APPRENTICESHIP CURRICULUM (OPTIONAL TRADE)

Rubber

Rubber_Mixing Supervisor

Course Code: CO072200045

☒NAPS ☐Non-NAPS

NSQF Level: 5

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Course Details

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<tr><td rowspan="2">3.</td><td>Apprenticeship Training Duration:
(2 to 4 weeks of BT is embedded in this duration as per the requirement of the establishment)</td><td>Months: 12 month</td></tr>
<tr><td>Remarks</td><td></td></tr>
<tr><td>4.</td><td>Credit</td><td>TBD</td></tr>
<tr><td>5.</td><td>NSQF Level (Mandatory for NAPS)</td><td>5 NSQC Approval Date: 31st March 2022</td></tr>
<tr><td>6.</td><td>Related NSQF aligned qualification details</td><td>
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<tr><th>S. No.</th><th>QP/ Qualification/ NOS Name (As applicable)</th><th>QP/ NOS Code & Version</th><th>NQR Code</th></tr>
<tr><td>1.</td><td>Rubber Mixing Supervisor</td><td>RSC/Q0111_V2</td><td>2022/RUB/RSDC/05754</td></tr>
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<tr><td>7.</td><td>Brief Job Role Description</td><td>A Rubber Mixing Supervisor is responsible to supervise all the processes involved in mixing operation that is being carried out to prepare the master batch and final batch of rubber compound in Banbury /Mixer/ Kneader and/or Open Mill. He is responsible to monitor and manage the mixing area w.r.t machines, equipments, manpower and material.</td></tr>
<tr><td>8.</td><td>NCO-2015 Code & Occupation (Access the NCO 2015 volumes from: https://labour.gov.in/organizationsofmole/directorate-general-employment-training-dget)</td><td>NCO-2015/NIL</td></tr>
<tr><td>9.</td><td>Minimum Eligibility Criteria
(Educational and/ or Technical Qualification)</td><td>10th Class + I.T.I ((after 10th class) in the relevant field with 2 years of relevant experience)
OR
12th Class (4 years of relevant experience)</td></tr>
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		OR Certificate (of Level 4- Rubber Internal Mixer Operator/ Rubber Pre-mixing Operator/ Rubber Mill Operator/ Rubber Adhesive Cement Mixing Operator with 2 years of relevant experience)
10	**Entry Age for Apprenticeship**	*18 Years*
11	**Any Licensing Requirements** (*wherever applicable*)	NA
12	**Is the Job Role amenable to Persons with Disability**	☐ **Yes** ☒ **No** **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 Disease** ☐ **Haemophilia** ☐ **Thalassemia** ☐ **Sickle Cell Disease** ☐ **Multiple Disabilities**
		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**	1. Assistant/Deputy Manager: The apprentice may be employed with the biggest players of the Rubber industry. The individual has to coordinate with interdepartmental functions like purchase, quality, and maintenance. He or she needs to ensure that quality standards of the mixed compounds are met by the mixing department. Added to this, he/ she have to ensure that material movement/ flow, storage, plant layout, and upkeep are maintained. 2. Sr. Engineer Chemist (Rubber Mixing): The apprentice will be encouraged to work on rubber processing and troubleshooting issues related to it. Added to it, the individual will also have to be involved in various rubber testing and mixing procedures to determine that the equipment in use or the process is functioning efficiently. 3. Foreman: The apprentice will be encouraged to work with various rubber mixing machines and coordinate with different departments and worker groups.
16	**Career Progression**	Rubber Mixing Supervisor level role which leads to supervisor Mixing in Mixing Occupation under Tyre and Non-Tyre rubber manufacturing process
17	**Trainer's Qualification & Experience:**	Trainer Prerequisites for course: Rubber Mixing Supervisor
18	**Curriculum Creation Date**	11/07/2022
19	**Curriculum Valid up to Date**	30/09/2022

Module Details

Sno	Module/NOS Name, Code, Version	Outcomes	Assessment Marks		Passing Percentage	
			Th.	Pr.	Th.	Pr.
1	Supervise the preparatory activities for rubber mixing RSC/N0130_V2	• Interpret the information available in a production plan for the rubber mixing process. • Arrange the weighment and issuance of the rubber compound ingredients as per the compound recipe. • Plan the rubber mixer and other auxiliary equipment as per the compound specification. • Illustrate the operating procedure of the tools and equipment req suired for the rubber mixing. • State the importance of cleaning process to maintain quality during rubber mixing. • Outline the purpose of different utility equipment in rubber mixing. • Use batch number/identification details/ quality approval status against job sheet for input material to be used for the rubber mixing. • Interpret the production specifications required to set the rubber mixing machine parameters. • Assess the requirement of the tools and equipment for rubber mixing process as per the given production plan. • Determine the materials needed for rubber mixing process against the given recipe. • Check and validate the set parameters of the rubber mixer equipment by rubber mixing operator. • Inspect and cross check the given weighed material for ensuring correct weighing.	40	60	70%	70%

Sno	Module/NOS Name, Code, Version	Outcomes	Assessment Marks		Passing Percentage	
			Th.	Pr.	Th.	Pr.
2	Supervise rubber mixing operations RSC/N0131_V2	• Review the safety measures to be followed during rubber mixing process, for effectiveness. • Arrange the in-process checks to ensure the quality of the rubber compound. • Interpret the machine signals indicating any variation in the process parameter during rubber mixing process. • Outline the implication of producing nonconfirming rubber compound. • Use corrective actions in case of any abnormality observed during rubber mixing process. • Utilize the available resources – material, equipment, and manpower, as per the company's target. • Differentiate between TAKT time and cycle time. • Estimate the time to be taken to complete the given production plan based on the mixing and cycle time of planned compounds. • Inspect and verify the rubber mixing process being carried out by the operator against company's SOP (Standard operating procedure). • Check and verify if the operator is mixing batches as per time and temperature and maintaining uniformity between batches. • Inspect and verify if the operator is cross checking the weights of ingredients using a check weight scale before each mixing cycle. • Calculate efficiency parameters of the rubber mixing section, such as: production efficiency, availability, quality and OEE (Overall equipment efficiency.	40	60	70%	70%

Sno	Module/NOS Name, Code, Version	Outcomes	Assessment Marks		Passing Percentage	
			Th.	Pr.	Th.	Pr.
3	Supervise post-rubber mixing operations RSC/N0132_V2	• Arrange the equipment used for post-rubber mixing activities, such as: cooling rack, anti tac chemical application tank, etc. • Differentiate between different quality issues occurring during rubber mixing. • Outline the importance of post- production inspection for maintaining quality and mitigating risk of rejection at customer end. • Illustrate the safety precautions to taken by the rubber mixing operator during post-rubber mixing activities. • Define the importance of controlling nonconfirming products. • Estimate the mixed compound's inventory level as per the company's norm. • State the concept and importance of FIFO (First In First Out) in material storage. • Check if the identification of the mixed compound is as per the company's SOP. • Compare the achieved rubber mixing process time against standard rubber mixing process time to evaluate the performance efficiency of the operator. • Evaluate the quality of the produced rubber for visual defects. • Inspect to verify if the sampling procedure for lab testing and release is followed as per the company's SOP. • Arrange storage of the of mixed rubber compound demonstrating consideration of following: ♣ Batches pending to be lab tested ♣ lab tested ♣ lab rejected compound batches are located at their respective designated locations to facilitate FIFO • Manage the segregation of the rubber mixing waste and follow up on appropriate disposal procedure as per the company's SOP.	40	60	70%	70%

Sno	Module/NOS Name, Code, Version	Outcomes	Assessment Marks		Passing Percentage	
			Th.	Pr.	Th.	Pr.
4	Manage housekeeping at workplace RSC/N5605_V1	• Organise cleaning standards and procedures. • Outline the importance of completing the housekeeping activities as per the schedules in rubber mixing process. • Plan the cleaning equipment required for housekeeping. • Arrange the suitable chemicals for the rubber mixing area cleaning. • Infer the meaning of '5S.' • Paraphrase each 'S' of 5S methodology. • Demonstrate the 1S and 2S deployment in the rubber mixing area. • Inspect the rubber mixing area for cleaning requirements. • Prepare plan and schedule for cleaning the rubber mixing area. • Arrange the cleaning of rubber mixing area with the specified cleaning aid and chemicals.	40	60	70%	70%
5	Manage reporting and documentation RSC/N5606_V1	• Outline the importance of reporting production performance for rubber mixing. • Interpret the information given in a standard production report for rubber mixing machine. • Compile the performance reports of all the equipment used in the rubber mixing section. • Interpret the work instructions for rubber mixing to the rubber mixing operator. • State the use of SPC (Statistical Process Control) in rubber mixing. • Propose the ways of overcoming general problems encountered in communication at workplace. • Use the traits of active listening • Demonstrate the production data compilation for the rubber mixing section with production efficiency and loss analysis. • Demonstrate the SPC graph filling based on the given data. • Demonstrate the filling up of machine maintenance request slip for given machine maintenance issue.	40	60	70%	70%

Sno	Module/NOS Name, Code, Version	Outcomes	Assessment Marks		Passing Percentage	
			Th.	Pr.	Th.	Pr.
6	Supervise quality checks RSC/N5607_V1	• Organise relevant standards and procedures for rubber compound testing and inspection. • Outline the basic concept of AQL (Acceptable Quality Level) for sample drawing process for product testing. • Identify and analyse the defects generated during rubber mixing operation, such as: ♣ Poor quality of mix ♣ Nerviness ♣ Bloom ♣ Lumps ♣ Bagging on the mill, etc. • Interpret the test report issued by the quality lab. • Explain the methods for checking in-process quality during rubber mixing process. • Analyse the causes of the defects in a rubber mixing product and take corrective and preventive actions. • Identify and select the appropriate inspection equipment used for carrying out the quality inspection of rubber compound. • Evaluate the effectiveness of post-production visual inspection conducted by the operator. • Select samples of the material from each batch of the produced compounds for submitting it to lab for testing. • Inspect and verify the correctness of labelling/numbering on the samples submitted to the lab for testing. • Demonstrate handling of the off-specification rubber compound batches, by segregating, identification marking, and quarantine to the designated area for further disposition by the technical department.	35	65	70%	70%

Sno	Module/NOS Name, Code, Version	Outcomes	Assessment Marks		Passing Percentage	
			Th.	Pr.	Th.	Pr.
7	Problem identification and escalation RSC/N5608_V1	• Point out regular problems encountered during rubber mixing process, such as: - Machine maintenance issue - Raw material non-availability - Manpower non-availability - Quality issue in input raw material - Quality issue in material produced • Differentiate between various root cause analysis methods available to analyse a problem. • Identify the wrong practices which may lead to quality issue in the produced material. • Illustrate the wrong practices which may lead to poor production performance. • Propose how to deal with common problems during rubber mixing operation. • Distinguish the problems beyond control for timely escalation. • Create a fish bone diagram for a given rubber compound quality problem. • Illustrate the hierarchy for escalating problem of a rubber mixing machine, quality of the mixed rubber compound and performance issues related to rubber mixing.	45	55	70%	70%
8	Manage health and safety practices RSC/N5609_V1	• Create a fish bone diagram for a given rubber compound quality problem. • Illustrate the hierarchy for escalating problem of a rubber mixing machine, quality of the mixed rubber compound and performance issues related to rubber mixing. • Demonstrate the use of the given Personal Protective Equipment (PPE). • Demonstrate how to handle fire emergencies through a role play. • Demonstrate how to use a multi-purpose fire extinguisher on simulated fire. • Select the fire extinguisher from the given fire extinguishers, for the specified fire type and class. • Demonstrate first aid procedure for a given injury. • Demonstrate how to spot potential fire threat at rubber mixers. • Check and ensure fire control indicator is working correctly.	30	70	70%	70%

Sno	Module/NOS Name, Code, Version	Outcomes	Assessment Marks		Passing Percentage	
			Th.	Pr.	Th.	Pr.
9	Implement Ethical and Sustainable Practices at Workplace RSC/N5604_V1	• List use of alternate energy sources and their advantages. • Describe the harmful effects of using fuel such as diesel on the environment and ways to prevent it. • Outline the importance of water harvesting techniques and common practices of conserving water. • Interpret the outcome of energy audit for rubber mixing. • Classify the methods of material conservation in a production process. • Point out the importance of energy conservation in rubber mixing. • Discuss the process of effective waste management for rubber mixing. • List the implication of ineffective waste management and poor waste disposal. • Describe the methods of effective recycling practices for rubber mixing wastes. • Explain the concept of disability and gender inclusiveness. • List implication of discriminating a person for gender and physical disability in an organisation. • State different types of disability. • Outline the importance of treating all employees equally, without any gender/ disability bias. • Demonstrate the effective ways to save energy in rubber mixing process. • Demonstrate the effective ways to manage the rubber waste generated from rubber mixing process. • Demonstrate the use of gender and disability inclusive communication through a role play.	40	60	70%	70%
Total Marking			**350**	**550**		

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:

S. No.	Tool / Equipment Name	Specification (as per batch of 30 trainees)
1	Safety Goggles,Rubber Gloves, Safety gloves,Fire Extinguisher,Apron,Helmet,First Aid Box with Medicines	10
2	Two Roll Mill/Internal Mixer,/Kneader	1
3	Raw Materials such dry rubber/carbon etc for training purpose	10

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.