Model Curriculum

QP Name: Machine Operator – Blow Moulding

Code: QG-3.5-CP-04118-2025-V2-CIPET

QP Version: 2.0

NSQF Level: 3.5

Model Curriculum Version: 1.0

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Training Parameters

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<tr><td>Sector</td><td>Chemicals and Petrochemicals</td></tr>
<tr><td>Sub-Sector</td><td>Plastics Processing</td></tr>
<tr><td>Occupation</td><td>Machine operator – Blow Moulding</td></tr>
<tr><td>Country</td><td>India</td></tr>
<tr><td>NSQF Level</td><td>3.5</td></tr>
<tr><td>Aligned to NCO/ISCO/ISIC Code</td><td>NCO-2015/8142.0700</td></tr>
<tr><td>Minimum Educational Qualification and Experience</td><td>
<table>
<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>11th Standard</td><td>-</td></tr>
<tr><td>2.</td><td>10th or Equivalent</td><td>1.5 years relevant Experience</td></tr>
<tr><td>3.</td><td>8th grade pass</td><td>4.5 years relevant Experience</td></tr>
<tr><td>4.</td><td>Previous relevant NSQF Level 3 Achieved</td><td>1.5 years relevant Experience</td></tr>
</table>
</td></tr>
<tr><td>Pre-Requisite License or Training</td><td></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></td></tr>
<tr><td>NSQC Approval Date</td><td></td></tr>
<tr><td>QP Version</td><td></td></tr>
<tr><td>Model Curriculum Creation Date</td><td></td></tr>
<tr><td>Model Curriculum Valid Up to Date</td><td></td></tr>
<tr><td>Model Curriculum Version</td><td></td></tr>
<tr><td>Minimum Duration of the Course</td><td>600 Hrs.</td></tr>
<tr><td>Maximum Duration of the Course</td><td>600 Hrs.</td></tr>
</table>

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.

1. Familiarize work environment in the Plastics Blow Molding and allied industries
2. Understand the job requirement and related processes in Plastics and allied Industry
3. Work on entire Blow Moulding techniques to produce quality products-EBM, IBM, SBM.
4. Operate and Troubleshoot Blow Moulding machine and process.
5. Understand and apply various rules and Safety measures while working in Blow Moulding Industry

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/N 0411 : Maintain basic Health , Safety Practices at workplace, 5S	10	20	-	-	30
Module 2. CPC/N 0414: Basics of Plastics Processing methods	30	60	-	-	90
Module 3. CPC/N 0416: Auxiliary equipments in Plastics processing.	20	40	-	-	60
Module 4. CPC/N 0418: Basic Knowledge of Communication/soft skills.	10	20	-	-	30
Module 5. CPC/N 0420: Advanced method for Fitting Tools Measuring Equipments & Practice.	20	40	-	-	60
Module 6. CPC/N 0421: Introduction to test method for Polymers & Thermoplastics Materials.	20	40	-	-	60
Module 7. CPC/N 0423: Advanced Blow Moulding Techniques for Plastics processing and inspection of the finished products.	30	60	-	-	90
Module 8. CPC/N 0425: Advanced Mould Technology Techniques for Plastics Processing	30	60	-	-	90
Module 9. CPC/N 0427: Quality Management systems	10	20	-	-	30
Module 10. DGT/VSQ/NO/101 Employability Skill	30	-	-	-	30
On Job Training (OJT)	-	-	30	-	30
Duration (in Hours)	**210**	**360**	**30**	**-**	**600**

Module Details

Module 1: Maintain basic health and safety practices at the workplace, 5S

Mapped to: _____

Terminal Outcomes:

- Implement Workplace Safety Practices – Use personal protective equipment (PPE), identify hazards, and follow safe working procedures to protect self and others.
- Apply Fire Safety and Emergency Procedures – Operate fire extinguishers correctly, follow fire prevention measures, and demonstrate rescue techniques during fire hazards.
- Maintain 5S and Housekeeping Standards – Organize tools, equipment, and materials systematically, follow waste segregation procedures, and ensure a clutter-free workspace.
- Identify and Report Workplace Risks – Conduct regular checks on machinery and workplace conditions, report potential hazards, and raise safety awareness among colleagues.
- Follow Proper Storage and Handling Practices – Sort, label, and store raw materials, tools, and chemicals properly to prevent accidents, spills, and equipment damage.

Duration: *10*	**Duration**: *20*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Understand the Importance of Personal Protective Equipment (PPE) – Identify appropriate protective clothing and equipment for specific tasks and work conditions. • Explain Workplace Hazards and Safety Practices – Recognize potential hazards such as sharp objects, burns, falls, electricity, gas leaks, radiation, and chemicals, and understand safe working practices. • Demonstrate Fire Safety Awareness – Explain the different types of fire extinguishers and their correct usage. • Understand Risk Reporting Procedures – Identify potential risks in workplace layout, processes, and materials, and know how to report them to the concerned authorities. • Explain Waste Management and Sorting Processes – Understand segregation of hazardous and non-hazardous waste, proper waste disposal techniques, and storage guidelines. • Understand 5S Workplace Organization Principles – Explain sorting, labeling, and organizing tools, materials, and work areas for efficiency and safety.	• Demonstrate the use of protective clothing and equipment for specific work conditions. • Follow proper housekeeping procedures to minimize risks and maintain a safe work environment. • Use fire extinguishers correctly, apply rescue techniques during fire hazards, and implement preventive fire safety measures. • Regularly check machinery for potential hazards, report safety risks, and ensure workplace hygiene. • Sort and store tools, equipment, and materials in designated areas, follow floor markings, label instruments properly, and maintain workplace organization. • Check and store lubricants, oils, solvents, and chemicals properly to prevent spills, leakages, and fire hazards. • Follow correct stacking procedures for boxes and containers to prevent falls or breakage, and store all materials in designated locations.
Classroom Aids:	
Charts, Models, Video presentation, Flip Chart, White-Board/Smart Board, Marker, Duster,etc.	
Tools, Equipment and Other Requirements	
HDPE/PVC (extrusion grade),Weighing balance, steel measuring tape, micrometer, vernier caliper, radius gauge, feeler gauge, Hammer, screwdriver set, Allen key, twist drill bits, file, hacksaw, spanner set, crimping tools, Scrap grinder, automatic hopper loader, high-speed mixer, blender, agglomerator, weighing scale HDPE/PVC pipe extrusion plants, blown film extruder, extrusion blow molding machine, Die heads for HDPE/PVC pipes, dies for blown film and extrusion blow molding & Safety goggles, rubber gloves, asbestos gloves, fire extinguisher, apron, helmet, first aid box	

Module 2: Basics of Plastics Processing methods

Mapped to: _____

Terminal Outcomes:

- Understanding to plastics processing like methods, types, machinery, raw material type etc.
- Learning Types of processing methods, their properties, application, process etc. in detail, and comparison of Blow Molding with other process.
- Understand the basic knowledge of fundamental of Plastics Processing Methods.
- Understand the merits and demerits of Blow Moulding to over the all-others plastic Process.
- Follow Safety and Housekeeping Standards – Use safety equipment, follow operational precautions, and maintain proper storage and housekeeping practices.
- Understanding of process according to the component, material

Duration: *30*	**Duration**: *60*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Learn variety of methods used to process plastic. • Learn advantages and disadvantages of each process and specific applications. • Plastics processing encompasses the processing, design, development, and Manufacture of plastics products. • Understand the merits and demerits of Blow Moulding to over the all other plastic Process. • Different types of Plastics conversion techniques – Primary & Secondary processing method. • Understand the basic knowledge of fundamental of Plastics Processing Methods. • Commodity plastics and their application.	• Learn variety of methods used to process plastic, parts and functions, specifications. • Performance requirement as per practical approach. • Machine selection criteria based on application. • Understand the merits and demerits of Blow Moulding to over the all-other plastic Process. • Hand operated machines start up and shut down procedures. • Parameters of all the processing techniques. • Designing parts based on material and processing characteristics, considering part complexity and size as well as a product and process cost comparison
Classroom Aids:	
Charts, Models, Video presentation, Flip Chart, White-Board/Smart Board, Marker, Duster,etc.	
Tools, Equipment and Other Requirements	
HDPE/PVC (extrusion grade),Weighing balance, steel measuring tape, micrometer, vernier caliper, radius gauge, feeler gauge, Hammer, screwdriver set, Allen key, twist drill bits, file, hacksaw, spanner set, crimping tools, Scrap grinder, automatic hopper loader, high-speed mixer, blender, agglomerator, weighing scale Hand operated Blow and Injection moulding machines, Blow moulds, Die heads for HDPE/PVC pipes, dies for blown film and extrusion blow molding & Safety goggles, rubber gloves, asbestos gloves, fire extinguisher, apron, helmet, first aid box	

Module 3: Auxiliary equipment in plastic processing

Mapped to: ----------

Terminal Outcomes:

- Participants will learn about various auxiliary equipment commonly used in plastic processing, such as dryers, granulators, conveyors, material handling systems, molds, chillers, compressors, and robots.
- The understanding of their roles in improving the efficiency and quality of plastic production.
- Understanding the importance of dryer in moisture removal from raw materials.
- Learning about the importance of Granulator use in reducing plastic scrap or material to smaller sizes.
- Understanding temperature control mechanisms used to maintain optimal processing conditions through Chillers & Heaters.
- Gaining knowledge of automated systems for material handling, packing, and assembly.

Duration: *20*	**Duration**: *40*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Participants will learn about various auxiliary equipment commonly used in plastic processing, such as dryers, granulators, conveyors, material handling systems, molds, chillers, compressors, and robots. • The understanding of their roles in improving the efficiency and quality of plastic production. • **Dryers**: Understanding their importance in moisture removal from raw materials. • **Granulators/Shredders**: Learning about their use in reducing plastic scrap or material to smaller sizes. • **Chillers and Heaters**: Understanding temperature control mechanisms used to maintain optimal processing conditions. • Gaining knowledge of automated systems for material handling, packing, and assembly. • Training in identifying hazards related to the operation of auxiliary equipment, ensuring a safe working environment. • Understanding the routine maintenance and troubleshooting of these machines to ensure uninterrupted operations. • Learning techniques to optimize energy consumption of auxiliary equipment, contributing to lower operational costs. • Exploring strategies for reducing downtime and maintenance costs through the proper use of auxiliary equipment. • Gaining an understanding of how auxiliary equipment integrates with Blow Moulding machines to optimize the overall manufacturing process.	Hands-on Operation of Auxiliary Equipment: • Participants will gain experience operating various auxiliary equipment like dryers, granulators, cooling systems, robots, and material handling systems. • Understanding the setup and calibration processes to ensure that each piece of equipment functions optimally within the plastics processing workflow. • Participants will learn how to perform regular maintenance tasks on auxiliary equipment, including lubrication, cleaning, and inspecting parts for wear and tear. • Practical skills in troubleshooting common issues such as equipment malfunctions, inefficient operations, and incorrect settings. They will also learn to identify and resolve issues quickly to minimize downtime. • Practical experience with loading and unloading materials into and from auxiliary equipment (e.g., hoppers, dryers, granulators). • Understanding how to control the flow of materials through systems to ensure consistent production rates and prevent material blockages or contamination. • Hands-on training in setting up auxiliary equipment to minimize energy consumption, including adjusting settings to improve energy efficiency during the drying, cooling, and conveying processes. • Learning how to monitor and analyze energy usage, and implementing solutions to reduce energy waste during production. • Practical experience in integrating auxiliary equipment with main processing machines, such as injection molding machines or extruders, to enhance productivity. • Participants will learn to synchronize processes like material feeding, temperature control, and cooling to improve overall production efficiency. • Practical exposure to robotic systems, conveyors,

	and automated material handling systems used in plastic manufacturing, with hands-on training in programming and operating these systems. • Troubleshooting automation systems and learning to make adjustments as needed to maintain efficient production. • Hands-on learning of how auxiliary equipment impacts the quality of the finished product (e.g., how drying or cooling can affect the material properties). • Participants will develop skills in adjusting auxiliary equipment to ensure the desired product quality is achieved consistently. • Real-world problem-solving scenarios where participants will be asked to diagnose and fix issues related to equipment performance, safety, and production flow. • Troubleshooting mechanical and electronic problems in auxiliary equipment and figuring out effective solutions. • Practical training on safety protocols related to working with auxiliary equipment, such as using proper protective gear, understanding machine safety features, and ensuring safe handling of materials. • Hands-on experience with emergency procedures and equipment shutdowns to ensure safe operations in case of malfunctions. • Training on how to implement eco-friendly practices during the operation of auxiliary equipment, such as managing waste from granulators, reducing energy consumption, and using water and energy-efficient chillers. • Participants will learn how to monitor environmental factors during the operation of equipment to minimize the ecological footprint. • Practical experience with logging maintenance activities, repairs, and performance monitoring for auxiliary equipment. • Understanding how to create reports on equipment performance, efficiency, and issues to support production planning and improvements.
Classroom Aids:	
Charts, Models, Video presentation, Flip Chart, White-Board/Smart Board, Marker, Duster,etc.	
Tools, Equipment and Other Requirements	
Material (Blow grade),Weighing balance, steel measuring tape, micrometer, vernier caliper, radius gauge, feeler gauge, Hammer, screwdriver set, Allen key, twist drill bits, file, hacksaw, spanner set, crimping tools, Scrap grinder, automatic hopper loader, high-speed mixer, blender, agglomerator, weighing scale, Chiller, Cooling tower, extrusion blow molding & Safety goggles, rubber gloves, asbestos gloves, fire extinguisher, apron, helmet, first aid box	

Module 4: Basic Knowledge of Communication & Soft Skill

Mapped to:

Terminal Outcomes:

- Report Data and Incidents Accurately – Follow company procedures to document and report problems in the prescribed format.
- Complete and Maintain Documentation – Identify required records, ensure accuracy, and complete reports within the stipulated time.
- Ensure Proper Record Keeping – Store and make documents available for inspection by appropriate authorities.
- Handle Information Requests Professionally – Respond to and escalate information requests while following organizational procedures.
- Communicate with Authorities Effectively – Inform the appropriate personnel regarding incidents, reports, and documentation requirements.

Duration: *10*	**Duration**: 30
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Communication and its importance • Elements and Principles of Communication • Anatomy of a Computer and Components of a computer	• Study of Need for communicates communication and its importance, examples of good communication and case studies. • Study of Principles of effective communication, Process of communication, examples of effective Communication and case studies. • Study of Types of communication, verbal, non-verbal, written, e-mail, Learning introduction to computer, software & hardware, types of computers, windows, etc • Study of Working on computers for knowing about starting & stopping of the computer by using the mouse, word, excel, power point, internet etc. study of MS Office with examples like Bio data Preparation, etc
Classroom Aids:	
Charts, Models, Video presentation, Flip Chart, White-Board/Smart Board, Marker, Duster,etc.	
Tools, Equipment and Other Requirements	
Computer/Laptop, Printed Study Materials & Charts, MS Office Software (Word, Excel, PowerPoint), Registers & Logbooks	

Module 5: Advanced method for Fitting Tools Measuring Equipments & Practice.

Mapped to:

Terminal Outcomes:

- Understanding of Modern Fitting Tools.
- Understanding Advanced Fitting Techniques:
- Understanding Tool Selection
- Use Measuring Instruments and Tools – Operate vernier calipers, micrometers, and other equipment to assess product quality.
- Understand Integration with Manufacturing Systems
- Understanding the safety measures to avoid accidents related to tool usage, such as sharp tools, high-precision instruments, and heavy machinery.

Duration: *20*	**Duration**: *40*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Participants will learn how to use and maintain advanced fitting tools such as micrometers, calipers, digital readouts, height gauges, and surface plates. • Developing the ability to choose the right tool for specific applications, based on the material, tolerance levels, and required precision. • Participants will gain skills in ensuring high levels of measurement accuracy, including learning the principles of calibration, traceability, and measurement uncertainty. • Participants will understand the concepts of clearance, interference, and transition fits, and learn how to apply them in real-world manufacturing scenarios. • Learning how to measure and inspect parts during assembly to verify the correct fit and functioning of components, ensuring that assembly meets design specifications. • Developing skills to troubleshoot measurement-related issues and identify the causes of discrepancies, such as tool wear, environmental factors, or operator error. • Gaining insights into how measurement results can be used in feedback loops to improve production processes and reduce defects.	• Hands-on practice in measuring and ensuring that parts meet the specified tolerances and fit requirements, contributing to high-quality assembly • Operate micrometers, vernier calipers, gauges, and other quality-checking tools accurately • Gaining knowledge in calculating limits, fits, and tolerances for parts using advanced techniques such as Geometric Dimensioning and Tolerancing (GD&T). • Training participants to use advanced fitting tools for precise assembly, ensuring the correct positioning and alignment of components for smooth, functional operation. • Engaging in practical exercises where participants apply advanced fitting and measuring techniques to assemble and test components for accuracy and quality. • Applying principles of continuous improvement to measurement and fitting practices to enhance overall efficiency, accuracy, and consistency. • Gaining knowledge of the safety protocols involved in using advanced fitting tools and measuring instruments, such as proper handling, storage, and maintenance of tools. • Learning how measurement and fitting tools integrate with broader manufacturing systems, such as Blow Moulding machines, robotics, and automated inspection stations.
Classroom Aids:	
Charts, Models, Video presentation, Flip Chart, White-Board/Smart Board, Marker, Duster,etc.	
Tools, Equipment and Other Requirements	
Vernier Caliper, Micrometer, Radius Gauge, Feeler Gauge, Steel Measuring Tape & Weighing Balance	

Module 6: Introduction to test method for Polymers & Thermoplastics Materials.

Mapped to:

Terminal Outcomes:

- Understanding of Polymer and Thermoplastic Properties
- Gaining insights into the behavior of thermoplastics under different conditions, such as temperature and pressure, and how these properties affect their processing and end-use.
- Understanding the role of material testing in determining the suitability of polymers and thermoplastics for specific applications, ensuring optimal performance and safety.
- Identification of Plastics Material
-

Duration: *20*	**Duration**: *40*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Learning about Polymers, its type, characteristics, Melting point, processing parameters etc. • Nomenclature of plastics, types, grades etc. • Classification of polymers, polymer structure, density, Melt index, melting temperature, glass transition temperature and morphology, etc. • Understanding of commodity plastics, engineering plastics, their characteristics, speciality plastics. Study of PET material properties and its application in blow Molding. • Methods of Identification and common acronyms in the plastics and commercial trade names. • Importance of quality control in the manufacturing process • Parameters for product quality assessment (dimensions, weight, wall thickness, aesthetic quality) • Types of defects in blow molded products and their causes • Inspection standards and measurement techniques (calipers, gauges, weight checks)	• Participants will develop a clear understanding of different polymer types (thermoplastics, thermosets, elastomers) and their unique properties. • Identification of Plastics-By conventional methods. • Basic blow grade materials such as Polyolefin's-LDPE-HDPE –LLDPE- Polypropylene-copolymer PPCP- copolymer- Polyvinylchloride – Polyamides- Nylon 6 Nylon 66. PET material properties and its application in blow Molding. • Plastics material requirements for formation of parison and blowing. • Gaining knowledge about which test methods are suitable for different types of polymers, considering factors like material type, application, and performance • Visual inspection techniques for blow molded products • Hands-on use of measurement tools to check product dimensions (calipers, micrometers, etc.) • Identifying defects in the final product (color defects, surface finish, air pockets, etc.) • Based on the results of testing, participants will be able to select the most appropriate polymer or thermoplastic material for a specific application, considering factors like mechanical performance, thermal stability, and environmental resistance. • Developing an understanding of how the material's properties, such as strength, flexibility, and durability, affect its performance in practical applications (e.g., automotive, medical, or consumer products).
Classroom Aids:	
Charts, Models, Video presentation, Flip Chart, White-Board/Smart Board, Marker, Duster,etc.	
Tools, Equipment and Other Requirements	
Vernier Caliper, Micrometer ,Radius Gauge ,Feeler Gauge ,Steel Measuring Tape, Weighing Balance, MFI Tester, Density Tester etc.	

Module 7: Advanced Blow Moulding Techniques for Plastics processing and inspection of the finished products.

Mapped to:

Terminal Outcomes:

- Understanding Advanced Blow Moulding Processes
- Understanding Material Selection and Compatibility
- Understanding of Advanced Mould Design Techniques
- Advanced Inspection and Quality Control of Finished Products
- Advanced Troubleshooting and Process Optimization Skills
- Understanding Advanced Blow Moulding Applications

Duration: *30*	**Duration**: **60**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Principles and basics Of Blow Moulding • Explain the principles and working mechanisms of advanced blow molding processes such as **Stretch Blow Molding**, **Injection Blow Molding**, and **Multilayer Blow Molding**. • Identify the key advantages and disadvantages of various blow molding techniques based on product requirements and material properties. • Demonstrate the ability to configure blow molding machines for different types of plastics and end products. • Study of process parameters for the blow molding as per SOP • Check the operations of the equipment used in the Extrusion blow molding process • Study of parison Programming and Controlling of Parison and Preform • Organize for the material to be moulded and apparatus required for the same •	• Study of Principle of Blow Moulding process • Learning various types of blow moulding Process Merits and Demerits. • Understanding Extrusion blow moulding Process in detail. • Understanding process Parameters- Temperature, pressure, current, extruder speed etc. in line with the work instructions/ SOPs • parison Programming, parison Controlling wall thickness Effect and Blow Ration, Swell Ratio and air Pressure • Understand the material Use, lifting equipments or for lift/trolley for mold/material. Keep all safety requirements • Understanding and Record Optimization of Process Parameters, sequence and Operation as SOP. • Measure the final plastic molded product and compare the dimensions as prescribed in the work order/product requirement. • Learning about how to fill Log book. • Understanding of inspection to detect deviations. • Understanding and correction of minor defect of product • Feed the plastic granules in the hopper and conduct a test process • Conduct the actual moulding process monitor the molding process • Perform the visual inspection of the output and finishing operation • Inspection of finished goods to detect any deviations from the product design. • Record log of defective products and discard defective batch process. • Corrective batch process with minor defects. • Perform Batch Quality Procedure
Classroom Aids:	
Charts, Models, Video presentation, Flip Chart, White-Board/Smart Board, Marker, Duster,etc.	
Tools, Equipment and Other Requirements	
Hammer, screw driver set with Multiple heads, Allen key hexagonal , File triangular, Hacksaw, adjustable, Spanner set double side, Adjustable spanner, Automatic Hopper Loader, Hot air oven and Dryer, Dehumidifier, Mould Temperature Controller, Scrap Grinder, Crane, Air Compressor, Hot air blow Gun, Water cooling Tower, Hand operated Blow Moulding Machine, Fully automatic Blow Moulding Machine,Rubber Gloves, Asbestos gloves, Fire Extinguisher, Apron, Helmet, First Aid Box with Medicines	

Module 8: Advanced Mould Technology Techniques for Plastics Processing

Mapped to:

Terminal Outcomes:

- participants will be capable of maintaining advanced blow moulds for complex plastic parts.
- participants will be capable of Selecting the right materials and technologies to meet specific production and product requirements.
- participants will be capable of Implementing effective process control methods for moulding, optimizing both quality and productivity.
- participants will be capable of Troubleshooting, repairing, and maintaining moulds to minimize downtime and ensure continuous production.
- participants will be capable of Adhering to sustainability practices in mould technology, contributing to reducing the environmental footprint of the plastics industry.
- participants will be capable of Safety Standards in Advanced Mold Technology

Duration: *30*	**Duration**: *60*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Study of type of mold Manufacturing • Study of Types of Mould temperature controller –Chillers, MTC associated with the moulding process. • Understanding requirement of Preform mold construction and polish requirements. • PET Preform mold construction and polish requirements. • Discuss how advancements in blow molding technologies can improve product quality, cycle times, and cost efficiency in mass production. • the impact of material selection on the life cycle of molds, maintenance requirements, and overall efficiency in the production process. • Develop strategies for **preventive maintenance** and **repair procedures** to minimize downtime and reduce the risk of mold-related production disruptions.	• Explain the principles and differences between advanced blow molding techniques, such as **Extrusion Blow Molding (EBM)**, **Injection Blow Molding (IBM)**, **Stretch Blow Molding (SBM)**, and **Multilayer Blow Molding**. • Demonstrate blow molds for different product types, including the impact of mold geometry, cavity design, cooling systems, and venting to achieve optimal product quality • Explain the use **cooling channels** in molds to reduce cycle times and improve the quality of blow-molded products. • Understand and optimize blow molding machine settings (air pressure, material temperature, and cooling rate) to ensure high-quality production of molded products with uniformity in thickness and shape. • Troubleshoot common issues in blow molding, such as air bubbles, excessive flash, and uneven wall thickness, identifying and correcting the underlying causes. • Perform hands-on maintenance tasks for blow molds, including cleaning, lubrication, and inspecting for signs of wear, corrosion, or damage. • Apply best practices for the regular maintenance of blow molds to ensure long service life, including cleaning, lubricating, and inspecting for wear or defects. • Operate advanced blow molding machinery for different product sizes and complexities, adjusting parameters to achieve optimal product quality and minimal defects.
Classroom Aids:	
Charts, Models, Video presentation, Flip Chart, White-Board/Smart Board, Marker, Duster,etc.	
Tools, Equipment and Other Requirements	
Allen key hexagonal , File triangular, Hacksaw, adjustable, Spanner set double side, Adjustable spanner, Automatic Hopper Loader, Hot air oven and Dryer, Dehumidifier, Mould Temperature Controller, Scrap Grinder, Crane, Air Compressor, Hot air blow Gun, Water cooling Tower, Hand operated Blow Moulding Machine, Fully automatic Blow Moulding Machine,Rubber Gloves, Asbestos gloves, Fire Extinguisher, Apron, Helmet, First Aid Box with Medicines	

Module 9: Quality Management systems

Mapped to:

Terminal Outcomes:

- Understand and Implement Quality Management Systems (QMS)

Duration: *10*	**Duration**: 20
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Study and understanding of Total Quality Control, Need of Management of Product Quality Introduction to TQM • Identify and describe the key principles of quality management, including customer focus, leadership, engagement of people, process approach, improvement, and evidence-based decision making. • Study of Behavioural Science and Entrepreneurship development • Implement continuous improvement strategies such as Plan-Do-Check-Act (PDCA) and Six Sigma to drive organizational excellence. • Evaluate and measure the effectiveness of QMS through regular audits, reporting on non-conformities, and ensuring that corrective and preventive actions (CAPA) are implemented.	• Understand the Concept of Total Quality Management. Understanding the TQM Philosophy. • Understanding the need for Quality system. • Demonstrate a comprehensive understanding of Quality Management Systems (QMS) frameworks, with a focus on **ISO 9001**, and apply them effectively within an organization. • Develop and document quality processes for production and service operations, ensuring alignment with industry standards like **ISO 9001**. • Identify and document key quality processes (e.g., production, design, customer service) and establish performance metrics to ensure continual monitoring and improvement. • Apply customer satisfaction data to make improvements to products or services, ensuring that quality standards align with customer expectations. • To visit industry in nearby area and prepare a report on visit which will include name of industry visited, product range, machinery used, manpower employed etc
Classroom Aids:	
Charts, Models, Video presentation, Flip Chart, White-Board/Smart Board, Marker, Duster,etc.	
Tools, Equipment and Other Requirements	
Vernier Caliper, Micrometer ,Radius Gauge ,Feeler Gauge ,Steel Measuring Tape & Weighing Balance etc.	

Module 10. Employability Skills

Mapped to: DGT/VSQ/N0101: Employability Skills

Mandatory Duration: *30:00*			
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.	Whiteboard	As required
Note: Above Tools & Equipment not required, if Computer LAB is available in the institute.		

Module 11: On-the-Job Training

Mandatory Duration: *30:00*
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 job role relevant skill training course from CIPET.	Recommended that the Trainer Should have done 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
OJT	On-the-job Training
PwD	People with Disability PPE Personal Protective Equipment ES Employability Skills
PPE	Personal Protective Equipment
ES	Employability Skills