Model Curriculum

QP Name: Automotive Plastic Moulding Technician

QP Code: ASC/Q4401

QP Version: 2.0

NSQF Level: 4

Model Curriculum Version: 1.0

Automotive Skills Development Council | 153, Gr Floor, Okhla Industrial Area, Phase – III, Leela Building, New Delhi – 110020

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Training Parameters

Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Plastic Moulding Operation
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/8142.1301
Minimum Educational Qualification and Experience	10th Class + 1 year ITI with 4 years of experience OR 10th Class + 2 year ITI with 3 years of experience OR 12th Class with 3 Years of experience
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 years
Last Reviewed On	29/07/2021
Next Review Date	29/07/2026
NSQC Approval Date	29/07/2021
QP Version	2.0
Model Curriculum Creation Date	29/07/2021
Model Curriculum Valid Up to Date	29/07/2026
Model Curriculum Version	2.0
Minimum Duration of the Course	400 Hours 00 Minutes
Maximum Duration of the Course	400 Hours 00 Minutes

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills.

- Interpret assembly drawing/work instructions/SOPs for identification of raw material, tools and equipment required for the moulding process.
- Carry out preparatory activities such as lifting of workpiece, inspection of tools and equipment etc.
- Carry out plastic moulding and post-moulding activities.
- Work effectively and efficiently as per schedules and timelines.
- Implement safety practices.
- Optimize the use of resources to ensure less wastage and maximum conservation.

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
Bridge Module					
Module 1: Introduction to the role of an Automotive Plastic Moulding Technician	8:00	0:00			8:00
ASC/N9803 – Organize work and resources (Manufacturing) **NOS Version No. – 1.0** **NSQF Level – 3**	**16:00**	**24:00**			**40:00**
Module 2: Organize work and resources according to safety and conservation standards	16:00	24:00			40:00
ASC/N9802 – Interact effectively with colleagues, customers and others **NOS Version No. – 1.0** **NSQF Level - 3**	**12:00**	**20:00**			**32:00**
Module 3: Communicate effectively and efficiently	12:00	20:00			32:00
ASC/N4401 – Prepare for plastic moulding process **NOS Version No. – 2.0** **NSQF Level - 4**	**40:00**	**64:00**			**104:00**
Module 4: Prepare for plastic moulding process	40:00	64:00			104:00
ASC/N4402 – Perform plastic moulding and post-moulding operations **NOS Version No. – 2.0**	**72:00**	**144:00**			**216:00**

NSQF Level - 4					
Module 5: Perform plastic moulding and post-moulding operations	72:00	144:00			216:00
Total Duration	**148:00**	**252:00**			**400:00**

Module Details

Module 1: Introduction to the role of an Automotive Plastic Moulding Technician

Bridge module

Terminal Outcomes:

- Discuss the role and responsibilities of an Automotive Plastic Moulding Technician.

Duration: *<08:00>*	**Duration**: *<00:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the role and responsibilities of an Automotive Plastic Moulding Technician. • Discuss the job opportunities of an Automotive Plastic Moulding Technician in an automobile industry. • Explain about Indian automotive market. • List various automobile Original Equipment Manufacturers (OEMs) and different products/ models manufactured by them. • Discuss the standards and procedures involved in the different processes of plastic moulding. • Identify the standard checklists and schedules recommended by OEM.	
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 2: Organize work and resources according to safety and conservation standards

Mapped to ASC/N9803, v1.0

Terminal Outcomes:

- Employ appropriate ways to maintain safe and secure working environment.
- Perform work as per the quality standards.
- Apply conservation practices at the workplace.

Duration: *<16:00>*	**Duration**: *<24:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the potential workplace related risks and hazards, their causes and preventions. • Identify PPE to be used at workplace. • Identify various warning signs used at the workplace. • Describe appropriate strategies to deal with emergencies and accidents at the workplace. • Outline the organizational structure to be followed to report about health, safety and security breaches to the concerned authorities. • Discuss the importance of keeping work area clean and tidy. • Discuss the significance of conforming to basic hygiene practices such as washing hands, using alcohol based hand sanitizers or soap. • Discuss organizational hygiene and sanitation guidelines and ways of reporting breaches/gaps if any to the concerned authorities. • Discuss the ways of dealing with stress and anxiety. • Discuss how to complete the given work within the stipulated time period. • Explain how to maintain a proper balance between team and individual goals. • Explain 5S guidelines at workplace. • List the various materials used at the workplace. • Explain organisational recommended procedure for storage of tools, equipment and material after completion of work. • Explain the ways to optimize usage of resources. • Discuss various methods of waste management and its disposal.	• Apply appropriate safety practices to ensure safety of people at the workplace • Display the correct way of wearing and removing PPE such as face masks, hand gloves, face shields, PPE suits, etc. • Demonstrate the use of fire extinguisher. • Apply basic first aid procedure in case of emergencies. • Perform routine cleaning of tools, equipment and machines. • Employ various techniques for checking malfunctions in the equipment as per Standard Operating Procedure (SOP). • Show how to sanitize and disinfect one's work area regularly. • Demonstrate the correct way of washing hands using soap and water. • Demonstrate the correct way of sanitizing hands using alcohol-based hand rubs. • Demonstrate how to evacuate the workplace in case of an emergency. • Demonstrate sorting of materials, tools and equipment and spare parts after completion of work. • Demonstrate the steps involved in storage of tools, equipment and material after completion of work. • Perform basic checks to identify any spills and leaks and that need to be plugged /stopped. • Demonstrate different disposal techniques depending upon types of waste. • Employ different ways to check if equipment/machines are functioning as per requirements and report malfunctioning, if observed. • Employ ways for efficient utilization of material and water.

• List the different categories of waste for the purpose of segregation • Differentiate between recyclable and non-recyclable waste • State the importance of using appropriate colour dustbins for different types of waste. • Discuss common practices for conserving electricity at workplace. • Discuss the common sources of pollution and ways to minimize it.	
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
• Housekeeping material: Cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel, fire extinguisher • Safety gears: Safety shoes, ear plug, goggles, gloves, helmet, first-aid kit	

Module 3: Communicate Effectively and Efficiently

Mapped to ASC/N9802, v1.0

Terminal Outcomes:

- Use effective communication and interpersonal skills.
- Apply sensitivity while interacting with different genders and people with disabilities.

Duration: *<12:00>*	**Duration**: *<20:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the organizational structure for communicating with colleagues, seniors and others. • Discuss the ways to adjust the communication styles to reflect sensitivity towards gender and persons with disability (PwD). • Explain the importance of respecting personal space of colleagues. • State the procedure to receive work instructions and report problems to the supervisor. • List the various organizational policies and procedures to be followed at the workplace. • Describe different ways to rectify commonly occurring errors. • Explain the importance of complying with the instructions/guidelines and procedures while performing tasks related to the job specifications. • Discuss the importance of PwD and gender sensitization.	• Employ different means of communication depending upon the requirement while interacting with others. • Demonstrate using new ways to maintain good relationships with colleagues and supervisor. • Prepare a sample report to send the work status to the supervisor. • Demonstrate how to communicate with different genders and persons with disability (PwD) in a sensitive manner.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
Sample of escalation matrix, organisation structure.	

Module 4: Prepare for plastic moulding process

Mapped to ASC/N4401, v2.0

Terminal Outcomes:

- Identify tools and equipment required for plastic moulding process.
- Perform the steps to carry out preparatory activities such as lifting of workpiece, collection and inspection of tools and equipment etc.

Duration: *<40:00>*	**Duration**: *<64:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe different types of moulding processes. • Describe basic process followed for moulding of the pieces. • Describe various types of plastics like thermoplastics/ thermosetting plastics and their properties. • Discuss the information derived from the engineering drawings, work order, SOPs and instructions from supervisor. • List the tools, equipment, additives, dies, coolant and input materials required during plastic moulding work. • List various parts of moulding machine apparatus. • Describe the selection criteria of tools, equipment, additives, dies, coolant and input materials required for plastic moulding work. • Describe various types of coolants and their properties. • Discuss the organisational process of collecting and arranging the tools, equipment, additives, dies, coolant and input materials from the store. • Summarise the steps to be performed for checking the tools, equipment, additives, dies, coolant and input materials before use. • Discuss the importance of correct ratio of granules and additives in the hopper. • List the steps to be performed for pre-heat the hygroscopic plastic granules. • Discuss various plastic moulding machine parameters such as heater temperature, hydraulic pressure/air pressure/vacuum pressure, rotating speed of the screw, operating current and voltage, injection time, refilling time etc. and their impact	• Read the drawing and work orders for identifying work requirements, selecting and planning sequence of assembling and machining operations. • Demonstrate the standard operating procedure to use tools, equipment, additives, dies, coolant and input materials required during plastic moulding work. • Show how to select and arrange the required tools, equipment, additives, dies, coolant and input materials from the store. • Apply appropriate ways to check the tools, equipment, additives, dies, coolant and input materials before use. • Show how to check the operation of moulding apparatus as per the checklist. • Show how to fix the die/mould to the moulding apparatus. • Apply appropriate ways to measure the quantity of granular input material and additives. • Show how to pre-heat the hygroscopic plastic granules for removing the moisture content. • Apply appropriate ways to check that dies and moulding apparatus are clean and free from dust and unwanted material. • Show how to set the moulding machine and its parameters as per the work instructions.

on output. • Discuss the necessary precautions to avoid any hazard and accident during plastic moulding activities.	
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
• PPT's, teaching aids, drawing / blue print, work order • Injection moulding machine with PLC control, hydraulic oil, cooling tower, toolbox with different sizes of round and open-ended spanner, work table with vice, hammer plastic/steel, allen key set, moulds simple and complex ones, clamps for mounting moulds, bolt and spacer block, grease, silicon spray, rail girder with chain pulling block, raw material PE, PVC, polystyrene, nylon 6/6, over for drying, cutter and blade for flash removal, extruder with die, blow moulding and lower welding machine, vernier calliper, micrometer, height gauge, surface plate, CMM • **Lifting devices:** Hoists, cranes, bins, part trolleys, pallet trucks • **Safety materials**: Fire extinguisher, portable welding curtains, leather safety gloves, leather aprons, safety glasses, helmet, safety shoe and first-aid kit • **Cleaning material**: Wire brush (M.S.), cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel	

Module 5: Perform plastic moulding and post-moulding operations

Mapped to ASC/N4402, v2.0

Terminal Outcomes:

- Demonstrate various moulding processes.
- Perform steps to carry out post-moulding activities.

Duration: *<72:00>*	**Duration**: *<144:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss ways to collect the number of heaters required to generate the given temperature/ current as per the requirements. • Discuss the importance of selecting correct program in the moulding machine for operation as per the work instructions. • Discuss the importance of monitoring process parameters during the moulding process and correcting them as per the requirements. • List the steps to be performed for observing and recording machine performance. • Discuss post-moulding activities like inspection, cleaning, maintenance etc. • List the steps to be performed for de-gating and de-flashing processes. • Discuss the information needed to be mentioned on the labels of the moulded pieces. • Discuss impact of runners/gates on final output. • Explain methods of inspecting the quality of moulded workpieces. • List the commonly occurring defects in the moulded workpieces. • Discuss various processes i.e. cutting, sawing, finishing etc. for removing defects in moulded workpiece. • Discuss the process of segregating, tagging and storing of damaged and ok workpieces and maintaining records of segregation as per organisational guidelines. • List the steps to be performed for checking the machine operations for any defects in its component and informing the supervisor. • List different methods for disposing off	• Show how to select the program in the moulding machine and modify it as per the production requirements and WI. • Show how to feed the plastic granules in the machine and turn valves of machine to regulate speed and quantity of the plastic. • Apply appropriate ways to observe the feeding operations for any issue or abnormality. • Demonstrate organisational specified procedure of all the moulding processes. • Demonstrate how to start the machine, produce the sample piece and inspect it against the required specifications. • Show how to adjust the machine parameters to achieve required specifications. • Perform steps to run the machine for mass production after first piece meets the specified requirements. • Read the measurement gauges to monitor the process parameters and maintain the quality standards. • Apply appropriate ways to monitor the moulding operations and record the operational data as per the control plan. • Show how to remove the moulded pieces from the machine after completion of moulding process. • Prepare a sample report about any problems faced during the moulding process. • Demonstrate organisational specified procedure of de-gating and de-flashing processes for removing the runners/gates or extra materials. • Demonstrate the organizational specified procedure for labelling the moulded pieces. • Employ appropriate ways for comparing

waste material and scrap. • Discuss documents and records needed to prepare and update related to moulding work. • List the steps to be performed for sending the workpieces to lab for quality check and obtaining batch clearance.	the moulded piece texture, color, surface properties, hardness and strength with the specified product specifications. • Apply appropriate inspection methods for identifying the defects, checking the quality of moulded workpieces and noting the observations of inspection process as per the control plan. • Show how to remove the minor defects like flash in hole, non-filling, etc. by cutting, finishing etc. • Show how to segregate, tag, store and record data of damaged and ok workpieces as per organisational guidelines. • Show how to dispose scrap or waste as per organisational guidelines. • Demonstrate organisational specified procedure of sending first and last work piece from each batch to the lab for quality check and obtaining batch clearance.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
• PPT's, teaching aids, drawing / blue print, work order • Injection moulding machine with PLC control, hydraulic oil, cooling tower, toolbox with different sizes of round and open-ended spanner, work table with vice, hammer plastic/steel, allen key set, moulds simple and complex ones, clamps for mounting moulds, bolt and spacer block, grease, silicon spray, rail girder with chain pulling block, raw material PE, PVC, polystyrene, nylon 6/6, over for drying, cutter and blade for flash removal, extruder with die, blow moulding and lower welding machine, vernier calliper, micrometer, height gauge, surface plate, CMM • **Lifting devices:** Hoists, cranes, bins, part trolleys, pallet trucks • **Safety materials**: Fire extinguisher, portable welding curtains, leather safety gloves, leather aprons, safety glasses, helmet, safety shoe and first-aid kit • **Cleaning material**: Wire brush (M.S.), cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel	

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
ITI	Turner/Fitter/ Electrician	3	Plastic Moulding	1	Plastic Moulding	NA
ITI	Turner/Fitter/ Electrician	4	Plastic Moulding	0	NA	NA
Diploma	Mechanical/Electrical/ Automobile	2	Plastic Moulding	1	Plastic Moulding	NA
Diploma	Mechanical/Electrical/ Automobile	3	Plastic Moulding	0	NA	NA

Trainer Certification	
Domain Certification	**Platform Certification**
"Automotive Plastic Moulding Technician, ASC/Q4401, version 2.0". Minimum accepted score is 80%.	"Trainer, MEP/Q2601 v1.0" Minimum accepted score is 80%.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training/Assessment Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
ITI	Turner/Fitter/Electrician	4	Plastic Moulding	1	Plastic Moulding	NA
ITI	Turner/Fitter/Electrician	5	Plastic Moulding	0	NA	NA
Diploma	Mechanical/Electrical/ Automobile	3	Plastic Moulding	1	Plastic Moulding	NA
Diploma	Mechanical/Electrical/ Automobile	4	Plastic Moulding	0	NA	NA

Assessor Certification	
Domain Certification	**Platform Certification**
"Automotive Plastic Moulding Technician, ASC/Q4401, version 2.0". Minimum accepted score is 80%.	"Assessor; MEP/Q2701 v1.0" Minimum accepted score is 80%.

Assessment Strategy

1. Assessment System Overview:
    - Batches assigned to the assessment agencies for conducting the assessment on SDMS/SIP or email
    - Assessment agencies send the assessment confirmation to VTP/TC looping SSC
    - Assessment agency deploys the ToA certified Assessor for executing the assessment
    - SSC monitors the assessment process & records

2. Testing Environment:
    - Confirm that the centre is available at the same address as mentioned on SDMS or SIP
    - Check the duration of the training.
    - Check the Assessment Start and End time to be as 10 a.m. and 5 p.m.
    - If the batch size is more than 30, then there should be 2 Assessors.
    - Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
    - Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
    - Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
    - Check the availability of the Lab Equipment for the particular Job Role.

3. Assessment Quality Assurance levels / Framework:
    - Question papers created by the Subject Matter Experts (SME)
    - Question papers created by the SME verified by the other subject Matter Experts
    - Questions are mapped with NOS and PC
    - Question papers are prepared considering that level 1 to 3 are for the unskilled & semi-skilled individuals, and level 4 and above are for the skilled, supervisor & higher management
    - Assessor must be ToA certified & trainer must be ToT Certified
    - Assessment agency must follow the assessment guidelines to conduct the assessment

4. Types of evidence or evidence-gathering protocol:
    - Time-stamped & geotagged reporting of the assessor from assessment location
    - Centre photographs with signboards and scheme specific branding
    - Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
    - Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos

5. Method of verification or validation:
    - Surprise visit to the assessment location
    - Random audit of the batch
    - Random audit of any candidate

6. Method for assessment documentation, archiving, and access
    - Hard copies of the documents are stored
    - Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage
    - Soft copies of the documents & photographs of the assessment are stored in the Hard Drives

References

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training.
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module. A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
SOP	Standard Operating Procedure
WI	Work Instructions
PPE	Personal Protective equipment