Model Curriculum

Machine Operator – Plastic Injection Moulding

SECTOR: RUBBER
SUB-SECTOR: PLASTICS PROCESSING
OCCUPATION: INJECTION MOULDING
REF ID: RSC/Q4502 (CPC/Q0204), V 1.0
NSQF LEVEL: 4

Skill India
कौशल भारत-कुशल भारत

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National
Skill Development
Corporation

Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

RUBBER SKILL DEVELOPMENT COUNCIL

for the

MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/ Qualification Pack: **'Machine Operator – Plastic Injection Moulding'**
QP No. **'RSC/Q4502(CPC/Q0204), V1.0, NSQF Level 4'**

Date of Issuance: **December 26th, 2016**

Valid up to: **December 25th, 2021**

** Valid up to the next review date of the Qualification Pack*

Authorised Signatory
(Rubber Skill Development Council)

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Machine Operator- Plastic Injection Moulding

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a "Machine Operator- Plastic Injection Moulding", in the "Rubber Skill Development Council" Sector/Industry and aims at building the following key competencies amongst the learners.

Program Name	**Machine Operator- Plastic Injection Moulding**		
Qualification Pack Name & Reference ID	RSC/Q4502 (CPC/Q0204), V 1.0		
Version No.	1.0	**Version Update Date**	02/05/2019
Pre-requisites to Training	VIIIth Standard		
Training Outcomes	**After completing this programme, participants will be able to:** • Identify the job requirements and the basic concepts linked with plastic injection moulding process • Operate machinery in order to produce good quality plastic parts using given material and mould • Identify the raw material and equipment required to perform the injection moulding process • Prepare the injection moulding machine • Demonstrate feeding of plastic granules for trial of the product • Operate the injection moulding machine for executing the operations • Monitor various parameters of the process • Perform troubleshooting of the process/product if any. • Perform quality check and inspection of the finished products • Practise repairing the parts produced to correct the defective pieces • Practice the basics of MS Office/relevant software • Describe marketing, planning and client relation management • Maintain basic health and safety practices at the workplace.		

This course encompasses 6 out of 6 National Occupational Standards (NOS) of "Machine Operator-Plastic Injection Moulding" Qualification Pack issued by "Rubber Skill Development Council".

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1.	**Introduction to the job role** **Theory Duration** (hh:mm) 20:00 **Practical Duration** (hh:mm) 10:00 **Corresponding NOS Code** Bridge Module	• Evaluate the history of development of plastic products • Describe current industrial scenario of plastics and prospects • Identify types of plastic • List major industrial associations related to injection moulding • Describe roles and responsibilities for a machine operator – plastic injection moulding.	**Class Room equipment:** LCD Projector/Screen, Computer, charts, Black / White board and Duster.
2.	**Analyse basic concepts, job requirements of the process.** **Theory Duration** (hh:mm) 25:00 **Practical Duration** (hh:mm) 70:00 **Corresponding NOS Code** RSC/N4501 (CPC/N0214)	• Interact with the operator to assess the production schedule • Plan the day's production activities based on the operator's instructions • Ensure availability of consumables and plastics materials for production in sufficient quantity as per production plan/operators instructions • Assess the does and don'ts of the manufacturing process as defined in SOPs • Demonstrate the use of the personal protective equipment (PPE) like gloves, goggles etc. • Comply with the moulding procedure and process to be adopted for completing the work order from the operator • Ensure that the required material is procured from the store before starting the process • Manage the mould required to execute the moulding operation • Ensure that the same is available for operation • Organize the mould from tool room If mould is not available	**Measuring equipment:** Steel Ruler, Micrometer, Vernier Caliper, Radius gauge, Feeler gage, Steel measuring tape, Weighing Balance (1 No.) **Hand Tools:** Hammer, screw driver set with Multiple heads, Allen key hexagonal, File triangular, Hacksaw, adjustable, Spanner set double side, Adjustable spanner. **Plastics raw material:** PP, HDPE, Injection grade. Mould: Hand mould, Two plate mould, Three Plate mould **Auxiliaries equipment:** Automatic Hopper Loader, Hot air oven and Dryer, Dehumidifier, Mould Temperature Controller, Scrap Grinder, Crane, Air Compressor, Hot air blow Gun, Water cooling Tower Hand operated Injection

Sr. No.	Module	Key Learning Outcomes	Equipment Required
			Moulding Machine Semi-Automatic Vertical / Horizontal Injection Moulding Machine Fully Automatic Injection Moulding Machine Microprocessor Based Injection Moulding Machine
3.	**Evaluate basic knowledge related to the process** **Theory Duration** (hh:mm) 25:00 **Practical Duration** (hh:mm) 65:00 **Corresponding NOS Code** RSC/N4501 (CPC/N0214)	• Demonstrate how to install and bolt the mould in place and slide the safety door shut • Practise adding the raw material in the machine using material loader or by manual feeding • Ensure moulds are clean and if not, clean with soft cotton cloth • Ensure that cleaning of other auxiliary's tools, (if any) before the initiation of the moulding and trimming process • Practise cleaning of the area around the apparatus for any oil, grease, combustible substances etc. • Ensure that coolant in the valves is working properly • Identify the raw material like plastics granules, fillers, bonding additives etc. required for executing the activity • Discuss with your supervisor to resolve an issue that cannot be done by the operator • Clarify all doubts and queries before the actual execution process starts	**Measuring equipment:** Steel Ruler, Micrometer, Vernier Caliper, Radius gauge, Feeler gage, Steel measuring tape, Weighing Balance (1 No.) **Plastics raw material:** PP, HDPE, Injection grade. Mould: Hand mould, Two plate mould, Three Plate mould **Auxiliaries equipment:** Automatic Hopper Loader, Hot air oven and Dryer, Dehumidifier, Mould Temperature Controller, Scrap Grinder, Crane, Air Compressor, Hot air blow Gun, Water cooling Tower Hand operated Injection Moulding Machine Semi-Automatic Vertical / Horizontal Injection Moulding Machine Fully Automatic Injection Moulding Machine Microprocessor Based Injection Moulding Machine
4.	**Perform the injection moulding related operations** **Theory Duration** (hh:mm) 30:00	• Assess the operation of moulding apparatus like hopper, heaters etc. as per the checklist provided • Demonstrate how to repair the mould to the injection moulding machine in order to achieve the desired operation • Adjust the process parameters (by selecting the right program from	**Measuring equipment:** Steel Ruler, Micrometer, Vernier Caliper, Radius gauge, Feeler gage, Steel measuring tape, Weighing Balance (1 No.) **Hand Tools:** Hammer, screw driver set with

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	Practical Duration (hh:mm) 70:00 **Corresponding NOS Code** RSC/N4505 (CPC/N0221)	the machine control system) if required • Ensure alignment with the prescribed standards • Perform preheating of plastic granules (In case of Engineering plastics) • Ensure that the plastic granules are mixed with additives (if any) before being fed into the hopper • Practise how to feed the required operation code in the apparatus for heaters to melt the plastic granules at the predefined temperature	Multiple heads, Allen key hexagonal, File triangular, Hacksaw, adjustable, Spanner set double side, Adjustable spanner. **Auxiliaries equipment:** Automatic Hopper Loader, Hot air oven and Dryer, Dehumidifier, Mould Temperature Controller, Scrap Grinder, Crane, Air Compressor, Hot air blow Gun, Water cooling Tower Hand operated Injection Moulding Machine Semi-Automatic Vertical / Horizontal Injection Moulding Machine Fully Automatic Injection Moulding Machine Microprocessor Based Injection Moulding Machine
5.	**Monitor process parameters and troubleshoot the process/product** **Theory Duration** (hh:mm) 25:00 **Practical Duration** (hh:mm) 70:00 **Corresponding NOS Code** RSC/N4505 (CPC/N0221)	• Demonstrate a test process • Design a sample output as per the required guidelines • Ensure that the dimensions of the output product are measured as per the process given in the Work Instructions/ SOP • Ensure that the product matches the dimensions • Ensure the quality of the final output • Perform the production process • Perform troubleshooting of the process as per SOP	**Measuring equipment:** Steel Ruler, Micrometer, Vernier Caliper, Radius gauge, Feeler gage, Steel measuring tape, Weighing Balance (1 No.) **Hand Tools:** Hammer, screw driver set with Multiple heads, Allen key hexagonal, File triangular, Hacksaw, adjustable, Spanner set double side, Adjustable spanner. **Plastics raw material:** PP, HDPE, Injection grade. Mould: Hand mould, Two plate mould, Three Plate mould
6.	**Setup various pre-requisites and perform mixing**	• Setup moulding temperature, volume of plastic and weight settings in the machine as per	**Measuring equipment:** Steel Ruler, Micrometer, Vernier Caliper, Radius

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	operations **Theory Duration** (hh:mm) 20:00 **Practical Duration** (hh:mm) 60:00 **Corresponding NOS Code** RSC/N4505 (CPC/N0221)	data sheet • Setup machine and process parameters such as moulding pressure and time as per the data sheet • Construct master batch and regrind raw material as per standard composition • Perform mixing operations • Ensure the procedure to ensure quality of final product	gauge, Feeler gage, Steel measuring tape, Weighing Balance (1 No.) **Hand Tools:** Hammer, screw driver set with Multiple heads, Allen key hexagonal, File triangular, Hacksaw, adjustable, Spanner set double side, Adjustable spanner. **Auxiliaries equipment:** Automatic Hopper Loader, Hot air oven and Dryer, Dehumidifier, Mould Temperature Controller, Scrap Grinder, Crane, Air Compressor, Hot air blow Gun, Water cooling Tower Hand operated Injection Moulding Machine Semi-Automatic Vertical / Horizontal Injection Moulding Machine Fully Automatic Injection Moulding Machine Microprocessor Based Injection Moulding Machine
7.	**Conduct quality check and inspection of the finished products with reference to approved product** **Theory Duration** (hh:mm) 25:00 **Practical Duration** (hh:mm) 65:00 **Corresponding NOS Code**	• Compare texture, colour, surface properties, hardness and strength etc. with the given approved product • Practise recording the observations of the basic inspection process • Identify pieces which are OK and also not meeting the specified standards • Practise rejecting the batch which are beyond repair and repair the ones which need minor modifications	**Personal Protective equipment:** Safety Goggles, Rubber Gloves, Asbestos gloves, Fire Extinguisher, Apron, Helmet, First Aid Box with Medicines **Raw material:** Mild Steel, Stainless Steel, Aluminium, Brass, Wood CNC Lathe Machine Lathe Machine CNC Simulator 3-Jaw and 4-Jaw Chuck, Cutting Tools (Single Point) Both HSS and Carbide Inserts types CAM software, CNC

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	RSC/N4506 (CPC/N0222)		controller, CNC simulator, milling machine, CNC Milling machine CAM software, CNC controller, different type CNC Controller Like HASS, FANUC, Heidenhain, CNC HASS Simulators
8.	**Maintain records and perform repairs as per SOP** **Theory Duration** (hh:mm) 30:00 **Practical Duration** (hh:mm) 60:00 **Corresponding NOS Code** RSC/N4506 (CPC/N0222)	• Maintain records of each category of work outputs as per the batch etc., so that correction can be organized • Organize linkage between rejection of output and the pertinent causes for the same (process/ material etc.) • Practise repairing minor defects like dimension variation, thickness variation etc. by control process parameters etc. • Escalate all issues related to change in surface properties, tensile strength etc. so that the manufacturing equipment can be reset • Manage first and last output from each batch to the lab for quality check on its composition, properties etc. • Organize clearance for the entire batch from the lab	**Raw material:** Mild Steel, Stainless Steel, Aluminium, Brass, Wood CNC Lathe Machine Lathe Machine CNC Simulator 3-Jaw and 4-Jaw Chuck, Cutting Tools (Single Point) Both HSS and Carbide Inserts types CAM software, CNC controller, CNC simulator, milling machine, CNC Milling machine CAM software, CNC controller, different type CNC Controller Like HASS, FANUC, Heidenhain, CNC HASS Simulators, Micro-processor Based Injection Moulding Machine.
9.	**Entrepreneurship in injection moulding** **Theory Duration** (hh.mm) 30:00 **Practical Duration** (hh.mm) 70:00 **Corresponding NOS Code** RSC/N4507 (CPC/N0223)	• Plan with reference to various components of injection moulding • Maintain books of accounts and various transactions • Organize financial assistance from various quarters in the light of various schemes available • Justify the prices of various inputs and products from the market • Assess the influence of various quality parameters of products on the product pricing • Maintain cordial relations with various clients for the benefit of industry • Assess the needs and	**Class Room equipment:** LCD Projector/Screen, Computer, charts, Black / White board and Duster. **Personal Protective equipment:** Safety Goggles, Rubber Gloves, Asbestos gloves, Fire Extinguisher, Apron, Helmet, First Aid Box with Medicines

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		requirement of the clients and assess one's own unique selling proposition • Assess critical market information that is otherwise not in the public domain • Choose appropriate buyer in a given situation of market parameters • Identify best ways of attracting market price for one's produce • Ensure quality before and during the sale activity to ensure good returns	
10.	**Basics of MS office / office open source suite** **Theory Duration** (hh.mm) 24:00 **Practical Duration** (hh.mm) 66:00 **Corresponding NOS Code** RSC/N4504 (CPC/N0219)	• Perform data handling process such as entering data, tracking data, documenting, reporting, etc. using various MS office tools • Perform scan operations on source documents in accordance with specific instructions. • Validate data entered with source documents, checks for compliance and correct all typographical errors • Manage files of source documents or other information • Update database to reflect most current source information • Assist in the filing and storage of security and back up files • Practise ways to access relevant files based on requests	**Class Room equipment:** LCD Projector/Screen, Computer, charts, Black / White board and Duster.
11.	**Maintain basic health and safety practices at the workplace** **Theory Duration** (hh:mm) 34:00 **Practical Duration** (hh:mm) 66:00	• Discuss the job role of an Injection Moulding Operator • Comply with environmental and safety policies of organisation • Identify personal safety, job safety and machine safety procedures • Coordinate with other resources at the workplace to achieve the healthy, safe and secure environment for all • Identify and correct any hazards like illness, accidents, fires or any other natural calamity safely.	**Class Room equipment:** LCD Projector/Screen, Computer, charts, Black / White board and Duster. **Personal Protective equipment:** Safety Goggles, Rubber Gloves, Asbestos gloves, Fire Extinguisher, Apron, Helmet, First Aid Box with Medicines **Raw material:** Mild Steel,

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	Corresponding NOS Code RSC/N4101 (CPC/N0411)	• Demonstrate safe working practices while dealing with hazards • Practise good housekeeping practices at all times • Demonstrate rescue techniques applied during fire hazard • Demonstrate the correct use of a fire extinguisher. • Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals, loud noise • 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. • Practise how to create awareness amongst others by sharing information on the identified risks. • Demonstrate the sorting process and check that the tools, fixtures and jigs that are lying on workstations are the ones in use and un- necessary items are not cluttering the workbenches or work surfaces. • Categorize the types of wastes • Demonstrate the technique of waste disposal and waste storage in proper bins as per SOP • Segregate the items which are labelled as red tag items for the process area and keep them in the correct places • Categorize the tools/ equipment/ fasteners/ spare parts as per specifications/ utility into proper trays, cabinets, lockers • Practise proper stacking of various types of boxes and containers as per the size/ utility to avoid any fall of items/	Stainless Steel, Aluminium, Brass, Wood CNC Lathe Machine Lathe Machine CNC Simulator 3-Jaw and 4-Jaw Chuck, Cutting Tools (Single Point) Both HSS and Carbide Inserts types CAM software, CNC controller, CNC simulator, milling machine, CNC Milling machine CAM software, CNC controller, different type CNC Controller Like HASS, FANUC, Heidenhain, CNC HASS Simulators

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		breakage and also enable easy sorting when required • Identify the floor markings/ area markings used for demarcating the various sections in the plant • Practise proper labelling mechanism of instruments/ boxes/ containers and maintaining reference files/ documents • Validate the items in the respective areas • Comply with the given instructions and check for labelling of fluids, oils, lubricants, solvents, chemicals etc. and proper storage of the same. • Organize all material and tools in the designated places as indicated in the 5S instructions	
	Total Duration **Theory Duration 288:00** **Practical Duration 672:00**	**Unique Equipment Required:** 1. **Class Room equipment:** LCD Projector/Screen, Computer, charts, Black / White board and Duster. 2. **Measuring equipment:** Steel Ruler, Micrometer, Vernier Caliper, Radius gauge, Feeler gauge, Height gauge, Thread gauge, Steel measuring tape, Weighing Balance (1 No.) 3. **Hand Tools:** Hammer, screw driver set with Multiple heads, Allen key hexagonal, Twist drills bit, File triangular, Hacksaw adjustable, Spanner set double side, Adjustable spanner, Crimping tools, Calculator, wrenches, pliers, cutters, striking tools, struck or hammered tools, vices, clamps, snips, saws, drills and knives 4. **Personal Protective equipment:** Safety Goggles, Rubber Gloves, Asbestos gloves, Fire Extinguisher, Apron, Helmet, First Aid Box with Medicines 5. **Plastics raw material:** PP, HDPE, Injection grade 6. **Mould:** Hand mould, Two plate mould, Three Plate mould 7. **Auxiliaries equipment:** Automatic Hopper Loader, Hot air oven and Dryer, Dehumidifier, Mould Temperature Controller, Scrap Grinder, Crane, Air Compressor, Hot Air Blow Gun, Water Cooling Tower, Hand operated Injection Moulding Machine, Semi-Automatic Vertical / Horizontal Injection Moulding Machine, Fully Automatic Injection Moulding Machine, Micro- processor Based Injection Moulding Machine.	

Grand Total Course Duration: **960 Hours 0 Minutes**

(This syllabus/ curriculum has been approved by ***Rubber Skill Development Council)***

Trainer Prerequisites for Job role: "Machine Operator- Plastic Injection Moulding" mapped to Qualification Pack: "RSC/Q4502 (CPC/Q0204)" Version 1.0

Sr. No.	Area	Details
1	**Description**	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack "RSC/Q4502 (CPC/Q0204), V 1.0".
2	**Personal Attributes**	A Trainer should be free from socio-economic preferences and prejudice. He/ she should be safety conscious and proficient in handling and use security/ safety equipment. Besides being knowledgeable, he/ she should be energetic, motivating, innovative and good at communication. The trainer should be able to establish rapport with the trainees and employ innovative methods to impart instructions.
3	**Minimum Educational Qualification**	VIIIth Standard
4a	**Domain Certification**	Certified for Job Role "Machine Operator- Plastic Injection Moulding" mapped to the Qualification Pack "RSC/Q4502 (CPC/Q0204), V 1.0" issued by RSDC
4b	**Platform Certification**	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "MEP/Q2601" with scoring of minimum 80%.
5	**Experience**	As per the standards set by relevant SSC to practice in different industry sectors.

Annexure: Assessment Criteria

CRITERIA FOR ASSESSMENT OF TRAINEES
Job Role: Machine Operator- Plastic Injection Moulding **Qualification Pack Code: RSC/Q4502 (CPC/Q0204), V 1.0** **Sector Skill Council: Rubber Skill Development Council**

Guidelines for Assessment

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also laydown proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below).
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training centre based on these criteria.
5. To pass the Qualification Pack, every trainee should score a minimum of 70% in every NOS.
6. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

Assessable Outcome		Marks Allocation		
NOS	**Performance Criteria**	**Total**	**Theory**	**Practical**
RSC/N4501 (CPC/N0214) Understand basic concepts, job requirements and basics know how related to the Injection moulding process	PC1. To interact with the operator in order to understand the production schedule	6	4	2
	PC2. To help in planning the day's production activities based on the operator's instructions	6	4	2
	PC3. To ensure availability of consumables and plastics materials for production in sufficient quantity as per production plan/operators instructions.	6	4	2
	PC4. Clearly understanding the does and don'ts of the manufacturing process as defined in SOPs/ Work Instructions or defined by operator.	4	3	1
	PC5. Check availability of the personal protective equipment (PPE) like Gloves, Goggles etc.	4	3	1
	PC6. Understand the moulding procedure and process to be adopted for completing the work order from the operator by referring the Work Instruction document/ SOP manual.	4	3	1
	PC7. Ensure that the required material is procured from the store before starting the process	3.5	2.5	1
	PC8. Understand the Mould required for executing the required operation and ensure that the same is available for operation.	3.5	2.5	1
	PC9. Collect the mould from tool room If mould is not available.	3.5	2.5	1
	PC10. Install and bolt the mould in place and slide the safety door shut.	3.5	2.5	1
	PC11. Add the raw material in the machine using material loader or by manual feeding.	3.5	2.5	1
	PC12. Ensure moulds are clean if not clean with soft cotton cloth.	3.5	2.5	1
	PC13. Ensure cleaning of the other auxiliaries tools, (if any) before the initiation of the moulding and trimming process	3.5	2.5	1
	PC14. Ensure cleaning of the area around the apparatus for any oil, grease, combustible substances etc. so as to prevent any	3.5	2.5	1

Assessable Outcome		Marks Allocation		
NOS	**Performance Criteria**	**Total**	**Theory**	**Practical**
	accident			
	PC15. Ensure availability of the coolant and working of valves to circulate the coolant to cool and solidify plastic	3.5	2.5	1
	PC16. Understand the raw material like plastics granules, fillers, bonding additives etc. required for executing the activity	3.5	1.5	2
	PC17. Refer the queries to supervisor if they cannot be resolved by the operator	3.5	1.5	2
	PC18. Confirm self - understanding to the operator once the query is resolved so that all doubts & queries can be resolved before the actual process execution	3.5	1.5	2
	Sub total	**72**	**48**	**24**
RSC/N4505 (CPC/N0221) Perform the Injection moulding related operations, monitor process parameters and troubleshoot the process/product if any	PC1. Check for operation of moulding apparatus like hopper, heaters etc. as per the checklist provided	20	10	10
	PC2. Fix the desired Mould to the injection moulding machine in order to achieve the desired operation as per the Work Instructions/ SOPs	20	10	10
	PC3. 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	25	10	15
	PC4. Perform preheating of plastic granules (In case of Engineering plastics)	20	5	15
	PC5. Ensure that the plastic granules are mixed with additives (if any) before being fed into the hopper	20	5	15
	PC6. Conduct a test process and produce a sample output as per the required	20	10	10
	PC7. Ensure that the dimensions of the output product are measured as per the process given in the Work Instructions/ SOP under guidance of operator.	31	15	16
	PC8. In case the test product matches the dimensions and quality of the final output, start the production process	20	10	10

Assessable Outcome		Marks Allocation		
NOS	**Performance Criteria**	**Total**	**Theory**	**Practical**
	PC9.Feed the required operation code in the apparatus for heaters to melt the plastic granules at the predefined temperature	35	15	20
	PC10. Enter moulding temperature, volume of plastic and weight settings in the machine as per data sheet	35	15	20
	PC11. Enter machine and process parameters such as moulding pressure and time as per the data sheet	25	15	10
	PC12. Add master batch and regrind raw material as per standard composition and mix it well	30	10	20
	PC13. Check-list procedure to ensure quality of final product	22	8	14
	PC14. Enter machine and process parameters such as moulding pressure and time as per the data sheet	22	8	14
	Sub total	**345**	**146**	**199**
RSC/N4506 (CPC/N0222) Conduct quality checks and inspection of the finished products with reference to the approved product.	PC1. Compare texture, colour, surface properties, hardness and strength etc. with the given approved product.	12	4	8
	PC2. Rectify minor defects like dimension variation, thickness variation etc. by control process parameters etc and informing operator.	11	3	8
	PC3. Provide first and last output from each batch to the lab for quality check on its composition, properties etc.	11	3	8
	PC4. Obtain clearance for the entire batch from the lab and submit the operator.	11	3	8
	PC5.Establish linkage between rejection of output and the pertinent causes for the same (process/ material etc.); Recommend the means for rejection control.	11	3	8
	PC6.Rectify minor defects like dimension variation, thickness variation etc. by control process parameters etc.	11	3	8
	PC7.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.	11	3	8
	PC8.Provide first and last output from each batch to the lab for quality check on its	7	2	5

Assessable Outcome		Marks Allocation		
NOS	**Performance Criteria**	**Total**	**Theory**	**Practical**
	composition, properties etc.			
	PC9. Obtain clearance for the entire batch from the lab	6	2	4
	Sub total	**91**	**26**	**65**
RSC/N4101 (CPC/N0411) Maintain basic health and safety practices at the workplace, 5S	PC1. Wear protective clothing/equipment for specific tasks and work conditions	2.5	0.5	2
	PC2. Carry out safe working practices while dealing with hazards to ensure the safety of self and others.	2.5	0.5	2
	PC3. Apply good housekeeping practices at all times	2.5	0.5	2
	PC4. Use the various appropriate fire extinguishers on different types of fires correctly	2.5	0.5	2
	PC5. Demonstrate rescue techniques applied during fire hazard, demonstrate good housekeeping in order to prevent fire hazards, demonstrate the correct use of a fire extinguisher.	2.5	0.5	2
	PC6. 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.	2.5	0.5	2
	PC7. 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.	2.5	0.5	2
	PC8. Create awareness amongst other by sharing information on the identified risks.	2.5	0.5	2
	PC9. 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	2.5	0.5	2

Assessable Outcome		Marks Allocation		
NOS	Performance Criteria	Total	Theory	Practical
	workbenches or work surfaces.			
	PC10. Ensure segregation of waste in hazardous/ non Hazardous waste as per the sorting work instructions	2.5	0.5	2
	PC11. Follow the technique of waste disposal and waste storage in the proper bins as per SOP	1.5	0.5	1
	PC12. Segregate the items which are labelled as red tag items for the process area and keep them in the correct places	1.5	0.5	1
	PC13. Sort the tools/ equipment/ fasteners/ spare parts as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/ work instructions	1.5	0.5	1
	PC14. Ensure that areas of material storage areas are not overflowing PC15. 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	1.5	0.5	1
	PC16. Return the extra material and tools to the designated sections and make sure that no additional material/ tool is lying near the work area	1.5	0.5	1
	PC17. Follow the floor markings/ area markings used for demarcating the various sections in the plant as per the prescribed instructions and standards.	1.5	0.5	1
	PC18. Follow the proper labelling mechanism of instruments/ boxes/ containers and maintaining reference files/ documents with the codes and the lists	1.5	0.5	1
	PC19. Check that the items in the respective areas have been identified as broken or damaged	1.5	0.5	1
	PC20. Follow the given instructions and check for levelling of fluids, oils, lubricants, solvents, chemicals etc. and proper storage of the same To avoid spillage, leakage, fire etc.	1.5	0.5	1
	PC21. Make sure that all material and tools are stored in the designated places and in the manner indicated in the 5S	1.5	0.5	1

Assessable Outcome		Marks Allocation		
NOS	**Performance Criteria**	**Total**	**Theory**	**Practical**
	instructions.			
	Sub total	**40**	**10**	**30**
RSC/N4507 (CPC/N0223) Entrepreneurship in Injection moulding	PC1. Planning and Budgeting with reference to various components of Injection Moulding.	2.5	2	0.5
	PC2. Keep books of accounts and various transactions.	2.5	2	0.5
	PC3. Arrange for financial assistance from various quarters in the light of various schemes available in setup for Injection Moulding.	2.5	2	0.5
	PC4. Ascertain the prices of various inputs and products from the market.	2.5	2	0.5
	PC5. Assess the influence of various quality parameters of products on the product pricing.	3	2	1
	PC6. Establish cordial relations with various clients for the benefit of industry.	2.5	2	0.5
	PC7. Assess the needs and requirement of the clients and assess one's own unique selling proposition.	2.5	2	0.5
	PC8. Extract critical market information that is otherwise not in the public domain.	3	2	1
	PC9. Choose appropriate buyer in a given situation of market parameters	3	2	1
	PC10. Identify best ways of attracting market price for one's produce	3	2	1
	PC11. Ensure quality before and during the sale activity to ensure good returns.	3	2	**1**
	Sub total	**30**	**22**	**8**
RSC/N4504 (CPC/N0219) Basics of computer and data entry in MS Office/Office open source suite software	PC1. Fill and process mandated forms for receiving, processing, or tracking data enter data from source documents (such as trial report, process sheet etc.) into Computer application having MS Office software.	3	2	1
	PC2. Scan source documents in accordance with specific instructions.	3	2	1
	PC3. Ensure data entered with source documents, checks for compliance and corrects all typographical errors and missing or repeated data.	3	2	1

Assessable Outcome		Marks Allocation		
NOS	**Performance Criteria**	**Total**	**Theory**	**Practical**
	PC4. Maintain files of source documents or other information related to data entered.	3	2	1
	PC5. Investigate and confirm data that is unclear before entering, generate reports of data entry, store completed work in designated locations and perform backup operations.	3	2	1
	PC6. Update database information to reflect most current source information	2	1	1
	PC7.Assist in the filing and storage of security and back up data files	3	2	1
	PC8. Respond to requests for information and access relevant files	2	1	1
	Sub total	**22**	**14**	**8**
	Total	**600**	**266**	**334**