Model Curriculum

QP Name: Assistant Machine Operator – Injection Moulding

NQR Code: QG-03CP-04130-2025-V2-CIPET

NSQF Level: 3

QP Version: 2.0

Model Curriculum Version: 1.0

Sector: Chemicals & Petrochemicals (CPC)

Central Institute of Petrochemicals Engineering & Technology (CIPET)
Department of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilizers, Govt. of India
CIPET Head office, T.V.K Industrial Estate, Guindy, Chennai – 600 032.

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Training Parameters

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<tr><td>Country</td><td>India</td></tr>
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<tr><td>Minimum Educational Qualification and Experience</td><td>
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<tr><th>S. No.</th><th>Academic/Skill Qualification (with Specialization - if applicable)</th><th>Required Experience (with Specialization - if applicable)</th></tr>
<tr><td>1</td><td>Grade 10 pass or equivalent</td><td>No Experience required</td></tr>
<tr><td>2</td><td>Grade 8 pass with two year of (NTC/ NAC) after 8th</td><td>No Experience required</td></tr>
<tr><td>3</td><td>9th Grade pass</td><td>1.5 years relevant experience</td></tr>
<tr><td>4</td><td>8thgrade pass</td><td>3 years relevant experience</td></tr>
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<tr><td>Pre-Requisite License or Training</td><td>Not applicable</td></tr>
<tr><td>Minimum Job Entry Age</td><td>18 Years</td></tr>
<tr><td>Last Reviewed On</td><td></td></tr>
<tr><td>Next Review Date</td><td>25.05.2028</td></tr>
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<tr><td>QP Version</td><td>2.0</td></tr>
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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.

After the successful completion of session, the trainee will be able to-

- Interact with the supervisor in order to understand the production schedule
- Help in planning the day's production activities based on the supervisor's instructions
- Follow the molding procedure and process to be adopted for completing the work order from the supervisor by referring to the Work Instruction document/ SOP manual.
- Mould required for executing the required operation and ensure that the same is available for operation.
- Collect the Mould from the tool room If Mould is not available.
- Understand the raw material like plastics granules, fillers, bonding additives etc. required for executing the activity

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
Module 1: CPC/N0214 - Understand basic concepts, job requirements & basics knowhow related to process	30:00	60:00	00:00	00:00	**90:00**
Module 2: CPC/N0215 - Assist in performing the Injection moulding related operations, monitor process parameters and troubleshoot the process/ product if any under the guidance of Operator	50:00	130:00	00:00	00:00	**180:00**
Module 3: CPC/N0216- To conduct basic quality check of finished products with reference to approved product	20:00	70:00	00:00	00:00	**90:00**
Module 4: CPC/N0411- Maintain basic health and safety practices at the workplace, 5S.	10:00	20:00	00:00	00:00	**30:00**
Module 5: CPC/N0219 Basics of MS Office / Open Source office suite software	10:00	20:00	00:00	00:00	**30:00**
Module 6: DGT/VSQ/N0101: Employability Skills	30:00	00:00	00:00	00:00	**30:00**
Module 7: On-the-Job Training	00:00	00:00	30:00	00:00	**30:00**
Total Duration	**150:00**	**300:00**	**30:00**	**00:00**	**480:00**

Module Details

Module 1: CPC/N0214 -Understand basic concepts, job requirements & basics knowhow related to process

Mapped to:

Terminal Outcomes:

- Understanding the work order and the process requirement from the supervisor
- Arranging the required raw material and Moulds for the process
- Cleaning the equipment and the Moulds

Duration: *30:00 Hours*	**Duration**: *60:00 Hours*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Interact with the supervisor in order to understand the production schedule • Help in planning the day's production activities based on the supervisor's instructions • Follow the molding procedure and process to be adopted for completing the work order from the supervisor by referring to the Work Instruction document/ SOP manual. • Mould required for executing the required operation and ensure that the same is available for operation. • Collect the mould from the tool room If mould is not available . • Understand the raw material like plastics granules, fillers, bonding additives etc. required for executing the activity	• Availability of consumables and plastics materials for production in sufficient quantity as per production plan/supervisor instructions. • Understanding the does and don'ts of the manufacturing process as defined in SOPs/ Work Instructions or defined by supervisors. • Understand the Mould required for executing the required operation and ensure that the same is available for operation. • Cleaning of the other auxiliaries tools, (if any) before the initiation of the moulding and trimming process • Cleaning of the area around the apparatus for any oil, grease, combustible substances etc. so as to prevent any accident • Availability of the coolant and working of valves to circulate the coolant to cool and solidify plastic • Understand the raw material like plastics granules, fillers, bonding additives etc. required for executing the activity
Classroom Aids:	
Charts, Models, Video presentation, Flip Chart, White-Board/Smart Board, Marker, Duster	
Tools, Equipment and Other Requirements	
Steel rule 15 cm with metric Graduations, Measure Tape, Outside, inside spring calliper, Screwdriver 15 cm, Screwdriver set, D/E spanner set inch & mm, Allen key set inch & mm, Hand Hacksaw frame adjustable, Flat file second cut & smooth, Half round file second cut & smooth, Needle file rough & smooth, Micrometre 0-25 mm, Vernier calliper, Thickness gauge, Safety PPE's like apron, gloves etc.	

Module 2: CPC/N0215 - Assist in performing the Injection moulding related operations, monitor process parameters and troubleshoot the process/ product if any under the guidance of Operator

Mapped to:

Terminal Outcomes:

- Checking the operations of the equipment
- Feeding the granules as per requirement
- Set up and operate the Injection moulding machine
- Perform visual inspection of the output products
- Achieve productivity, quality and safety standards as per company's norms
- Report problems to supervisor

Duration: *50:00 Hours*	**Duration**: *130:00 Hours*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Check for operation of molding apparatus like hopper, heaters etc. as per the checklist provided • Make modifications in the process parameters (by selecting the right program from the machine control system) if required and ensure alignment with the prescribed standards • Ensure that the plastic granules are mixed with additives (if any) before being fed into the hopper • Conduct a test process and produce a sample output as per the required • Ensure that the dimensions of the output product are measured as per the process given in the Work Instructions/ SOP • Feed the required operation code in the apparatus for heaters to melt the plastic granules at the predefined temperature • Enter moulding temperature, volume of plastic and weight settings in the machine as per data sheet • Enter machine and process parameters such as moulding pressure and time as per the data sheet	• Operation of molding apparatus like hopper, heaters etc. as per the checklist provided • Fixing the desired Mould to the injection moulding machine in order to achieve the desired operation as per the Work Instructions/ SOPs • Modifications in the process parameters (by selecting the right program from the machine control system) if required and ensure alignment with the prescribed standards • To Ensure that the plastic granules are mixed with additives (if any) before being fed into the hopper • To ensure that the dimensions of the output product are measured as per the process given in the Work Instructions/ SOP under guidance of the operator. • Production process as instructed by operator. • Feed the required operation code in the apparatus for heaters to melt the plastic granules at the predefined temperature • Run the machine in Semi-Auto or Automatic mode of operation as guided by the operator. • Check-list procedure to ensure quality of final product
Classroom Aids:	
Charts, Models, Video presentation, Flip Chart, White-Board/Smart Board, Marker, Duster	
Tools, Equipment and Other Requirements	
Hand operated Injection Moulding Machine, Semi Auto Vertical Injection Moulding Machine, Semi Auto Horizontal Injection Moulding machine, Fully Auto Injection Moulding Machine, Microprocessor based Injection Moulding Machine, Automatic Hopper Loader, Oven / Drier, Dehumidifier, Colour Blender, Mould Temperature Controller, Scrap Grinder, Hydraulic Trainer, Pneumatic Trainer, Hot air gun, Blow lamp, Weighing balance, Moulds – two plate, three plate, split mould etc. for automatic injection moulding & hand, moulds, Mould polishing kit, Cooling tower, Hydraulic Trolley, Crane, Chilling Unit, Utility equipment (Cooling Circuit), Steel rule 15 cm with metric Graduations, Measure Tape, Outside, inside spring calliper, Screwdriver 15 cm, Screwdriver set, D/E spanner set inch & mm, Allen key set inch & mm, Hand Hacksaw frame adjustable, Flat file second cut & smooth, Half round file second cut & smooth, Needle file rough & smooth, Micrometre 0-25 mm, Vernier calliper, Thickness gauge,Safety PPE's like apron, gloves etc.	

Module 3: CPC/N0216- To conduct basic quality check of finished products with reference to approved product

Mapped to:

Terminal Outcomes:

- Inspecting the finished components
- keeping records of production and defects
- conducting minor repair/deflashing if any on output parts which can be reworked
- The role holder will interact with the maintenance team and material management team.

Duration: *20:00 Hours*	**Duration**: *70:00 Hours*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Compare texture, colour, surface properties, hardness and strength etc. with the given approved product • Note down the observations of the basic inspection process and Identify pieces which are OK and also not meeting the specified standards • Maintain records of each category of work outputs as per the batch etc. so that correction can be organized. • Rectify minor defects like dimension variation, thickness variation etc. by control process parameters etc.	• Compare texture, colour, surface properties, hardness and strength etc. with the given approved product. • Rectify minor defects like dimension variation, thickness variation etc. by controlling process parameters etc and informing operators. • Provide first and last output from each batch to the lab for quality check on its composition, properties etc. • Obtain clearance for the entire batch from the lab and submit the operator.
Classroom Aids:	
Charts, Models, Video presentation, Flip Chart, White-Board/Smart Board, Marker, Duster	
Tools, Equipment and Other Requirements	
Semi Auto Vertical Injection Moulding Machine, Semi Auto Horizontal Injection Moulding machine, Fully Auto Injection Moulding Machine, Microprocessor based Injection Moulding Machine, Automatic Hopper Loader, Oven / Drier, Weighing balance, Moulds – two plate, three plate, split mould etc. for automatic injection moulding & hand, moulds, Mould polishing kit, Cooling tower, Hydraulic Trolley, Crane, Chilling Unit, Utility equipment (Cooling Circuit), Steel rule 15 cm with metric Graduations, Measure Tape, Outside, inside spring calliper, Screwdriver 15 cm, Screwdriver set, D/E spanner set inch & mm, Allen key set inch & mm, Hand Hacksaw frame adjustable, Flat file second cut & smooth, Half round file second cut & smooth, Needle file rough & smooth, Micrometre 0-25 mm, Vernier calliper, Thickness gauge, Safety PPE's like apron, gloves etc.	

Module 4: CPC/N0411- Maintain basic health and safety practices at the workplace, 5S.

Mapped to:

Terminal Outcomes:

- Health and safety procedure.
- Fire safety procedure.
- Emergencies, rescue and first aid procedures.
- Ensure sorting, stream lining, storage and documentation, cleaning, standardization and sustenance across the plant premises of the organization.

Duration: *10:00 Hours*	**Duration**: *20:00 Hours*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Wear protective clothing/equipment for specific tasks and work conditions • Carry out safe working practices while dealing with hazards to ensure the safety of self and others. • Apply good housekeeping practices at all times • Demonstrate rescue techniques applied during fire hazard, demonstrate good housekeeping in order to prevent fire hazards, demonstrate the correct use of a fire extinguisher • Carry out safe working practices while dealing with hazards to ensure the safety of self and others • Demonstrate rescue techniques applied during fire hazard, demonstrate good housekeeping in order to prevent fire hazards, demonstrate the correct use of a fire extinguisher.	• Carry out safe working practices while dealing with hazards to ensure the safety of self and others. • Apply good housekeeping practices at all times • Use the various appropriate fire extinguishers on different types of fires correctly • Demonstrate rescue techniques applied during fire hazard, demonstrate good housekeeping in order to prevent fire hazards, demonstrate the correct use of a fire extinguisher. • Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals, loud noise, and Identify areas in the plant which are potentially Hazardous/ unhygienic in nature. • Conduct regular checks with support of the maintenance team on machine health to identify potential hazards due to wear and tear of machine. • Create awareness amongst others by sharing information on the identified risks. • Ensure segregation of waste in hazardous/ non Hazardous waste as per the sorting work instructions • Follow the technique of waste disposal and waste storage in the proper bins as per SOP • Segregate the items which are labeled as red tag items for the process area and keep them in the correct places • Follow the floor markings/ area markings used for demarcating the various sections in the plant as per the prescribed instructions and standards. • Check that the items in the respective areas have been identified as broken or damaged • Make sure that all material and tools are stored in the designated places and in the manner indicated in the 5S instructions.
Classroom Aids:	
Charts, Models, Video presentation, Flip Chart, White-Board/Smart Board, Marker, Duster	
Tools, Equipment and Other Requirements	
Safety PPE's like apron, gloves etc.	

Module 5: CPC/N0219 - Basics of MS Office / Open Source office suite software

Mapped to:

Terminal Outcomes:

- Enter, update and maintain data in MS Office / Open Source office suite software.

Duration: *10:00 Hours*	**Duration**: *20:00 Hours*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Fill and process mandated forms for receiving, processing, or tracking data, enter data from source documents (such as trial report, process sheet etc.) into a MS Office / Open Source office suite software. • Scan source documents in accordance with specific instructions. • Maintain files of source documents or other information related to data entered. • Update database information to reflect most current source information	• Filling and processing mandated forms for receiving, processing, or tracking data enter data from source documents (such as trial report, process sheet etc.) into MS Office / Open Source office suite software. • Scanning source documents in accordance with specific instructions. • verify data entered with source documents, checks for compliance and corrects all typographical errors and missing or repeated data. • Maintain files of source documents or other information related to data entered. • update database information to reflect most current source information • Assist in the filing and storage of security and back up data files
Classroom Aids:	
Charts, Models, Video presentation, Flip Chart, White-Board/Smart Board, Marker, Duster	
Tools, Equipment and Other Requirements	
Computer with MS Office / Open Source office suite software, UPS, Table Chair etc.	

Module 6: Employability Skills
Mapped to: DGT/VSQ/N0101

Mandatory Duration: *30:00 Hours*			
Location: Training Centre			
S. No.	**Module Name**	**Key Learning Outcomes**	**Duration (hours)**
1.	Introduction to Employability Skills	• Discuss the importance of Employability Skills in meeting the job requirements.	1
2.	Constitutional values - Citizenship	• Explain constitutional values, civic rights, duties, citizenship, responsibility towards society etc. that are required to be followed to become a responsible citizen. • Show how to practice different environmentally sustainable practices.	1
3.	Becoming a Professional in the 21st Century	• Discuss 21st century skills. • Display positive attitude, self -motivation, problem solving, time management skills and continuous learning mindset in different situations.	1
4.	Basic English Skills	• Use appropriate basic English sentences/phrases while speaking.	2
5.	Communication Skills	• Demonstrate how to communicate in a well -mannered way with others. • Demonstrate working with others in a team.	4
6.	Diversity & Inclusion	• Show how to conduct oneself appropriately with all genders and PwD. • Discuss the significance of reporting sexual harassment issues in time.	1
7.	Financial and Legal Literacy	• Discuss the significance of using financial products and services safely and securely. • Explain the importance of managing expenses, income, and savings. • Explain the significance of approaching the concerned authorities in time for any exploitation as per legal rights and laws.	4
8.	Essential Digital Skills	• Show how to operate digital devices and use the associated applications and features, safely and securely. • Discuss the significance of using the internet for browsing, accessing social media platforms, safely and securely.	3
9.	Entrepreneurship	• Discuss the need for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges.	7
10.	Customer Service	• Differentiate between types of customers. • Explain the significance of identifying customer needs and addressing them. • Discuss the significance of maintaining hygiene and dressing appropriately.	4
11	Getting ready for apprenticeship & Jobs	• Create biodata. • Use various sources to search and apply for jobs. • Discuss the significance of dressing up neatly and maintaining hygiene for an interview. • Discuss how to search and register for apprenticeship opportunities.	2

LIST OF TOOLS & EQUIPMENT FOR EMPLOYABILITY SKILLS		
S.No.	**Name of the Equipment**	**Quantity**
1.	Computer (PC) with latest configurations – and Internet connection with standard operating system and standard word processor and worksheet software (Licensed) (all software should either be latest version or one/two version below)	As required
2.	UPS	As required
3.	Scanner cum Printer	As required
4.	Computer Tables	As required
5.	Computer Chairs	As required
6.	LCD Projector	As required
7.	White Board 1200mm x 900mm	As required
Note: Above Tools & Equipment not required, if Computer LAB is available in the institute.		

Module 7: On-the-Job Training

Mandatory Duration: *30:00 Hours*
Module Name: On-the-Job Training
Location: On Site
Terminal Outcomes ● On-the-Job Training (OJT) is a hands-on learning method where participants acquire skills and knowledge while performing their job tasks. ● Participants learn specific job-related skills that are directly applicable to their roles. ● Industrial training often leads to participants becoming more effective and efficient in their learning. ● Industrial training experience builds the confidence level of participants. ● Training occurs in the actual work environment, reducing the need for induction training programs while joining in industry. ● Interaction with industry captains or mentors during training strengthens learning teamwork and workplace relationships. ● Trainees become familiar with the industrial tools, systems, and workflows quickly. ● Participants encounter and address challenges in industry, developing critical thinking and adaptability.

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
Diploma	Plastics / Polymer Engineering / Technology	2	Plastics Processing Industry	-	-	-
B.E. / B.Tech. / M.Sc.	Plastics / Polymer Engineering / Science	-	-	-	-	-

Trainer Certification	
Domain Certification	**Platform Certification**
Minimum Educational Qualification as above, additionally he/ she should have done a job role relevant skill training course from CIPET.	Recommended that the Trainer Should have done a job role relevant upskilling course from CIPET.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training/Assessment Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
Diploma	Plastics / Polymer Engineering / Technology	2	Plastics Processing Industry	3	Plastics / Polymer Engineering / Technology	-
B.E. / B.Tech.	Plastics / Polymer Engineering	1	Plastics Processing Industry	1	Plastics / Polymer Engineering	-

Assessor Certification	
Domain Certification	**Platform Certification**
Minimum Educational Qualification as above, additionally he/ she should have done a job role relevant skill training course from CIPET.	Recommended that the Trainer Should have done a job role relevant upskilling course from CIPET.

Assessment Strategy

This section includes the processes involved in identifying, gathering, and interpreting information to evaluate the Candidate on the required competencies of the program.

Mention the detailed assessment strategy in the provided template.

1. Assessment System Overview:
    - Batches are assigned to Training Assessment Wing (TAW), CIPET HO for planning of assessment
    - Training Centers request TAW for Assessment and Certification of Trainees
    - TAW identifies suitable assessor and nominates the assessor to the respective Training Centre
    - TAW monitors the assessment process
    - Training Centers maintain necessary records

2. Testing Environment:
    - Check the Assessment location, date and time
    - If the batch size is more than 30, then there should be 02 Assessors in a day (or) 01 assessor in 2 days
    - Check that the allotted time to the candidates to complete the Theory & Practical Assessment

3. Assessment Quality Assurance levels/Framework:
    - Question bank / Question Paper is prepared by the Subject Matter Experts (SME) / Assessor
    - Questions are mapped to the specified assessment criteria
    - Certified Assessor & Trainer will be engaged in the process

4. Types of evidence or evidence-gathering protocol:
    - Date / Time recorded for the reporting of the assessor from assessment location
    - Assessment batch - Group Photo of Trainees along with Assessor

5. Method of verification or validation:
    - Surprise visit to the assessment location
    - Virtual meet with the Assessor / Trainees

6. Method for assessment documentation, archiving, and access
    - Hard copies of the documents are stored, soft copies of assessment evidences are stored in Email for future correspondence

References

Glossary

Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform a similar/ related set of functions in an industry.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualification pack code.

Acronyms and Abbreviations

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack