colour, form of material) iv. Powdered resin and compounded materials loading procedure 					<ul style="list-style-type: none"> specification compounding procedure. ii. Physical appearance of compounded materials produce (colour, form of material) examined according to materials specification. iii. Powdered resin and compounded materials loaded in mould according product specification and product standards.
		<ul style="list-style-type: none"> i. Measure weight of powdered resin ii. Load measured quantity of materials in a form of powder into the extruder / mixer to improve materials within specification. iii. Check physical appearance of compounded materials iv. Follow powdered resin and compounded materials loading procedure 	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Focus and observant in executing pre-production 	18 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			activities ii. Adhere to pre production process procedure <u>Safety:</u> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace / machinery safe to be used			
6. Carry out Plastics Rotational Moulding Production process	i. Water or / and air circulation for cooling chamber ii. Oven heats setting iii. Stages / cycle / sequence of rotational moulding process iv. Rotational Moulding production procedures			24 hours	Lecture and Discussion	i. Mould in the oven heated until fully melt and coalesce on the mould wall confirmed according to required length of time setting and process

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	v. Cooling system: <ul style="list-style-type: none"> • Fan • Water spray vi. Range of cooling rate					requirements. ii. Hollow part rotated through two or more axes within required speed in order to avoid the accumulation of polymer powder.
		i. Heat mould in the oven until fully melt and coalesce on the mould wall ii. Confirm hollow part rotates through two or more axes within required speed in order to avoid the accumulation of polymer powder iii. Confirm cooling fan functionality for cooling the mould iv. Confirm the materials are solidified by cooling system within a certain range of cooling rate in order to avoid part defect (warping) v. Remove part from the mould process		30 hours	Demonstration and Observation	iii. Cooling fan functionality for cooling the mould confirmed according to cooling rate. iv. The materials solidified by cooling system (fan / water spray) within a certain range of cooling rate in order to avoid part defect (warping). v. Part from the mould removed and examined according to product specification.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		flow vi. Check physical appearance of parts (colour, form of material, thickness)	<u>Attitude:</u> i. Focus and observant in executing rotational moulding production ii. Handle production machine, auxiliary equipment and mould with care <u>Safety:</u> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) iii. Ensure workplace / machinery safe			vi. Physical appearance of parts (colour, form of material, thickness) examined according to materials specification.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			to be used			
7. Carry out product finishing process	i. Types of finishing process: <ul style="list-style-type: none"> • Cleaning • Trimming • Buffing • Cutting ii. Finished goods appearance after trimming: <ul style="list-style-type: none"> • Roughness • Surface cracking flashing • Burr • Wave • Warping iii. Method and Technique of product finishing process iv. Product finishing process v. Product packaging specification vi. Type of reject: <ul style="list-style-type: none"> • Uneven wall thickness • Incomplete fusion • Bridging of powder 			6 hours	Lecture and Discussion	i. Types of finishing process and tools specified according to process requirements. ii. Finished goods appearance examined according to product specification. iii. Method and technique of product finishing process employed. iv. Product packaging executed according to packaging standard instructions.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	in mould <ul style="list-style-type: none"> • Mould release difficult • Warping • Low impact strength • Surface pitting 					
		i. Confirm types of finishing process (cleaning, trimming, buffing, and cutting) and tools to be used ii. Check finished goods appearance (roughness, surface cracking, flashing, wave, warping) iii. Apply method and technique of product finishing process iv. Execute product finishing v. Pack product into suitable packaging	<u>Attitude:</u> i. Focus and observant in executing product	12 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			finishing process ii. Handle production machine and tools with care <u>Safety:</u> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace / machinery safe to be used			
8. Report Plastics Rotational Moulding Production activities	i. Production output status / results: <ul style="list-style-type: none"> • rejection rate, • quantity, • quality (type of defects) • wastage ii. Product acceptance			6 hours	Lecture and Discussion	i. Production output status / results reviewed and confirmed according to product acceptance criteria.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	criteria: <ul style="list-style-type: none"> • Appearance • Dimension • Functional iii. Reporting format (verbally / written) iv. Reporting medium (manually or electronically) v. Organizational hierarchy / charts vi. Standard Operating Procedure					ii. Reporting format completed and submitted to superior according to reporting procedure and company policy.
		i. Compile production output status / results ii. Determine product acceptance criteria iii. Complete reporting format (manually or electronically) iv. Utilise reporting medium v. Acknowledge status to superior		12 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		/ authorised party	<u>Attitude:</u> i. Meticulous in producing report ii. Adhere to company reporting procedure			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria

Employability Skills

CORE ABILITIES	SOCIAL SKILLS
<p>01.01 Identify and gather information.</p> <p>01.02 Document information procedures or processes.</p> <p>02.01 Interpret and follow manuals, instructions and SOP's.</p> <p>02.03 Communicate clearly.</p> <p>02.04 Prepare brief reports and checklist using standard forms.</p> <p>02.05 Read/Interpret flowcharts and pictorial information.</p> <p>03.01 Apply cultural requirement to the workplace.</p> <p>03.02 Demonstrate integrity and apply practical practices.</p> <p>03.03 Accept responsibility for own work and work area.</p> <p>03.04 Seek and act constructively upon feedback about work performance.</p> <p>03.05 Demonstrate safety skills.</p> <p>03.06 Respond appropriately to people and situations.</p> <p>06.01 Understand systems.</p> <p>06.02 Comply with and follow chain of command.</p> <p>06.03 Identify and highlight problems.</p> <p>06.04 Adapt competencies to new situations/systems.</p> <p>01.04 Analyse information.</p> <p>01.06 Utilize word processor to process information.</p> <p>02.07 Utilize Local Area Network (LAN)/Intranet to exchange information.</p>	<ol style="list-style-type: none"> 1. Communication skills 2. Conceptual skills 3. Interpersonal skills 4. Multitasking and prioritizing 5. Leadership skills 6. Self-discipline 7. Teamwork 8. Integrity

CORE ABILITIES	SOCIAL SKILLS
<p>02.08 Prepare pictorial and graphic information.</p> <p>03.08 Develop and maintain a cooperation within work group.</p> <p>04.01 Organize own work activities.</p> <p>04.02 Set and revise own objectives and goals.</p> <p>04.03 Organize and maintain own workplace.</p> <p>04.05 Demonstrate initiative and flexibility.</p> <p>06.05 Analyse technical systems.</p> <p>06.06 Monitor and correct performance of systems.</p> <p>01.07 Utilize database applications to locate and process information.</p> <p>01.08 Utilizespreadsheets applications to locate and process information.</p> <p>01.09 Utilize business graphic application to processinformation.</p> <p>01.10 Apply a variety of mathematical techniques.</p> <p>01.11 Apply thinking skills and creativity.</p> <p>02.10 Prepare reports and instructions.</p> <p>03.09 Manage and improve performance of individuals.</p> <p>03.15 Liaise to achieve identified outcomes.</p> <p>03.16 Identify and assess client/customer needs.</p> <p>04.07 Negotiate acceptance and support for objectives and strategies.</p> <p>05.01 Implement project/work plans.</p> <p>05.02 Inspect and monitor work done and/or in progress.</p>	

CORE ABILITIES	SOCIAL SKILLS

Tools, Equipments and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1. Computer	1:5
2. Plant Layout / Workplace / Shop Floor	1:25
3. Safety Handbook	1:1
4. Equipment Safety Manual, Emergency and Hazardous Signage	1:25
5. Standard Operating Procedure	1:25
6. Manual Operation	1:25
7. Organization Chart	1:25
8. Application of Information Technology (word processor, data sheet, database, etc.)	1:25
9. Rotational Moulding machine :(Shuttle or swing arm Machine or carousel Machine or Rock and roll machine or Clamshell machine or Vertical / up and over rotational machine).	1:5
10. Rotational mould structure (Aluminium base mould or Stainless steel mould or Mild Steel Mould).	1:5
11. Rotational grade thermoplastic material (ABS, PP, HDPE, PVC, Acrylic) – powder form type	5kg: 1 (per type)
12. Auxiliary equipment (Extruder, Blender, Grinder, Boom Crane, Mixer and Weight Machine)	1:5
13. Trimming tools set (cutter and knives)	1:1
14. Special tools (Router, Jigsaws, Band/Table Saw, Circular saw, Drill Machine and Cutting/ trimming Jig)	1:10
15. Mould Hand Tools (min size 2 mm ~ 14mm, bsf 1/8 “ ~ 2”), Common	1:1

ITEMS	RATIO (TEM : Trainees)
Spanner Set, Screw driver (flat min size = 6”),1 feet ½” steel pipe, Copper Rod (min= diameter 3 “ x 6”), mallet , plier, cutter, multi-grips, knife, high temperature and normal grease, thread tape, apron and tools box). 16. Measurement Equipment set (Ruler, calliper, dial indicator and measurement tape)	1:5

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CURRICULUM of COMPETENCY UNIT (CoCU)

Sub Sector		METAL MACHINING TECHNOLOGY						
Job Area		PLASTICS PRODUCTION OPERATION						
Competency Unit Title		PLASTICS PRODUCTION QUALITY CONTROL						
Learning Outcome		<p>The person who is competent in this competency unit shall be able to carry out product inspection during the production process in order to ensure the quality of the product. Upon completion of this competency unit, trainees will be able to:-</p> <ul style="list-style-type: none"> • Assess plastics production quality control requirements • Coordinate plastics production quality control activities • Carry out plastics production quality control activities • Carry out quality control activities assessment • Report quality control activities 						
Competency Unit ID		C06	Level	3	Training Duration	170 Hours	Credit Hours	17.0
Work Activities	Related Knowledge	Related Skills		Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria	
1. Assess plastics production quality control requirements	i. Job / work order, quality standards, product specifications and requirements ii. Quality Inspection Standards (QIS) iii. Control plan / Process Manufacturing Plan (PMP) on quality inspection iv. Previous similar product history record v. Production quality trends				18 hours	Lecture and Discussion	i. Job / Work order, quality standards, product specifications and requirements specified according to production requirements. ii. Inspection criteria determined. iii. Inspection	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	vi. Statutory bodies requirement such as <ul style="list-style-type: none"> • Occupational Safety & Health Act (OSHA) • Department of Environment (DOE) vii. Work Place Organization Method (5S)					frequency confirmed. iv. Previous similar product history record reviewed according to production quality trends.
		i. Interpret job / work order, quality standards, product specifications and requirements ii. Identify Inspection criteria iii. Determine inspection frequency iv. Determine production quality trends v. Review previous similar product history record	<u>Attitude:</u> i. Thorough and precise in interpreting Quality	18 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			Inspection Standards ii. Analytical in assessing product quality and process performance <u>Safety:</u> i. Aware of 5S and safety requirement at all time			
2. Coordinate plastics production quality control activities	i. Inspection measuring instrument and equipment for: <ul style="list-style-type: none"> • Geometrical, dimensional & tolerance (GDT) <ul style="list-style-type: none"> ▪ Micrometre, ▪ Venire ▪ Calliper ▪ Gauge, ▪ Inspection jig, ▪ Colour comparator, ▪ Measurement inspection 			18 hours	Lecture and Discussion	i. Inspection measuring instrument and equipment for geometrical, dimensional & tolerance (GDT) obtained. ii. Equipment for material properties testing arranged. iii. Sample for testing specified. iv. Recording format

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<p>testing equipment (Coordinate Measuring Machine, smart scope, profile projector, Tool Maker scope, etc.)</p> <ul style="list-style-type: none"> • Equipment for material properties testing: <ul style="list-style-type: none"> ▪ tensile tester, ▪ Charpy Tester, ▪ Melt Flow index Tester ▪ Smart scope ▪ Oven for heat revision testing / burn in test ▪ UV tester ▪ Ohm meter gauge ii. Inspection methods and techniques iii. Recording format: <ul style="list-style-type: none"> • Work-In-Progress, • Check sheet, • Control chart 					<p>selected.</p> <p>v. Inspection methods and techniques selected according to inspection requirements.</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<ul style="list-style-type: none"> i. Arrange inspection measuring instrument and equipment for geometrical, dimensional & tolerance (GDT) ii. Arrange equipment for material properties testing iii. Determine sample for testing iv. Determine recording format v. Determine inspection methods and techniques 	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Efficient and well organised in coordinating plastics production quality control activities <p><u>Safety:</u></p> <ul style="list-style-type: none"> i. Adhere to safety rules and regulation at all time 	30 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace / machinery safe to be used			
3. Carry out plastics production quality control activities	i. Procedure of sampling ii. Method of sampling / sample collection: <ul style="list-style-type: none"> • Randomly from mass production • Frequency of sample retrieving • Acceptance quality level (AQL) iii. Technique of inspection iv. Current production processes v. Parts quality inspection material properties and material strength vi. Parts quality inspection (geometrical, dimensional & tolerance (GDT)) process			18 hours	Lecture and Discussion	i. Sample for testing collected. ii. Existing production processes implemented and adjusted according to process requirement. iii. Current production process reviewed. iv. Parts quality inspection material properties and material strength implemented.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> vii. Recording format (Work-In-Progress, inspection results, etc.) viii. Quality status 					<ul style="list-style-type: none"> v. Parts quality inspection executed according to process requirement. vi. Quality status documented according to recording format.
		<ul style="list-style-type: none"> i. Collect sample for testing ii. Implement existing production processes adjustment iii. Implement current production process iv. Execute parts quality inspection material properties and material strength v. Conduct parts quality inspection vi. Complete recording format (Work-In-Progress, inspection results, etc.) vii. Update quality status 	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Focus and observant in executing quality control activities ii. Transparent in 	24 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			recording quality issues ii. Diligent in handling quality issues <u>Safety:</u> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace / machinery safe to be used			
4. Carry out quality control activities assessment	i. Quality control status ii. Product / Parts specifications and requirements iii. Quality performance iv. 7QC tools v. Assessment procedure vi. Assessment method vii. Standard Operating			6 hours	Lecture and Discussion	i. Quality control status specified according to standards product / parts specifications and requirements. ii. Quality

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	Procedure	<ul style="list-style-type: none"> i. Determine quality control status ii. Determine standards parts specifications and requirements iii. Determine 7QC tools iv. Evaluate quality performance v. Follow quality control activities procedure vi. Apply quality control activities assessment vii. Comply to Standard Operating Procedure 	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Transparent in conducting quality control assessment ii. Impartial in determining quality level <p><u>Safety:</u></p> <ul style="list-style-type: none"> i. Adhere to safety rules and regulation at all time 	20 hours	Demonstration and Observation	<p>performance measured according to quality performance evaluation procedure.</p> <ul style="list-style-type: none"> iii. Quality control activities assessment method employed according to quality standards.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			<ul style="list-style-type: none"> ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace / machinery safe to be used 			
5. Report quality control activities	<ul style="list-style-type: none"> i. Quality inspection status ii. Quality control standards iii. Reporting format (Inspection checklist, check sheet, etc.) iv. Reporting medium (manually or electronically) v. Organizational hierarchy / chart vi. Standard Operating Procedure (SOP) 			6 hours	Lecture and Discussion	<ul style="list-style-type: none"> i. Quality inspection status confirmed according to quality control standards. ii. Quality control activities documented and superior acknowledged according to reporting procedure.
		<ul style="list-style-type: none"> i. Determine quality inspection status ii. Complete reporting format (inspection 		12 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		checklist, check sheet, etc.) iii. Utilise reporting medium iv. Disseminate quality reports to superior / responsible personnel v. Comply to Standard Operating Procedure (SOP)	<u>Attitude:</u> i. Meticulous in producing quality control report ii. Adhere to company reporting procedure			

Employability Skills

CORE ABILITIES	SOCIAL SKILLS
<p>01.01 Identify and gather information.</p> <p>01.02 Document information procedures or processes.</p> <p>02.01 Interpret and follow manuals, instructions and SOP's.</p> <p>02.03 Communicate clearly.</p> <p>02.04 Prepare brief reports and checklist using standard forms.</p> <p>02.05 Read/Interpret flowcharts and pictorial information.</p> <p>03.01 Apply cultural requirement to the workplace.</p> <p>03.02 Demonstrate integrity and apply practical practices.</p> <p>03.03 Accept responsibility for own work and work area.</p> <p>03.04 Seek and act constructively upon feedback about work performance.</p> <p>03.05 Demonstrate safety skills.</p> <p>03.06 Respond appropriately to people and situations.</p> <p>06.01 Understand systems.</p> <p>06.02 Comply with and follow chain of command.</p> <p>06.03 Identify and highlight problems.</p> <p>06.04 Adapt competencies to new situations/systems.</p> <p>01.04 Analyse information.</p> <p>01.06 Utilize word processor to process information.</p> <p>02.07 Utilize Local Area Network (LAN)/Intranet to exchange information.</p> <p>02.08 Prepare pictorial and graphic information.</p> <p>03.08 Develop and maintain a cooperation within work group.</p> <p>04.01 Organize own work activities.</p> <p>04.02 Set and revise own objectives and goals.</p>	<ol style="list-style-type: none"> 1. Communication skills 2. Conceptual skills 3. Interpersonal skills 4. Multitasking and prioritizing 5. Leadership skills 6. Self-discipline 7. Teamwork 8. Integrity

CORE ABILITIES	SOCIAL SKILLS
<p>04.03 Organize and maintain own workplace.</p> <p>04.05 Demonstrate initiative and flexibility.</p> <p>06.05 Analyse technical systems.</p> <p>06.06 Monitor and correct performance of systems.</p> <p>01.07 Utilize database applications to locate and process information.</p> <p>01.08 Utilizespreadsheets applications to locate and process information.</p> <p>01.09 Utilize business graphic application to processinformation.</p> <p>01.10 Apply a variety of mathematical techniques.</p> <p>01.11 Apply thinking skills and creativity.</p> <p>02.10 Prepare reports and instructions.</p> <p>03.09 Manage and improve performance of individuals.</p> <p>03.15 Liaise to achieve identified outcomes.</p> <p>03.16 Identify and assess client/customer needs.</p> <p>04.07 Negotiate acceptance and support for objectives and strategies.</p> <p>05.01 Implement project/work plans.</p> <p>05.02 Inspect and monitor work done and/or in progress.</p>	

Tools, Equipments and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1. Computer	1:5
2. Plant Layout / Workplace / Shop Floor	1:25
3. Safety Handbook	1:1
4. Equipment Safety Manual, Emergency and Hazardous Signage	1:25
5. Standard Operating Procedure	1:25
6. Manual Operation	1:25
7. Organization Chart	1:25
8. Application of Information Technology (word processor, data sheet, database, etc.)	1: 5
9. Geometrical, dimensional & tolerance (GDT)set (micrometre, venire calliper, gauge, inspection jig and colour comparator)	1:5
10. Measurement inspection testing equipment (Coordinate Measuring Machine, smart scope, profile projector, Tool Maker scope)	1:20
11. Equipment for material properties (tensile tester, Charpy Tester, Melt Flow index Tester, Smart scope, Oven for heat revision testing / burn in test, UV tester and Ohm meter gauge)	1:20
12. Quality standard (AQL, QIS)	1:1

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CURRICULUM of COMPETENCY UNIT (CoCU)

Sub Sector	METAL MACHINING TECHNOLOGY						
Job Area	PLASTICS PRODUCTION OPERATION						
Competency Unit Title	PLASTICS PRODUCTION MACHINERY AND MOULD / DIE PREVENTIVE MAINTENANCE						
Learning Outcome	<p>The person who is competent in this competency unit shall be able to maintain the production machines and mould and die performance, by using lubricants (grease, oil etc.) and tools (air gun, grease gun, pump, etc.), consumable item (cotton rag, brush, etc.) and equipment (vacuum cleaner, dryer etc.) in order to ensure every machine and mould / die in a production process always functions in good condition and performs its required task and its put rate is never disrupted. Upon completion of this competency unit, trainees will be able to:-</p> <ul style="list-style-type: none"> • Identify plastics production preventive maintenance requirements • Coordinate plastics production machinery and mould / die preventive maintenance activities • Carry out plastics production machinery preventive maintenance • Carry out plastics production mould / die maintenance • Verify plastics production machine and mould / die condition and function status 						
Competency Unit ID	C07	Level	3	Training Duration	260 Hours	Credit Hours	26.0
Work Activities	Related Knowledge	Related Skills		Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
1. Identify plastics production preventive maintenance requirements	i. Machine and mould / die fundamental ii. Engineering drawing iii. Electrical and electronic diagram iv. Types of maintenance tools and lubricants v. Machine manual vi. Statutory bodies requirement such as: <ul style="list-style-type: none"> • Occupational Safety & Health Act (OSHA) • Department of 				18 hours	Lecture and Discussion	i. Machine and mould / die condition, function and maintenance requirements listed and defined. ii. Usage of engineering drawing determined. iii. Types of

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	Environment (DOE) vii. Work Place Organization Method (5S)					maintenance tools and lubricants specified.
		i. Interpret machine and Mould / die condition, function and maintenance requirements ii. Interpret usage of engineering drawing iii. List types of maintenance tools and lubricants	<u>Attitude:</u> i. Thorough and precise in interpreting preventive maintenance requirements ii. Resourceful in identifying maintenance tools and lubricants <u>Safety:</u> i. Aware of 5S and safety	24 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			requirement at all time			
2. Coordinate plastics production machinery and mould / die preventive maintenance activities	i. Standard parts of machine, Mould / die and auxiliary component ii. Machinery /auxiliary parts such as : <ul style="list-style-type: none"> • CPU / PLC Unit • Hydraulic components • Pneumatic component • Electrical / Electronic component • Nozel • Screw / Barrel iii. Mould / die parts : <ul style="list-style-type: none"> • Sprue Bush • Ejection system • Sliding block • Cooling system • Blow pin • Spider / Torpedo • Bush Pin • Cutting Die 			18 hours	Lecture and Discussion	i. Standard parts machine, mould / die and auxiliary component listed. ii. Mould / die parts categorised. iii. Production preventive maintenance activities planned. iv. Spare part for both mould and machine work arranged according to preventive maintenance requirements. v. Preventive maintenance schedule prepared.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> • Punch • Die Base • Choke bar iv. Preventive maintenance schedule: <ul style="list-style-type: none"> • Frequency of maintenance (daily / weekly / monthly / yearly) 					
		i. Interpret machine and mould / die condition, function and maintenance requirements ii. Interpret usage of engineering drawing iii. Determine standard parts of machine, Mould / die and auxiliary component iv. List types of maintenance tools and lubricants	<u>Attitude:</u> i. Efficient and well organized in coordinating plastics production	24 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			preventive maintenance activities <u>Safety:</u> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace / machinery safe to be used			
3. Carry out plastics production machinery preventive maintenance	i. Tools and lubricants ii. Machine / equipment preventive maintenance procedure iii. Scope of machinery preventive maintenance under production operation personnel iv. Machine / equipment preventive maintenance method			30 hours	Lecture and Discussion	i. Tools and lubricants for machinery preventive maintenance listed and specified according to machine manual. ii. Preventive maintenance of

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	v. Machine / equipment preventive maintenance technique vi. Type of faulty machine part vii. Type of parts for replacement: <ul style="list-style-type: none"> • Thermo couple and Band heater (for barrel) • Temperature controller • Contactors / Relay • Nozzle viii. Maintenance recording format ix. Maintenance checklist					iii. Machine cleaning and housekeeping practices ensured according to housekeeping guidelines. iv. Scope of machinery preventive maintenance works during production operation assured.
		i. Determine tools and lubricants ii. Execute preventive maintenance of machine iii. Execute machine cleaning iv. Apply faulty machine part replacement v. Determine scope of preventive		32 hours	Demonstration and Observation	v. Faulty machine part replaced according to machine specification. vi. Maintenance record updated upon completion of the job according to documentation procedure.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<p>maintenance works under production operation personnel</p> <p>vi. Complete maintenance record is upon completion of the job</p>	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Focus and observant in executing machinery preventive maintenance activities ii. Accuracy in recording maintenance issues <p><u>Safety:</u></p> <ul style="list-style-type: none"> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) iii. Ensure workplace / 			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			machinery safe to be used iv. Pre caution on hot equipment and moving parts			
4. Carry out plastics production mould / die maintenance	i. Tools and lubricants ii. Mould / die preventive maintenance procedure iii. Mould / die preventive maintenance method iv. Scope of mould / die preventive maintenance under production operation personnel v. Mould / die preventive maintenance technique vi. Type of faulty Mould / die component vii. Type of components for replacement: <ul style="list-style-type: none"> • Thermocouple, cartridge/band heater, temperature controller • Ejector system • Sprue Bush • Centering Bolt 			30 hours	Lecture and Discussion	i. Tools and lubricants listed and specified for mould / die preventive maintenance according to mould / die specification / drawing. ii. Maintenance of mould / die performed according to preventive maintenance procedure. iii. Mould / die dismantled for maintenance according to work

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> • Blow pin • Roller viii. Mould / die maintenance cleaning tools (ultrasonic/manual) ix. Mould / die maintenance recording format x. Mould / die Maintenance checklist					requirements and scope of preventive maintenance works. iv. Mould or die cleaning executed according to maintenance procedure. v. Defective items serviced / rectified / replaced / reported for further action according to maintenance procedure.
		i. Obtain tools and lubricants ii. Execute maintenance of Mould / die iii. Dismantle mould /die for maintenance iv. Utilise Mould / die maintenance cleaning tools (ultrasonic/manual) v. Execute mould or die cleaning vi. Service/ rectify/ replace/report of defective items for further action		48 hours	Demonstration and Observation	vi. Scope of mould / die preventive maintenance works during production operation assured. vii. Mould or die condition verified and

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		vii. Evaluate mould or die condition iii. Complete maintenance record upon completion of the job	<u>Attitude:</u> i. Focus and observant in executing mould / die preventive maintenance activities ii. Accuracy in recording maintenance issues <u>Safety:</u> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace / machinery safe to be used			assembled according to mould or die specification viii. Maintenance record updated upon completion of the job according to documentation procedure.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			iv. Pre caution on hot equipment and moving parts			
5. Verify plastics production machine and mould / die condition and function status	i. Preventive maintenance of machine / auxiliary equipment and mould / die details: <ul style="list-style-type: none"> • Machine and mould / die identification name/tag number • Condition • Functionality • Date / time ii. Plastics production machine and mould / die condition and function verification method iii. Servicing / rectification / replacement of defective items recording format			12 hour	Lecture and Discussion	i. Machine / mould and die functionality tested according to machine specification. ii. Servicing / replacement / rectification of defective item for further action documented according to preventive maintenance procedure. iii. Records of Preventive maintenance details disseminated to superior / responsible personnel according to
		i. Test machine and mould / die functionality ii. Record of servicing/		24 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<p>replacement/rectification defective item for further action</p> <p>iii. Distribute record of preventive maintenance activities status</p>	<p><u>Attitude:</u></p> <p>i. Adhere to verification procedure during checking production machine and mould / die condition and function status</p> <p>ii. Knowledgeable regarding machinery and mould / die functionality</p> <p><u>Safety:</u></p> <p>i. Adhere to safety rules and regulation at all time</p> <p>ii. Wear Personal Protective Equipment</p>			documentation procedure.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			(PPE) ii. Ensure workplace / machinery safe to be used			

Employability Skills

CORE ABILITIES	SOCIAL SKILLS
<p>01.01 Identify and gather information.</p> <p>01.02 Document information procedures or processes.</p> <p>02.01 Interpret and follow manuals, instructions and SOP's.</p> <p>02.03 Communicate clearly.</p> <p>02.04 Prepare brief reports and checklist using standard forms.</p> <p>02.05 Read/Interpret flowcharts and pictorial information.</p> <p>03.01 Apply cultural requirement to the workplace.</p> <p>03.02 Demonstrate integrity and apply practical practices.</p> <p>03.03 Accept responsibility for own work and work area.</p> <p>03.04 Seek and act constructively upon feedback about work performance.</p> <p>03.05 Demonstrate safety skills.</p> <p>03.06 Respond appropriately to people and situations.</p> <p>06.01 Understand systems.</p> <p>06.02 Comply with and follow chain of command.</p> <p>06.03 Identify and highlight problems.</p> <p>06.04 Adapt competencies to new situations/systems.</p> <p>01.04 Analyse information.</p> <p>01.06 Utilize word processor to process information.</p> <p>02.07 Utilize Local Area Network (LAN)/Intranet toexchange information.</p> <p>02.08 Prepare pictorial and graphic information.</p> <p>03.08 Develop and maintain a cooperation within work group.</p> <p>04.01 Organize own work activities.</p> <p>04.02 Set and revise own objectives and goals.</p>	<ol style="list-style-type: none"> 1. Communication skills 2. Conceptual skills 3. Interpersonal skills 4. Multitasking and prioritizing 5. Leadership skills 6. Self-discipline 7. Teamwork 8. Integrity

CORE ABILITIES	SOCIAL SKILLS
<p>04.03 Organize and maintain own workplace.</p> <p>04.05 Demonstrate initiative and flexibility.</p> <p>06.05 Analyse technical systems.</p> <p>06.06 Monitor and correct performance of systems.</p> <p>01.07 Utilize database applications to locate and process information.</p> <p>01.08 Utilizespreadsheets applications to locate and process information.</p> <p>01.09 Utilize business graphic application to processinformation.</p> <p>01.10 Apply a variety of mathematical techniques.</p> <p>01.11 Apply thinking skills and creativity.</p> <p>02.10 Prepare reports and instructions.</p> <p>03.09 Manage and improve performance of individuals.</p> <p>03.15 Liaise to achieve identified outcomes.</p> <p>03.16 Identify and assess client/customer needs.</p> <p>04.07 Negotiate acceptance and support for objectives and strategies.</p> <p>05.01 Implement project/work plans.</p> <p>05.02 Inspect and monitor work done and/or in progress.</p>	

Tools, Equipments and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1. Computer	1:5
2. Plant Layout / Workplace / Shop Floor	1:25
3. Safety Handbook	1:1
4. Equipment Safety Manual, Emergency and Hazardous Signage	1:25
5. Standard Operating Procedure	1:25
6. Machine Manual Operation	1:25
7. Organization Chart	1:25
8. Application of Information Technology (word processor, data sheet, database, etc.)	1:25
9. Machine and mould drawing including the Electrical and electronic diagram	1:20
10. Standard parts of machine, Mould / die and auxiliary component list.	1:20
11. Plastic processing machine (Injection or blow or extrusion or compression moulding)	1:5
12. Mould or die (2 plate mould , 3 plate mould, hot runner mould, blow mould, extrusion die and compression mould)	1:3
13. Maintenance tools for machine / equipment / auxiliary	1:5
14. Lubricants (for machine / equipment / auxiliary and mould / die (normal grease and high temperature grease))	Depend on usage
15. Mould / die Hand Tools (min size 2 mm ~ 14mm, bsf 1/8 " ~ 2"), Common Spanner Set, Screw driver (flat min size = 6"), 1 feet 1/2" steel pipe, Copper Rod (min= diameter 3 " x 6"), mallet , plier, cutter, multi-grips, knife, high temperature and normal grease, thread tape, apron and tools box).	1:1
16. Lifting equipment.	1:20
17. Mould handling protection items (wood (min size 2"x2)", rubber map and big tyre)	1:5

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CURRICULUM of COMPETENCY UNIT (CoCU)

Sub Sector		METAL MACHINING TECHNOLOGY						
Job Area		PLASTICS PRODUCTION OPERATION						
Competency Unit Title		PLASTICS PRODUCTION SUPERVISION						
Learning Outcome		<p>The person who is competent in this competency unit shall be able to ensure the output of production meets company target based on work order. Upon completion of this competency unit, trainees will be able to:-</p> <ul style="list-style-type: none"> • Assess production supervision requirements • Monitor plastics production Safety, Health and Environmental (SHE) compliance • Supervise plastics production operation • Carry out production materials handling activities • Coordinate new or existing employees training • Prepare report of production supervision activities 						
Competency Unit ID		C08	Level	3	Training Duration	150 Hours	Credit Hours	15.0
Work Activities	Related Knowledge	Related Skills		Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria	
1. Assess production supervision requirements	i. Production schedule ii. Stock balance, place order, work order instruction iii. Production process stages iv. Raw Materials: <ul style="list-style-type: none"> • Pellet / coil, • Equipment and facilities v. Sources of raw materials: <ul style="list-style-type: none"> • Supplies of raw material 				12 hours	Lecture and Discussion	i. Production schedule defined according to customer requirements and company plan. ii. Stock balance, place order, work order instruction identified according to production requirements. iii. Production	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> • Specifications • Tools <ul style="list-style-type: none"> ▪ Allen key ▪ Calliper ▪ Micro meter ▪ Colour meter/ comparator • Equipment : <ul style="list-style-type: none"> ▪ Forklift ▪ Stacker ▪ Container, pallet truck vi. Quantity of products with lead time, type of process, type of packaging vii. Production materials handling activities viii. Percentage rejection rate ix. Defects rework, waste and disposal activities x. Production inventory status, incoming and outgoing goods xi. Statutory bodies requirement such as <ul style="list-style-type: none"> • Occupational Safety & Health Act (OSHA) • Department of 					<p>process stages specified.</p> <p>iv. Raw materials equipment and facilities and its sources listed and functions categorised.</p> <p>v. Quantity of products with lead time, type of process, type of packaging reviewed according to production schedule.</p> <p>vi. Production materials handling activities determined.</p> <p>vii. Percentage rejection rate, defects rework, waste and disposal activities classified according to production output status.</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	Environment (DOE) xii. Work Place Organization Method (5S)					iii. Production inventory status, incoming and outgoing goods confirmed according to production schedule / target.
		i. Interpret production schedule ii. List stock balance, place order, work order instruction. iii. Determine production process stage iv. Identify raw materials (pellet / coil), equipment and facilities v. Identify sources of raw materials, tools and equipment vi. List quantity of products with lead time, type of process, type of packaging vii. List production materials handling activities iii. Identify percentage		18 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		rejection rate ix. Classify defects rework, waste and disposal activities x. Check production inventory status, incoming and outgoing goods	<u>Attitude:</u> i. Knowledgeable in interpreting production schedule ii. Precise in reviewing production resources and sources of the resources <u>Safety:</u> i. Aware of 5S and safety requirement at all time			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
2. Monitor plastics production Safety, Health and Environmental (SHE) compliance	<ul style="list-style-type: none"> i. Safe work station, waste disposal, Personal Protection Equipment (PPE) etc. ii. Personal, machinery, workplace health, safety and environment enforcement procedure iii. Regulatory /statutory / authority bodies requirements iv. Personal, machinery and workplace safety, health and environment implementation status v. Safety briefing, signage of danger / hazardous area evacuation plan and fire drill exercises vi. Workplace safety, health and environment implementation feedbacks vii. Effectiveness of personal, machinery and workplace safety, health and environment activities viii. Level of compliance 			12 hours	Lecture and Discussion	<ul style="list-style-type: none"> i. Safe work station, waste disposal, Personal Protection Equipment (PPE) identified according to company safety policy and Regulatory / Statutory bodies requirements. ii. Personal, machinery, workplace health, safety and environment enforcement procedure adhered according to Regulatory / Statutory bodies requirements. iii. Rules and regulation of regulatory / statutory / authority bodies

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	ix. Documentation procedure					defined. iv. Compliance of personal health, machinery and work place safety and environmental rules and regulation assured according to Regulatory / Statutory bodies requirements.
		i. Interpret safe work station, waste disposal, Personal Protection Equipment (PPE) ii. Follow personal, machinery, workplace safety, health and environment enforcement procedure iii. Identify rules and regulation, regulatory/authority bodies etc. iv. Observe current personal ,machinery and workplace safety , health and environment implementation status v. Participate in safety briefing, signage of		12 hours	Demonstration and Observation	v. Safety briefing participated and signage of danger / hazardous area evacuation plan and fire drills exercised according Safety, Health and Environmental requirements. vi. Feedbacks on implementation of workplace health, safety and environment

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<p>danger/hazardous area evacuation plan and fire drills exercise</p> <p>vi. Provide workplace health, safety and environment implementation feedbacks</p> <p>vii. Asses effectiveness personal, machinery and workplace safety, health and environment activities</p> <p>iii. Document findings, planning and level of compliance</p>	<p><u>Attitude:</u></p> <p>i. Responsible and accountable for compliances of SHE requirements</p> <p>ii. Proactive and committed in monitoring implementation status</p>			<p>activities collected and documented according to documentation procedure.</p> <p>vii. Level of compliance assured.</p> <p>viii. Effectiveness of personal, machinery and workplace safety, health and environment activities evaluated and documented.</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			<u>Safety:</u> i. Adhere to safety rules and regulations at all time			
3. Supervise plastics production operation	i. Production resources planning and monitoring: <ul style="list-style-type: none"> • Schedule • Manpower • Type of machine • Raw materials ii. Production process stages iii. Production output status efficiency: <ul style="list-style-type: none"> • Machine • Manpower iv. Supervision methods v. Production process flow vi. Regulatory / Statutory bodies requirements vii. Company policy			12 hours	Lecture and Discussion	i. Production planning confirmed according production planning. ii. Production process stage differentiated. iii. Production output status identified according to production target and planning. iv. Supervisory methods employed according to company policy. v. Production process flow reviewed according to process
		i. Obtain production planning ii. Determine production process		12 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		stages iii. Production output status iv. Apply supervisory methods v. Follow production process flow vi. Comply to company policy and Regulatory / Statutory bodies requirements	<u>Attitude:</u> i. Responsible and accountable for the production achievement ii. Proactive and committed and rational in supervising subordinate ii. Result oriented in decision making <u>Safety:</u> i. Adhere to safety rules and regulations			requirements. vi. Company policy and Regulatory / Statutory bodies requirements complied.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			at all time			
4. Carry out production materials handling activities	<ul style="list-style-type: none"> i. Raw materials for the plastic production availability / readiness ii. Material handling tools and equipment: <ul style="list-style-type: none"> • Tools (knife, cutter) • Equipment (forklift, wheel barrow, stacker, container) iii. Production inventory status, incoming and outgoing goods iv. Inventory status: <ul style="list-style-type: none"> • Incoming materials, • Stock & balance • Finished goods status v. Test sampling of materials and finish products (tensile strength, hardness, impact, melt flow etc.) vi. Production materials handling activities vii. Quality and quantity of finished goods 			6 hours	Lecture and Discussion	<ul style="list-style-type: none"> i. Raw materials for the plastic production availability / readiness confirmed according to production planning. ii. Tools and equipment determined. iii. Production inventory status, incoming and outgoing goods reviewed. iv. Inventory and finished goods status calculated and recorder into the inventory system and stocks card. v. Test sampling of materials and

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> viii. Production inventory results and data, rejected items, scrap and materials waste ix. Company inventory filing system (manual, electronic, etc.) x. Regulatory / authority body requirements on waste management xi. Facilities, equipment, or procedures to improve safety, quality, and efficiency in materials handling 					<ul style="list-style-type: none"> finish products arranged. vi. Production materials handling activities implemented. vii. Quality and quantity of finished goods compiled and analysed. iii. Production inventory results and data, rejected items, scrap and materials waste kept and documented.
		<ul style="list-style-type: none"> i. Check raw materials for the plastic production availability / readiness ii. Identify tools and equipment iii. Check production inventory status, incoming and outgoing goods iv. Asses inventory status (incoming 		18 hours	Demonstration and Observation	<ul style="list-style-type: none"> ix. Company inventory filing system employed. x. Compliance of Regulatory / authority body requirements on waste management assured. xi. Facilities, equipment, or

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		materials, stock & balance, etc.) and finished goods status v. Coordinate test sampling of materials and finish products (tensile strength, hardness, impact, melt flow etc.) vi. Execute production materials handling activities vii. Evaluate quality and quantity of finished goods iii. Store and document production inventory results and data, rejected items, scrap and materials waste properly ix. Utilise company inventory filing system (manual, electronic, etc.) x. Comply to regulatory / authority body requirements				procedures to improve safety, quality, and efficiency in materials handling proposed to superior.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<p>on waste management</p> <p>xi. Recommend facilities, equipment, or procedures to improve safety, quality, and efficiency in materials handling</p>	<p><u>Attitude:</u></p> <p>i. Adhere to regulatory bodies requirements and materials handling procedure</p> <p>ii. Accuracy in assessing inventory status</p> <p>ii. Diligent and practice integrity in handling production materials</p> <p><u>Safety:</u></p> <p>i. Adhere to safety rules and regulation</p>			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			at all time ii. Handle hazardous materials with care and caution			
5. Coordinate new or existing employees training	i. Training needs requirement and duration ii. Employees to be trained iii. Skill / Training gap analysis iv. Type of training program v. Development program schedule: <ul style="list-style-type: none"> • Date, • Type of training program, • Program objectives and outlines • Training delivery approach and mode vi. Training programs to subordinate vii. All other training order from management /			12 hours	Lecture and Discussion	i. Training needs requirement and duration determined and noted. ii. Employees to be trained listed. iii. Skill / Training gap analysis reviewed. iv. Type of training program listed and reviewed. v. Employee development program scheduled according to company training plan. vi. Trainings to subordinate executed.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	department viii. Accomplishment of employee development program ix. On job training module x. Organizational hierarchy/chart					vii. All other training order from management / department attended according to company training requirements. iii. Employee development program accomplished according to schedule and training duration hours.
		i. Identify training needs requirement and duration ii. Select employees to be trained iii. Identify skill/training gap analysis iv. Identify type of training program v. Check employee development program schedule and readiness vi. Deliver training to subordinate vii. Response all other training order from management / department		18 hours	Demonstration and Observation	ix. Prepare on job training module x. Completion / achievements of training program, recorded and explained to superior / responsible personnel.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		iii. Complete employee development program ix. Prepare on job training module x. Responsible party/departments acknowledged and documented on the completion/ achievements program	<u>Attitude:</u> i. Proactive and being optimistic in coordinating training for employees ii. Impartial in selecting/ proposing employees for training program			
6. Prepare report of production supervision activities	i. Status of production achievement ii. Production supervision performance iii. Report formatting			6 hours	Lecture and Discussion	i. Status of production achievement identified and compiled.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	iv. Company policy v. Organizational Hierarchy/Chart vi. Standard Operating Procedure					ii. Production supervision performance compared with production targets and planning.
		i. Analyse results of production achievements ii. Determine production supervision performance iii. Generate report of production supervision activities	<u>Attitude:</u> i. Meticulous in preparing report ii. Adhere to company reporting procedure	12 hours	Demonstration and Observation	iii. Production supervision activities documented and presented to superior according to company policy and documentation procedure.

Employability Skills

CORE ABILITIES	SOCIAL SKILLS
<p>01.01 Identify and gather information.</p> <p>01.02 Document information procedures or processes.</p> <p>02.01 Interpret and follow manuals, instructions and SOP's.</p> <p>02.03 Communicate clearly.</p> <p>02.04 Prepare brief reports and checklist using standard forms.</p> <p>02.05 Read/Interpret flowcharts and pictorial information.</p> <p>03.01 Apply cultural requirement to the workplace.</p> <p>03.02 Demonstrate integrity and apply practical practices.</p> <p>03.03 Accept responsibility for own work and work area.</p> <p>03.04 Seek and act constructively upon feedback about work performance.</p> <p>03.05 Demonstrate safety skills.</p> <p>03.06 Respond appropriately to people and situations.</p> <p>06.01 Understand systems.</p> <p>06.02 Comply with and follow chain of command.</p> <p>06.03 Identify and highlight problems.</p> <p>06.04 Adapt competencies to new situations/systems.</p> <p>01.04 Analyse information.</p> <p>01.06 Utilize word processor to process information.</p> <p>02.07 Utilize Local Area Network (LAN)/Intranet to exchange information.</p> <p>02.08 Prepare pictorial and graphic information.</p> <p>03.08 Develop and maintain a cooperation within work group.</p> <p>04.01 Organize own work activities.</p> <p>04.02 Set and revise own objectives and goals.</p>	<ol style="list-style-type: none">1. Communication skills2. Conceptual skills3. Interpersonal skills4. Multitasking and prioritizing5. Leadership skills6. Self-discipline7. Teamwork8. Integrity

CORE ABILITIES	SOCIAL SKILLS
<p>04.03 Organize and maintain own workplace.</p> <p>04.05 Demonstrate initiative and flexibility.</p> <p>06.05 Analyse technical systems.</p> <p>06.06 Monitor and correct performance of systems.</p> <p>01.07 Utilize database applications to locate and process information.</p> <p>01.08 Utilizespreadsheets applications to locate and process information.</p> <p>01.09 Utilize business graphic application to processinformation.</p> <p>01.10 Apply a variety of mathematical techniques.</p> <p>01.11 Apply thinking skills and creativity.</p> <p>02.10 Prepare reports and instructions.</p> <p>03.09 Manage and improve performance of individuals.</p> <p>03.15 Liaise to achieve identified outcomes.</p> <p>03.16 Identify and assess client/customer needs.</p> <p>04.07 Negotiate acceptance and support for objectives and strategies.</p> <p>05.01 Implement project/work plans.</p> <p>05.02 Inspect and monitor work done and/or in progress.</p>	

Tools, Equipments and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1. Computer	1:5
2. Plant Layout / Workplace / Shop Floor	1:25
3. Safety Handbook	1:1
4. Equipment Safety Manual, Emergency and Hazardous Signage	1:25
5. Standard Operating Procedure	1:25
6. Manual Operation	1:25
7. Organization Chart	1:25
8. Application of Information Technology (word processor, data sheet, database, etc.)	1:25
9. Production planning sheet (schedule, manpower, type of machine, raw materials)	1:1

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CURRICULUM of COMPETENCY UNIT (CoCU)

- ELECTIVE

CURRICULUM of COMPETENCY UNIT (CoCU)

Sub Sector	METAL MACHINING TECHNOLOGY						
Job Area	PLASTICS PRODUCTION OPERATION						
Competency Unit Title	PLASTICS THERMOFORMING OPERATION						
Learning Outcome	<p>The person who is competent in this competency unit shall be able to produce the product in a desired shape/mould using the thermo forming technology. Upon completion of this competency unit, trainees will be able to:-</p> <ul style="list-style-type: none"> • Assess the product requirements • Coordinate thermoforming process • Carry out thermoforming process • Conduct finished good output verification 						
Competency Unit ID	E01	Level	3	Training Duration	170 Hours	Credit Hours	17.0
Work Activities	Related Knowledge	Related Skills		Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
1. Assess the product requirements	i. Fundamental of Plastics Thermoforming production ii. Job order / instructions: <ul style="list-style-type: none"> • Product specification / parts drawing / customer product / limit / master sample • Delivery date • Quantity iii. Type of thermoforming: <ul style="list-style-type: none"> • Fundamental / straight vacuum forming • Plug assist forming • Reverse draw 				24 hours	Lecture and Discussion	i. Fundamental of Plastics Thermoforming production and job order / instructions listed and defined according to the approved customer needs / requirements. ii. Plastics Thermoforming production requirements compared

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> forming / billow forming • Drape forming • Snap-back forming • Pressure forming • Free forming / blowing • Matched die forming • Insert forming iv. Type of mould :- <ul style="list-style-type: none"> • Aluminium mould • Hard word mould • Cast epoxy mould • Thermoset material mould. v. Type of materials :- <ul style="list-style-type: none"> • Thermoplastic sheet. <ul style="list-style-type: none"> ▪ Roll form ▪ Single sheet form vi. Component of vacuum forming machine:- <ul style="list-style-type: none"> • Control unit <ul style="list-style-type: none"> ▪ Speed ▪ Vacuum ▪ Air pressure ▪ Position and stroke ▪ Temperature/ heating 					<ul style="list-style-type: none"> according to customer requirements. iii. Delivery date and quantity stated according to customer requirements. iv. Type of thermoforming / Vacuum forming process determined according to job order / instructions and product design. v. Type of mould, materials and component of vacuum forming machine specified according to process requirements. vi. Machine and auxiliary size and functionality reviewed

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> ▪ Time. • Forming station <ul style="list-style-type: none"> ▪ Vacuum plate ▪ Moving lower table ▪ Moving upper table ▪ Clamp frame ▪ Cooling fans ▪ Water spray / channel ▪ Heating plate • Trim station <ul style="list-style-type: none"> ▪ Spiked chain rails / rake feed ▪ Cutting tools ▪ Manual operated trimming • Material transport system <ul style="list-style-type: none"> ▪ Single sheet transport mechanisms ▪ Rotary / carousel ▪ Sheet roll transport mechanism • Heating unit <ul style="list-style-type: none"> ▪ Convection 					<p>according to product specification.</p> <p>vii. Product finishes requirements and finish goods packaging specification stated and described according to customer requirements.</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> ▪ Conduction ▪ radiation • Stacking system vii. Machine size and functionality viii. Vacuum Forming Process: <ul style="list-style-type: none"> • Sheet-feeding • Sheet-heating • Mould actuation / forming • Cooling • Ejection ix. Auxiliary equipment <ul style="list-style-type: none"> • Chillers <ul style="list-style-type: none"> ▪ Portables units ▪ Individual units ▪ Centralised system • Punches and dies • Trimming and finishing equipment: <ul style="list-style-type: none"> ▪ Band saws ▪ Routers ▪ Guillotines ▪ Punches ▪ Drills ▪ Knives • Take out devices • Sheet feeding 					

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> equipment <ul style="list-style-type: none"> • Robotic arm • Vacuum pump x. Product finish requirements: <ul style="list-style-type: none"> • Roughness • Dimension • Appearance <ul style="list-style-type: none"> ▪ Surface finish ▪ Trim accuracy • Color • Weight xi. Finish goods packaging specification xii. Statutory bodies requirement such as: <ul style="list-style-type: none"> • Occupational Safety & Health Act (OSHA) • Department of Environment (DOE) xiii. Work Place Organization Method (5S) 					
		<ul style="list-style-type: none"> i. Interpret Fundamental of plastics thermoforming production 		24 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<ul style="list-style-type: none"> ii. Review Plastics Thermoforming production requirements iii. Interpret job order /instructions iv. Determine delivery date and quantity v. Determine type of thermoforming vi. Determine type of mould, machine and materials vii. Determine component of vacuum forming machine viii. Determine machine size and functionality ix. Determine vacuum forming process x. Determine auxiliary equipment xi. Determine product finish requirements xii. Determine finish goods packaging specification 	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Knowledgeable in interpreting 			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			fundamental of Plastics Thermoforming production ii. Thorough and precise in reviewing plastics thermoforming production requirements <u>Safety:</u> i. Aware of 5S and safety requirement at all time			
2. Coordinate thermoforming process	i. Production schedule: <ul style="list-style-type: none"> • Production date • Manpower availability • Machine and auxiliary equipment • Mould • Materials ii. Trimming tools: <ul style="list-style-type: none"> • Cutter • Knives 			18 hours	Lecture and Discussion	i. Mould, machine and auxiliary equipment, materials and manpower readiness confirmed according to job order / instructions. ii. Production

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> • Scissors • Plastic nipper • Deburring tools <ul style="list-style-type: none"> ▪ Jig cutter ▪ Gas burner <p>iii. Production workplace / line setup checking procedure</p> <p>iv. Production workplace / line setup evaluation check sheet</p> <p>v. Machine pre-heated parameter :</p> <ul style="list-style-type: none"> • Temperature setting • Time 					<p>workplace / line setup checked based on job order / instructions.</p> <p>iii. Materials (sheet), packaging items, obtained according to job process, production planning and quantity requirements.</p> <p>iv. Trimming tools selected according to process / product requirements.</p>
		<p>i. Identify mould, machine and auxiliary equipment, materials and manpower readiness</p> <p>ii. Check production workplace / line setup</p> <p>iii. Obtain materials(sheet), packaging items,</p> <p>iv. Determine trimming tools</p>		24 hours	Demonstration and Observation	<p>v. Machine manual / setup assured according to product requirements and process.</p> <p>vi. Thermo product sample confirmed according to</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		v. Review machine manual / setup vi. Evaluate thermo product	<p><u>Attitude:</u></p> i. Well organized in coordinating thermoforming process			customer requirement / approved product.
			<p><u>Safety:</u></p> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) iii. Ensure workplace / machinery safe to be used			
3. Carry out thermoforming process	i. Thermo machine and auxiliary machine setup information sheet: <ul style="list-style-type: none"> • Type of material • Colour 			20 hours	Lecture and Discussion	i. Thermo machine and auxiliary machine setup information sheet compiled

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> • Sheet size • Production rate / cycle time • Mould type • Type of clamp frame assembly or chain rail spacing to use <p>ii. Process parameter setup:</p> <ul style="list-style-type: none"> • Oven temperature setting <ul style="list-style-type: none"> ▪ oven zones going over the set temperature ▪ low temperature on certain sections ▪ product finish • Vacuum <ul style="list-style-type: none"> ▪ Vacuum pump • Air pressure <ul style="list-style-type: none"> ▪ Ejection of the product ▪ Pre-blow ▪ Driving the pneumatics. • Raw material 					<p>according to process requirements.</p> <p>ii. Mould, machine, materials and manpower readiness confirmed according to job order / instructions.</p> <p>iii. Process parameter setup executed and procedures complied according to process requirements and product specifications.</p> <p>iv. Temperature controller and heater handled according to product specification and parameter setting.</p> <p>v. Trial shot / shot</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> supply <ul style="list-style-type: none"> ▪ Sheet identification ▪ Sheet condition ▪ Sheet gauge ▪ Sheet dimension • Mould temperature <ul style="list-style-type: none"> ▪ Leaking water ▪ Fluctuations between normal temperature ▪ Steady water flow and pressure • Cycle time. <ul style="list-style-type: none"> ▪ Time higher than on set up ▪ Time lower than set up. <p>iii. Trial shot and sample of parts</p> <p>iv. Machine setting procedure</p> <p>v. Standard Operating Procedure (SOP)</p>					<p>short and sample of parts produced according to job order / instructions and machine setting procedure.</p> <p>vi. Thermoforming process implementation recorded according to documentation procedure.</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<ul style="list-style-type: none"> i. Obtain thermo machine and auxiliary machine setup information sheet ii. Determine mould, machine, materials and manpower readiness iii. Determine process parameter setup iv. Adjust temperature controller and heater v. Execute production of trial shot and sample of parts vi. Follow machine setting procedure vii. Update line setup readiness check sheet <p>Comply to Standard Operating Procedure (SOP)</p>	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Patient in handling thermoforming process ii. Focus and 	30 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			<p>accurate in executing thermoforming</p> <p><u>Safety:</u></p> <ul style="list-style-type: none"> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) iii. Ensure workplace / machinery safe to be used 			
4. Conduct finished goods output verification	<ul style="list-style-type: none"> i. Finished goods output status ii. Finished goods appearance and condition iii. Method and technique of product finishing process iv. Product finishing process v. Product packaging 			12 hours	Lecture and Discussion	<ul style="list-style-type: none"> i. Finished goods output status complied and evaluated according to production requirements. ii. Finished goods appearance and condition examined

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	standard instructions vi. Production output specification: <ul style="list-style-type: none"> • Dimension • Weight • Appearance vii. Recording format					according to packaging standard instructions. iii. Finished goods quality verified according to quality requirements. iv. Apply method and technique of verification.
		i. Finished goods output status ii. Determine finished goods appearance and condition iii. Check finished goods quality iv. Apply method and technique of verification v. Determine product packaging standard instructions vi. Determine production output specification vii. Complete recording format	<u>Attitude:</u> i. Thorough and	18 hours	Demonstration and Observation	v. Determine product packaging specification. vi. Determine production output specification. vii. Verification record updated according to documentation procedure.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			<p>precise in verifying finished product</p> <p>ii. Knowledgeable regarding thermoforming processes</p> <p><u>Safety:</u></p> <p>i. Adhere to safety rules and regulation at all time</p> <p>ii. Wear Personal Protective Equipment (PPE)</p> <p>iii. Ensure workplace / machinery safe to be used</p>			

Employability Skills

CORE ABILITIES	SOCIAL SKILLS
<p>01.01 Identify and gather information.</p> <p>01.02 Document information procedures or processes.</p> <p>02.01 Interpret and follow manuals, instructions and SOP's.</p> <p>02.03 Communicate clearly.</p> <p>02.04 Prepare brief reports and checklist using standard forms.</p> <p>02.05 Read/Interpret flowcharts and pictorial information.</p> <p>03.01 Apply cultural requirement to the workplace.</p> <p>03.02 Demonstrate integrity and apply practical practices.</p> <p>03.03 Accept responsibility for own work and work area.</p> <p>03.04 Seek and act constructively upon feedback about work performance.</p> <p>03.05 Demonstrate safety skills.</p> <p>03.06 Respond appropriately to people and situations.</p> <p>06.01 Understand systems.</p> <p>06.02 Comply with and follow chain of command.</p> <p>06.03 Identify and highlight problems.</p> <p>06.04 Adapt competencies to new situations/systems.</p> <p>01.04 Analyse information.</p> <p>01.06 Utilize word processor to process information.</p> <p>02.07 Utilize Local Area Network (LAN)/Intranet to exchange information.</p> <p>02.08 Prepare pictorial and graphic information.</p> <p>03.08 Develop and maintain a cooperation within work group.</p> <p>04.01 Organize own work activities.</p> <p>04.02 Set and revise own objectives and goals.</p>	<ol style="list-style-type: none">1. Communication skills2. Conceptual skills3. Interpersonal skills4. Multitasking and prioritizing5. Leadership skills6. Self-discipline7. Teamwork8. Integrity

CORE ABILITIES	SOCIAL SKILLS
<p>04.03 Organize and maintain own workplace.</p> <p>04.05 Demonstrate initiative and flexibility.</p> <p>06.05 Analyse technical systems.</p> <p>06.06 Monitor and correct performance of systems.</p> <p>01.07 Utilize database applications to locate and process information.</p> <p>01.08 Utilizespreadsheets applications to locate and process information.</p> <p>01.09 Utilize business graphic application to processinformation.</p> <p>01.10 Apply a variety of mathematical techniques.</p> <p>01.11 Apply thinking skills and creativity.</p> <p>02.10 Prepare reports and instructions.</p> <p>03.09 Manage and improve performance of individuals.</p> <p>03.15 Liaise to achieve identified outcomes.</p> <p>03.16 Identify and assess client/customer needs.</p> <p>04.07 Negotiate acceptance and support for objectives and strategies.</p> <p>05.01 Implement project/work plans.</p> <p>05.02 Inspect and monitor work done and/or in progress.</p>	

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ITEMS	RATIO (TEM : Trainees)
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5. Standard Operating Procedure	1:25
6. Manual Operation	1:25
7. Organization Chart	1:25
8. Application of Information Technology (word processor, data sheet, database, etc.)	1:25
9. Thermoforming machine (Fundamental / straight vacuum forming or Plug assist forming or Reverse draw forming / billow forming or Drape forming or Snap-back forming or Pressure forming or Free forming / blowing or Matched die forming or Insert forming)	1:5
10. Thermoforming mould (Aluminium mould or hard word mould or Cast epoxy mould or Thermoset material mould).	1:5
11. Auxiliary equipment (Chillers, mould temperature controller, punches and dies, trimming and finishing equipment, take out devices, sheet feeding equipment and Robot)	1:5
12. Thermo grade thermoplastic material (ABS, PP, HDPE, PVC, Acrylic) – sheet form type	10 sheets:1
13. Mould Hand Tools (min size 2 mm ~ 14mm, bsf 1/8 “ ~ 2”), Common Spanner Set, Screw driver (flat min size = 6”),1 feet 1/2” steel pipe, Copper Rod (min= diameter 3 “ x 6”), mallet , plier, cutter, multi-grips, knife, high temperature and normal grease, thread tape, apron and tools box).	1:1
14. Measurement Equipment set (Ruler, calliper, dial indicator and measurement tape)	1:5
15. Trimming tools set (cutter, knives, scissors and jig cutter)	1:1

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2. Baird, Donald G., Collias, Dimitris I. (1988), Polymer Processing Principles and Design, Canada, John Wiley & Sons, Inc., ISBN: 0-471-25453-3
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CURRICULUM of COMPETENCY UNIT (CoCU)

Sub Sector	METAL MACHINING TECHNOLOGY						
Job Area	PLASTICS PRODUCTION OPERATION						
Competency Unit Title	PLASTICS PRODUCT SECONDARY PROCESS CUSTOMIZATION						
Learning Outcome	<p>The person who is competent in this competency unit shall be able to complete and customize all the process of work piece. Upon completion of this competency unit, trainees will be able to:-</p> <ul style="list-style-type: none"> • Identify secondary process customization requirements • Prepare tools, machines and materials to be used for colour application • Prepare tools, machines and materials to be used for assembly process • Carry out plastic production secondary process customization • Prepare plastic product secondary process customization reports 						
Competency Unit ID	E02	Level	3	Training Duration	170 Hours	Credit Hours	17.0
Work Activities	Related Knowledge	Related Skills		Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
1. Identify secondary process customization requirements	i. Fundamental of secondary process: <ul style="list-style-type: none"> • Silk screening/Pad/ Tempo printing • Spray painting • Offline accessory assembly • Stamping : <ul style="list-style-type: none"> ○ embossing ○ cutting • Plastic welding (Ultra Sonic / hot melting, Radio Frequency) • Die cutter • Riveting machine 				24 hours	Lecture and Discussion	i. Fundamental of secondary process defined according to process / product requirements. ii. Product specification determined according to customer requirement. iii. Process customization selected

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	ii. Product specification iii. Type of customization iv. Working Environment Controlled Area: <ul style="list-style-type: none"> • Clean room • Assembly area v. Statutory bodies requirement such as <ul style="list-style-type: none"> • Occupational Safety & Health Act (OSHA) • Department of Environment (DOE) vi. Work Place Organization Method (5S)					according to product specification. iv. Working environment controlled area procedures determined according to company nature, product specification and customer requirements.
		i. Interpret fundamental of secondary process ii. Determine product specification iii. Identify type of secondary process customization iv. Check working environment controlled area procedures requirements	<u>Attitude:</u> i. Thorough and	24 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			precise in interpreting fundamental of secondary process ii. Meticulous in identifying secondary process requirements <u>Safety:</u> i. Aware of 5S and safety requirement at all time			
2. Prepare tools, machines and materials to be used for colour application	i. Tools for colour application: <ul style="list-style-type: none"> • Spray gun, • Mixing tumbler • Stencil ii. Machines: <ul style="list-style-type: none"> • Tempo printing, • Weight machine, • Silk screen printer, • Spray booth • Oven iii. Jigs and fixtures			12 hours	Lecture and Discussion	i. Tools for colour application arranged according to process / product and customer requirements. ii. Machines condition and functionality for colour application used confirmed

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> iv. Colour mixing for spray processing v. Ink mixing for tempo printing and silk screen 					<ul style="list-style-type: none"> according to process requirements. iii. Oven temperature required for drying assured according to process requirements, parameter and colour material supplier guidelines.
		<ul style="list-style-type: none"> i. Obtain tools for colour application ii. Setup machines for colour application iii. Heat oven for drying iv. Select Jigs and fixtures v. Determine colour mixing for spray processing vi. Determine ink mixing for tempo printing and silk screen 	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Adhere to procedures and method in preparing tools and machine for colour application <p><u>Safety:</u></p> <ul style="list-style-type: none"> i. Adhere to safety rules and 	12 hours	Demonstration and Observation	<ul style="list-style-type: none"> iv. Jigs and fixtures functionality tested according to product specifications. v. Colour mixing for spray processing selected according to the approved colour slide and viscosity test. vi. Ink mixing for tempo printing and silk screen selected

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			<ul style="list-style-type: none"> regulation at all time ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace / machinery safe to be used 			according to the approved colour slide and viscosity test.
3. Prepare tools, machines and materials to be used for assembly process	<ul style="list-style-type: none"> i. Tools for assembly process: <ul style="list-style-type: none"> • Cutter, • Scissor • Knives • Screwdriver • Allen key ii. Machines: <ul style="list-style-type: none"> • Ultra-sonic welding • Conveyor • Motor screw driver • Torque • Die cutter • Riveting machine iii. Jigs, fixtures and child parts / offline accessories iv. Layout of assembly 			12 hours	Lecture and Discussion	<ul style="list-style-type: none"> i. Tools for assembly process arranged according to process requirements. ii. Machines condition and functionality for assembly process confirmed according to process requirements. iii. Jigs, fixtures tested and child parts / offline

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	v. Type of assembly process: <ul style="list-style-type: none"> • Screwing • Snatching / locking • drilling • Ultra sonic welding • Sticking label • Punching • Leak test • Mistake proof (poka-yoke) vi. Working Environment Controlled Area requirements: <ul style="list-style-type: none"> • Clean room criteria • Assembly area 					accessory examined according to product specifications or / and assembly process layout. iv. Layout of assembly set up according to product specification, process requirements and company area availability. v. Working environment controlled area requirements and criteria reviewed assured based on type of product and customer requirements.
		i. Obtain tools to be used for assembly process ii. Setup machines for assemble process iii. Arrange jigs, fixtures, child parts and offline accessory iv. Check layout of assembly v. Determine assembly process		24 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		vi. Review Working Environment Controlled Area requirements	<p><u>Attitude:</u></p> <p>i. Adhere to procedures and method in preparing tools and machine for assembly process</p> <p><u>Safety:</u></p> <p>i. Adhere to safety rules and regulation at all time</p> <p>ii. Wear Personal Protective Equipment (PPE)</p> <p>ii. Ensure workplace / machinery safe to be used</p>			
4. Carry out plastic production secondary	<p>i. Plastic production secondary process:</p> <ul style="list-style-type: none"> • Silk screening / pad / 			20 hours	Lecture and Discussion	i. Plastic production secondary

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
process customization	tempo printing <ul style="list-style-type: none"> • Spray painting • Offline accessory assembly • Plastic welding (ultra sonic / hot melting, radio frequency) ii. Production secondary process customization procedure iii. Production secondary process customization method iv. Production secondary process customization technique v. Working environment procedure vi. Finished product quality vii. Final product packaging					process confirmed according to drawing, product specification and customer approval sample. ii. Secondary process executed according to Standard Operating Procedure and product requirement. iii. Clean room procedure followed based on product requirements, company work instructions or Standard Operating Procedure (SOP).
		i. Determine plastic production secondary process ii. Implement secondary process iii. Follow production secondary process customization		24 hours	Demonstration and Observation	iv. Finished product quality verified according to approved sample

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		procedure iv. Apply production secondary process customization method v. Apply production secondary process customization technique vi. Follow working environment controlled area procedure if applicable vii. Evaluate finished product quality iii. Conduct customised product packaging	<u>Attitude:</u> i. Focus and observant in executing production secondary process customization ii. Handle tools and machine with care			and customer requirements. v. Product packaging customised according to customer requirements.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			<u>Safety:</u> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) ii. Ensure workplace / machinery safe to be used			
5. Prepare plastic product secondary process customization reports	i. Plastics product secondary process customization status ii. Plastics product secondary process customization process output iii. Secondary process customization reporting format: <ul style="list-style-type: none"> • Inspection checklist • Logbook • Check sheet • Database iv. Standard Operating			6 hours	Lecture and Discussion	i. Plastics product secondary process customization status confirmed. ii. Product secondary process customization output compiled according to customer requirements. iii. Reporting format completed and

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	Procedure (SOP)	<ul style="list-style-type: none"> i. Determine plastics product secondary process customization status ii. Compile Plastics product secondary process customization data iii. Update reporting format 	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Thorough and precise in verifying completed products ii. Knowledgeable regarding secondary process 	12 hours	Demonstration and Observation	submitted to superior according to Standard Operating Procedure (SOP).

Employability Skills

CORE ABILITIES	SOCIAL SKILLS
<p>01.01 Identify and gather information.</p> <p>01.02 Document information procedures or processes.</p> <p>02.01 Interpret and follow manuals, instructions and SOP's.</p> <p>02.03 Communicate clearly.</p> <p>02.04 Prepare brief reports and checklist using standard forms.</p> <p>02.05 Read/Interpret flowcharts and pictorial information.</p> <p>03.01 Apply cultural requirement to the workplace.</p> <p>03.02 Demonstrate integrity and apply practical practices.</p> <p>03.03 Accept responsibility for own work and work area.</p> <p>03.04 Seek and act constructively upon feedback about work performance.</p> <p>03.05 Demonstrate safety skills.</p> <p>03.06 Respond appropriately to people and situations.</p> <p>06.01 Understand systems.</p> <p>06.02 Comply with and follow chain of command.</p> <p>06.03 Identify and highlight problems.</p> <p>06.04 Adapt competencies to new situations/systems.</p> <p>01.04 Analyse information.</p> <p>01.06 Utilize word processor to process information.</p> <p>02.07 Utilize Local Area Network (LAN)/Intranet to exchange information.</p> <p>02.08 Prepare pictorial and graphic information.</p> <p>03.08 Develop and maintain a cooperation within work group.</p> <p>04.01 Organize own work activities.</p> <p>04.02 Set and revise own objectives and goals.</p>	<ol style="list-style-type: none">1. Communication skills2. Conceptual skills3. Interpersonal skills4. Multitasking and prioritizing5. Leadership skills6. Self-discipline7. Teamwork8. Integrity

CORE ABILITIES	SOCIAL SKILLS
<p>04.03 Organize and maintain own workplace.</p> <p>04.05 Demonstrate initiative and flexibility.</p> <p>06.05 Analyse technical systems.</p> <p>06.06 Monitor and correct performance of systems.</p> <p>01.07 Utilize database applications to locate and process information.</p> <p>01.08 Utilizespreadsheets applications to locate and process information.</p> <p>01.09 Utilize business graphic application to processinformation.</p> <p>01.10 Apply a variety of mathematical techniques.</p> <p>01.11 Apply thinking skills and creativity.</p> <p>02.10 Prepare reports and instructions.</p> <p>03.09 Manage and improve performance of individuals.</p> <p>03.15 Liaise to achieve identified outcomes.</p> <p>03.16 Identify and assess client/customer needs.</p> <p>04.07 Negotiate acceptance and support for objectives and strategies.</p> <p>05.01 Implement project/work plans.</p> <p>05.02 Inspect and monitor work done and/or in progress.</p>	

Tools, Equipments and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1. Computer	1:5
2. Plant Layout / Workplace / Shop Floor	1:25
3. Safety Handbook	1:1
4. Equipment Safety Manual, Emergency and Hazardous Signage	1:25
5. Standard Operating Procedure	1:25
6. Manual Operation	1:25
7. Organization Chart	1:25
8. Application of Information Technology (word processor, data sheet, database, etc.)	1:25
9. Secondary Machines (Plastic welding , tempo printing or Silk screen printer or Spray painting booth, torque, motor screwdriver) and oven	1:10
10. Tools (spray gun or mixing tumbler or stencil or Squeegee- depend on equipment) , cutter, scissor, knives, screw driver and Allen key	1:3
11. Jigs, fixtures and child parts/ offline	1:5
12. Assembly table / line	1:3

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2. Baird, Donald G., Collias, Dimitris I. (1988), Polymer Processing Principles and Design, Canada, John Wiley & Sons, Inc., ISBN: 0-471-25453-3
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CURRICULUM of COMPETENCY UNIT (CoCU)

Sub Sector		METAL MACHINING TECHNOLOGY						
Job Area		PLASTICS PRODUCTION OPERATION						
Competency Unit Title		CHILD PARTS ASSEMBLY						
Learning Outcome		<p>The person who is competent in this competency unit shall be able to assemble manufactured parts or work in progress (WIP) parts to make a complete product/finished parts. Upon completion of this competency unit, trainees will be able to:-</p> <ul style="list-style-type: none"> • Assess <i>child parts</i> assembly process requirements • Coordinate parts assembly process activities • Carry out <i>child parts</i> assembly process • Verify assembled parts 						
Competency Unit ID		E03	Level	3	Training Duration	140 Hours	Credit Hours	14.0
Work Activities	Related Knowledge	Related Skills			Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
1. Assess <i>child parts</i> assembly process requirements	i. Fundamental in <i>child parts</i> (manufactured parts / work in progress) assembly process: <ul style="list-style-type: none"> • Before process • After process ii. Job order, assembly drawing and specification iii. Assembly process requirements iv. Type of working environment: <ul style="list-style-type: none"> • Clean room • Assembly area 					24 hours	Lecture and Discussion	i. Fundamental in <i>child parts</i> assembly process stated and defined according to production requirements or part drawing listed. ii. Assembly drawing and specification requirements determined and

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	v. Type of assembly process such as: <ul style="list-style-type: none"> • Parts insertion • Bottle cap screwing • Part pressing (hand / jig) vi. Type of assembly tools, machines, jigs, fixture and hand tools and standard parts vii. Statutory bodies requirement such as <ul style="list-style-type: none"> • Occupational Safety & Health Act (OSHA) • Department of Environment (DOE) viii. Work Place Organization Method (5S)					parts to be assembled listed according to customer requirements. iii. Assembly process requirements interpreted according to work order. iv. Type of assembly process specified according to product specification and customer requirement.
		i. Interpret fundamental in <i>child parts</i> assembly process ii. Determine job order, assembly drawing and specification requirements and parts to be assembled		24 hours	Demonstration and Observation	v. Type of assembly tools, machines, jigs, fixture and hand tools and standard parts to be used listed according to process requirements

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<ul style="list-style-type: none"> iii. Determine type of assembly process requirements and working environment v. Determine type of assembly tools, machines, jigs, fixture and hand tools and standard parts to be used 	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Knowledgeable in interpreting fundamental in <i>child parts</i> assembly process ii. Clearly/ precise in reviewing job order, assembly drawing and specification requirements <p><u>Safety:</u></p> <ul style="list-style-type: none"> i. Aware of 5S and safety requirement at all time 			and product specification with customer approval.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
2. Coordinate parts assembly process activities	i. Production schedule: <ul style="list-style-type: none"> • Production date • Manpower availability • Machine and auxiliary equipment • Manufactured parts • Work in Progress ii. Assembly tools: <ul style="list-style-type: none"> • cutter • knives • scissors • plastic nipper • Special tools <ul style="list-style-type: none"> ▪ Hot cutter ▪ Blower ▪ Ultrasonic cutter ▪ Deburring tools ▪ Jig cutter ▪ Gas burner ▪ Allen Key ▪ Screw Driver iii. Production workplace / line setup procedure iv. Assembly process stages v. Production workplace/			18 hours	Lecture and Discussion	i. Parts assembly checklist reviewed according to production requirements and schedule. ii. Assembly process stages arranged based on work order and production setup procedure. iii. Assembly tools, machines, jigs, fixture and hand tools and standard parts selected according to process requirements. iv. Assembly method and technique to be applied selected according to process

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	line setup evaluation check sheet vi. Assembly method and technique					requirements. v. Production workplace / line setup evaluation check sheet updated according to Standard Operating Procedure (SOP).
		i. Review production schedule ii. Check parts assembly checklist iii. Arrange assembly tools, machines, jigs, fixture and hand tools and standard iv. Arrange assembly process stages v. Follow production workplace/ line setup procedure vi. Determine assembly method and technique	<u>Attitude:</u> i. Well organized in coordinating parts assembly process ii. Handle tools, machines, jigs and fixture with care	20 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			<u>Safety:</u> i. Adhere to safety rules and regulation at all time ii. Wear Personal Protective Equipment (PPE) iii. Ensure workplace / machinery safe to be used			
3. Carry out <i>child parts</i> assembly process	i. <i>Child parts</i> assembly process: <ul style="list-style-type: none"> • Parts insertion • Bottle cap screwing • Part pressing (hand / jig / automation) ii. <i>Child parts</i> assembly procedure, method and technique iii. Working environment Procedure iv. Finished product quality v. Final product packaging			12 hours	Lecture and Discussion	i. <i>Child parts</i> assembly process selected according to production requirements. ii. Working environment procedure complied according to customer. iii. <i>Child parts</i> assembled

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<ul style="list-style-type: none"> i. Determine <i>child parts</i> assembly process ii. Utilise assembly tools, machines, jigs, fixtures, hand tools and standard parts iii. Follow <i>child parts</i> assembly procedure iv. Follow working environment procedure if applicable v. Execute <i>child parts</i> assembly activities vi. Review finished product quality vii. Determine final product packaging 	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> i. Focus and accurate in executing assembly activities <p><u>Safety:</u></p> <ul style="list-style-type: none"> i. Adhere to safety rules and regulation at all time 	24 hours	Demonstration and Observation	<ul style="list-style-type: none"> according to assembly drawing and specifications requirements. iv. Finished quality products evaluated according to product specification. v. Final product packaging selected and executed according to customer requirements.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			ii. Wear Personal Protective Equipment_(PPE) iii. Ensure workplace / machinery safe to be used			
4. Verify assembled parts	i. Assembled parts quality and quantity status ii. Assembled parts checking procedure iii. Recording format: <ul style="list-style-type: none"> • Checklist, • Check sheet, • Database iv. Standard Operating Procedure (SOP)			6 hours	Lecture and Discussion	i. Assembled parts quality and quantity status examined according to product specifications. ii. Quality and quantity of assembled parts evaluated according to checking procedures.
		i. Check assembled parts quality and quantity status ii. Follow checking procedure iii. Complete recording format iv. Comply to SOP	<u>Attitude:</u> i. Thorough and	12 hours	Demonstration and Observation	iii. Recording format updated according to documentation procedure.

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			<p>precise in examining assembled parts</p> <p>ii. Knowledgeable regarding assembly processes</p> <p><u>Safety:</u></p> <p>i. Adhere to safety rules and regulation at all time</p> <p>ii. Wear Personal Protective Equipment (PPE)</p> <p>iii. Ensure workplace / machinery safe to be used</p>			

Employability Skills

CORE ABILITIES	SOCIAL SKILLS
<p>01.01 Identify and gather information.</p> <p>01.02 Document information procedures or processes.</p> <p>02.01 Interpret and follow manuals, instructions and SOP's.</p> <p>02.03 Communicate clearly.</p> <p>02.04 Prepare brief reports and checklist using standard forms.</p> <p>02.05 Read/Interpret flowcharts and pictorial information.</p> <p>03.01 Apply cultural requirement to the workplace.</p> <p>03.02 Demonstrate integrity and apply practical practices.</p> <p>03.03 Accept responsibility for own work and work area.</p> <p>03.04 Seek and act constructively upon feedback about work performance.</p> <p>03.05 Demonstrate safety skills.</p> <p>03.06 Respond appropriately to people and situations.</p> <p>06.01 Understand systems.</p> <p>06.02 Comply with and follow chain of command.</p> <p>06.03 Identify and highlight problems.</p> <p>06.04 Adapt competencies to new situations/systems.</p> <p>01.04 Analyse information.</p> <p>01.06 Utilize word processor to process information.</p> <p>02.07 Utilize Local Area Network (LAN)/Intranet to exchange information.</p> <p>02.08 Prepare pictorial and graphic information.</p> <p>03.08 Develop and maintain a cooperation within work group.</p> <p>04.01 Organize own work activities.</p> <p>04.02 Set and revise own objectives and goals.</p>	<ol style="list-style-type: none">1. Communication skills2. Conceptual skills3. Interpersonal skills4. Multitasking and prioritizing5. Leadership skills6. Self-discipline7. Teamwork8. Integrity

CORE ABILITIES	SOCIAL SKILLS
<p>04.03 Organize and maintain own workplace.</p> <p>04.05 Demonstrate initiative and flexibility.</p> <p>06.05 Analyse technical systems.</p> <p>06.06 Monitor and correct performance of systems.</p> <p>01.07 Utilize database applications to locate and process information.</p> <p>01.08 Utilizespreadsheets applications to locate and process information.</p> <p>01.09 Utilize business graphic application to processinformation.</p> <p>01.10 Apply a variety of mathematical techniques.</p> <p>01.11 Apply thinking skills and creativity.</p> <p>02.10 Prepare reports and instructions.</p> <p>03.09 Manage and improve performance of individuals.</p> <p>03.15 Liaise to achieve identified outcomes.</p> <p>03.16 Identify and assess client/customer needs.</p> <p>04.07 Negotiate acceptance and support for objectives and strategies.</p> <p>05.01 Implement project/work plans.</p> <p>05.02 Inspect and monitor work done and/or in progress.</p>	

Tools, Equipments and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1. Computer	1:5
2. Plant Layout / Workplace / Shop Floor	1:25
3. Safety Handbook	1:1
4. Equipment Safety Manual, Emergency and Hazardous Signage	1:25
5. Standard Operating Procedure	1:25
6. Manual Operation	1:25
7. Organization Chart	1:25
8. Application of Information Technology (word processor, data sheet, database, etc.)	1:25
9. Job order, assembly drawing and specification sheet.	1:1
10. Working table.	1:1
11. Assembly tools set (cutter, knives, scissors, plastic nipper).	1:1
12. Special tools (Hot cutter, Blower, Ultrasonic cutter, Deburring tools. Jig cutter, Gas burner, Allen Key ,Screw Driver) and screw driver motor)	1:10

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TRAINING HOUR SUMMARY

SUMMARY OF TRAINING DURATION FOR PLASTICS PRODUCTION OPERATION (MC-100-3:2012)

CU CODE	COMPETENCY UNIT TITLE	WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	HOURS	TOTAL (HOURS)
			(A)	(B)	(A)+(B)	Σ (C)
MC-100-3:2012 – C01	PLASTICS INJECTION MOULDING PRODUCTION	1. Identify Plastics Injection Moulding Production requirements	60	90	150	450
		2. Coordinate Plastics Injection Moulding Production activities	30	30	60	
		3. Carry out Plastics Injection Moulding Production mould setup	18	30	48	
		4. Carry out Plastics Injection Moulding Production machine setting	18	30	48	
		5. Carry out pre-production process	12	12	24	
		6. Carry out Plastics Injection Moulding Production process	30	30	60	
		7. Carry out product finishing process	24	24	48	
		8. Report Plastics Injection Moulding Production activities	6	6	12	
MC-100-3:2012 – C02	PLASTICS EXTRUSION PRODUCTION	1. Identify Plastics Extrusion Production requirements	60	60	120	540
		2. Coordinate Plastics Extrusion Production activities	30	42	72	
		3. Carry out Plastics Extrusion Production die setup	30	60	90	
		4. Carry out Plastics Extrusion Production machine setting	30	30	60	
		5. Carry out pre-production process	18	24	42	
		6. Carry out Plastics Extrusion Production process	36	60	96	
		7. Carry out product finishing process	18	18	36	
		8. Report Plastics Extrusion Production activities	12	12	24	
MC-100-3:2012 – C03	PLASTICS BLOW MOULDING PRODUCTION	1. Identify Plastics Blow Moulding Production requirements	30	30	60	340
		2. Coordinate Plastics Blow Moulding Production activities	24	30	54	
		3. Carry out Plastics Blow Moulding Production mould/die setup	22	24	46	
		4. Carry out Plastics Blow Moulding Production machine setting	16	24	40	
		5. Carry out pre-production process	16	24	40	
		6. Carry out Plastics Blow Moulding Production process	16	42	58	
		7. Carry out product finishing process	6	18	24	
		8. Report Plastics Blow Moulding Production activities	6	12	18	
MC-100-3:2012 – C04	PLASTICS COMPRESSION MOULDING PRODUCTION	1. Identify Plastics Compression Moulding Production requirements	24	24	48	280
		2. Coordinate Plastics Compression Moulding Production activities	24	24	48	
		3. Carry out Plastics Compression Moulding Production mould setup	24	24	48	
		4. Carry out Plastics Compression Moulding Production machine setting	12	16	28	
		5. Carry out pre-production process	6	18	24	
		6. Carry out Plastics Compression Moulding Production process	18	30	48	
		7. Carry out product finishing process	6	12	18	
		8. Report Plastics Compression Moulding Production activities	6	12	18	
MC-100-3:2012 – C05	PLASTICS ROTATIONAL MOULDING PRODUCTION	1. Identify Plastics Rotational Moulding Production requirements	24	24	48	270
		2. Coordinate Plastics Rotational Moulding Production activities	12	18	30	
		3. Carry out Plastics Rotational Moulding Production mould setup	18	24	42	
		4. Carry out Plastics Rotational Moulding Production machine setting	12	18	30	
		5. Carry out pre-production process	12	18	30	
		6. Carry out Plastics Rotational Moulding Production process	24	30	54	
		7. Carry out product finishing process	6	12	18	
		8. Report Plastics Rotational Moulding Production activities	6	12	18	
MC-100-3:2012 – C06	PLASTICS PRODUCTION QUALITY CONTROL	1. Assess plastics production quality control requirements	18	18	36	170
		2. Coordinate plastics production quality control activities	18	30	48	
		3. Carry out plastics production quality control activities	18	24	42	
		4. Carry out quality control activities assessment	6	20	26	
		5. Report quality control activities	6	12	18	
MC-100-3:2012 – C07	PLASTICS PRODUCTION MACHINERY AND MOULD / DIE PREVENTIVE MAINTENANCE	1. Identify plastics production preventive maintenance requirements	18	24	42	260
		2. Coordinate plastics production machinery and mould / die preventive maintenance activities	18	24	42	
		3. Carry out plastics production machinery preventive maintenance	30	32	62	
		4. Carry out plastics production mould / die maintenance	30	48	78	
		5. Verify plastics production machine and mould / die condition and function status	12	24	36	

MC-100-3:2012 – C08	PLASTICS PRODUCTION SUPERVISION	1. Assess production supervision requirements	12	18	30	150
		2. Monitor plastics production Safety, Health and Environmental (SHE) compliance	12	12	24	
		3. Supervise plastics production operation	12	12	24	
		4. Carry out production materials handling activities	6	18	24	
		5. Coordinate new or existing employees training	12	18	30	
		6. Prepare report of production supervision activities	6	12	18	
TOTAL HOURS (CORE COMPETENCY)			1036	1424	2460	2460
MC-100-3:2012-E01	PLASTICS THERMOFORMING OPERATION	1. Assess the product requirements	24	24	48	170
		2. Coordinate thermoforming process	18	24	42	
		3. Carry out thermoforming process	20	30	50	
		4. Conduct finished good output verification	12	18	30	
MC-100-3:2012-E02	PLASTICS PRODUCT SECONDARY PROCESS CUSTOMIZATION	1. Identify secondary process customization requirements	24	24	48	170
		2. Prepare tools, machines and materials to be used for colour application	12	12	24	
		3. Prepare tools, machines and materials to be used for assembly process	12	24	36	
		4. Carry out plastic production secondary process customization	20	24	44	
		5. Prepare plastic product secondary process customization reports	6	12	18	
MC-100-3:2012-E03	CHILD PARTS ASSEMBLY	1. Assess child parts assembly process requirements	24	24	48	140
		2. Coordinate parts assembly process activities	18	20	38	
		3. Carry out child parts assembly process	12	24	36	
		4. Verify assembled parts	6	12	18	
TOTAL HOURS (ELECTIVE COMPETENCY)			208	272	480	960