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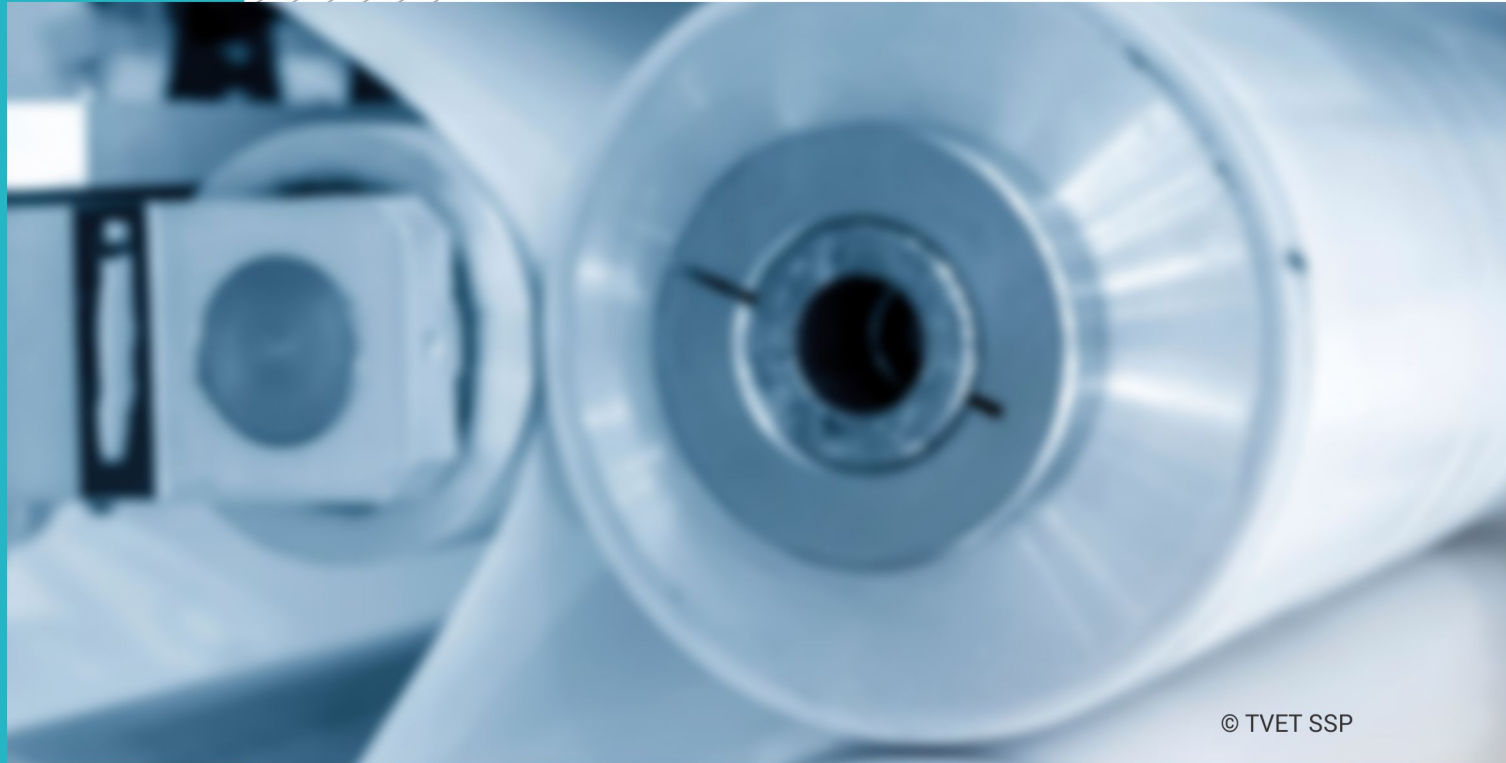
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PLASTIC PROCESSOR



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CBT CURRICULUM

National Vocational Certificate Level 2

Version 1 - September, 2018



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Introduction

Plastics processing machine operators set up and operate plastic mixing, calendaring, extruding and moulding processing machines used in the manufacture of plastic parts and plastic products. They are employed by plastic products manufacturing companies to monitor machines used to manufacture plastic products. Operators check the computer-controlled machines run efficiently. The work also involves making quality checks.

Typical plastic products include:

- Parts of Electronic products
- Automotive parts
- Bottles
- Packaging films
- Pipes
- Tupperware, etc.

To become a Plastic Processor, a candidate will need to:

- Be willing to do repetitive work
- Enjoy practical work with machinery
- Pay strict attention to health and safety regulations, and carry out necessary safety checks carefully
- Be reasonably fit, as you could spend most of each day on your feet

Safety is important at all times. There are risks of injury working with moving machine parts, flying chips, sharp edges and extreme heat from heated materials. Plastic Processors may also be lifting and moving heavy components. Precautions are required while working with manufacturing chemicals, airborne irritants, toxic lubricants and cleaners.

This level (2) of training is aimed at individuals having no knowledge or experience of the Plastic Processing machines but are willing get into this trade. Hence, it is designed to introduce and provide basic training to candidates.

Description of the training program for Plastic Processor:

Plastic Processor curriculum will prepare students to efficiently operate plastic processing machines such as injection moulding, compression, and extrusion, and to perform basic preventive maintenance on most types of plastic processing machines and equipment. Coursework

includes Safety, Plastic moulding Machines operations, grades, Legal & environmental concerns & equipment maintenance. Graduates of this program may find employment with state and local government agencies and private contractors engaged in manufacturing or other plastic processing activities.

Purpose of the training program:

The purpose of the training is to provide skilled manpower to improve the existing capacity of manufacturing sector. This training will provide the requisite skills to the trainees to operate plastic processing Machines. It will enable the participants to meet challenges in the field of plastic manufacturing industry. Further, to improve skill level of machine operators and prepare them for plastic manufacturing industry by meeting the market competition nationally and internationally.

The core purpose of this qualification is to produce employable Plastic Processors/Machine Operators who could operate plastic processing machines according to national and international standards. In addition, this qualification will prepare untrained youth for employment in plastic processing sector.

Overall objectives of training program:

The overall objectives of the Plastic Processor program are:

- Working safely and professionally
- Read & interpret technical parameters/documentation, plan and organize work processes, identify necessary materials and tools;
- Perform tasks with due consideration to safety rules, accident prevention regulations and environmental protection stipulations;
- Apply professional knowledge, core skills & employability skills while performing the job, and repair & maintenance work.
- Check the job with circuit diagrams/components as per drawing for functioning, diagnose and rectify faults in the components/module.
- Document the technical parameters in tabulation sheet related to the task undertaken.

Competencies to be gained after completion of course:

At the end of the course, the trainee must have attained the following competencies:

- Maintain Personal Health, Hygiene and Safety
- Arrange Raw Material for Processing
- Develop Basic Literacy & Numeracy Skill
- Perform Off Tool Sampling (OTS)
- Operate Injection Moulding Machine

- Operate Pipe Extrusion Machine
- Operate Compression Moulding Machine
- Operate Blow Moulding Machine

Possible job opportunities available immediately and later in the future

The positive impact of Plastic on our everyday lives is quite unlike any other material. From medical, automotive and aerospace applications, right through to packaging, construction and agriculture, plastics have enabled progression and change in a variety of industries. It can often be seen (or rather 'hidden') as an industry behind industries, providing technological advances that benefit many fields and promote innovation.

Upon Completion of the course, depending on achieved level, successful candidates can opt for the following roles:

1. Process Operator
2. Process Technician
3. Process/Machine Tool Setter/Fitter

There are several sub-sectors in the plastic industry in which a Plastic Processor can later get employed in:

- Raw Materials Sector:

A role in this 'upstream' area of the industry could range from exciting colour chemistry through to hands on manufacturing of raw material (polymers), helping to supply downstream users with the ingredients and tools to innovate for everyday life.

- Machinery Sector:

This sector provides the nuts and bolts for those looking to mould and shape raw materials into useful products. Furthermore, this sector also provides key equipment to the raw materials sector, as well as recycling, helping the industry full circle to further its sustainability credentials. A career in this sector could range from the manufacture of machinery (an exciting opportunity for budding engineers!) to the sale and supply of key ancillary equipment to aid moulding and testing of products. As we move to the future, 3D printing looks set to play an ever more prominent role in this sector too.

- Processing Sector:

This is the real 'meat and bones' of the Plastics Industry, where raw materials are converted into the finished product applications that we encounter today. Whether it's your computer screen housing, a steering wheel or specialist aerospace parts, a career in this sector can provide a tangible and visible effect on everyday life. Engineers, apprentices, graduates and need to look no further for a fulfilling career providing products that benefit and drive growth.

- Recycling Sector:

Arguably the 'youngest' sector of the industry, recycling has come a long way over the years in terms of detection, separation and increased volumes. Seeking to 'close the loop' and increase the sustainability (and self-sufficiency) of the Plastics Industry as a whole, this sector involves the collection, recycling and reuse of plastics which have reached their end of life. This could range from short life application plastics (i.e. food packaging or bottles) to longer life application plastics (i.e. window frames or cars). Through its inherent goal to increase sustainability, a career in the recycling industry could have a real positive impact on the world.

Trainee entry level

Title		Entry Requirements
National Certificate “Plastic (0722 PPP 019)	Vocational level 2, in Processor”	Entry for assessment for this qualification is open. However, entry into formal training institutes, based on this qualification may require skills and knowledge equivalent to middle

Minimum qualification of trainer

Should have **at least** NVQF level 3 and above or at least three years’ experience in the role of Plastic Processor in Plastic Processing. Or D.A.E / B-Tech and having 3 years academic experience & at least 3 years industrial experience

They should also hold or be working towards a formal teaching qualification.

Other formal qualifications in the plastic industry would be useful in addition to the above (Polymer Engineering, Advanced Materials Engineering, etc.).

Recommended trainer: trainee ratio

The recommended maximum trainer: trainee ratio for this programme is 1 trainer for 20 trainees.

Medium of instruction i.e. language of instruction

Instruction will be Urdu and English

Duration of the course (Total time, Theory & Practical time)

This curriculum comprises 9 modules divided comprises of generic and technical competencies. The recommended delivery time is 800 hours. Delivery of the course could therefore be full time, 5 days a week, for 6 months. Training providers are at liberty to develop other models of delivery, including part-time and evening delivery.

The full structure of the course is as follows:

Module	Theory hours	Workplace hours	Total hours
Module 1: Comply Personal Health and Safety Guidelines	6	24	30
Module 2: Communicate the Workplace Policy and Procedure	4	16	20
Module 3: Perform Basic Communication (Specific)	6	24	30
Module 4: Perform Basic Computer Application (Specific)	8	32	40
Module 5: Arrange Raw Material for Processing	16	64	80
Module 6: Produce Injection Moulded Plastic Parts	30	120	150
Module 7: Produce Pipe through Extrusion Moulding Machine	30	120	150
Module 8: Produce Blow Moulded Plastic Parts	30	120	150
Module 9: Produce Compression Moulded Plastic Parts	30	120	150

Sequence of the modules

This qualification is made up of 9 modules. Four modules relate to health and safety, basic literacy, basic communication skill, professionalism, for example Module 1: Comply Personal Health and Safety Guidelines; or Module 4: Perform Basic Computer Application (Specific). A suggested distribution of these modules is presented below. This is not prescriptive and training providers may modify this if they wish.

The rest of the modules are technical trainings in nature and should be taught as per designed program. Modules have been progressively positioned in the table below, e.g., Module 5: Arrange Raw Material for Processing is a pre-requisite for Module 6: Produce Injection Moulded Plastic Parts.

Each module covers a range of learning components. These are intended to provide detailed guidance to teachers (for example the Learning Elements component) and give them additional support for preparing their lessons (for example the Materials Required component). The detail provided by each module will contribute to a standardised approach to teaching, ensuring that training providers in different parts of the country have clear information on what should be taught.

Module 5: Arrange Raw Material for Processing (072200910)	Module 2: Communicate the Workplace Policy and Procedure	Module 1: Comply Personal Health and Safety Guidelines
Module 6: Produce Injection Moulded Plastic Parts (072200911)		
Module 7: Produce Pipe through Extrusion Moulding Machine (072200912)	Module 3: Perform Basic Communication (Specific)	Module 4: Perform Basic Computer Application (Specific)
Module 8: Produce Blow Moulded Plastic Parts (072200913)		
Module 9: Produce Compression Moulded Plastic Parts (072200914)		

Summary – overview of the curriculum

Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
<p>Module 1: Comply Personal Health and Safety Guidelines</p> <p>Aim: This Competency Standard identifies the competencies required to protect/apply occupational Safety, Health and Environment at workplace according to the industry's approved guidelines, procedures and interpret environmental rules/regulations. Trainee will be expected to identify and use Personal Protective Equipment (PPE) according to the work place requirements. The underpinning knowledge regarding Observe Occupational Safety and Health (OSH) will be sufficient to provide the basis for the job at workplace.</p>	<p>LU1: Identify Hazard at work place LU2: Apply personal protective and safety equipment (PPE). LU3: Observe occupational safety and health (OSH) LU4: Dispose of hazardous waste/materials</p>	6	24	30

Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
<p>Module 2: Communicate the Workplace Policy and Procedure</p> <p>Aim: This unit describes the performance outcomes, skills and knowledge required to develop communication skills in the workplace. It covers gathering, conveying and receiving information, along with completing assigned written information under direct supervision.</p>	<p>LU1. Identify workplace communication procedures</p> <p>LU2. Communicate at workplace</p> <p>LU3. Draft Written Information</p> <p>LU4. Review Documents</p>	5	15	20
<p>Module 3: Perform Basic Communication (Specific)</p> <p>Aim: This unit describes the skills and knowledge required to assist in the development of communication competence by providing information regarding different forms of communication and their appropriate use.</p>	<p>LU1. Communicate in a team to achieve intended outcomes</p> <p>LU2. Follow Supervisor's instructions as per organizational SOPs</p> <p>LU3. Develop Generic communication skills at workplace</p>	6	24	30

Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
<p>Module 4: Perform Basic Computer Application (Specific)</p> <p>Aim: This unit describes the skills and knowledge required to use spreadsheet to prepare a page of document, develops familiarity with Word, Excel, email, and computer graphics basics.</p>	<p>LU1. Create Word Documents</p> <p>LU2. Create Excel Documents</p> <p>LU3. Use internet for Browsing</p>	8	32	40
<p>Module 5: Arrange Raw Material for Processing</p> <p>Aim: This competency standard is designed to gain basic knowledge and skills required to arrangement of raw material for processing of manufacturing products and sample.</p>	<p>LU1: Obtain Work Order</p> <p>LU2: Identify Components & Attachments</p> <p>LU3: Apply pre-processing procedure</p>	16	64	80
<p>Module 6: Produce Injection Moulded Plastic Parts</p> <p>Aim: The aim of this module to provide skills and knowledge to operate injection moulding machine in accordance with the manufacturer's manual</p>	<p>LU1: Interpret Work Order</p> <p>LU2: Perform Production</p> <p>LU3: Perform follow up procedure for machine production</p> <p>LU4: Submit production report</p> <p>LU5: Transport finish product to Concerned department</p>	30	120	150

Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
<p>Module 7: Produce Pipe through extrusion moulding machine</p> <p>Aim: The aim of this module to provide skills and knowledge to operate pipe extrusion machine in accordance with the manufacturer's manual</p>	<p>LU1: Interpret Work Order</p> <p>LU2: Start Production as Per Requirement</p> <p>LU3: Perform Follow up Procedure</p> <p>LU4: Submit Production Report</p> <p>LU5: Transport Finished Product</p>	30	120	150
<p>Module 8: Produce Blow moulded plastic parts</p> <p>Aim: The aim of this module to provide skills and knowledge to operate compression moulding machine in accordance with the manufacturer's manual</p>	<p>LU1: Interpret Work Order</p> <p>LU2: Perform Production</p> <p>LU3: Perform Follow up Procedure for Machine Production</p> <p>LU4: Submit Production Report</p> <p>LU5: Transport Finish Product to Concerned Department</p>	30	120	150
<p>Module 9: Produce Compression moulded plastic parts</p> <p>Aim: The aim of this module to provide skills and knowledge to operate compression moulding machine in accordance with the manufacturer's manual</p>	<p>LU1: Interpret Work Order</p> <p>LU2: Perform Production</p> <p>LU3: Perform Follow up Procedure for Machine Production</p> <p>LU4: Submit Production Report</p> <p>LU5: Transport Finish Product to Concerned Department</p>	30	120	150

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Modules

Module 5: Arrange Raw Material for Processing

Objective of the module: This competency standard is designed to gain basic knowledge and skills required to arrangement of raw material for processing of manufacturing products and sample.

Duration: 80 hours **Theory:** 16 hours **Practical:** 64 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Obtain Work Order	The trainee will be able to: Interpret existing job order sheet/card. Communicate pre-completion of existing job order to relevant department.	i) Basic literacy skills <ul style="list-style-type: none"> • Be able to read instructions about product, quantity and raw material • Be able to identify rolling required to produce different components as per work order ii) Reporting procedure <ul style="list-style-type: none"> • Understanding the work order contents • Knowledge of units (Kg, inches, etc.) iii) Work order process <ul style="list-style-type: none"> • Understand the top-down stream of task assignment • Knowledge of what the work order represents • Who generates the work order? • Where can it be obtained from? iv) Material handling and storing procedure <ul style="list-style-type: none"> • Understanding where to obtain raw material for the required production quantity • How to handle raw material? 	Total 20 hours Theory: 4 hours Practical: 16 Hours	Service Manuals Operational Manuals Material data/facts Sheets	Classroom with multimedia aid and flip charts EITHER Visit to Plastic Processing Facilities OR Visit to a training institute with relevant facilities

		<ul style="list-style-type: none"> How to transport raw material to machine? 			
LU2: Identify components & attachments	The trainee will be able to: Enlist different components Enlist different attachments	i) Define Plastics/Polymers <ul style="list-style-type: none"> Understand basic differences between thermoplastics and thermosets Basic difference between Engineering plastics and Commodity plastics Processing parameters of commonly used plastics ii) Explain Drying procedures <ul style="list-style-type: none"> Be able to identify dryers, mixers and cutters iii) Explain Material mixing procedure <ul style="list-style-type: none"> Understanding difference between mixing additives and mixing recycled material iv) Explain different attachments <ul style="list-style-type: none"> Understand difference between pneumatic and hydraulic lines Understand relationship between filtration mesh and particle size 	Total 30 hours Theory: 06 hours Practical: 24 Hours	Basic Hand tools Measuring tools and instruments Service Manuals Operational Manuals Material data/facts Sheets	Classroom with multimedia aid and flip charts EITHER Visit to Plastic Processing Facilities OR Visit to a training institute with relevant facilities
LU3: Apply pre-processing procedure	The trainee will be able to: Adapt procedure for coloring as per job card /work order. Use additives as per requirement Load the material in machine hopper as per	i) Plastics/Polymers <ul style="list-style-type: none"> Understand and identify requirements for a plastic to be dried or pre-processed into processing compound ii) Additives of plastics <ul style="list-style-type: none"> Understand difference of pigments and masterbatches Be able to determine mixing ratios of pigments and masterbatches 	Total 30 hours Theory: 06 hours Practical: 24 Hours	Basic Hand tools Measuring tools and instruments Service Manuals Operational Manuals	Classroom with multimedia aid and flip charts EITHER Visit to Plastic Processing Facilities OR Visit to a training institute with relevant facilities

	<p>work order.</p> <p>Apply drying of the material as per requirement of job.</p>	<ul style="list-style-type: none"> • Be able to understand mixing of other additives <p>iii) Drying procedures</p> <ul style="list-style-type: none"> • Understand the concept of moisture absorption • Problems associated with moist raw material • Drying conditions and procedures <p>iv) Explain crushing tools & techniques</p> <ul style="list-style-type: none"> • Understanding tools required for crushing and re-granulating • Difference in usability of crushed and re-granulated material 		<p>Material data/facts Sheets</p>	
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Module 6: Produce Injection Moulded Plastic Parts

Objective of the module: The aim of this module to provide skills and knowledge to operate injection moulding machine in accordance with the manufacturer's manual

Duration: 150 hours **Theory:** 30 hours **Practical:** 120 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Interpret Work Order	The trainee will be able to: Obtain work order Verify production quantity available Ensure raw material available as per work order Ensure machine setting for production as per data sheet provided	i) Basic literacy skills <ul style="list-style-type: none"> Be able to read instructions about product, quantity and raw material Be able to identify rolling required to produce different components as per work order ii) Reporting procedure <ul style="list-style-type: none"> Understanding the work order contents Knowledge of units (Kg, inches, etc.) iii) Work order process <ul style="list-style-type: none"> Understand the top-down stream of task assignment Knowledge of what the work order represents Who generates the work order? Where can it be obtained from? iv) Material handling and storing procedure <ul style="list-style-type: none"> Understanding where to obtain raw material for the required production quantity How to handle raw material? 	Total 20 hours Theory: 4 hours Practical: 16 Hours	Injection Moulding Machine Mould Utility documentation. Service Manuals. Operational Manuals. Basic Hand tools Job card/PPS	Classroom with multimedia aid and flip charts EITHER Visit to Plastic Processing Facilities OR Visit to a training institute with relevant facilities

		v) Set machine parameters as per data sheet provided <ul style="list-style-type: none"> Be able to input machine parameters as mentioned in work order or datasheet 			
LU2: Perform Production	The trainee will be able to: Start machine on auto-cycle Perform periodic quality checks as per requirement	i) Machine operation in automatic mode <ul style="list-style-type: none"> Be able to perform dry-run Be able to perform semi-auto operation Up on successfully obtaining required product, switching the machine to auto mode ii) Maintaining product quality as per specifications <ul style="list-style-type: none"> Be able to measure components for identification of dimensional defects Usage of measurement tools is critical: Vernier caliper, micrometer gauge, scale, etc. iii) Recognize different defects and their causes <ul style="list-style-type: none"> Be able to visually identify commonly occurring defects, such as gating, flashing, orange-peel, etc. Gain knowledge of rectification of commonly occurring defects. 	Total 60 hours Theory: 12 hours Practical: 48 hours	Injection Moulding Machine Mould Utility documentation. Service Manuals. Operational Manuals. Basic Hand tools	Classroom with multimedia aid and flip charts EITHER Visit to Plastic Processing Facilities OR Visit to a training institute with relevant facilities
LU3: Perform follow-up procedure for machine	The trainee will be able to: Ensure product packed in assigned packaging	i) Knowledge of product packaging <ul style="list-style-type: none"> Understand different types of packaging, e.g.; flexible packaging, packing in cartons, etc. 	Total 10 hours Theory:	Injection Moulding Machine Machine Mould	Classroom with multimedia aid and flip charts EITHER

production	<p>Check feed level hopper/bin, etc.</p> <p>Ensure machine lubrication as per requirement</p>	<ul style="list-style-type: none"> • How to pack final product? <p>ii) Raw material input in moulding machine</p> <ul style="list-style-type: none"> • Ensure consistent raw material feed into hopper/feeder • Be able to use overhead crane or moveable lifts/ladders • Understand the importance of cutting tools in opening raw material bags. • Concept of 'clean slits' using sharp tools to ensure particles of bag don't get mixed in raw material <p>iii) Lubrication requirements and procedure of machine</p> <ul style="list-style-type: none"> • Understand the concept of lubricating moveable parts of machines • Carefully use mould lubricant sprays • Ensure spray cans are stored in a secure location after pre-shot application • Be able to identify different mould release agents as per raw material • Be able to provide first-hand feedback to maintenance department for periodic machine maintenance 	<p>02 hours</p> <p>Practical:</p> <p>08 hours</p>	<p>Utility documentation.</p> <p>Service Manuals.</p> <p>Operational Manuals.</p> <p>Basic Hand tools</p>	<p>Visit to Plastic Processing Facilities</p> <p>OR</p> <p>Visit to a training institute with relevant facilities</p>
<p>LU4:</p> <p>Submit</p>	<p>The trainee will be able to:</p>	<p>i) Production report writing</p> <ul style="list-style-type: none"> • Understand the importance of 	<p>Total</p>	<p>Injection Moulding Machine</p>	<p>Classroom with multimedia aid and flip</p>

Production report	Record production report as per given format (kg/nos, hours) Submit report to concerned department	<p>reporting accurate production quantity</p> <ul style="list-style-type: none"> • Be able to fill-in relevant production reports • Be able to identify waste generated along with identification of machine downtime with reasons <p>ii) Data sharing with relevant departments</p> <ul style="list-style-type: none"> • Understanding the concept of producing accurate data and benefits of the same on a larger scale • Submission of production reports to production planning department or the supervisor for timely actions. 	<p>40 hours</p> <p>Theory:</p> <p>08 hours</p> <p>Practical:</p> <p>32 hours</p>	<p>Mould</p> <p>Utility documentation.</p> <p>Service Manuals.</p> <p>Operational Manuals.</p> <p>Basic Hand tools</p>	<p>charts</p> <p>EITHER</p> <p>Visit to Plastic Processing Facilities</p> <p>OR</p> <p>Visit to a training institute with relevant facilities</p>
<p>LU5:</p> <p>Transport finished product to concerned department</p>	<p>The trainee will be able to:</p> <p>Place finished product in designated area</p> <p>Take approval of finished product from Quality Control</p> <p>Deliver relevant packaging documents to store personnel</p>	<p>i) Understand QC protocols</p> <ul style="list-style-type: none"> • Understand and appreciate the importance of producing products as per specification • Be able to implement the first quality control protocol on machine to ensure elimination of defective products at sight <p>ii) Inter-department co-ordination</p> <ul style="list-style-type: none"> • Be able to co-ordinate with QC department with produced batches for relevant approvals <p>iii) Be able to hand over final products to store</p> <p>Familiarize with handing over protocols and paperwork.</p>	<p>Total</p> <p>20 hours</p> <p>Theory:</p> <p>04 hours</p> <p>Practical:</p> <p>16 hours</p>	<p>Injection Moulding Machine</p> <p>Mould</p> <p>Utility documentation.</p> <p>Service Manuals.</p> <p>Operational Manuals.</p> <p>Basic Hand tools</p>	<p>Classroom with multimedia aid and flip charts</p> <p>EITHER</p> <p>Visit to Plastic Processing Facilities</p> <p>OR</p> <p>Visit to a training institute with relevant facilities</p>

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Module 7: Produce Pipe Through Extrusion Moulding Machine

Objective of the module: The aim of this module to provide skills and knowledge to operate pipe extrusion machine in accordance with the manufacturer's manual

Duration: 150 hours **Theory:** 30 hours **Practical:** 120 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Interpret Work Order	The trainee will be able to: Obtain Work order Verify production quantity available Ensure raw material as per work order Ensure machine setting as per production per data sheet provided	i) Basic literacy skills <ul style="list-style-type: none"> • Be able to read instructions about product, quantity and raw material • Be able to identify rolling required to produce different components as per work order ii) Reporting procedure <ul style="list-style-type: none"> • Understanding the work order contents • Knowledge of units (Kg, inches, etc.) iii) Work order process <ul style="list-style-type: none"> • Understand the top-down stream of task assignment • Knowledge of what the work order represents • Who generates the work order? • Where can it be obtained from? iv) Material handling and storing	Total 20 hours Theory: 4 hours Practical: 16 Hours	Extruder High speed mixer Pipe extrusion downstream line Extruded product samples Operation manual Basic Hand Tools	Classroom with multimedia aid and flip charts EITHER Visit to Plastic Processing Facilities OR Visit to a training institute with relevant facilities

		<p>procedure</p> <ul style="list-style-type: none"> Understanding where to obtain raw material for the required production quantity How to handle raw material? <p>v) Set machine parameters as per data sheet provided</p> <p>vi) Be able to input machine parameters as mentioned in work order or datasheet</p>			
<p>LU2:</p> <p>Start production as per requirement</p>	<p>The trainee will be able to:</p> <p>Adjust pipe sizing as per job card</p> <p>Fix printer as per job card</p> <p>Manage production rate as per machine capacity to achieve standard component</p>	<p>i) Machine controls</p> <ul style="list-style-type: none"> Learn to input processing parameters in the machine and peripheral components <p>ii) Machine operation in automatic mode</p> <ul style="list-style-type: none"> Be able to perform semi-auto operation Up on successfully obtaining required product specification, switching the machine to auto mode <p>iii) Peripheral equipments such as air compressors, chillers, vacuum pump, printer, dryer, etc.</p> <ul style="list-style-type: none"> Ensure working and operation of all affiliated equipment 	<p>Total</p> <p>60 hours</p> <p>Theory:</p> <p>12 hours</p> <p>Practical:</p> <p>48 hours</p>	<p>Extruder</p> <p>High speed mixer</p> <p>Pipe extrusion downstream line</p> <p>Extruded product samples</p> <p>Operation manual</p> <p>Basic Hand Tools</p>	<p>Classroom with multimedia aid and flip charts</p> <p>EITHER</p> <p>Visit to Plastic Processing Facilities</p> <p>OR</p> <p>Visit to a training institute with relevant facilities</p>

<p>LU3:</p> <p>Perform follow up procedure</p>	<p>The trainee will be able to:</p> <p>Verify pipe length as per order</p> <p>Verify pipe standard dimensions and visual inspection</p> <p>Generate parameters report according to set format</p>	<p>i) Knowledge of pipe standards (BS 3505, etc.)</p> <ul style="list-style-type: none"> • Understand the difference in producing pipes as per multiple standards • Memorize dimensions of pipes as per commonly used standards <p>ii) Maintaining product quality as per specifications</p> <ul style="list-style-type: none"> • Be able to measure components for identification of dimensional defects • Usage of measurement tools is critical: Vernier caliper, micrometer gauge, scale, etc. <p>iii) Raw material input in machine</p> <ul style="list-style-type: none"> • Ensure consistent raw material feed into hopper/feeder • Be able to use overhead crane or moveable lifts/ladders • Understand the importance of cutting tools in opening raw material bags. • Concept of 'clean slits' using sharp tools to ensure particles of bag don't get mixed in raw 	<p>Total</p> <p>10 hours</p> <p>Theory:</p> <p>02 hours</p> <p>Practical:</p> <p>08 hours</p>	<p>Extruder</p> <p>High speed mixer</p> <p>Pipe extrusion downstream line</p> <p>Extruded product samples</p> <p>Operation manual</p> <p>Basic Hand Tools</p>	<p>Classroom with multimedia aid and flip charts</p> <p>EITHER</p> <p>Visit to Plastic Processing Facilities</p> <p>OR</p> <p>Visit to a training institute with relevant facilities</p>
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		<p>material</p> <p>iv) Lubrication requirements and procedure of machine</p> <ul style="list-style-type: none"> • Understand the concept of lubricating moveable parts of machines • Be able to provide first-hand feedback to maintenance department for periodic machine maintenance <p>v) Recognize different defects and their causes</p> <ul style="list-style-type: none"> • Be able to visually identify commonly occurring defects, such as eccentricity, burn lines, blistering, etc. • Gain knowledge of rectification of commonly occurring defects. 			
<p>LU4:</p> <p>Submit production report</p>	<p>The trainee will be able to:</p> <p>Record machine hours as per format</p> <p>Record production (kg/hr) as per format</p> <p>Record rejection (kg/no) on set format</p> <p>Record machine downtime (hours or minutes)</p>	<p>i) Production report writing</p> <ul style="list-style-type: none"> • Understand the importance of reporting accurate production quantity • Be able to fill-in relevant production reports • Be able to identify waste generated along with identification of machine downtime with reasons <p>ii) Data sharing with relevant</p>	<p>Total</p> <p>40 hours</p> <p>Theory:</p> <p>08 hours</p> <p>Practical:</p> <p>32 hours</p>	<p>Reporting formats</p> <p>Job card</p> <p>Extruder</p> <p>High speed mixer</p> <p>Pipe extrusion downstream line</p> <p>Extruded product samples</p>	<p>Classroom with multimedia aid and flip charts</p> <p>EITHER</p> <p>Visit to Plastic Processing Facilities</p> <p>OR</p> <p>Visit to a training institute with relevant</p>

	Record machine output (productivity) on set format	departments <ul style="list-style-type: none"> Understanding the concept of producing accurate data and benefits of the same on a larger scale Submission of production reports to production planning department or the supervisor for timely actions. 		Operation manual Basic Hand Tools	facilities
LU5: Transport finished product	The trainee will be able to: Ensure finished goods are counted according to organization procedure Deliver relevant packaging documents to store personnel	i) Understand QC protocols <ul style="list-style-type: none"> Understand and appreciate the importance of producing products as per specification Be able to implement the first quality control protocol on machine to ensure elimination of defective products at sight ii) Inter-department co-ordination <ul style="list-style-type: none"> Be able to co-ordinate with QC department with produced batches for relevant approvals iii) Be able to hand over final products to store <ul style="list-style-type: none"> Familiarize with handing-over protocols and paperwork. 	Total 20 hours Theory: 04 hours Practical: 16 hours	Reporting formats Job card Basic Hand Tools Medium of material transport	Classroom with multimedia aid and flip charts EITHER Visit to Plastic Processing Facilities OR Visit to a training institute with relevant facilities

PLASTIC PROCESSOR



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Module-8
CBT CURRICULUM
National Vocational Certificate Level 2

Version 1 - September, 2018

Module 8: Produce Blow Moulded Plastic Parts

Objective of the module: The aim of this module to provide skills and knowledge to operate blow moulding machine in accordance with the manufacturer's manual

Duration: 150 hours **Theory:** 30 hours **Practical:** 120 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Interpret Work Order	The trainee will be able to: Obtain work order Verify production quantity available Ensure raw material available as per work order Ensure machine setting for production as per data sheet provided	i) Basic literacy skills <ul style="list-style-type: none"> Be able to read instructions about product, quantity and raw material Be able to identify rolling required to produce different components as per work order ii) Reporting procedure <ul style="list-style-type: none"> Understanding the work order contents Knowledge of units (Kg, inches, etc.) iii) Work order process <ul style="list-style-type: none"> Understand the top-down stream of task assignment Knowledge of what the work order represents Who generates the work order? Where can it be 	Total 20 hours Theory: 4 hours Practical: 16 Hours	Blow moulding machine Machine mould Air compressor Vacuum machine De-humidifier Chiller for cold water Utility documentation Service manual Operation manual Basic hand tools	Classroom with multimedia aid and flip charts EITHER Visit to Plastic Processing Facilities OR Visit to a training institute with relevant facilities

		<p>obtained from?</p> <p>iv) Material handling and storing procedure</p> <ul style="list-style-type: none"> • Understanding where to obtain raw material for the required production quantity • How to handle raw material? <p>v) Set machine parameters as per data sheet provided</p> <ul style="list-style-type: none"> • Be able to input machine parameters as mentioned in work order or datasheet 			
<p>LU2:</p> <p>Perform production</p>	<p>The trainee will be able to:</p> <p>Set machine on auto-cycle mode as per SOP</p> <p>Perform periodic quality checks as per requirement</p>	<p>i) Machine operation in automatic mode</p> <ul style="list-style-type: none"> • Be able to perform dry-run • Be able to perform semi-auto operation • Up on successfully obtaining required product, switching the machine to auto mode <p>ii) Maintaining product quality as per specifications</p> <ul style="list-style-type: none"> • Be able to measure components for identification of dimensional defects • Usage of measurement tools is critical: Vernier caliper, micrometer 	<p>Total</p> <p>60 hours</p> <p>Theory:</p> <p>12 hours</p> <p>Practical:</p> <p>48 hours</p>	<p>Blow moulding machine</p> <p>Machine mould</p> <p>Air compressor</p> <p>Vacuum machine</p> <p>De-humidifier</p> <p>Chiller for cold water</p> <p>Utility documentation</p> <p>Service manual</p> <p>Operation manual</p> <p>Basic hand tools</p>	<p>Classroom with multimedia aid and flip charts</p> <p>EITHER</p> <p>Visit to Plastic Processing Facilities</p> <p>OR</p> <p>Visit to a training institute with relevant facilities</p>

		<p>gauge, scale, etc.</p> <p>iii) Recognize different defects and their causes</p> <ul style="list-style-type: none"> • Be able to visually identify commonly occurring defects, such as flashing, orange-peel, drooling, etc. • Gain knowledge of rectification of commonly occurring defects. 			
<p>LU3:</p> <p>Perform follow up procedure for machine production</p>	<p>The trainee will be able to:</p> <p>Ensure product packed in assigned packaging</p> <p>Check feed level in hopper/bin, etc.</p> <p>Ensure machine lubrication as per requirement</p>	<p>i) Knowledge of product packaging</p> <ul style="list-style-type: none"> • Understand different types of packaging, e.g.; flexible packaging, packing in cartons, etc. • How to pack final product? <p>ii) Raw material input in moulding machine</p> <ul style="list-style-type: none"> • Ensure consistent raw material feed into hopper/feeder • Be able to use overhead crane or moveable lifts/ladders • Understand the importance of cutting tools in opening raw material bags. • Concept of 'clean slits' using sharp tools to 	<p>Total</p> <p>10 hours</p> <p>Theory:</p> <p>02 hours</p> <p>Practical:</p> <p>08 hours</p>	<p>Blow moulding machine</p> <p>Machine mould</p> <p>Air compressor</p> <p>Vacuum machine</p> <p>De-humidifier</p> <p>Chiller for cold water</p> <p>Utility documentation</p> <p>Service manual</p> <p>Operation manual</p> <p>Basic hand tools</p>	<p>Classroom with multimedia aid and flip charts</p> <p>EITHER</p> <p>Visit to Plastic Processing Facilities</p> <p>OR</p> <p>Visit to a training institute with relevant facilities</p>

		<p>ensure particles of bag don't get mixed in raw material</p> <p>iii) Lubrication requirements and procedure of machine</p> <ul style="list-style-type: none"> • Understand the concept of lubricating moveable parts of machines • Carefully use mould lubricant sprays • Ensure spray cans are stored in a secure location after pre-shot application • Be able to identify different mould release agents as per raw material • Be able to provide first-hand feedback to maintenance department for periodic machine maintenance 			
<p>LU4:</p> <p>Submit production report</p>	<p>The trainee will be able to:</p> <p>Record production report as per given format (kg/nos, hours)</p> <p>Submit report to concerned department</p>	<p>i) Production report writing</p> <ul style="list-style-type: none"> • Understand the importance of reporting accurate production quantity • Be able to fill-in relevant production reports • Be able to identify waste generated along with identification of machine downtime with reasons 	<p>Total</p> <p>40 hours</p> <p>Theory:</p> <p>08 hours</p> <p>Practical:</p> <p>32 hours</p>	<p>Job card</p> <p>Production report format</p>	<p>Classroom with multimedia aid and flip charts</p> <p>EITHER</p> <p>Visit to Plastic Processing Facilities</p> <p>OR</p> <p>Visit to a training institute with relevant</p>

		ii) Data sharing with relevant departments <ul style="list-style-type: none"> Understanding the concept of producing accurate data and benefits of the same on a larger scale Submission of production reports to production planning department or the supervisor for timely actions. 			facilities
LU5: Transport finished product to concerned department	The trainee will be able to: Place finished product in designated area Take approval of finished product from Quality Control Deliver relevant packaging documents to store personnel	i) Understand QC protocols <ul style="list-style-type: none"> Understand and appreciate the importance of producing products as per specification Be able to implement the first quality control protocol on machine to ensure elimination of defective products at sight ii) Inter-department co-ordination <ul style="list-style-type: none"> Be able to co-ordinate with QC department with produced batches for relevant approvals iii) Be able to hand over final products to store	Total 20 hours Theory: 04 hours Practical: 16 hours	Reporting formats Job card Basic Hand Tools Medium of material transport	Classroom with multimedia aid and flip charts EITHER Visit to Plastic Processing Facilities OR Visit to a training institute with relevant facilities

		<ul style="list-style-type: none">• Familiarize with handing-over protocols and paperwork.			
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PLASTIC PROCESSOR



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Module-9
CBT CURRICULUM
National Vocational Certificate Level 2

Version 1 - September, 2018

Module 9: Produce Compression Moulded Plastic Parts

Objective of the module: The aim of this module is to provide skills and knowledge to operate compression moulding machine in accordance with the manufacturer's manual

Duration: 150 hours **Theory:** 30 hours **Practical:** 120 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Interpret Work Order	The trainee will be able to: Obtain work order Verify production quantity available Ensure raw material available as per work order Ensure machine setting for production as per data sheet provided	i) Basic literacy skills <ul style="list-style-type: none"> • Be able to read instructions about product, quantity and raw material • Be able to identify rolling required to produce different components as per work order ii) Reporting procedure <ul style="list-style-type: none"> • Understanding the work order contents • Knowledge of units (Kg, inches, etc.) iii) Work order process <ul style="list-style-type: none"> • Understand the top-down stream of task assignment • Knowledge of what the work order represents • Who generates the work order? • Where can it be obtained from? iv) Material handling and storing procedure <ul style="list-style-type: none"> • Understanding where to 	Total 20 hours Theory: 4 hours Practical: 16 Hours	Compression moulding machine & mould Weighing scale Plastic raw material Product samples Machine manual Job card	Classroom with multimedia aid and flip charts EITHER Visit to Plastic Processing Facilities OR Visit to a training institute with relevant facilities

		<p>obtain raw material for the required production quantity</p> <ul style="list-style-type: none"> • How to handle raw material? <p>v) Set machine parameters as per data sheet provided</p> <ul style="list-style-type: none"> • Be able to input machine parameters as mentioned in work order or datasheet 			
<p>LU2:</p> <p>Perform production</p>	<p>The trainee will be able to:</p> <p>Start machine on auto-cycle mode as per operation manual</p> <p>Perform periodic quality check as per requirement</p>	<p>i) Machine operation in automatic mode</p> <ul style="list-style-type: none"> • Be able to perform dry-run • Be able to perform semi-auto operation • Up on successfully obtaining required product, switching the machine to auto mode <p>ii) Maintaining product quality as per specifications</p> <ul style="list-style-type: none"> • Be able to measure components for identification of dimensional defects • Usage of measurement tools is critical: Vernier caliper, micrometer gauge, scale, etc. <p>iii) Recognize different defects and their causes</p> <ul style="list-style-type: none"> • Be able to visually 	<p>Total</p> <p>60 hours</p> <p>Theory:</p> <p>12 hours</p> <p>Practical:</p> <p>48 hours</p>	<p>Compression moulding machine & mould</p> <p>Weighing scale</p> <p>Plastic raw material</p> <p>Product samples</p> <p>Machine manual</p> <p>Job card</p>	<p>Classroom with multimedia aid and flip charts</p> <p>EITHER</p> <p>Visit to Plastic Processing Facilities</p> <p>OR</p> <p>Visit to a training institute with relevant facilities</p>

		<p>identify commonly occurring defects, such as flashing, pin-holes, short-shots, etc.</p> <ul style="list-style-type: none"> Gain knowledge of rectification of commonly occurring defects. 			
<p>LU3:</p> <p>Perform follow-up procedure for machine production</p>	<p>The trainee will be able to:</p> <p>Ensure product packed in assigned packaging</p> <p>Check feed level in hopper/bin as per requirement</p> <p>Ensure machine lubrication as per requirement</p>	<p>i) Knowledge of product packaging</p> <ul style="list-style-type: none"> Understand different types of packaging, e.g.; flexible packaging, packing in cartons, etc. How to pack final product? <p>ii) Raw material input in moulding machine</p> <ul style="list-style-type: none"> Ensure consistent raw material feed into hopper/feeder Be able to use overhead crane or moveable lifts/ladders Understand the importance of cutting tools in opening raw material bags. Concept of 'clean slits' using sharp tools to ensure particles of bag don't get mixed in raw material <p>iii) Lubrication requirements</p>	<p>Total</p> <p>10 hours</p> <p>Theory:</p> <p>02 hours</p> <p>Practical:</p> <p>08 hours</p>	<p>Compression moulding machine & mould</p> <p>Weighing scale</p> <p>Plastic raw material</p> <p>Product samples</p> <p>Machine manual</p> <p>Job card</p>	<p>Classroom with multimedia aid and flip charts</p> <p>EITHER</p> <p>Visit to Plastic Processing Facilities</p> <p>OR</p> <p>Visit to a training institute with relevant facilities</p>

		<p>and procedure of machine</p> <ul style="list-style-type: none"> • Understand the concept of lubricating moveable parts of machines • Carefully use mould lubricant sprays • Ensure spray cans are stored in a secure location after pre-shot application • Be able to identify different mould release agents as per raw material • Be able to provide first-hand feedback to maintenance department for periodic machine maintenance 			
<p>LU4:</p> <p>Submit production report</p>	<p>The trainee will be able to:</p> <p>Record production report as per given format (kg/nos, hours)</p> <p>Submit report to concerned department</p>	<p>i) Production report writing</p> <ul style="list-style-type: none"> • Understand the importance of reporting accurate production quantity • Be able to fill-in relevant production reports • Be able to identify waste generated along with identification of machine downtime with reasons <p>ii) Data sharing with relevant departments</p> <ul style="list-style-type: none"> • Understanding the concept of producing 	<p>Total</p> <p>40 hours</p> <p>Theory:</p> <p>08 hours</p> <p>Practical:</p> <p>32 hours</p>	<p>Job card</p> <p>Production report format</p>	<p>Classroom with multimedia aid and flip charts</p> <p>EITHER</p> <p>Visit to Plastic Processing Facilities</p> <p>OR</p> <p>Visit to a training institute with relevant facilities</p>

		<p>accurate data and benefits of the same on a larger scale</p> <ul style="list-style-type: none"> • Submission of production reports to production planning department or the supervisor for timely actions. 			
<p>LU5:</p> <p>Transport finish product to concerned department</p>	<p>The trainee will be able to:</p> <p>Place finished product in designated area</p> <p>Take approval of finished product from Quality Control</p> <p>Deliver relevant packaging documents to store personnel</p>	<p>i) Understand QC protocols</p> <ul style="list-style-type: none"> • Understand and appreciate the importance of producing products as per specification • Be able to implement the first quality control protocol on machine to ensure elimination of defective products at sight <p>ii) Inter-department co-ordination</p> <ul style="list-style-type: none"> • Be able to co-ordinate with QC department with produced batches for relevant approvals <p>iii) Be able to hand over final products to store</p> <ul style="list-style-type: none"> • Familiarize with handing-over protocols and paperwork. 	<p>Total</p> <p>20 hours</p> <p>Theory:</p> <p>04 hours</p> <p>Practical:</p> <p>16 hours</p>	<p>Reporting formats</p> <p>Job card</p> <p>Basic Hand Tools</p> <p>Medium of material transport</p>	<p>Classroom with multimedia aid and flip charts</p> <p>EITHER</p> <p>Visit to Plastic Processing Facilities</p> <p>OR</p> <p>Visit to a training institute with relevant facilities</p>

General assessment guidance for the Plastic Processor Level 2

Good practice in Pakistan makes use of sessional and final assessments, the basis of which is described below. Good practice by vocational training providers in Pakistan is to use a combination of these sessional and final assessments, combined to produce the final qualification result.

Sessional assessment is going on all the time. Its purpose is to provide feedback on what students are learning:

- to the student: to identify achievement and areas for further work
- to the teacher: to evaluate the effectiveness of teaching to date, and to focus on future plans.

Assessors need to devise sessional assessments for both theoretical and practical work. Guidance is provided in the assessment strategy

Final assessment is the assessment, usually on completion of a course or module, which says whether the student has "passed". It is – or should be – undertaken with reference to all the objectives or outcomes of the course and is usually fairly formal. Considerations of security – ensuring that the student who gets the credit is the person who did the work – assume considerable importance in final assessment.

Methods of assessment

For lessons with a high quantity of theory, written or oral tests related to learning outcomes and/ or learning content can be conducted. For workplace lessons, assessment can focus on the quality of planning the related process, the quality of executing the process, the quality of the product and/or evaluation of the process.

Methods include direct assessment, which is the most desirable form of assessment. For this method, evidence is obtained by direct observation of the student's performance.

Examples for direct assessment of a Plastic Processor include:

- Work performances, for example operating an injection Moulding machine or an extrusion machine
- Demonstrations, for example demonstrating tool change over on a machine
- Direct questioning, where the assessor would ask the student about temperature, pressure gauges and their effect on products
- Paper-based tests, such as multiple choice or short answer questions on plastic feeding system, location of power supply, function of torpedo or mandrel.

Indirect assessment is the method used where the performance could not be watched, and evidence is gained indirectly.

Examples for indirect assessment of a Plastic Processor include:

- Work products, such as produced plastic product sample
- Workplace documents, such as a log of production.

Indirect assessment should only be a second choice. (In some cases, it may not even be guaranteed that the work products were produced by the person being assessed.)

Principles of assessment

All assessments should be valid, reliable, fair and flexible:

Fairness means that there should be no advantages or disadvantages for any assessed person. For example, it should not happen that one student gets prior information about the type of work performance that will be assessed, while another candidate does not get any prior information.

Validity means that a valid assessment assesses what it claims to assess. For example, if complex cooking skills are to be assessed and certificated, the assessment should involve performance criteria that are directly related to that cooking activity. An interview about the effect of the cooking processes on different foods would not meet the performance criteria.

Reliability means that the assessment is consistent and reproducible. For example, if the work performance of preparing and cooking a complex poultry dish has been assessed, another assessor (eg the future employer) should be able to see the same work performance and witness the same level of achievement.

Flexibility means that the assessor has to be flexible concerning the assessment approach. For example, if there is a power failure during the assessment, the assessor should modify the arrangements to accommodate the students' needs.

Assessment strategy for the Plastic Processor Level 2

This curriculum consists of 09 modules:

- Module 1: Maintain Personal Health, hygiene and Safety
- Module 2: Perform basic communication Skills
- Module 3: Dispose the Waste material
- Module 4: Demonstrate Basic Numeracy Skills
- Module 5: Arrange Raw Material for Processing
- Module 6: Produce Injection moulded plastic parts
- Module 7: Produce Pipe through extrusion moulding machine
- Module 8: Produce Blow moulded plastic parts
- Module 9: Produce Compression moulded plastic parts

Sessional assessment

The sessional assessment for all modules shall be in two parts: theoretical assessment and practical assessment. The sessional marks shall contribute to the final qualification.

Theoretical assessment for all learning modules must consist of a written paper lasting at least one hour per module. This can be a combination of multiple choice and short answer questions.

For practical assessment, all procedures and methods for the modules must be assessed on a sessional basis. Guidance is provided below under Planning for assessment.

Final assessment

Final assessment shall be in two parts: theoretical assessment and practical assessment. The final assessment marks shall contribute to the final qualification.

The final theoretical assessment shall consist of one 3-hour paper. The paper shall be in two parts.

Part A shall last for 2 hours and shall consist of half multiple choice and half short-answer questions. This part shall cover the technical modules:

- Module 5: Arrange Raw Material for Processing
- Module 6: Produce Injection moulded plastic parts

- Module 7: Produce Pipe through extrusion moulding machine
- Module 8: Produce Blow moulded plastic parts
- Module 9: Produce Compression moulded plastic parts

For the final practical assessment, each student shall be assessed over a period of two days, with two 3-hour sessions on each day. This represents a total of four sessions totaling 3 hours of practical assessment for each student. During this period, each student must be assessed on his/her ability to operate an assigned machine of the 4 operating modules. The student shall therefore operate 4 plastic processing machines along with their auxiliary equipment.

The assessment teams

The number of assessors must meet the needs of the students and the training provider. For example, where two assessors are conducting the assessment, there must be a maximum of five students per assessor. In this example, a group of 20 students shall therefore require assessments to be carried out over a four-day period. For a group of only 10 students, assessments would be carried out over a two-day period only.

Planning for assessment

Sessional assessment: assessors need to plan in advance how they will conduct sessional assessments for each module. The tables on the following pages are for assessors to use to insert how many hours of theoretical and practical assessment will be conducted and what the scheduled dates are.

Final assessment: Training providers need to decide ways to combine modules into a cohesive two-day final assessment programme for each group of five students. Training providers must agree the dishes for practical assessments in advance.

Complete list of tools and equipment

List of Machines and Tools

Sr. #	Description
1.	Steel-toed footwear,
2.	hard hat,
3.	safety gloves,
4.	appropriate safety glasses,
5.	high visibility vest,
6.	hearing protection,
7.	breathing apparatus,
8.	De-electric boots and gloves for protection from electrical shock.
9.	fall protection, and other applicable PPE
10.	Site emergency response plan,
11.	fire extinguishers,
12.	fire blankets,
13.	respirators, masks,
14.	fire hoses,
15.	first aid kits, stretchers, WHMIS book, and other related tools and gear
16.	basic tools, such as grease gun,
17.	hammer,
18.	screwdrivers,

Sr. #	Description
19.	pliers,
20.	self-locking pliers,
21.	adjustable wrench,
22.	assorted other wrenches, measuring tape(100m)
23.	Basic supplies, such as grease, oil, window cleaner, rags, ice scraper, whisk broom.
24.	Color-code cards, utility documentation. Logbooks Service Manuals, OHS Regulation,
	Measuring & marking tools
	Inspection gauges
MACHINES	
1	<p data-bbox="443 794 996 831">Injection Molding Machine (60-120 ton)</p> <ul style="list-style-type: none"> <li data-bbox="501 847 864 884">○ Air Cool Chiller (5 ton) <li data-bbox="501 900 833 936">○ Hopper Drier (25kg) <li data-bbox="501 952 629 989">○ Mixer <li data-bbox="501 1005 667 1042">○ Crusher <li data-bbox="501 1058 725 1094">○ Auto Loader <li data-bbox="501 1110 622 1147">○ Mold <li data-bbox="501 1163 943 1200">○ Mold temperature controller <li data-bbox="501 1216 898 1252">○ Sprue picker robotic arm <li data-bbox="501 1268 846 1305">○ Compressor (10 bar) <li data-bbox="501 1321 725 1358">○ Dosing units

Sr. #	Description
	<ul style="list-style-type: none"> ○ Power Winch set for lifting ○ Chain pulley block set ○ Pallet lifter ○ Hydraulic oil ○ Hydraulic pipes ○ Cooling pipes ○ Mold surveillance system/ Mold monitor
2	<p>Extrusion blow molding</p> <ul style="list-style-type: none"> ○ Mixer ○ Crusher ○ Auto Loader ○ Mold ○ Dosing units ○ Power Winch set for lifting ○ Chain pulley block set ○ Pallet lifter ○ Hydraulic oil ○ Hydraulic pipes ○ Cooling pipes ○ Compressor (12 bar)

Sr. #	Description
	<ul style="list-style-type: none"> ○ Die heads ○ Parison wall thickness control ○ 2-litre double head double station ○ Water Level gauge ○ De flasher unit ○ Leak tester
3	<ul style="list-style-type: none"> ● Hand operated blow molding machine
4	<ul style="list-style-type: none"> ● Stretch Blow moulding machine <ul style="list-style-type: none"> ○ Heating Oven ○ Blowing Unit ○ Compressor (35 bar) with air tank ○ Mold De-Humidifier ○ Mold ○ 1 liter twin Cavity hand feeding automatic machine ○ Pre-form loader ○ Crusher ○ Cooling pipes ○ Low pressure compressor

Sr. #	Description
5	<ul style="list-style-type: none"> • Injection blow molding machine (30ton) <ul style="list-style-type: none"> ○ Mold (120 ml) ○ Mold temperature controller ○ Air Drier ○ Air cooled Chiller 5 ton ○ Auto Loader ○ Hydraulic Oil ○ Compressor (12 bar) ○ Cooling pipes ○ High temperature hydraulic pipes ○ Mould protection sprays
6	<ul style="list-style-type: none"> • Injection stretch blow moulding machine (45 ton) <ul style="list-style-type: none"> ○ Drier ○ Mould humidifier ○ Chillier ○ Mould temperature controller ○ Auto Loader ○ Compressor

Sr. #	Description
	<ul style="list-style-type: none"> ○ Pre-Mixer ○ Liquid Dosing system ○ Mould sprays
7	<ul style="list-style-type: none"> ● Pipe Extrusion Machine 90mm Screw diameter <ul style="list-style-type: none"> ○ High speed mixer ○ Twin screw extruder ○ Auto loader ○ Extrusion Die ○ Pip- profile die ○ Vacuum sizing unit ○ Haul-off unit ○ Pipe Cutter ○ Stacker ○ Belling machine ○ Automatic winding unit ○ Pelletizing unit ○ Die changing trolleys
8	<ul style="list-style-type: none"> ● PE pipe extruder 60 mm Screw diameter <ul style="list-style-type: none"> ○ High speed mixer

Sr. #	Description
	<ul style="list-style-type: none"> ○ Auto loader ○ Extrusion Die ○ Pip- profile die ○ Vacuum sizing unit ○ Haul-off unit ○ Pipe Cutter ○ Stacker ○ Belling machine ○ Automatic winding unit ○ Pelletizing unit ○ Die changing trolleys
9	<ul style="list-style-type: none"> ● Sheet Extruder Machine <ul style="list-style-type: none"> ○ Auto loader ○ Sheet die ○ Vacuum sizing unit ○ Haul-off unit ○ Stacker ○ Automatic winding unit ○ Pelletizing unit ○ Die changing trolleys

Sr. #	Description
	<ul style="list-style-type: none"> ○ Slitter
10	<ul style="list-style-type: none"> ● Pet Injection Molding Machine (140 ton) <ul style="list-style-type: none"> ○ Air Cool Chiller (5 ton) ○ Hopper Drier (25kg) ○ Mixer ○ Crusher ○ Auto Loader ○ Mold ○ Mold temperature controller ○ Sprue picker robotic arm ○ Compressor (10 bar) ○ Dosing units ○ Power Winch set for lifting ○ Chain pulley block set ○ Pallet lifter ○ Hydraulic oil ○ Hydraulic pipes ○ Cooling pipes ○ Mold surveillance system/ Mold monitor

Sr. #	Description
	<ul style="list-style-type: none">○ Mold Sprays
11	<ul style="list-style-type: none">● Film Extrusion Machine<ul style="list-style-type: none">○ Auto loader○ Blown film die○ sizing unit○ Winding unit○ Pelletizing unit○ Die changing trolleys○ Slitter

