





APPRENTICESHIP CURRICULUM (OPTIONAL TRADE)

Rubber

Machine Operator_Plastics Processing

Course Code: CO072200135

 \boxtimes NAPS \square Non-NAPS

NSQF Level: 4



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Course Details

1.	Course Name	Machin	e Operator_Plastics Proce	essing	
2.	Course Code	CO0722	200135		
3.	Apprenticeship Training Duration:	Months: 12 months			
	(2 to 4 weeks of BT is embedded in this duration as per the requirement of				
	the establishment)				
	Remarks				
4.	Credit	TBD			
5.	NSQF Level (Mandatory for NAPS)	4	NSQC A	pproval Date: 20/07/2	2016
6.	Related NSQF aligned qualification details				
		S.	QP/ Qualification/ NOS	QP/ NOS Code &	NQR Code
		No.	Name (As applicable)	Version	
		1	Machine	RSC/Q4803_V1	2021/CP/CIPET/04626
			Operator_Plastics		
			Processing		
7.	Brief Job Role Description	The Ma	chine operator handles the	ne plastic granules (ra	w material), set up and
		operate	e the plastic processing m	achines , finishes the I	product & stores in desired
		place.			
8.	NCO-2015 Code & Occupation (Access the NCO 2015 volumes from:	NIL			
	$\label{eq:https://labour.gov.in/organizationsofmole/directorate-general-employment-training-dget} \)$	<u>et</u>)			
9.	Minimum Eligibility Criteria	8 th Class			
	(Educational and/ or Technical Qualification)				
10.	Entry Age for Apprenticeship	18 year			
11.	Any Licensing Requirements (wherever applicable)	NA			

12.	Is the Job Role amenable to Persons with Disability	□ Yes				
		If yes, check the applicable type of Disability				
		□ Locomotor Disability	□ Leprosy Cured Person	□ Cerebral Palsy	🗆 Dwarfism	□ Muscular Dystrophy
		☐ Acid Attack Victims	Blindness	□ Low Vision	🗆 Deaf	☐ Hard of Hearing
		□ Speech and Language Disability	□ Intellectual Disability	□ Specific Learning Disabilities	□ Autism Spectrum Disorder	☐ Mental Illness
		Multiple Sclerosis	□ Parkinson's	□ Haemophilia	□ Thalassemia	□ Sickle Cell
		Multiple Disabilities	Disease			Disease
		Remarks:				
13.	Submitting Body Details	Name: Rubber, C	hemical & Petrocl	hemical Skill Develo	pment Council	
		E-mail ID: ceo@rcpsdc.in Contact Number: 011-41009347- 48				
14.	Certifying Body	Rubber, Chemical & Petrochemical Skill development Council				
15.	Employment Avenues/Opportunities	 Plastic manufacturing units in India: The apprentice may be employed with the biggest player of the trades and be a part of their manufacturing set and deliver quality work. Education and Training: They may also take up the role of the instructor in this field where they can impart their manufacturing knowledge to the aspiring students. 				

16.	Career Progression	The Machine Operator - Plastics Processing (Level 4) has a clear pathway to
		Plastic Processing highly skilled Operator (Level 5) or Supervisor / Shift In-charge.
17.	Trainer's Qualification & Experience:	Any Graduate preferably in rubber or polymer and 5+ year Experience
18.	Curriculum Creation Date	15 th July 2022
19.	Curriculum Valid up to Date	31 st Dec 2024

Module Details

Sn	Module/NOS	Outcomes	Assessment Passin		Passing	
	Name, Code,		Marks		Percent	age
	Version		Th.	Pr.	Th.	Pr.
1.	Introduction	 Describe the developmental history of plastic. Describe current industrial scenario of plastics and prospects. Identify types of plastic. List major industrial associations related to plastics processing. Identify equipment used for plastics processing. Identify the roles and responsibilities of a machine operator- plasticsprocessing. 	0	0	0	0
2.	Familiarization with basic concepts, job requirements & basic related process RSC/N4801_V1	 Evaluate the work order (work output) required with the support of supervisor. Examine all the components/ processes related documents tounderstand dimensions and properties of the required output. Comply with the process requirements in terms of temperature of the heater, hydraulic pressure/air pressure/ vacuum pressure, rotating speed of the screw pressure, injection time, refilling time, blowing timeetc. as mentioned in the work instruction/ SOP/ control diagrams. Comply with dos and don'ts of the manufacturing process as defined inSOPs/ work instructions. Apply the conversion procedure and process to be adopted forcompleting the work order provided by the supervisor. Identify the various parameters like temperature of the heaters, hydraulicpressure/air pressure/vacuum pressure, rotating speed of the screw pressure, regulating current, flow of coolant/water etc., before starting the process. Identify the raw material like plastics granules, bonding additives etc.required for executing the activity. Assemble the required material before starting the process. Assemble the same is available for mouldingoperations. Assemble spare parts for continuous operation of the machine. Ensure that mould/dye is cleaned properly and no foreign material isentrapped in the parts of the mould/ dve. 	30	60	70%	70%

Sn	Module/NOS	Outcomes	Assessment Passir		Passing	ing	
	Name, Code,		Marks Percen			age	
	Version		Th.	Pr.	Th.	Pr.	
		 Ensure the cleaning of other moulding machine tools, auxiliaries. Demonstrate the process for cleaning oil, grease, water etc. from thearea around the machine. Recognise the need for consulting with superiors in case of any doubt/clarification. Complete the task post the queries are resolved. Plan and report to superiors on completion of the task. Demonstrate good interpersonal relations with superiors and co-workers. Demonstrate disciplined behaviour at the workplace. Practice coordination with other departments to gain their support. Analyse the work order with the supervisor. Determine all components / process related documents required for workoutput. Determine the process requirements. Apply do's and don'ts of the machine parameters setting. Identify the raw material required for process. Demonstrate the process of verification of the required material. Identify the type of mould / dye required as per the work order. Demonstrate the process of the moulding machine, tools and auxiliariesequipment. Demonstrate the process of problem escalation to superiors. 					
3	Basic Knowledge	Create report of work completion for superiors.	15	65	70%	70%	
	about different	 Analyse the work order required for the process, with the support of thesupervisor 	15	05	/0/0	1070	
	plastic material	Examine the material mentioned in the work order to understandproperties of the					
	RSC/N4802 V1	required work output					
		heater, rotating speed of the screw, pressure, injection as mentioned in the work					
		instruction/ SOP/ control diagrams					
		 Identify the temperature required for melting, processing, etc. for plasticraw material Identify the processing characteristics of the plastics material in use, for conversion procedure 					
		 Demonstrate the process to be adopted for completing the work orderfrom the supervisor by 					

Sn	Module/NOS	Outcomes	Assessr	nent	Passing	
	Name, Code,		Marks		Percent	age
	Version		Th.	Pr.	Th.	Pr.
		 referring to the work instruction document/SOPmanual Check if the required material is available before starting the process Ensure that the plastics material is blended with requisite additives Check if the machine/ mould/ dye are cleaned properly and no foreignparticle is entrapped. Identify the types of raw material being used in the plastic industry. Describe the properties of different plastic raw materials. Explain the importance of defining process requirements. Determine the melting temperature and processing temperature etc. forplastic raw material. Identify the processing characteristics of the plastics material being used. Determine the requisite additives to blend with plastics material. 				
4	Maintain basic health and safety practices at the workplace, 5S RSC/N4101_ V1	 Analyse the importance of wearing protective clothing/equipment forspecific tasks and work conditions Demonstrate safe working practices while dealing with hazards toensure the safety of self and others. Follow good housekeeping standards at all times Apply appropriate fire extinguishers for different types of fires Demonstrate rescue techniques applied during fire hazard Demonstrate the correct use of a fire extinguisher. Identify potential injuries through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals, loud noise Conduct regular checks with support of the maintenance team onmachine health to identify potential hazards Inform the concerned authorities about machine breakdown and damages which can potentially be hazardous to man/ machine, whilecarrying out operations Create awareness amongst others by sharing information on theidentified risks Ensure there is no clutter around the workstation and only the tools, fixtures and jigs that are required should be kept Categorize waste in hazardous/non-hazardous form as per the instructions Demonstrate the technique of waste disposal and waste storage in theproper bins as per the SOP Segregate the items which are labelled as red tag items for the processarea and keep them in 	10	30	70%	70%

Sn	Module/NOS	Outcomes	Assessment Pas		Passing	
	Name, Code,		Marks		Percentag	
	Version		Th.	Pr.	Th.	Pr.
		 the correct places Demonstrate segregating tools/equipment/fasteners/spare parts as per specifications/utility into proper trays, cabinets, lockers as mentioned inthe 5S guidelines/ work instructions Ensure the cleanliness around the area where material is stored Practise stacking the various types of boxes and containers properly asper the size/utility , to avoid any spillage or breaking of items and also enable to easily locate Assemble extra material and tools to the designated sections and makesure that no additional material/tool is lying near the work area Ensure proper demarcation of the various sections in the plant throughthe floor markings/area markings for the same Identify and follow the proper labelling mechanism of instruments/ boxes/ containers and maintaining reference files/documents with the codes and the lists Comply with 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. Use protective clothing/ equipment for specific tasks and work conditions. Demonstrate safe working practices during work. Demonstrate good housekeeping practices at all the times. Use the various appropriate fire extinguishers on different types of firescorrectly. Demonstrate segregation to the concerned authorities on the potential risksidentified during operations. Demonstrate segregation of waste as hazardous/ non Hazardous waste. Use the technique of waste disposal and waste storage in the proper bins asper standard operating procedure (SOP). Use the labelling mechanism of instruments/ boxes/ containers. 				
	Onerete Injection	Demonstrate the good practice of storing material and tools as perthe 5S instructions.	25	00	700/	700/
5	Operate Injection	 Determine the work schedule in concurrence with Superior. Analyse the information on the job card 	35	90	70%	70%
	Moulding Machine	 Determine the availability of data sheet, manuals, work instructionsrequired for 				

Sn	Module/NOS	Outcomes	Assessn	nent	Passing	
	Name, Code,		Marl	(S	Percent	age
	Version		Th.	Pr.	Th.	Pr.
	& its trouble shooting RSC/N4807_ V1	 performing the job. Evaluate the power supply, hydraulic oil level, water connections. Determine that the mould is ready and having no problem in dry run. Perform the trial run to get sample piece before carrying out regularproduction run. Perform the parameters adjustment unless getting final product. Perform the injection moulding process with minimum wastage. Perform the cleaning process of the machine and equipment at regularintervals. Describe machine problem to maintenance department for resolvingbreakdown. Perform the visual check of final product. Perform the post moulding operation during the cycle time run. Demonstrate the process of storing the final product in specified area. Perform the root cause analysis of moulding defects. Apply the corrective and preventive action. 				
6	Operate Extrusion Machine & its trouble shooting RSC/N4808_ V1	 Create the report of defects in the moulds that do not have the authority torepair. Apply quality systems in post injection process to get better product. Apply safety and health guidelines. Determine the work schedule in concurrence with Superior. Analyse the information on the job card. Determine the availability of data sheet, manual, work instructions. Determine that the material is available for production, compounding/colour blending. Perform the in-process inspection. 	25	110	70%	70%
		 Perform the trial run to get extruded sample after machine set up. Perform the machine parameters adjustment for getting final product. Perform the cleaning process of the machine and equipment at regularinterval. Apply organization's health and safety standards during operations. Apply quality system to get better product. Perform the visual check of final product. Perform the corona treatment and printing, as per job requirement. Demonstrate the process of storing the final product in specified area. Perform the cleaning process of the machine and equipment at regularinterval. 				

Sn	Module/NOS	Outcomes	Assessment Passi		Passing	
	Name, Code,		Marks		Percentage	
	Version		Th.	Pr.	Th.	Pr.
		 Perform the prevent maintenance of machines and ancillary equipment. Demonstrate the coordination with maintenance department for resolvingbreakdown maintenance in minimum possible time. Perform the root cause analysis of extrusion defects Apply the corrective and preventive action identified during root causeanalysis. Create the report of defects in the moulds that do not have the authority torepair. Apply safety and health guidelines. 				
7	Operate the Blow moulding machine & its trouble shooting RSC/N4809_ V1	 Determine all components / process related documents to understanddimensions and properties of the required work output. Determine the process requirements. Apply do's and don'ts of the blow moulding process as defined in workinstructions. Determine the conversion procedure to be adopted for completing the workorder. Perform the process of setting the process parameters. Identify the raw material like plastics granules, bonding additives etc.required for production. Evaluate that sufficient stock of the required material is available beforestarting the process. Determine the type of mould / dye required for moulding operations. Analyse the availability of spare parts for continuous operation of machine 	35	95	70%	70%
		 Determine all components / process related documents to understanddimensions and properties of the required work output. Determine the process requirements. Apply do's and don'ts of the blow moulding process as defined in workinstructions. Determine the conversion procedure to be adopted for completing the workorder. Perform the process of setting the process parameters. Identify the raw material like plastics granules, bonding additives etc.required for production. Evaluate that sufficient stock of the required material is available beforestarting the process. Determine the type of mould / dye required for moulding operations. Analyse the availability of spare parts for continuous operation of machine 				
	Tot	al Marks	150	450		

Glossary

Term	Description
Sector	Sector is a conglomeration of different business operations
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organization.
National Occupational	NOS are occupational standards which apply uniquely in the Indian context.
Standards (NOS)	

Acronyms

Acronym	Description
NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training

Annexure 1: Tools and Equipment

List of Tools and Equipment

The tools and equipment required are:

Sno	Tool / Equipment Name	Specification (per batch of 30 trainees)
1	Allen key hexagonal	4
2	Steel Ruler	4
3	File Sets	4
4	Spanner set double side,	4
5	Hacksaw	4
6	Adjustable spanner single side	4
7	Safety Goggles	4
8	Hammer	4
9	screw driver set with Multiple heads,	4
10	Fire Extinguisher	4
11	First Aid Box with Medicines	1
12	PP	5
13	HDPE	2
14	Gloves	4
15	Two plate mould	2
16	Blow Mould	2
17	Helmet	30
18	Hot air oven	1
19	Extrusion Die	1
20	Hand mould	1

21	Dryer	1
22	Mould Temperature Controller	1
23	Apron,	30
24	Hot air blow Gun	1
25	Injection Moulding Machine	1
26	Extrusion machine	1
27	Blow Moulding Machine	1
28	Cooling Tower	1
29	Air Compressor	1
30	Crane	1
31	Scrap Grinder	1
32	Micrometer	4
33	Vernier Caliper	4
34	Radius gauge	4
35	Feeler gauge	4
36	Black / White board	1
37	Steel measuring tape	4
38	Weighing Balance	4
39	Projector/Screen	1

Classroom Aids

The aids required to conduct sessions in the classroom are:

- 1 Projector
- 2 Computer/laptops
- 3 Internet connectivity
- 4 Whiteboard

Annexure 2: Assessment Strategy

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

Assessment System Overview:

- Batches assigned to the assessment agencies for conducting the assessment on SDSM/SIP or email
- Assessment agencies send the assessment confirmation to VTP/TC looping SSC
- Assessment agency deploys the ToA certified Assessor for executing the assessment
- SSC monitors the assessment process & records
- If the batch size is more than 30, then there should be 2 Assessors.

Testing Environment: Assessor must:

- Confirm that the centre is available at the same address as mentioned on SDMS or SIP
- Check the duration of the training.
- Check the Assessment Start and End time to be as 10 a.m. and 5 p.m.
- Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
- Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
- Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
- Check the availability of the Lab Equipment for the particular Job Role.

Assessment Quality Assurance levels / Framework:

- Question papers created by the Subject Matter Experts (SME)
- Question papers created by the SME should be verified by the other subject Matter Experts along with the approval required from SSC
- Questions are mapped with NOS and PC

- Question papers are prepared considering that level 1 to 3 is for the unskilled & semi-skilled individuals, and level 4 and above are for the skilled, supervisor & higher management Apprenticeship Curriculum: NAPS Jr. Machine Operator CNC Milling of Plastic Page 20 of 14
- Assessor must be ToA certified
- Assessment agency must follow the assessment guidelines to conduct the assessment

Types of evidence or evidence-gathering protocol:

- Time-stamped & geotagged reporting of the assessor from assessment location
- Centre photographs with signboards and scheme specific branding
- Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
- Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos.

Method of verification or validation:

- Surprise visit to the assessment location
- Random audit of the batch
- Random audit of any candidate

Method for assessment documentation, archiving, and access

- Hard copies of the documents are stored
- Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage and are stored in the Hard Drive

On the Job:

- 1. Assessment for on the job training to be conducted by the industry partner on the practical competency output defined in the NOS/QP and the assessment criteria.
- 2. The candidate must score 70% in each module to complete the OJT.
- 3. Tools of Assessment that can be used are:
 - a. Videos of Trainees during OJT should be shared by employer to RCPSDC.
- 4. Assessment will ensure that the apprentice will be able to:
 - a. Work effectively and efficiently as per schedules and timelines while complying with the health and hygiene norms.
 - b. Implement safety practices.
 - c. Optimize the use of resources to ensure less wastage and maximum conservation.
 - d. Communicate effectively and develop interpersonal skills.