

APPRENTICESHIP CURRICULUM (OPTIONAL TRADE)

Rubber

Machine Operator_Plastics Recycling

Course Code: C0072200052

☒NAPS ☐Non-NAPS

NSQF Level: 4



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Course Details

1.	Course Name	Machine Operator_Plastics Recycling			
2.	Course Code	CO072200052			
3.	Apprenticeship Training Duration: (2 to 4 weeks of BT is embedded in this duration as per the requirement of the establishment)	Months: 12 months			
	Remarks				
4.	Credit	TBD			
5.	NSQF Level (Mandatory for NAPS)	4NSQC Approval Date: 20/07/2016			
6.	Related NSQF aligned qualification details				
		S. No.	QP/ Qualification/ NOS Name (As applicable)	QP/ NOS Code & Version	NQR Code
			Machine Operator Plastics Recycling	RSC/Q4902_V1	2021/CP/CIPET/04627
7.	Brief Job Role Description	The individual at work sets up and operates the Plastics Recycling machine to produce raw material by recycling various plastic wastes which is used for different product applications.			
8.	NCO-2015 Code & Occupation (Access the NCO 2015 volumes from: https://labour.gov.in/organizationsofmole/directorate-general-employment-training-dget)	Plastics Recycling			
9.	Minimum Eligibility Criteria (Educational and/ or Technical Qualification)	8 th class			
10.	Entry Age for Apprenticeship	18 years			
11.	Any Licensing Requirements (wherever applicable)	NA			

12.	Is the Job Role amenable to Persons with Disability	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, check the applicable type of Disability <div style="display: flex; flex-wrap: wrap;"> <div style="width: 20%;"><input type="checkbox"/> Locomotor Disability</div> <div style="width: 20%;"><input type="checkbox"/> Leprosy Cured Person</div> <div style="width: 20%;"><input type="checkbox"/> Cerebral Palsy</div> <div style="width: 20%;"><input type="checkbox"/> Dwarfism</div> <div style="width: 20%;"><input type="checkbox"/> Muscular Dystrophy</div> <div style="width: 20%;"><input type="checkbox"/> Acid Attack Victims</div> <div style="width: 20%;"><input type="checkbox"/> Blindness</div> <div style="width: 20%;"><input type="checkbox"/> Low Vision</div> <div style="width: 20%;"><input type="checkbox"/> Deaf</div> <div style="width: 20%;"><input type="checkbox"/> Hard of Hearing</div> <div style="width: 20%;"><input type="checkbox"/> Speech and Language Disability</div> <div style="width: 20%;"><input type="checkbox"/> Intellectual Disability</div> <div style="width: 20%;"><input type="checkbox"/> Specific Learning Disabilities</div> <div style="width: 20%;"><input type="checkbox"/> Autism Spectrum Disorder</div> <div style="width: 20%;"><input type="checkbox"/> Mental Illness</div> <div style="width: 20%;"><input type="checkbox"/> Multiple Sclerosis</div> <div style="width: 20%;"><input type="checkbox"/> Parkinson's Disease</div> <div style="width: 20%;"><input type="checkbox"/> Haemophilia</div> <div style="width: 20%;"><input type="checkbox"/> Thalassemia</div> <div style="width: 20%;"><input type="checkbox"/> Sickle Cell Disease</div> <div style="width: 20%;"><input type="checkbox"/> Multiple Disabilities</div> </div>
		Remarks:
13.	Submitting Body Details	Name: Rubber, Chemical & Petrochemical Skill Development 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 product manufacturing company, Plastic furniture, construction, sports and leisure industry
16.	Career Progression	The Machine Operator - Plastics Recycling (Level 4) has a clear pathway to Plastics Recycling highly skilled Operator (Level 5) or Supervisor / Shift In-charge.

17.	Trainer's Qualification & Experience:	B.Tech / BE preferably in Chemical or Polymer with 5+ yrs. of experience in Plastic or related industry
18.	Curriculum Creation Date	10.08.2022
19.	Curriculum Valid up to Date	31.12.2024

Module Details

S. No	Module/NOS Name, Code, Version	Outcomes	Assessment Marks		Passing Percentage	
			Th.	Pr.	Th.	Pr.
1.	Understand basic concept, job requirements and basics know how related to the process RSC/N4901 Version 1.0	<ul style="list-style-type: none"> • Discuss about different types of products manufactured by the company • Throw light on functional processes like procurement, store management, inventory management, quality management, incentives, personnel management • Elucidate the general principles of recycling procedure and process knowledge machine functioning parts concepts • Recognise types of plastics like thermoplastics and the additives & grades to be used temperature, pressure etc. of the machine being operated • List various types of cooling systems and their properties • Plan the days production activities based on the operators instructions • Ensure availability of consumables and plastics materials for production in sufficient quantity as per production plan/operators instructions • Summarize the does and don'ts of the manufacturing process as defined in sops/ work instructions or defined by operator • Identify hazards and safety aspects involved in tape production and usage of relevant PPEs. • Explain the molding procedure and process to be adopted for completing the work order from the operator by referring the work instruction document/ sop manual. • Identify the die & pelletizer etc. required for executing the required operation and ensure that the same is available for operation • Discuss how to ensure cleaning of the area around the apparatus for any oil, grease, combustible substances etc. so as to prevent any accident 	25	75	70%	70%

		<ul style="list-style-type: none"> • Identify the plastics waste material like types dust, moisture and metal contaminants etc.required for executing the activity • Demonstrate how to interact with the operator in order to understand the production schedule • Show how to help in planning the days production activities based on the operators instructions • Demonstrate how to check availability of the personal protective equipment (PPE) like gloves, goggles etc. • Practice following the molding procedure and process to be adopted for completing the work order from the operator by referring the work instruction document/ sop manual • Demonstrate how to procured required plastics waste material from the store before starting the process • Practice collecting the die from tool room, if die is not available • Demonstrate how to install and bolt the die and pelletizer etc. in place • Show how to add the plastics waste material in the machine using material loader or by manual feeding • Prepare the die and pelletizer etc. to be clean, if not clean with soft cotton cloth • Conduct cleaning of the other auxiliaries tools, (if any) before the initiation of the recycling and pelletizing process • Practice cleaning of the area around the apparatus for any oil, grease, combustible substances etc. so as to prevent any accident • Use coolant to cool and solidify plastics filaments for pelletizing • Dramatise a situation to refer the queries to supervisor if they cannot be resolved by the operator 				
2	Perform the Plastics Recycling related	<ul style="list-style-type: none"> • Discuss about departments code of conduct • Identify different types machines in the company, its specifications etc. • Describe department documentation policy 	55	175	70%	70%

	<p>operations, monitor process parameters and troubleshoot the process/product if any RSC/N4904 Version 1.0</p>	<ul style="list-style-type: none"> • Discuss about general principles of recycling machine operations, startup, shutdown etc. • Explain the process parameters setting, producing good product etc. • Discuss about the operation of recycling apparatus like hopper, heaters, washing equipment etc. and inspection of the plastics sorting equipment like sensors, ejectors etc.as per the checklist provided • Explain how to modify the process parameters (by selecting the right program from the machine control system) • State how to ensure the plastic waste are mixed with additives, fillers (if any) before being fed into the hopper • Discuss about the check-list procedure to ensure quality of final product • Show how to check for operation of recycling apparatus like hopper, heaters, washing equipment etc. and inspection of the plastics sorting equipment like sensors, ejectors etc.as per the checklist provided • Demonstrate how to fix the desired die to the extrusion machine in order to achieve the desired operation as per the work instructions/ sops • Modify the process parameters (by selecting the right program from the machine control system) • Perform preheating of sorted plastic waste (in case of engineering plastics) • Practice mixing the plastic waste with additives, fillers (if any) before being fed into the hopper • Conduct a test process and produce a sample output as per requirement • Conduct inspection to check the dimension of the output pellets • Demonstrate how to start the production process if the test product or pellet matches the quality of the final output • Demonstrate feeding the required operation code in the apparatus for heaters to melt the plastic waste at the predefined temperature • Show how to enter recycling temperature, volume of plastic waste and weight settings in the machine as per data sheet 				
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		<ul style="list-style-type: none"> • Demonstrate entering machine and process parameters such as pressure and time as per the data sheet • Demonstrate how to add master batch and fillers as per standard composition and mix it well 				
4.	Conduct quality check and inspection of contamination levels of the recycled resins with reference to approved product RSC/N4905 Version 1.0	<ul style="list-style-type: none"> • Discuss about the relevant standards specified for the manufacturing process • Throw light on the basic process followed for inspection of the lot • Discuss about quality management policy of the organization • Illustrate the processes and procedures followed for manufacturing the lot/ pellets • Illustrate the techniques of using measurement instruments like rulers, vernier calipers, micrometers and sorting equipment like sensors, ejectors etc. • Elucidate the methods to identify quality defects in the lot • Discuss about the impact of defects on the overall working of the plastics recycling machine • Discuss about various quality standards used by the organization • Explain how to maintain records of each category of work outputs as per the batch etc. • State how to obtain clearance for the entire batch from the lab • Compare texture, colour, surface properties, hardness and strength etc. with the given approved product • Show how to note down the observations of the basic inspection process and identify pieces which are ok and also not meeting the specified standards • Demonstrate how to discard the batch which are contaminated and reprocess it again • Show how to maintain records of each category of work outputs as per the batch etc. <p>Dramatize a situation to 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</p>	30	80	70%	70%

		<ul style="list-style-type: none"> Practice providing first and last output from each batch to the lab for quality check on its composition, contamination and properties etc. Demonstrate how to obtain clearance for the entire batch from the lab 				
5.	Entrepreneurship in Plastics Recycling RSC/N4906 Version 1.0	<ul style="list-style-type: none"> Discuss the basic steps of plastic recycling planning and budgeting Summarize basic principles of keeping books of accounts Discuss about various government and other schemes / products / offers available for startup and support of plastic recycling List different players selling various plastic recycling products and their prices List different players buying plastic recycling products & their prices Explain various methods of updating oneself with market information such as mobile, internet etc. Discuss about usage, contact with key informants, tie up government agencies etc. Identify the needs and options available with various clients State the advantages and disadvantages of doing business with each one of the clients Discuss about the quality parameters of plastic recycled products and their market prices Summarize the pricing mechanism of various buyers of plastic recycled products Describe the costing of various logistic arrangements towards the sale plastic recycled products at different markets and consumer points Perform planning and budgeting with reference to various plastic wastes for recycling Show how to keep books of accounts and various transactions Practice arranging for financial assistance from various quarters in the light of various schemes available in setup for plastic recycling Compute the prices of various inputs and products from the market 	10	70	70%	70%

		<ul style="list-style-type: none"> • Practice establishing cordial relations with various clients for the benefit of industry • Assess the needs and requirement of the clients and assess one's own unique selling proposition • Show how to extract critical market information that is otherwise not in the public domain • Choose appropriate buyer in a given situation of market parameters • Employ best ways of attracting market price for ones produce • Demonstrate how to ensure the quality before & during the sale activity to ensure good returns 				
6.	Basics of computer and data entry in MS OFFICE/office Open source suite Software RSC/N4504 Version 1.0	<ul style="list-style-type: none"> • Discuss about data handling process such as entering data, tracking data, documenting, reporting, etc. using various MS office tools • Explain how to perform scan operations on source documents in accordance with specific instructions. • Explain how to validate data entered with source documents, checks for compliance and correct all typographical errors • Discuss how to manage files of source documents or other information • Explain how to update database to reflect most current source information • Discuss how to assist in the filing and storage of security and back up files • State how to access relevant files based on requests • Demonstrate how to fill and process mandated forms for receiving, processing, or tracking data, enter data from source documents (such as trial report, process sheet etc.) in to computer application having MS office software/office open source software • Show how to scan source documents in accordance with specific instructions • Perform verification of data entered with source documents, checks for compliance and corrects all typographical errors and missing or repeated data • Demonstrate how to maintain files of source documents or other information related to data entered 	25	15	70%	70%

		<ul style="list-style-type: none"> • Perform investigation and confirm data that is unclear before entering, generate reports of data entry, store completed work in designated locations and perform backup operations • Demonstrate how to update database information to reflect most current source information • Show how to assist in the filing and storage of security and back up data files • Practice to respond to requests for information and access relevant files 				
7.	Maintain basic health and safety practices at the workplace, 5S RSC/N4101 Version 1.0	<ul style="list-style-type: none"> • Explain how to comply with environmental and safety policies of organisation • Identify personal safety, job safety and machine safety procedures • Discuss how to coordinate with other resources at the workplace to achieve the healthy, safe and secure environment for all • Identify hazards like illness, accidents, fires • Discuss about safe working practices while dealing with hazards • Explain good housekeeping standards at all times • State the correct use of a fire extinguishers • Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals, loud noise • State how to conduct regular checks with support of the maintenance team on machine health • Discuss how to maintain awareness amongst others by sharing information on the identified risks. • Categorize the types of wastes • Explain the technique of waste disposal and waste storage in proper bins • Identify the floor markings/ area markings used for demarcating the various sections in the plant • Explain how to maintain reference files/ documents with the codes and the lists 	10	30	70%	70%

		<ul style="list-style-type: none"> • Discuss how to comply with the given instructions and check for labelling of fluids, oils, lubricants, solvents, chemicals etc. • Comply with environmental and safety policies of organisation • Show how to coordinate with other resources at workplace to achieve the healthy environment • Demonstrate how to identify any hazards like accidents, fires or any other natural calamity and act appropriately • Demonstrate safe working practices while dealing with hazards • Practise good housekeeping standards at all times • Demonstrate rescue techniques applied during fire hazard • Demonstrate the correct use of a fire extinguisher. • Demonstrate how to 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 unnecessary items are not cluttering the workbenches or work surfaces. • 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 • Practise proper stacking of various types of boxes and containers as per the size/ utility to avoid any fall of items • 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 				
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		<ul style="list-style-type: none"> • Comply with the given instructions for labelling of fluids, oils, lubricants, solvents, chemicals etc. • Demonstrate proper storage of the materials to avoid spillage, leakage, fire etc. 				
		Total Marks	155	445	70%	70%

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 Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.

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 (as per batch of 30 trainees)
1	screw driver set with Multiple heads,	4
2	Allen key hexagonal	4
3	File Sets	4
4	Hacksaw	4
5	Micrometer	4
6	Vernier Caliper	4
7	Steel Ruler	4
8	Spanner set double side,	4
9	Adjustable spanner single side	4
10	Weighing Balance	4
11	Hammer	4
12	Steel measuring tape	4
13	Apron,	10
14	Helmet	30
15	Mould Temperature Controller	1
16	First Aid Box with Medicines	1
17	Gloves	4
18	Hot air oven	1
19	Hot air blow Gun	1
20	Cooling Tower	1
21	Grinder/Shredder	1

22	Scrap Grinder	1
23	Crane	1
24	Air Compressor	1
25	Fire Extinguisher	2
26	Dryer	1
27	Safety Goggles	4
28	Black / White board	1
29	Radius gauge	4
30	Feeler gauge	4

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.