QUALIFICATION FILE

NSDA Reference
To be added by NSDA

CONTACT DETAILS OF THE AWARDING BODY FOR THE QUALIFICATION

Name and address of awarding body: Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Head Office, Guindy, Chennai

Name and contact details of individual dealing with the submission

Prof. (Dr.) S. K Nayak, Director General, CIPET, CIPET Head office, Guindy, Chennai

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List of documents submitted in support of the Qualifications File:

1. Qualification Document - Machine operator - Blow Moulding
2. Curriculum/ Syllabus
3. Training delivery Plan
4. Criteria for Assessment of Trainees
5. Occupational Map
6. Composition of core committee for QP Development order, DCPC, MoCF, GOI
7. Presentation of 2nd core group committee meeting along with Minutes of meeting approved by members
8. Assessment Process flow
9. Documents supporting need of the Qualification:
   a. Report of the Coordination Committee address the issue related with Human Resources/ Skilled manpower requirement of Industry- Department of Chemicals and Petrochemicals, Ministry of Chemicals and Fertilizers, Govt. Of India
   b. A Report on Human Resource and Skill requirement for the Chemicals and Pharmaceutical sector (2022) by NSDC.
   c. Brief report of Chemicals and petrochemicals Industry in India, April 2015, Corporate Catalyst India Pvt Ltd, Page 4
   d. Report on Indian Plastics Industry 2013-17, edition 2, Nov 2014, PlastIndia Foundation.
   e. Indian Plastics Industry – Vision 2012, Leverage Plastic, A report by CRISIL
   f. Potential of Downstream Plastics Industry in North India, 26 June 2012, Knowledge and Strategy paper by Tata Strategic management Group & FICCI
   g. Potential of plastics industry in Northern India with special focus on Plasticulture and Food Processing- 2014. A report on Plastic Industry by Tata Strategic management Group & FICCI.

h. Plastic Industry in India a BPF Overview for PlastIndia International Exhibition 2012, New Delhi
i. Porters Five force Analysis of the Plastics Industry by Santanu Mandal, International Journal of Multidisciplinary Research, Vol 1, Issue 7, November 2011, ISSN 2231 5780
j. Industry Engagement certificate in preparation of learning outcomes and Job Role Identification in Petrochemicals sector

QUALIFICATION FILE

SUMMARY

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: The Academic Cell – HO, Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Head Office, Guindy, Chennai.
Body which will accredit providers to offer courses leading to the qualification: The Academic Cell – HO, Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Head Office, Guindy, Chennai.
Body/bodies which will be responsible for assessment: The assessment is being carried out at individual Centre level. Training Assessment Wing is created in Head Office (HO) of Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Guindy, Chennai is responsible for overall assessment.
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 4
Anticipated volume of training/learning required to complete the qualification: 960 Notional hours.
Entry requirements / recommendations: Minimum qualification – Preferably 8th Standard, Minimum age - 18 years completed.
Progression from the qualification: The Blow Moulding Operator (Level 4) has a clear pathway to Blow Moulding highly skilled Operator (Level 5).

QUALIFICATION FILE

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 as comparability is being verified.

Date of planned review of Qualification: 04.08.2017

Format Structure of the Qualification:

Title and Identification code of component	Mandatory/ Optional	Estimated Size (Notional Hours)	Level
CPC/N 0419: Maintain basic health and safety practices at the workplace, 5S.	M	80	4
CPC/N 0420: Fitting Tools Measuring Equipments & Practice	M	80	4
CPC/N 0421: Introduction to Polymers and thermoplastics Materials	M	80	4
CPC/N 0422: Basics of Plastics Processing methods	M	120	4
CPC/N 0423: Blow Moulding Techniques for Plastics processing and inspection of the finished products.	M	200	4
CPC/N 0424: Auxiliary equipments in Plastics processing.	M	160	4
CPC/N 0425: Mould Technology Techniques for Plastics Processing	M	80	4
CPC/N 0426 :Communication/soft skills and Basic Computer concepts	M	80	4
CPC/N 0427: Quality Management systems	M	80	4
Total		**960**	

Qualifications Document - Machine Operator - Blow Moulding is attached as Annexure.

QUALIFICATION FILE

SECTION 1

ASSESSMENT

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, Head Office, Guindy, Chennai.

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 of candidates will be at learning outcome level. Assessment criterion has been defined for each learning 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 would include

- **Theoretical test suite –** Will include multiple choice questions, audio-video question etc. which will test the trainee on his knowledge of the subject

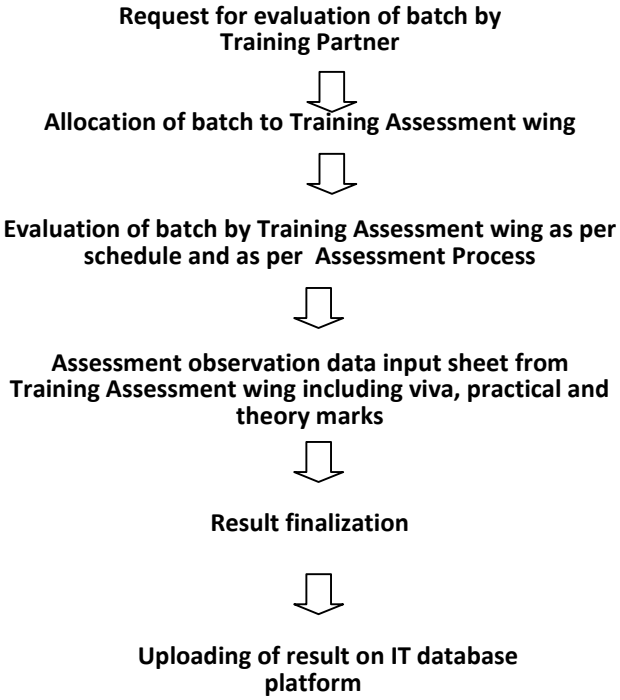
- **Practical Knowledge suite –** Practical knowledge can be tested through Assessor driven evaluation/test, Situational Judgment Tests etc to test practical core competence. A mix of these would be able to evaluate the trainee on his practical knowledge of the Qualification Document.

Assessment strategy:

- Assessment criteria for Qualification Document have been developed. Each Learning Outcome have separate marks for Theory and Practical Skills.
- 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.
- Set of question bank developed to assess the theoretical and practical knowledge. To ensure the quality, each trainees get the unique set of question
- 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.
- Empanelment of subject matter expert as assessor to assess trainee specifically on practical skills
- Assessments are preferably conducted by written examination papers in English/ regional languages according to the requirement.
- It has been ensure that TP/trainer should not be present during assessment

QUALIFICATION FILE

Assessment Process Flow:



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.

QUALIFICATION FILE

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

Assessable outcome		**Assessment criteria for the outcome**		
LO	**Assessable outcome Description**	**Theory**	**Practical**	**Total**
1. CPC/N 0419: Maintain basic health and safety practices at the workplace, 5S.	AO1. Use protective clothing/equipment for specific tasks and work conditions	0.5	1	1.5
	AO2. Carry out safe working practices while dealing with hazards to ensure the safety of Self and others.	0.5	1	1.5
	AO3. Apply good housekeeping practices at all times	0.5	2	2.5
	AO4. Use the various appropriate fire extinguishers on different types of fires correctly	0.5	2	2.5
	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.	0.5	2	2.5
	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	1	2	3

	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.	1	2	3
	AO8. Create awareness amongst other by sharing information on the identified risks.	1	2	3
	AO9. Follow the sorting process and check that the tools, fixtures & jigs that are lying on workstations are the ones in use and un-necessary items are not cluttering the workbenches or work surfaces.	1	4	5
	AO10. Ensure segregation of waste in hazardous/ non Hazardous waste as per the sorting work instructions	1	4	5
	AO11. Follow the technique of waste disposal and waste storage in the proper bins as per SOP	1	4	5
	AO12. Segregate the items which are labeled as red tag items for the process area and keep them in the correct places	1	4	5
	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	1	2	3
	AO14. Ensure that areas of material storage areas are not overflowing	1	2	3
	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	1	2	3
	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	0.5	2	2.5
	AO17. Follow the floor markings/ area markings used for demarcating the various sections in the plant as per the prescribed instructions and standards.	0.5	2	2.5
	AO18. Follow the floor markings/ area markings used for demarcating the various sections in the plant as per the prescribed instructions and standards.	0.5	2	2.5
	AO19. Check that the items in the respective areas have been identified as broken or damaged	0.5	2	2.5

	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.	0.5	1	1.5
	Sub total	**15**	**45**	**60**
2. CPC/N 0420: Fitting Tools Measuring Equipments & Practice	AO1. Comply with health and safety, environmental and other relevant regulations and guidelines at work .	0.5	1	1.5
	AO2. Adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing die fitting operations	0.5	1	1.5
	AO3. Work following laid down procedures and instructions	0.5	1	1.5
	AO4. Ensure work area is clean and safe from hazards	0.5	1	1.5
	AO6. Obtain job specification from a valid & approved source	0.5	1	1.5
	AO7. Read and understand job requirements from the job specification document properly	0.5	2	2.5
	AO8. Report & rectify incorrect information in job specification documents as per job requirement	0.5	2	2.5
	AO9. Preparation for the fitting operations as per procedure	0.5	2	2.5
	AO10. Ensure that all calibrated measuring instruments used.	0.5	2	2.5
	AO11. Ensure that the components used are free from foreign objects, dirt and corrosion	1	2	3
	AO12. Obtain correct work pieces and consumables as per job requirements	1	2	3
	AO13. Obtain appropriate tools and measuring instruments.	1	2	3
	AO14. Setting of work pieces as per job requirements using appropriate holding devices	1	2	3
	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.	1	2	3
	AO16. mark out templates for tracing/transferring the specified features on the work pieces as per drawing	0.5	2	2.5
	AO17. Tracing or transfer the specified features from the templates onto the work pieces as per drawin	0.5	2	2.5
	AO18. Perform fitting operations on various	0.5	2	2.5

	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	0.5	2	2.5
	AO20. Check the machined components to ensure completeness of work	0.5	2	2.5
	AO21. Check the quality of the output as per required standards, using visual checks and measurement of dimensional parameters using measuring instruments.	0.5	2	2.5
	AO22. Produce components with various features as per standards applicable to the process.	0.5	2	2.5
	AO23. Check the finished components as per job requirement	0.5	2	2.5
	AO24. Complete documentation during and post operations as per procedures	0.5	2	2.5
	AO25. Return all tools and equipment to the correct location on completion of the fitting activities	0.5	2	2.5
	AO26. Leave the work area in a safe and tidy condition on completion of job activities	0.5	2	2.5
	Sub total	**15**	**45**	**60**
3. CPC/N 0421: Introduction to Polymers and thermoplastics Materials	AO1. Basic Importance of polymers in Human Life.	1	2	3
	AO2. Study of fundamental terminology of polymers	1	2	3
	AO3. Classification of polymers- polymer structure & morphology, etc	1	4	5
	AO4. Introduction to monomers and Polymers	1	4	5
	AO6. Types of Polymerization- Condensation- Addition- Copolymerization	1	4	5
	AO7. Characterization	1	4	5
	AO8. Polymer Solution	2	4	6
	AO9. Measurement of Molecular weight and sizes-Structure and properties of Polymers.	2	4	6
	AO10. Commodity Polymers: Polyolefin: LDPE – HDPE – LLDPE, PP etc.	1	4	5
	AO11. Engineering Polymers: PC, ABS, PMMA, POM and PA- Nylon etc.	1	4	5
	AO12. Special Polymers: FEP, PVDF etc and PET material properties and its application in blow Molding.	1	4	5
	AO15. Conventional Methods of Identification:- Drop Test, water floatation Test, Scratch test	1	4	5
	AO16. Advanced Methods of Identification:-MFI,	1	1	2

	Melting etc. and common acronyms in the plastics and commercial trade names.			
	Sub total	**15**	**45**	**60**
4. CPC/N 0422: Basics of Plastics Processing methods	AO1. The need for plastics processing	1	2	3
	AO2. Ensure merits and demerits of Blow Molding to over the all others plastic Process.	1	2	3
	AO3. Definition and terminology related to Plastic Processing.	1	2	3
	AO4. Ensure finishing operation including surface treatment of the fabricated product if required as per SOP.	1	4	5
	AO5. Primary Processing Methods as per company's SOP.	1	6	7
	AO6. Secondary Processing Methods as per company's SOP.	2	6	8
	AO7. Processing fundamentals	2	6	8
	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.	2	6	8
	AO.9 Machine Operation Terminology: as per manual, semiautomatic, fully automatic.	2	6	8
	AO.10 Type of Conversion Techniques: Injection, Blow, Compression, Transfer, Rotational and Other processes and comparison of Blow Molding with other process.	2	6	8
	AO11. Material to be processed	1	6	7
	AO12. Product design / configuration, Tolerance.	1	2	3
	AO13. Process Limitations	1	2	3
	AO14. Quality	1	2	3
	AO15. Cost / Performance balance.	1	2	3
	Sub total	**20**	**60**	**80**
5. CPC/N 0423: Blow Moulding Techniques for Plastics processing and inspection of the finished products.	AO1. Study of Principle of Blow Molding process.	0.25	1	1.25
	• Plasticizing/ melting the resin	0.25	1	1.25
	• Parison or preform production	0.25	1	1.25
	• Blowing of parison	0.25	1	1.25
	• Ejection of the part and trim	0.25	1	1.25
	AO2. Basic Need of Tools and Accessories and Machineries.	0.25	1	1.25
	AO3. Understanding of Plastic Material for Blow Molding- Commodity-Polyolefin's, Engineering-PET	0.5	1	1.5
	AO4. Various types of extrusion blow moulding Process.	0.5	1	1.5
	AO5. Continuous blow moulding process:- single	0.5	1	1.5

	head method, Twin station method, Rotary table system			
	AO6. Intermitted blow moulding process:- Reciprocating screw extruder, Ram accumulator extrusion Accumulator head method	0.5	1	1.5
	AO4. Study of Extrusion blow molding (EBM)	0.5	1	1.5
	AO5. Study of Injection blow molding(IBM)	0.5	1	1.5
	AO6. Study of Injection Stretch blow molding process (ISBM)	0.5	1	1.5
	AO7. Study of Extrusion Stretch Blow Molding	0.5	1	1.5
	AO8. Various types of blow moulds-Side feed, Centre Feed, Spiral Mandrel, Extrusion Blow, stretch Blow, Injection Blow molds etc.	0.5	1	1.5
	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	0.5	1	1.5
	AO10. Check the identified feed strip for dimension uniformity/identified granules	0.5	1	1.5
	AO11. Make the plastic compound or granule ready for feeding into the machine	0.5	1	1.5
	AO12. Start the machine and feeding simultaneously	0.5	1	1.5
	AO13. Ensure that moulding pressure and temperature is maintained during the process cycle	0.5	1	1.5
	AO14. Ensure mould lifting/ ejection/ slide mechanism of the press are properly functioning	0.5	1	1.5
	AO15. Manufacturing the preform as per SOP	0.5	1	1.5
	AO16. Remove the Manufacturing the preform from the mould as per SOP.	0.5	1	1.5
	AO17. Check for operation of molding apparatus like hopper, heaters, extruder, blow molding die/mold, screen pack etc. as per the checklist provided	0.5	1	1.5
	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	0.5	1	1.5
	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	0.5	1	1.5
	AO20. Use weighing machines to measure the quantity of granules and ensure that the correct quantity of granules are put in the hopper	0.5	1	1.5

	AO21. Check the parameters – Temperature, pressure, current, extruder speed etc. in line with the work instructions/ SOPs	0.5	1	1.5
	AO22. Setup the apparatus as per the selected process and the moulding standards used in the processing industry	0.5	1	1.5
	AO23. Adjust the temperature and other parameters of the moulding apparatus as per the values given in Work Instructions/ SOPs	0.5	1	1.5
	AO24. Ensure availability of the coolant and working of valves to circulate the coolant to cool and solidify plastic	0.5	1	1.5
	AO25. Ensure the functionality and assembly of die as per SOP.	0.5	1	1.5
	AO26. Adjust the Parison controlling and program the parison with the help of parison programming tools and software as per requirement.	0.5	1	1.5
	AO27. Die shaping in blow molding.	0.5	1	1.5
	AO28. Study the types of mandrel used in blow molding.-Divergent and convergent.	0.5	1	1.5
	AO29. Study of Blow Ratio, parison swell, Die Swell, Types of Parison Blowing system:- Pneumatic and ejection system	0.5	1	1.5
	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	0.5	1	1.5
	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	0.5	1	1.5
	AO32. Understand raw material like plastics granules, fillers, bonding additives grades etc. required for executing the activity	0.5	1	1.5
	AO33. Ensure that the required material is procured from the store before starting the process	0.5	1	1.5
	AO34. Understand the type of Die required for executing the required operation and ensure that the same is available for operations	0.5	2	2.5
	AO35. Understand the number of heaters required for the extruder assembly, heater temperature and current required for the heating	0.5	2	2.5

	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	0.5	2	2.5
	AO37. Ensure that the plastic granules are mixed with additives (if any) before being fed into the hopper	0.5	2	2.5
	AO38. Turn valves of machines to regulate screw speed and quantity of the plastic coming out of the hopper	0.5	2	2.5
	AO39. Ensure pouring in line with the defined standards and specifications	0.5	2	2.5
	AO40. Record the feeding observations like interrupted pouring or any abnormality	0.5	2	2.5
	• In case extrusion blow molding.	0.5	2	2.5
	• In case of Injection Blow Molding.	0.5	2	2.5
	• In case of Injection Blow Molding	0.5	2	2.5
	• Optimization of Process Parameters.	0.5	2	2.5
	AO41. Conduct a test process and produce a sample output as per the sketches/ engineering drawing shared with the supervisor.	0.5	2	2.5
	AO42. Check the hollow articles (bottles, container) for geometry, material & dimensional parameters as per the Control Plan before starting the production.	0.5	2	2.5
	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	0.5	2	2.5
	AO44. Feed the required operation code in the apparatus for heaters to melt the plastic granules at the predefined temperature	0.5	2	2.5
	AO45. Adjust the extruder speed and the extruder pressure to force the molten plastic into the die to create the desired output.	0.5	2	2.5
	AO46. Turn valves of machines to regulate speed and quantity of the plastic coming out of the hopper	0.5	2	2.5
	AO47. Ensure feeding in line with the defined standards and specifications	0.5	2	2.5
	AO48. Record the feeding observations like interrupted pouring or any abnormality	0.5	2	2.5

	AO49. Ensure the proper functioning of screen pack and die for uniform melting of plastic and removal of the contaminants (if any)	0.5	2	2.5
	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	0.5	2	2.5
	AO51. Observe and analyze any irregularity in the process and take preventive steps	0.5	2	2.5
	AO52. Clean the die opening & die; changing the screen pack.	0.5	2	2.5
	AO53. Ensure code printing of the product with the identifying information (wherever required) and send the same for further processing	0.5	2	2.5
	AO54. Instruct the helper to neck finishing and pinch off of the product as per the desired geometric specifications. (doesn't required for IBM)	0.5	2	2.5
	AO55. Measure the final plastic molded product and compare the dimensions as prescribed in the work order/ engineering drawing	0.5	2	2.5
	AO56. In case the parts are not as per the given measurements, send the same for further processing in terms of cutting, finishing etc.	0.5	2	2.5
	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.	0.5	2	2.5
	AO58. Compare texture, surface properties, hardness and strength with the given product specifications	0.5	1	1.5
	AO59. Note down the observations of the basic inspection process and Identify pieces which are OK and also not meeting the specified standards	0.25	1	1.25
	AO60. Discard the batch which are beyond repair and repair the ones which need minor modifications in settings.	0.25	1	1.25
	AO61. Maintain records of each category of work outputs as per the batch etc. so that correction can be organized.	0.25	1	1.25
	AO62. Establish linkage between rejection of output and the pertinent causes for the same (process/ material etc.); Recommend the means	0.25	1	1.25

	for rejection control.			
	AO64. Rectify minor defects like dimension variation, thickness variation etc. by control process parameters etc.	0.25	1	1.25
	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	0.25	1	1.25
	AO66. Provide first and last output from each batch to the lab for quality check on its composition, properties etc.	0.25	1	1.25
	AO67. Obtain clearance for the entire batch from the lab	0.25	1	1.25
	Sub total	**35**	**105**	**140**
6. CPC/N 0424: 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.	0.25	1	1.25
	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.	0.25	1	1.25
	AO3. Setup and maintain molding machines and specified auxiliary equipment to meet production quality and quantity requirements.	0.25	1	1.25
	AO4. Connects basic plant services as needed to meet production requirements and makes initial checks of operating conditions before initiating production runs.	0.25	1	1.25
	AO5. Complete complex job changes on molding machines and auxiliary equipment.	0.5	1	1.5
	AO6. Assist in cleaning and lubrication of equipment and tooling and performs various preventative maintenance tasks as needed.	0.5	2	2.5
	AO7. Study of different types of Predrier-Hot air Oven, Hopper Driers, Dehumidifiers etc.	0.5	2	2.5
	AO8. Working of Chiller, Cooling Tower for the controlling temperature of Mold, machine and Fluids.	0.5	2	2.5
	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.	0.5	2	2.5

	AO10. Getting Information - Observing, receiving, and otherwise obtaining information from all relevant sources.	0.5	2	2.5
	AO11. Controlling Machines and Processes -Using either control mechanisms or direct physical activity to operate machines or processes.	0.5	2	2.5
	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.	0.5	1	1.5
	AO14. Equipment Selection -- Determining the kind of tools and equipment needed to do a job.	0.5	1	1.5
	AO15. Troubleshooting -- Determining causes of operating errors and deciding what to do about it.	0.5	1	1.5
	AO16. Follow the instructions given on the equipment manual describing the operating process of the equipment	0.5	1	1.5
	AO17. Follow the Safety, Health and Environment related practices developed by the organization	0.5	1	1.5
	AO18. Ensure relevant safety board's/ signs are placed on the shop floor	0.5	1	1.5
	AO19. Operate the machine using the recommended Personal Protective Equipment (PPE) and ensure team members also use the related PPEs at the workplace	0.5	1	1.5
	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.	0.5	1	1.5
	AO21. Attend all safety and fire drills to be self-aware of safety hazards and preventive techniques	0.5	1	1.5
	AO22. Maintain high standards of personal hygiene at the work place	0.25	1	1.25
	AO23. Ensure that the waste disposal is done in the designated area and manner as per organization SOP.	0.25	1	1.25
	Sub total	**10**	**30**	**40**
7. CPC/N 0425: Mould Technology Techniques for Plastics Processing	AO1. Basic Study of Mould Material requirement, Mold Manufacturing Process and machineries.	0.5	2	2.5
	AO2. Compute dimensions, sizes, shapes and tolerances of machining component are as per specifications and as per company procedures	0.5	2	2.5
	AO3. Determine information such as number of parts to make, engineered components and	1	2	3

	material to be used, and machines to be used			
	AO4. Identify and confirm resources required such as components, machinery, range of materials and processes	1	2	3
	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	1	2	3
	AO6. Identify the operations that will be required for machining components based on design requirements	1	4	5
	AO7. Identify type of equipment required for machining components based on the operations selected.	1	4	5
	AO8. Comparison of Blow Mold with the Injection rotational merits and demerits for overcome the above process mould.	1	2	3
	AO9. Construction and study Mold for EBM, IBM, and SBM.	1	2	3
	AO10. Mold cooling systems:-Pneumatic, water cooling	0.5	2	2.5
	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.	0.5	2	2.5
	AO12. Cavities Preform Mold, designed and developed as per SOP	0.5	2	2.5
	AO13. Follow the instructions given on the equipment manual describing the operating process of the equipment	0.5	2	2.5
	Sub total	**10**	**30**	**40**
8. CPC/N 0426 :Communication/soft skills and Basic Computer concepts	AO1. Accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	0.5	1	1.5
	AO2. Accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt	0.5	1	1.5
	AO3. Give information to others clearly, at a pace and in a manner that helps them to understand	0.5	1	1.5
	AO4. Display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible	0.5	1	1.5
	AO5. Consult with and assist others to maximize effectiveness and efficiency in carrying out tasks	0.5	2	2.5
	AO6. Display appropriate communication etiquette while working	0.5	2	2.5

	AO7. Display active listening skills while interacting with others at work	0.5	2	2.5
	AO8. Use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism	1	2	3
	AO9. Demonstrate responsible and disciplined behaviors at the workplace	1	2	3
	AO10. Escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict	1	2	3
	AO11. Stimulus	1	2	3
	AO12. Encoding/message	0.5	2	2.5
	AO13. Channel	0.5	2	2.5
	AO14. Decoding	0.5	2	2.5
	AO15. Receiver	0.5	2	2.5
	AO16. Barriers	0.5	2	2.5
	AO17. Principle of Communication Process	0.5	2	2.5
	• Clarity	0.5	2	2.5
	• Conciseness	0.5	2	2.5
	• Objectivity	0.5	2	2.5
	• Consistency	0.5	2	2.5
	• Completeness	0.5	2	2.5
	• Relevancy	0.5	2	2.5
	• Audience Knowledge	0.5	2	2.5
	AO18. Study of Fundamental of Computers.	0.5	2	2.5
	AO19. Components of Computer: - Hardware and the software.	0.5	2	2.5
	AO20. Study of Hardware Component:- central processing unit (CPU), memory, storage device, input devices, output devices.	0.5	2	2.5
	AO21. The computer accepts input	0.5	2	2.5
	AO22. The computer performs useful operations	0.5	1	1.5
	AO23. The computer stores data	0.5	1	1.5
	AO24. The computer produces output.	0.5	1	1.5
	AO25. Turning the Computer On and Logging On	0.5	1	1.5
	AO26.Introduction to Microsoft Office	0.5	1	1.5
	AO27. Study of MS Word	0.5	1	1.5
	AO28. Study of MS Excel	0.5	1	1.5
	AO29. Study of MS PPT.	0.5	1	1.5
	Sub total	**20**	**60**	**80**
9. CPC/N 0427: Quality Management systems.	AO1. Study and understand of Total Quality Control	1	2	3
	AO2. Need of Management of Product Quality.	1	2	3
	AO3. Understand the Concept of Total Quality Management.	1	2	3
	AO4. Understanding the TQM Philosophy.	1	4	5

	AO5. Understanding the need for Quality system.	1	4	5
	AO6. Study and understand of Total Quality control tools - ISO, 5S, Six Sigma, OHSAS 18001	1	4	5
	AO7. Study and understand of Behavioral Science.	1	4	5
	AO8. Different between Behavioral Science and Social Science.	1	4	5
	AO9. Categories of Behavioral Science.	1	2	3
	AO10. Theories of Behavioral Psychology, Entrepreneurship development, preparing project report selecting a particular plastic product of their choice and submission.	1	2	3
	Sub total	**10**	**30**	**40**
	Total	**150**	**450**	**600**

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.

QUALIFICATION FILE

SECTION 2

EVIDENCE OF LEVEL

Level of qualification: 4

Title /Name of Qualification/Component: Machine Operator - Blow Moulding **Level:** 4			
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	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	**4**

	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	about entrepreneurship, marketing and other quality related functions.	

	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/de-flashing 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.		
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 Operator - Blow Moulding should understand and know factual knowledge about process, principle of blow Moulding Technique and its operation, types, process related	**4**

	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	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	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.	**4**

	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.		
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	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.	**4**

	know and understand how to: • Discuss task lists, schedules, and work-loads with co-workers/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.		
Responsibility	Machine Operator - Blow Moulding is majorly responsible for his own job and self 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 of the QP at Level 4.	**4**

QUALIFICATION FILE

SECTION 3

EVIDENCE OF NEED

What evidence is there that the qualification is needed?

Qualification document has been developed by suggestion and approval of Chemicals and Petrochemicals Core committee constituted by Department of Chemicals and Petrochemicals, Ministry of Chemicals and Fertilizers, Govt. Of India vide order no. 45012/86/2015-PC-IV Dt. 10.03.2016 which consist of senior leaders and experts from Plastics and Allied Industry, Associations etc and has been further substantiated by various study reports, Annual reports etc. A report on the Coordination Committee addresses the issue related with Human Resources/ Skilled manpower requirement of Industry- Department of Chemicals and Petrochemicals, Ministry of Chemicals and Fertilizers, Govt. Of India (page no. 4, Attached as Annexure 9(a)).

What is the estimated uptake of this qualification and what is the basis of this estimate?

The Skill gap report states that, there will be 11.6 Lakhs additional manpower is required by 2023-24 is based on the Machinery & Sector growth and Technical Manpower. Refer: Name of the Report **"A report of the coordination committee to address the issues related with human resources/skilled manpower required of the industry" (page no. 6, Attached as Annexure 9 (a)) (Copy of the Skill Gap Report is enclosed).**

What steps were taken to ensure that the qualification(s) does/do not duplicate already existing or planned qualifications in the NSQF?

Mapping of Machine Operator - Blow Moulding has been done with National Classification of Occupation 2004 to ensure the qualification does not duplicate, the qualification have being checked with qualification pack of other sectors like Rubber, Electronics etc and there is no duplicity observed in terms of contents, module/syllabus covered etc.

The NSDC list of approved and under developed Qualification Packs was checked prior to stating the work to ensure no duplicity.

What arrangements are in place to monitor and review the qualification(s)? What data will be used and at what point will the qualification(s) be revised or updated?

Qualification documents shall be revised every two years and the feedback from Industries/ Associations, Alumni will be collected and necessary revisions/updating in Qualification document will be carried out. The feedback received from the industry in term of employability, course coverage, placement factors etc will be checked and growth indicators will be identified and reviewed.

ANNEXURE:

7. Presentation of 2nd core group committee meeting along with Minutes of meeting approved by members
9. Documents supporting need of the qualification:

QUALIFICATION FILE

a. Report of the Coordination Committee address the issue related with Human Resources/ Skilled manpower requirement of Industry- Department of Chemicals and Petrochemicals, Ministry of Chemicals and Fertilizers, Govt. Of India
b. A Report on Human Resource and Skill requirement for the Chemicals and Pharmaceutical sector (2022) by NSDC.
c. Brief report of Chemicals and petrochemicals Industry in India, April 2015, Corporate Catalyst India Pvt Ltd, Page 4
d. Report on Indian Plastics Industry 2013-17, edition 2, Nov 2014, PlastIndia Foundation.
e. Indian Plastics Industry – Vision 2012, Leverage Plastic, A report by CRISIL
f. Potential of Downstream Plastics Industry in North India, 26 June 2012, Knowledge and Strategy paper by Tata Strategic management Group & FICCI.
g. Potential of plastics industry in Northern India with special focus on Plasticulture and Food Processing- 2014. A report on Plastic Industry by Tata Strategic management Group & FICCI.
h. Plastic Industry in India a BPF Overview for PlastIndia International Exhibition 2012, New Delhi
i. Porters Five force Analysis of the Plastics Industry by Santanu Mandal, International Journal of Multidisciplinary Research, Vol 1, Issue 7, November 2011, ISSN 2231 5780

QUALIFICATION FILE

SECTION 4

EVIDENCE OF RECOGNITION AND PROGRESSION

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 ***(Minutes of Meeting of Core committee is attached)***.

The skills acquired at level 3 for a particular duration makes it easy for the Individual to progress to the next level.

ANNEXURE:

7. Presentation of 2nd core group committee meeting along with Minutes of meeting approved by members.

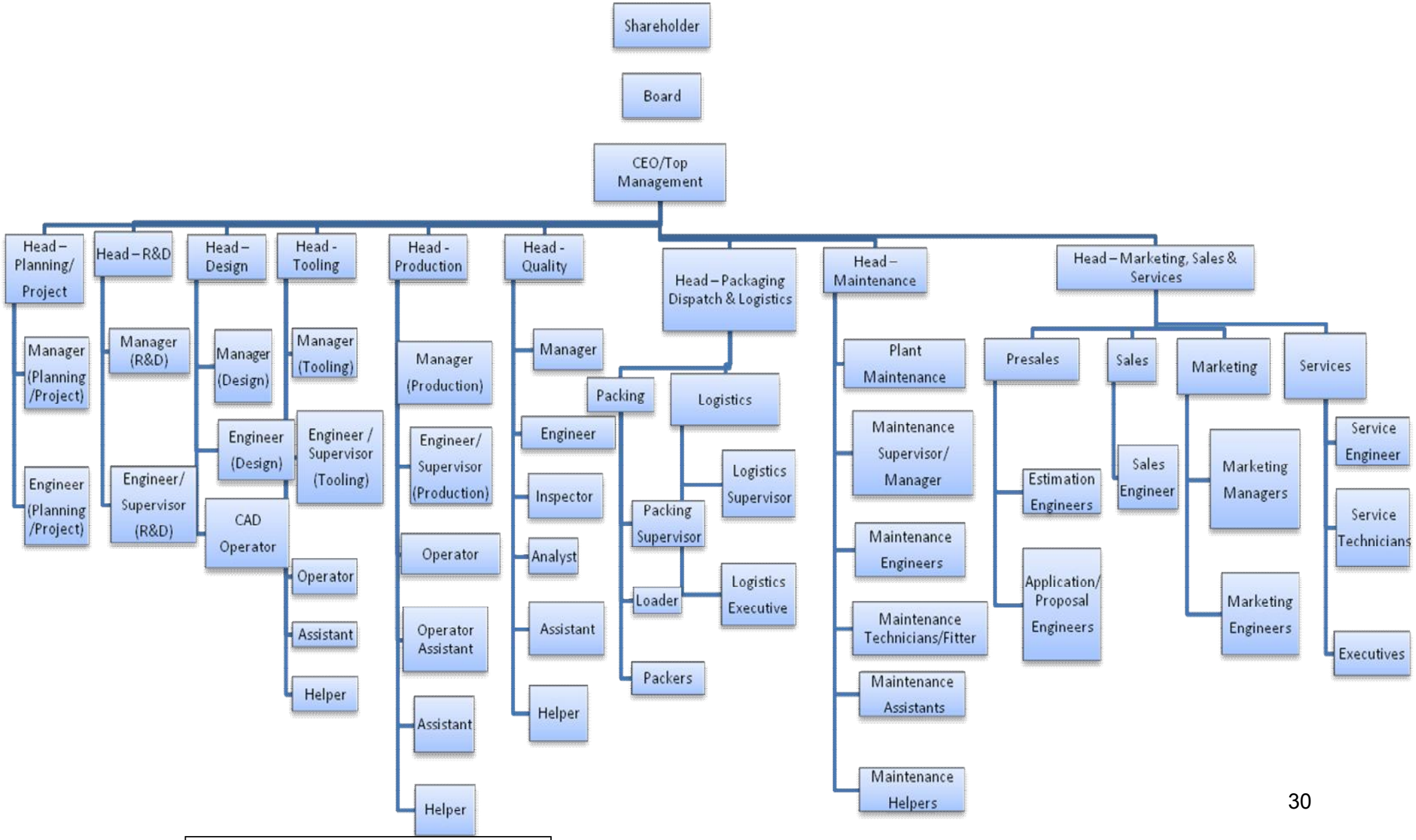
Vertical Pathway:

The Occupational Map has been created & attached.
The Blow Moulding Operator (Level 4) has a clear pathway to Blow Moulding highly skilled Operator (Level 5).

Horizontal Pathway:

The individual can migrate within the Plastics Processing related industries.

Occupation Map – Vertical Pathway



Job Role: Machine Operator - Blow Moulding