**CONTACT DETAILS OF THE AWARDING BODY FOR THE QUALIFICATION**

**Name and address of awarding body:** Central Institute of Plastics Engineering andTechnology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Hajipur, Industrial Area, Vaishali, Bihar. 844102.

**Name and contact details of individual dealing with the submission**

Dr. P.C. Padhi,Director& Head, CIPET Hajipur, Industrial Area, Vaishali, Bihar. 844102. Ph: +91-6224-277424,270085,273515.

E-mail address**:**cipetpatna@gmail.com, hajipur@cipet.gov.in

**SUMMARY**

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| **Qualification Title:** Machine Operator – Blow Moulding |
| **Nature and Purpose of the qualification:**  A CIPET trade certificate for Machine Operator-Blow Moulding and the he individual at work sets up and operates the blow moulding machine to produce good quality products from Plastics materials. He is responsible for produce bottles, containers or others hollow objects from plastics resin by operating semi & fully automatic and advance blow Moulding machines, troubleshooting process problems and performing minor maintenance to ensure continued operation of the production line. They are also responsible for completing the output learn Good Manufacturing Practices. |
| **Body/bodies which will award the qualification:**  Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Hajipur, Industrial Area, Vaishali, Bihar. 844102. |
| **Body which will accredit providers to offer courses leading to the qualification:**  Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Hajipur, Industrial Area, Vaishali, Bihar. 844102. |
| **Body/bodies which will be responsible for assessment:**  The assessment is being carried out at of Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Hajipur, Industrial Area, Vaishali, Bihar. 844102. |
| **Occupation(s) to which the qualification gives access:**  Blow Moulding Operator occupation in Plastics product manufacturing process. |
| **Proposed level of the qualification in the NSQF:** Level |
| **Anticipated volume of training/learning required to complete the qualification:**  800 Notional hours. |
| **Entry requirements / recommendations:**  Minimum qualification – Preferably Min -Class X/ITI, Minimum age - 18 years completed. |
| **Progression from the qualification:**  The Blow Moulding Operator has a clear pathway. |
| **Planned arrangements for the Recognition of Prior learning (RPL):**  RPL arrangements are being developed and will be informed in due course of time. |
| **International comparability where known:** It will be carried out in next phase ascomparability is being verified. |
| **Date of planned review of Qualification:** 20.10.2017 |

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| **Format Structure of the Qualification:** | | | |
| **Title and Identification code of component** | **Mandatory/ Optional** | **Estimated Size (Notional Hours)** | **Level** |
| 1. Maintain basic health and   safety practices at the workplace, 5S. | M | 60 |  |
| 1. Fitting Tools Measuring   Equipments& Practice | M | 80 |  |
| 1. Introduction to Polymers and   thermoplastics Materials | M | 80 |  |
| 1. Basics of Plastics Processing   methods | M | 90 |  |
| 1. Blow Moulding Techniques for   Plastics processing and inspection of the  finished products. | M | 150 |  |
| 1. Auxiliary equipments in   Plastics processing. | M | 120 |  |
| 1. Mould Technology Techniques   for Plastics Processing | M | 80 |  |
| 1. Communication/soft skills and   Basic Computer concepts | M | 80 |  |
| 9. Quality Management systems | M | 60 |  |
|  |  | 800 |  |

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| **Body/Bodies which will carry out assessment:**  A Separate department/ body -Training Assessment Wing of Central Institute of Plastics  Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of  Chemicals and Petrochemicals, Govt. Of India, Hajipur, Vaishali, Bihar 844102.  **Will the assessment body be responsible for RPL assessment?**  RPL arrangements are being developed and will be informed in due course of time.  **Describe the overall assessment strategy and specific arrangements which have been put in**  **place to ensure that assessment is always valid, consistent and fair and show that these are in**  **line with the requirements of the NSQF:**  With uniformity and setting of learning outcomes for different Jobs Roles the assessment ofcandidates will be at learning outcome level. Assessment criterion has been defined for eachlearning outcome and it includes both theoretical and practical skills on which the candidate will  be assessed. The question suite which will be used to check the skills of the trainee wouldinclude  **Theoretical test suite –** Will include multiple choice questions, audio-video question etc.  which will test the trainee on his knowledge of the subject  **Practical Knowledge suite –** Practical knowledge can be tested through Assessor drivenevaluation/test, Situational Judgment Tests etc to test practical core competence. Amix of these would be able to evaluate the trainee on his practical knowledge of the  Qualification Document.  **Assessment strategy:**   1. Assessment criteria for Qualification Document have been developed. Each Learning Outcome have separate marks for Theory and Practical Skills. 2. The Training Assessment Wing will have assessors who will not be associated with   training activities and will be provided training on the said work. Thus it will ensure that  the assessment carried out is fair and consistent.   1. Set of question bank developed to assess the theoretical and practical knowledge. To   ensure the quality, each trainees get the unique set of question   1. Student has to score minimum marks separately for theoretical and practical skill and overall percentage should also be 50% for theory and 70% for practical. 2. Empanelment of subject matter expert as assessor to assess trainee specifically on   practical skills   1. Assessments are preferably conducted by written examination papers in English/   regional languages according to the requirement.   1. It has been ensure that TP/trainer should not be present during assessment |

**Assessment Process Flow:**

**Request for evaluation of batch by**

**Training Partner**



**Allocation of batch to Training Assessment wing**



**Evaluation of batch by Training Assessment wing as per schedule and as per Assessment Process**



**Assessment observation data input sheet from Training Assessment wing including viva, practical and theory marks**



**Result finalization**



**Uploading of result on IT database platform**

**Summative Assessment**:

Based on the Total Marks allotted for the specific subject, formal evaluation shall be conducted. Based on secured marks, candidates shall be declared pass or fail.

Steps undertaken for summative assessment:

1. Based on Completion of Batch, Evaluation Schedule shall be prepared
2. Identified Assessor is nominated for Evaluation
3. Setting up of separate Question Paper for Theory & Practical Examination
4. Conduct of examination as per the schedule
5. Evaluation & Certification

**Evidence Collected during Assessment:** Theoretical Answer Sheets, Practical Exam Sheets,Evaluation Sheets, Jobs produced during practical Exams.

**Protocol for Selection of Assessors:**

* The Assessors should have the minimum qualification: Degree in Engineering.
* The Assessors should have minimum 5 years of Experience in the relevant field.

**ASSESSMENT EVIDENCE**

**Assessment Guidelines:**

1. Criteria for assessment for each Qualification Document will be created by CIPET.
2. Each Assessable outcome (AO) will be assigned marks proportional to its importance in Learning Outcome and few performance criteria may be allotted marks in combine.
3. Each Learning Outcome will be assessed both for theoretical knowledge and practical which is being proportionately demonstrated in the table below.
4. The assessment for the theory part will be based on knowledge bank of questions created by CIPET which will contain multiple choice theory questions and Practical question database with mark allotment criteria.
5. To pass the Qualification Document, every trainee should score a minimum of 50 % in Functional and all Generic Learning Outcome’s.
6. In case of successfully passing only certain number of Learning Outcome’s, the trainee is eligible to take Subsequent assessment on the balance Learning Outcome’s to pass the Qualification Document.

**Title of the Component:** Machine Operator - Blow Moulding

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| --- | --- | --- | --- | --- |
| **Assessable outcome** | | **Assessment criteria for the**  **outcome** | | |
| **LO** | **Assessable outcome Description** | **Theory** | **Practical** | **Total** |
| 1. Maintain basic   health and  safety practices  at the  workplace, 5S. | A01. Use protective clothing/equipment for  specific tasks and work conditions  A02. Carry out safe working practices while  dealing with hazards to ensure the safety of Self  and others.  AO3. Apply good housekeeping practices at all  times  AO4. Use the various appropriate fire  extinguishers on different types of fires correctly  AO5. Demonstrate rescue techniques applied  during fire hazard, demonstrate good  housekeeping in order to prevent fire hazards,  demonstrate the correct use of a fire  extinguisher.  AO6. 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.  AO7. Inform the concerned authorities on the  potential risks identified in the processes,  workplace area/ layout, materials used etc,  Inform the concerned authorities about machine  breakdowns, damages which can potentially  harm man/ machine during operations.  AO8. Create awareness amongst other by sharing  information on the identified risks.  AO9. Follow the sorting process and check that  the tools, fixtures & jigs that are lying on  workstations are the ones in use and unnecessary  items are not cluttering the  workbenches or work surfaces.  AO10. Ensure segregation of waste in hazardous/  non Hazardous waste as per the sorting work  instructions  AO11. Follow the technique of waste disposal  and waste storage in the proper bins as per SOP  AO12. Segregate the items which are labeled as  red tag items for the process area and keep them  in the correct places  AO13. Sort the tools/ equipment/ fasteners/  spare parts as per specifications/ utility into  proper trays, cabinets, lockers as mentioned in  the 5S guidelines/ work instructions  AO14. Ensure that areas of material storage  areas are not overflowing  AO15. Properly stack the various types of boxes  and containers as per the size/ utility to avoid any  fall of items/ breakage and also enable easy  sorting when required  AO16. Return the extra material and tools to the  designated sections and make sure that no  additional material/ tool is lying near the work  area  AO17. Follow the floor markings/ area markings  used for demarcating the various sections in the  plant as per the prescribed instructions and  standards.  AO18. Follow the floor markings/ area markings  used for demarcating the various sections in the  plant as per the prescribed instructions and  standards.  AO19. Check that the items in the respective  areas have been identified as broken or damaged.  AO20. Follow the given instructions and check for  labelling of fluids, oils, lubricants, solvents,  chemicals etc. and proper storage of the same to  avoid spillage, leakage, fire etc. | 18 | 42 | 60 |
|  | Sub Total | 18 | 42 | 60 |
| **2. Fitting Tools**  **Measuring**  **Equipments&**  **Practice** | AO1. Comply with health and safety,  environmental and other relevant regulations and  guidelines at work .  AO2. Adhere to procedures and guidelines for  personal protective equipment (PPE) and other  relevant safety regulations while performing die  fitting operations  AO3. Work following laid down procedures and  instructions  AO4. Ensure work area is clean and safe from  hazards  AO6. Obtain job specification from a valid &  approved source  AO7. Read and understand job requirements  from the job specification document properly  AO8. Report & rectify incorrect information in  job specification documents as per job  requirement  AO9. Preparation for the fitting operations as per  procedure  AO10. Ensure that all calibrated measuring  instruments used.  AO11. Ensure that the components used are free  from foreign objects, dirt and corrosion  AO12. Obtain correct work pieces and  consumables as per job requirements  AO13. Obtain appropriate tools and measuring  instruments.  AO14. Setting of work pieces as per job  requirements using appropriate holding devices  AO15. Marking specified features with the help  of marking-out methods on the work pieces as  per job specification by using appropriate  measuring and marking tools.  AO16. mark out templates for  tracing/transferring the specified features on the  work pieces as per drawing  AO17. Tracing or transfer the specified features  from the templates onto the work pieces as per  drawin.  AO18. Perform fitting operations on various forms of metal components using a range of hand  tools and manually operated machines  AO19. Follow the specified machining sequence  and procedure as per job specifications  AO20. Check the machined components to  ensure completeness of work  AO21. Check the quality of the output as per  required standards, using visual checks and  measurement of dimensional parameters using  measuring instruments.  AO22. Produce components with various  features as per standards applicable to the  process.  AO23. Check the finished components as per job  requirement  AO24. Complete documentation during and post  operations as per procedures  AO25. Return all tools and equipment to the  correct location on completion of the fitting  activities  AO26. Leave the work area in a safe and tidy  condition on completion of job activities | 24 | 56 | 80 |
|  | Sub total | 24 | 56 | 80 |
| **3. Introduction to**  **Polymers and**  **thermoplastics**  **Materials** | AO1. Basic Importance of polymers in Human  Life.  AO2. Study of fundamental terminology of  polymers  AO3. Classification of polymers- polymer  structure & morphology, etc  AO4. Introduction to monomers and Polymers  AO6. Types of Polymerization- Condensation-  Addition- Copolymerization  AO7. Characterization  AO8. Polymer Solution  AO9. Measurement of Molecular weight and  sizes-Structure and properties of Polymers.  AO10. Commodity Polymers: Polyolefin: LDPE –  HDPE – LLDPE, PP etc.  AO11. Engineering Polymers: PC, ABS, PMMA,  POM and PA- Nylon etc.  AO12. Special Polymers: FEP, PVDF etc and PET  material properties and its application in blow  Molding.  AO15. Conventional Methods of Identification:-  Drop Test, water floatation Test, Scratch test  AO16. Advanced Methods of Identification:-MFI, Melting etc. and common acronyms in the plastics and commercial trade names. | 24 | 56 | 80 |
|  | Sub total | 24 | 56 | 80 |
| 4. **Basics of**  **Plastics**  **Processing**  **methods** | AO1. The need for plastics processing  AO2. Ensure merits and demerits of Blow  Molding to over the all others plastic Process.  AO3. Definition and terminology related to  Plastic Processing.  AO4. Ensure finishing operation including surface  treatment of the fabricated product if required as  per SOP.  AO5. Primary Processing Methods as per  company’s SOP.  AO6. Secondary Processing Methods as per  company’s SOP.  AO7. Processing fundamentals  AO.8 The type of process to be used depends on a  variety of factors, including product shape and  size, plastic type, quantity to be produced, quality  and accuracy (Tolerances) required, design load  performance, cost limitation, and time schedule.  AO.9 Machine Operation Terminology: as per  manual, semiautomatic, fully automatic.  AO.10 Type of Conversion Techniques: Injection,  Blow, Compression, Transfer, Rotational and  Other processes and comparison of Blow  Molding with other process.  AO11. Material to be processed 1 6 7  AO12. Product design / configuration, Tolerance. AO13. Process Limitations AO14. Quality  AO15. Cost / Performance balance. | 27 | 63 | 90 |
|  | Sub Total | 27 | 63 | 90 |
| 5. **Blow Moulding**  **Techniques for**  **Plastics**  **processing and**  **inspection of**  **the finished**  **products.** | AO1. Study of Principle of Blow Molding process.  • Plasticizing/ melting the resin  • Parison or preform production  • Blowing of  • Ejection of the part and trim  AO2. Basic Need of Tools and Accessories and  Machineries.  AO3. Understanding of Plastic Material for Blow  Molding- Commodity-Polyolefin’s, Engineering-  PET  AO4. Various types of extrusion blow moulding  Process.  AO5. Continuous blow moulding process:- single head method, Twin station method, Rotary table  System.  Intermitted blow moulding process:-  Reciprocating screw extruder, Ram accumulator  extrusion Accumulator head method  AO4. Study of Extrusion blow molding (EBM) AO5. Study of Injection blow molding(IBM)  AO6. Study of Injection Stretch blow molding  process (ISBM)  AO7. Study of Extrusion Stretch Blow Molding 0AO8. Various types of blow moulds-Side feed,  Centre Feed, Spiral Mandrel, Extrusion Blow,  stretch Blow, Injection Blow molds etc.  AO9. Setting of PET Injection moulding Machine  operation , Load the material in the correct  pattern as per SOP to minimize material  overflow/ wastage/ excess flash  AO10. Check the identified feed strip for  dimension uniformity/identified granules  AO11. Make the plastic compound or granule  ready for feeding into the machine  AO12. Start the machine and feeding  simultaneously  AO13. Ensure that moulding pressure and  temperature is maintained during the process  cycle  AO14. Ensure mould lifting/ ejection/ slide  mechanism of the press are properly functioning  AO15. Manufacturing the preform as per SOP  AO16. Remove the Manufacturing the preform  from the mould as per SOP.  AO17. Check for operation of molding apparatus  like hopper, heaters, extruder, blow molding  die/mold, screen pack etc. as per the checklist  provided  AO18. Fix the desired die/mold to the blow  molding machine apparatus in order to achieve  the desired operation as per the Work  Instructions/ SOPs  AO19. 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  AO20. Use weighing machines to measure the  quantity of granules and ensure that the correct  quantity of granules are put in the hopper.  AO21. Check the parameters – Temperature,  pressure, current, extruder speed etc. in line with  the work instructions/ SOPs  AO22. Setup the apparatus as per the selected  process and the moulding standards used in the  processing industry  AO23. Adjust the temperature and other  parameters of the moulding apparatus as per the  values given in Work Instructions/ SOPs  AO24. Ensure availability of the coolant and  working of valves to circulate the coolant to cool  and solidify plastic  AO25. Ensure the functionality and assembly of die as per SOP.  AO26. Adjust the Parison controlling and  program the parison with the help of parison  programming tools and software as per  requirement.  AO27. Die shaping in blow molding.  AO28. Study the types of mandrel used in blow  molding.-Divergent and convergent.  AO29. Study of Blow Ratio, parison swell, Die  Swell, Types of Parison Blowing system:-  Pneumatic and ejection system  AO30. Understand the molding procedure &  process to be adopted for completing the work  order from the supervisor by referring the Work  Instruction document/ SOP manual  AO31. Set the various molding parameters like  temperature of heaters, back pressure/ air  pressure/ vacuum pressure, screw speed of the  extruder, regulating current, flow of coolant/  water etc. before starting the process. Process  parameters are mentioned in the Work  Instructions/ SOP manual  AO32. Understand raw material like plastics  granules, fillers, bonding additives grades etc.  required for executing the activity  AO33. Ensure that the required material is  procured from the store before starting the  process  AO34. Understand the type of Die required for  executing the required operation and ensure that  the same is available for operations  AO35. Understand the number of heaters  required for the extruder assembly, heater  temperature and current required for the heating operations as mentioned in the Work  Instructions/ SOP manual. Ensure housekeeping  safety in the molding area. Use lifting equipments  or for lift/trolley for mold/material. Keep all  safety requirements.  AO36. Preheating of plastic granules to improve  their tensile strength  AO37. Ensure that the plastic granules are mixed  with additives (if any) before being fed into the  hopper  AO38. Turn valves of machines to regulate screw  speed and quantity of the plastic coming out of  the hopper  AO39. Ensure pouring in line with the defined  standards and specifications  AO40. Record the feeding observations like  interrupted pouring or any abnormality  • In case extrusion blow molding.  • In case of Injection Blow Molding.  • In case of Injection Blow Molding  • Optimization of Process Parameters.  AO41. Conduct a test process and produce a  sample output as per the sketches/ engineering  drawing shared with the supervisor.  AO42. Check the hollow articles (bottles,  container) for geometry, material & dimensional  parameters as per the Control Plan before  starting the production.  AO43. Ensure that the dimensions of the output  product are measured as per the process given in  the Work Instructions/ SOP. In case the test  product matches the dimensions and quality of  the final output, start the production process  AO44. Feed the required operation code in the  apparatus for heaters to melt the plastic granules  at the predefined temperature  AO45. Adjust the extruder speed and the  extruder pressure to force the molten plastic into  the die to create the desired output.  AO46. Turn valves of machines to regulate speed  and quantity of the plastic coming out of the  hopper  AO47. Ensure feeding in line with the defined  standards and specifications  AO48. Record the feeding observations like  interrupted pouring or any abnormality.  AO49. Ensure the proper functioning of screen  pack and die for uniform melting of plastic and  removal of the contaminants (if any)  AO50. Monitor the process (parameters like  temperature, pressure, speed etc.) by observing  and analyzing the readings on various panels/  meters to prevent machine breakdown and  deviations of the output from desired  specifications  AO51. Observe and analyze any irregularity in the  process and take preventive steps  AO52. Clean the die opening & die; changing the  screen pack.  AO53. Ensure code printing of the product with  the identifying information (wherever required)  and send the same for further processing  AO54. Instruct the helper to neck finishing and  pinch off of the product as per the desired  geometric specifications. (doesn’t required for  IBM)  AO55. Measure the final plastic molded product  and compare the dimensions as prescribed in the  work order/ engineering drawing  AO56. In case the parts are not as per the given  measurements, send the same for further  processing in terms of cutting, finishing etc.  AO57. Measure the specifications of the finished  products using devices like micrometers, Vernier  calipers, gauges, rulers, weighing scales,  Thickness Gauge and any other inspection  equipment and compare with the parameters  given in the work order.  AO58. Compare texture, surface properties,  hardness and strength with the given product  specifications  AO59. Note down the observations of the basic  inspection process and Identify pieces which are  OK and also not meeting the specified standards  AO60. Discard the batch which are beyond repair  and repair the ones which need minor  modifications in settings.  AO61. Maintain records of each category of work  outputs as per the batch etc. so that correction  can be organized.  AO62. Establish linkage between rejection of  output and the pertinent causes for the same  (process/ material etc.); Recommend the means for rejection control.  AO64. Rectify minor defects like dimension  variation, thickness variation etc. by control  process parameters etc.  AO65. Escalate all issues related to change in  surface properties, Tensile strength etc. so that  the manufacturing equipment can be reset to  achieve the specified output  AO66. Provide first and last output from each  batch to the lab for quality check on its  composition, properties etc.  AO67. Obtain clearance for the entire batch from  the lab | 45 | 105 | 150 |
|  | Sub total | 45 | 105 | 150 |
| 6. **Auxiliary**  **equipments in**  **Plastics**  **processing.** | AO1. Some duties include: Inspecting,  monitoring, operating fuel systems, fuel oil  transfer & supply lines & associated equipment  and fossil fuel chillers.  AO2. Operating condensate & feed water  systems, circulating & cooling water systems,  condensate & makeup systems, circulating  service water treatment equipment, auxiliary  lube oil systems, emission control equipment and  miscellaneous equipment. Pass onsite training  programs. Follow safety rules, regulations and  procedures.  AO3. Setup and maintain molding machines and  specified auxiliary equipment to meet production  quality and quantity requirements.  AO4. Connects basic plant services as needed to  meet production requirements and makes initial  checks of operating conditions before initiating  production runs.  AO5. Complete complex job changes on molding  machines and auxiliary equipment.  AO6. Assist in cleaning and lubrication of  equipment and tooling and performs various  preventative maintenance tasks as needed.  AO7. Study of different types of Predrier-Hot air  Oven, Hopper Driers, Dehumidifiers etc.  AO8. Working of Chiller, Cooling Tower for the  controlling temperature of Mold, machine and  Fluids.  AO9. Operation Monitoring -- Watching gauges,  dials, or other indicators to make sure a machine  is working properly Operation and Control --  Controlling operations of equipment or systems.  AO10. Getting Information - Observing, receiving,  and otherwise obtaining information from all  relevant sources.  AO11. Controlling Machines and Processes -Using  either control mechanisms or direct physical  activity to operate machines or processes.  AO12. Study of Compressor and Scrap Grinder. 0.5 2 2.5  AO13. Equipment Maintenance -- Performing  routine maintenance on equipment and  determining when and what kind of maintenance  is needed.  AO14. Equipment Selection -- Determining the  kind of tools and equipment needed to do a job.  AO15. Troubleshooting -- Determining causes of  operating errors and deciding what to do about it.  AO16. Follow the instructions given on the  equipment manual describing the operating  process of the equipment  AO17. Follow the Safety, Health and Environment  related practices developed by the organization  AO18. Ensure relevant safety board’s/ signs are  placed on the shop floor  AO19. Operate the machine using the  recommended Personal Protective Equipment  (PPE) and ensure team members also use the  related PPEs at the workplace  AO20. Maintain a clean and safe working  environment near the work place and ensure  there is no spillage of chemicals, production  waste, oil, solvents etc.  AO21. Attend all safety and fire drills to be selfaware  of safety hazards and preventive  techniques  AO22. Maintain high standards of personal  hygiene at the work place  AO23. Ensure that the waste disposal is done in  the designated area and manner as per  organization SOP. | 36 | 84 | 120 |
|  | Sub total | 36 | 84 | 120 |
| **7.**  **Mould**  **Technology**  **Techniques for**  **Plastics**  **Processing** | AO1. Basic Study of Mould Material requirement,  Mold Manufacturing Process and machineries.  AO2. Compute dimensions, sizes, shapes and  tolerances of machining component are as per  specifications and as per company procedures  AO3. Determine information such as number of  parts to make, engineered components and material to be used, and machines to be used.  AO4. Identify and confirm resources required  such as components, machinery, range of  materials and processes  AO5. Study of range of Materials and how its  effect on process and life of mould: Ferrous  metals: eg. Carbon steels, stainless steels, cast  iron, tool steel, hard metals; Non-ferrous alloys  AO6. Identify the operations that will be required  for machining components based on design  requirements  AO7. Identify type of equipment required for  machining components based on the operations  selected.  AO8. Comparison of Blow Mold with the  Injection rotational merits and demerits for  overcome the above process mould.  AO9. Construction and study Mold for EBM, IBM,  and SBM.  AO10. Mold cooling systems:-Pneumatic, water  cooling  AO11. Basic Study of The main components of  molds (Die Core, Die Cavity And Screw Neck) are  made by injection process, which are made of  special mold steel.  AO12. Cavities Preform Mold, designed and  developed as per SOP  AO13. Follow the instructions given on the  equipment manual describing the operating  process of the equipment | 24 | 56 | 80 |
|  | Sub total | 24 | 56 | 80 |
| **8**  **:Communicatio**  **n/soft skills and**  **Basic Computer**  **concepts** | AO1. Accurately receive information and  instructions from the supervisor and fellow  workers, getting clarification where required  AO2. Accurately pass on information to  authorized persons who require it and within  agreed timescale and confirm its receipt  AO3. Give information to others clearly, at a pace  and in a manner that helps them to understand  AO4. Display helpful behavior by assisting others  in performing tasks in a positive manner, where  required and possible  AO5. Consult with and assist others to maximize  effectiveness and efficiency in carrying out tasks  AO6. Display appropriate communication  etiquette while working  AO7. Display active listening skills while  interacting with others at work  AO8. Use appropriate tone, pitch and language  to convey politeness, assertiveness, care and  professionalism  AO9. Demonstrate responsible and disciplined  behaviors at the workplace  AO10. Escalate grievances and problems to  appropriate authority as per procedure to resolve  them and avoid conflict  AO11. Stimulus  AO12. Encoding/message  AO13. Channel  AO14. Decoding  AO15. Receiver  AO16. Barriers  AO17. Principle of Communication Process  • Clarity  • Conciseness  • Objectivity  • Consistency  • Completeness  • Relevancy  • Audience Knowledge  AO18. Study of Fundamental of Computers.  AO19. Components of Computer: - Hardware and  the software.  AO20. Study of Hardware Component:- central  processing unit (CPU), memory, storage device,  input devices, output devices.  AO21. The computer accepts input  AO22. The computer performs useful operations  AO23. The computer stores data  AO24. The computer produces output.  AO25. Turning the Computer On and Logging On  AO26.Introduction to Microsoft Office  AO27. Study of MS Word  AO28. Study of MS Excel  AO29. Study of MS PPT. | 24 | 56 | 80 |
|  | Sub total | 24 | 56 | 80 |
| **9.**  **Quality**  **Management**  **systems.** | AO1. Study and understand of Total Quality  Control  AO2. Need of Management of Product Quality.  AO3. Understand the Concept of Total Quality  Management.  AO4. Understanding the TQM Philosophy.  AO5. Understanding the need for Quality system.  AO6. Study and understand of Total Quality  control tools - ISO, 5S, Six Sigma, OHSAS 18001  AO7. Study and understand of Behavioral Science.  AO8. Different between Behavioral Science and  Social Science.  AO9. Categories of Behavioral Science.  AO10. Theories of Behavioral Psychology,  Entrepreneurship development, preparing project  report selecting a particular plastic product of  their choice and submission. | 18 | 42 | 60 |
|  | Sub total | 18 | 42 | 60 |
|  | Total | 240 | 560 | 800 |
| **Means of assessment 1:**  The assessment comprise of -Theory Assessment  Viva voce  Practical assessment | | | | |
| **Means of assessment 2:**  Pass/Fail-  The Pass mark of theory written assessment is 50% and for viva and practical assessment is 70%.  The candidate has to pass separately in Theory and Practical. | | | | |

**EVIDENCE OF LEVEL**

**Level of qualification**

|  |  |  |  |
| --- | --- | --- | --- |
| **Title /Name of Qualification/Component:** Machine Operator **-** Blow Moulding  **Level:** | | | |
| **NSQF Domain** | **Outcomes of the**  **Qualification/Component** | **How the job role**  **relates to the NSQF**  **Level descriptors** | **NSQF**  **Level** |
| **Process** | Machine Operator **-** Blow Moulding  is expected to ensure housekeeping  and safety in the moulding area and  select the correct mould, etc he/she  has to-  Understanding the work order and  the process requirement from the  supervisor  Arranging the required raw  material and Moulds for the  process  To interact with the supervisor in  order to understand the  production schedule  To plan the day’s production  activities based on the  supervisor’s instructions  To collect material data sheet,  machine instructions and work  manuals  To ensure availability of  consumables and plastics  materials for production in  sufficient quantity as per  production plan/supervisor  instructions.  Clearly understanding the does  and don’ts of the manufacturing  process as defined in SOPs/ Work  Instructions or defined by  supervisors.  Check availability of the personal  protective equipments (PPE) like  Gloves, Goggles etc.  Ensure that the required material is procured from the store before  starting the process  Understand the Mould required  for executing the required  operation and ensure that the  same is available for operation.  If mould is not available collect the  mould from tool room.  Install and bolt the mould in place  and slide the safety door shut.  Add the raw material in the  machine using material loader or  by manual feeding.  Ensure moulds are clean if not  clean with soft cotton cloth.  Ensure cleaning of the other  auxiliaries tools, (if any) before the  initiation of the moulding and  trimming process  Ensure cleaning of the area  around the apparatus for any oil,  grease, combustible substances  etc. so as to prevent any accident  Ensure 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  Refer the queries to supervisor if  they cannot be resolved by the  operator  Confirm self - understanding to  the supervisor once the query is  resolved so that all doubts &  queries can be resolved before the  actual process execution  He is responsible for 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  He will be responsible for  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  maintenance team and material  management team  The individual needs to ensure  sorting, streamlining & organizing,  storage and documentation,  cleaning, standardization and  sustenance across the plant and  office premises of the organization  He needs to understand Market  Information Management  Client Relation Management  Marketing knowhow and strategy  He also needs to understand and  practice Entering, update and  maintain data in MS Office  system/ Office open source  system. | Machine Operator  **-** Blow Moulding  job requires  limited range of  activities which  are familiar and  predictable like  availability of  consumables,  safety PPE, raw  material used,  basic machine  parts and its  functions etc.  He has to collect  the mould from  tool room.  He has to check  the moulds are  clean if not clean  with soft cotton  cloth.  He should  understand the  raw material like  plastics granules,  fillers, bonding  additives etc.  required for  executing the  activity.  he should know about  entrepreneurship,  marketing and  other quality  related functions. |  |
| **Professional**  **knowledge** | The user/individual on the job needs to  know and understand:  Different types of Plastics  materials, Processes and  procedures followed for  Processing the lot/ pieces/  products.  Cleanliness and safety  requirements for operating a  blow moulding machine  Different types of blow moulding machine, distributions systems  and moulds, Operation of  multiple presses with common  power pack and importance of  sequencing.  Start Up & Shut down procedure  for blow Moulding | Machine Operator **-**  Blow Moulding  should understand  and know factual  knowledge about  process, principle  of blow Moulding  Technique and its  operation, types,  process related queries,  entrepreneurship,  marketing, quality  etc. |  |
| **Professional**  **skill** | The user/individual on the job needs to  know and understand:  General principles of Blow  moulding procedure and process  knowledge mould loading and  unloading procedure, parameter  settings etc.  Types of plastics like  thermoplastics and the additives  & grades to be used tonnage and  capacity of the machine being  operated.  Different types of tools and  machinery to process the plastic  and trim the output  Various types of cooling systems  and their properties.  How to perform moulding  machine safety check  Hazards and safety aspects  involved in tape production and  usage of relevant PPEs  Safety procedures to be adopted  to complete mould removal  process  Detect problems in day to day  tasks:  Support operator in using  specific problem solving  techniques and detailing out the  problems  Discuss possible solution with the  supervisor for problem solving.  The user/individual on the job needs to  know and understand how to:  Plan and organize the work order  and jobs received from the  internal customers/ operator.  Organize all process/ equipment  manuals so that sorting out  The user/individual on the job needs to  know and understand how to:  Follow instructions and work on  areas of improvement identified  Complete the assigned tasks with  minimum supervision  Complete the job defined by the  operator within the timelines and  quality.  The user/individual on the job  needs to know and understand  how to:  Use common sense and make  judgments during day to day  basis  Use basic reasoning skills to  identify and resolve basic  problems  Use intuition to detect any  potential problems which could  arise during operations.  He needs to know about  entrepreneurship associated with  injection moulding, its concepts  etc  He needs to know about  marketing strategy involved for  the products manufactured,  market availability etc. | Machine Operator **-**  Blow Moulding  should recall  general principles  of moulding  procedure and  process knowledge  which may be  repetitive type of  work in the area  allotted, Types of  plastics like  thermoplastics and  the additives &  grades to be used  tonnage etc. Thus  he should  demonstrate  practical skill,  routine and  repetitive in Blow  Moulding  application/  process, he should  also understand  quality concepts  and use in the area  of work allotted. |  |
| **Core skill** | The user/ individual on the job needs to  know and understand how to:  How to be able to read warnings,  instructions and other text  material on product labels,  components etc  How to enter into the history  card details of the fault identified  in the plastic product  manufactured read equipment  manuals and process documents  to understand the equipment  and processes better ts  Read instructions especially  safety instructions especially  symbols while using the  equipment in the plant area logs.  The user/individual on the job needs to know and understand how to:  Discuss task lists, schedules, and  work-loads with coworkers/  assistants and  supervisors  Question internal customers/  Shop floor operator  appropriately in order to  understand the nature of the  problem and make a diagnosis  Avoid using jargon, slang or  acronyms when communicating  with a operator /fellow  subordinates etc. Unless it is  required. | Machine Operator  **-** Blow Moulding  should be able to  read /write  warnings,  instructions and  other text material  on product labels,  components etc  with minimum  required clarity,  should have skill of  basic arithmetic,  like raw material  weights additions  etc. |  |
| **Responsibility** | Machine Operator **-** Blow Moulding  is majorly responsible for his own job  andself learning. He/she Set up basic  as well as all critical machine controls  and may operate Blow moulding  Machine in order to produce good  quality moulding as per approved  specifications by supervisor. He may  need to control/ check multiple  machines at a time. | Machine Operator  **-** Blow Moulding  is majorly  responsible for his  own job and  learning which  justifies the  pegging. |  |

**EVIDENCE OF RECOGNITION AND PROGRESSION**

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| **What steps have been taken in the design of this or other qualifications to ensure that**  **there is a clear path to other qualifications in this sector?**  Relevant information was collected from Industries and allied sector working in this area.  The Plastics industries are recruiting people based on the qualification acquired. Maximum  of the industries accept this as qualification for selection/short listing of the individual.  approved by members.  **Vertical Pathway:**  The Occupational Map has been created & attached.  The Blow Moulding Operator has a clear pathway  **Horizontal Pathway:**  The individual can migrate within the Plastics Processing related industries. |