



APPRENTICESHIP CURRICULUM
for
Extrusion and Calendaring
Under
Rubber, Chemicals and Petrochemicals

1	Program Title : Extrusion and Calendaring
2	Program Code, if any : RSC/Q0622, RSC/Q0624, RSC/Q0730, RSC/Q0101
3	Duration (hours and months) for theory (Block I): 1344 hours (7 months approximately)
4	Duration (hours and months) for On the Job Training (Block II): 5,952 hours (31 months approximately, with formative and summative assessments, and instructions)
5	Certifying body for theory component: RSDC
6	Certifying Body for On the Job training/practical component: Apollo Tyres
7	Minimum eligibility criteria (Educational Qualification and/or technical Qualification and Experience) Class VIII th pass Exemptions, if any: XII / ITI / Diploma
8	Trainer's Qualification and Experience (BT and OJT) : B.Tech/BE preferably in Rubber, Chemical or Polymer with 5+ yrs. of experience in Rubber or related industry
9	Indicative list of training tools required to deliver this qualification <ul style="list-style-type: none"> • Laptop/computer • MS Office Suite • Projector • LCD screen • Whiteboard • Markers • Blackboard • Chalk • Duster • Flipcharts • Participant Handbook • Copies of hand-outs • Extruder machine • Dies, die heaters, and die holders • Cooling tanks • Skivers • Blowers • Tcus • Finishing tools • Extruded products • Ruler • Dial gauge • Magnifying glass • CPR mannequin • First aid kit • Reporting formats (like production report format) • Registers

- Samples of unfinished cured tyre
- Rubber products
- Trimming machine
- Racks
- Identification tags
- Material handling equipment
- Unfinished rubber products
- Procedure and work instructions
- Rubber products with different quality defects
- Magnifying glass
- Inspection table with appropriate light arrangement
- Sample of PPE – safety goggles, safety shoes, safety gloves, safety hat, mask, earmuff, first aid box, fire extinguisher
- Samples of RSS sheets, crepe rubber, TSR rubber, synthetic rubber, reclaimed rubber, rubber finished parts
- Rubber product-specific testing equipment like rubber hardness tester, tensile tester, rebound tester, ozone tester, oven, furnace, melting point tester, ash content testing equipment, mooney viscometer, rheometer
- Different cleaning equipment
- Cured rubber parts with different quality defects
- Latex rubber product finishing tools
- Latex product (gloves, balloons, condoms, etc.) specific testing equipment, like compress air testing machine for gloves, balloons and condoms
- Equipment for performing water leakage tests for condoms
- Rubber mixing mill of size 30cm x 75 cm or higher
- Auxiliary equipment and tools
- Lab model
- Rubber processing equipment such as mill
- Extruder
- Calendar
- Press
- Mould
- Samples of rubber compounding ingredients

10 Formal structure of the curriculum

I. Theory Component (Block - I)

	Modules	Duration of Training-Theory (in hours)	Duration of Training-Practical (in hours)	Total duration (in hours)
Basic Training Program - Extruder Operator (including pre and post) - Trimester 1-3				
	1. Prepare Extruder Theory	31	45	76
	2. Feed Rubber Compound to the Extruder and Perform Extrusion Operation Theory	34	55	89
	3. Undertake Post Extrusion Activities Theory	24	35	59
	4. Health and Safety Theory	9	10	19
	5. House Keeping	02	18	20
	6. Reporting and Documentation	07	10	17
	7. Quality Checks	07	10	17
	8. Problem Identification and Escalation	04	10	14
	9. Soft Skills	02	09	11

	10. IT Skills	04	10	14
Total		124	212	336
	Modules	Duration of Training-Theory (in hours)	Duration of Training-Practical (in hours)	Total duration (in hours)
Basic Training Program - Quality Control Inspector – Extrusion - Trimester 4-6	1. Prepare material, tools and machine for finishing	23	30	53
	2. Undertake finishing of tyres	30	63	93
	3. Undertake finishing of non-tyre rubber products	30	63	93
	4. Carry out housekeeping in rubber product manufacturing	10	13	23
	5. Carry out reporting and documentation	5	5	10
	6. Carry Out Quality Checks	13	20	33
	7. Carry out problem identification and escalation	3	5	8
	8. Carry out health and safety	3	20	23
Total		117	219	336
	Modules	Duration of Training-Theory (in hours)	Duration of Training-Practical (in hours)	Total duration (in hours)
Basic Training Program - Quality Control Inspector - Calendaring (Option: Latex Products) - Trimester 7-9				
	1. Quality assurance at various stages of rubber production	30	68	98
	2. Carry out housekeeping in rubber product manufacturing	15	23	38
	3. Carry out reporting and documentation	20	28	48
	4. Carry Out Quality Checks	10	13	23
	5. Carry out problem identification and escalation	8	20	28
	6. Carry out health and safety	10	20	30

	7. Develop entrepreneurship skills	10	20	30
Latex Products	1. Quality assurance of latex products	8	33	41
Total		111	225	336
	Modules	Duration of Training-Theory (in hours)	Duration of Training-Practical (in hours)	Total duration (in hours)
Basic Training Program – Mill Operator - Trimester 10-12	1. Prepare mixing mill and accessories	30	50	80
	2. Mix raw material in mixing mill to prepare rubber compound	35	55	90
	3. Undertake post mixing mill activities Theory	34	55	55
	4. Health and Safety Theory	15	20	35
	5. House Keeping	5	10	15
	6. Reporting and Documentation	2	5	7
	7. Quality Checks	24	30	15
	8. Problem Identification and Escalation	8	10	18
	9. Soft Skills	5	5	10
	10.IT Skills	10	15	25
		130	206	336
Total duration of BT		482	862	1344

II. Practical/On the job Training component (Block - II)

	Modules	Duration of Training-Theory (in hours)	Duration of Training-Practical (in hours)	Total duration (in hours)
On the Job Training Program: Extruder Operator (including pre and post) - Trimester 1-3	1. Prepare Extruder	7	143	150
	2. Feed Rubber Compound to the Extruder and Perform Extrusion Operation	7	143	150
	3. Undertake Post Extrusion Activities	7	143	150
	4. Health and Safety	7	143	150
	5. Housekeeping	8	142	150
	6. Reporting and Documentation	7	143	150
	7. Quality Checks	7	143	150
	8. Problem Identification and Escalation	7	143	150
	9. Soft Skills	2	142	144
	10. IT Skills	2	142	144
Total		61	1427	1488
	Modules	Duration of Training-Theory (in hours)	Duration of Training-Practical (in hours)	Total duration (in hours)
On the Job Training Program: Quality Control Inspector - Extrusion - Trimester 4-6	1. Prepare material, tools and machine for finishing	5	181	186
	2. Undertake finishing of tyres	5	181	186
	3. Undertake finishing of non-tyre rubber products	5	181	186
	4. Carry out housekeeping in rubber product manufacturing	6	180	186
	5. Carry out reporting and documentation	6	180	186
	6. Carry Out Quality Checks	6	180	186

	7. Carry out problem identification and escalation	6	180	186
	8. Carry out health and safety	6	180	186
Total		45	1443	1488
	Modules	Duration of Training-Theory (in hours)	Duration of Training-Practical (in hours)	Total duration (in hours)
On the Job Training Program: Quality Control Inspector - Calendaring - Trimester 7-9	1. Quality assurance at various stages of rubber production	5	181	186
	2. Carry out housekeeping in rubber product manufacturing	5	181	186
	3. Carry out reporting and documentation	5	181	186
	4. Carry out Quality Checks	6	180	186
	5. Carry out problem identification and escalation	6	180	186
	6. Carry out health and safety	6	180	186
	7. Develop entrepreneurship skills	6	180	186
OPTION 1: Latex Products - Trimester 7-9	1. Quality assurance of latex products	6	180	186
Total		45	1443	1488
On the Job Training Program: Mill Operator - Trimester 10-12	1. Prepare mixing mill and accessories	7	143	150
	2. Mix raw material in mixing mill to prepare rubber	7	143	150

	compound			
	3. Undertake post mixing mill activities	7	143	150
	4. Health and Safety	8	142	150
	5. House Keeping	7	143	148
	6. Reporting and Documentation	5	143	148
	7. Quality Checks	5	143	148
	8. Problem Identification and Escalation	5	143	148
	9. Soft Skills	7	142	149
	10.IT Skills	7	142	149
	Total	60	1428	1488
	Total duration of OJT	211	5741	5952

11 Total Pass marks			
		Total and Pass Marks- Theory	Total and Pass Marks- Practical
	Basic Training Program	210 out of 300	140 out of 200
	On the Job Training Program	210 out of 300	140 out of 200

12 Job description-brief: On completion of the course, the individual has to perform the following job responsibilities:

- Feed the rubber compound to the extruder, carry out the extrusion operation using the extruder and perform post extrusion operations
- Inspect the final finished product for any defect, hold defective pieces for repair /scrapping
- Perform final finishing and prepare them for storage in finished goods stores /send for dispatch
- Inspect/control/assure the quality of raw material and their storage
- Issue the plant processing and the intermediate products produced at different stages of production process such as rubber compounds, semi-finished and finished products

	<ul style="list-style-type: none"> • Ensure conformity of quality standards • Final product inspection, segregation of non-conforming products and packaging • Warm or mix rubber compound on a two roll rubber mill.
13	Employment avenues/opportunities: Automotive Industry, Construction, Agriculture, Sports and Leisure Industry
14	Curriculum update version and date: V1.0, 13.03.2020
15	Curriculum revision date: 13.03.2023

I. Theory Component (Block - I)

Extruder Operator (including pre and post) – Trimester 1-3

Modules	Topics/Expected Key Learning outcomes
Introduction and Orientation Theory (hrs): 2 Practical (hrs): 0 Corresponding NOS Code: Bridge module	<ul style="list-style-type: none"> • Importance of Rubber Sector • Role and responsibility of Extruder Operator
Prepare Extruder Theory (hrs): 30 Practical (hrs): 45 Corresponding NOS Code: RSC/N2601	<ul style="list-style-type: none"> • Ensure that extruder is clean • Ensure emergency safety feature of machine is working – On extruder, extruder feed system , extruder line and other ancillary units • For hot feed, prepare the feed mill and overhead conveyor for feeding the strip to the extruder. • For cold feed, ensure pre-made strips are ready for feed • Fit the correct die assembly on the extruder head • Set parameters for the extruder(screw speed, temperature, conveyor speed) as per organizational SOP • Set the online measurement system as per specifications and tolerances • Ensure the cooling system(water sprays / immersible tanks)are set correctly and in working condition • Ensure the water pH as per the specification/SOP • Ensure acid dosing system to correct cooling water pH is operational

	<ul style="list-style-type: none"> • Ensure that rubber compounds to be fed are approved by laboratory • Collect all rubber compounds required for the production and store in designated areas • Match the batch code of each rubber compound with the batch code on the job schedule given by the planning department and also as per specification /SOP. Specification/SOP are considered as correct and planning schedule is only a guideline • Ensure housekeeping in extruder area • Perform the checks of upstream/ downstream equipment before starting the machine • Operate the conveyor belt within the speed limit at all times and always be aware of the upper limit • Adhere to all safety norms (like wearing protective gloves, shoes, safety goggle etc.) • Comply with health, safety, environment guidelines, regulations etc. in accordance with international/national standards or organizational SOP
<p>Feed Rubber Compound to the Extruder and Perform Extrusion Operation</p> <p>Theory (hrs): 35</p> <p>Practical (hrs): 55</p> <p>Corresponding NOS Code: RSC/N2602</p>	<ul style="list-style-type: none"> • Handle the rubber compound appropriately to avoid contamination • Ensure adequate rubber compound is available for the extrusion process to meet the production schedule Ensure the compound is released for usage as OK to use • Select the correct compound • Feed the extruder with proper strip width and thickness of correct dimension as per specification Produce product of correct width, length thickness free of lumps and torn edges • Ensure the product/output weight through online weighing scale as per specification to avoid rework or rejections. • Visually inspect the rubber strip to make sure it is free from defects and meets required specifications for further processing. • Ensure the extrudate temperature conforms to specifications • Ensure dimensions of the extrudate conforms to the specifications • Ensure that the extruded product is handled carefully and is free from contamination • Ensure housekeeping in extruder area • Perform the checks of upstream/ downstream equipment before starting the machine

	<ul style="list-style-type: none"> • Handle the moving parts like the conveyor belts, the feed inlet and discharge port, belts, gears and other rotating parts when the machine is running • Ensure the provision of safety guards /covers(if any) in the all moving parts while in operation • Operate the conveyor belt within the speed limit at all times and always be aware of the upper limit • Maintain protocol while the machine is in operation, like never reaching over the machine or machine guard to the point of operation • Handle the hot extrudates properly using hand gloves and other safety equipment • Adhere to all safety norms (like wearing protective gloves, shoe, safety goggles etc.) • Ensure the functioning of mill safety switch / safety bar in all mills • Comply with health, safety, environment guidelines, regulations etc. in accordance with international/national standards or organizational SO
<p>Undertake Post Extrusion Activities</p> <p>Theory (hrs): 25</p> <p>Practical (hrs): 35</p> <p>Corresponding NOS Code: RSC/N2603</p>	<ul style="list-style-type: none"> • Collect the extruded product of specified length/width/weight correctly on the leaf truck/trolley/pallets • Operate online marking system for product identification • Allow specified ageing/ maturing time for product to achieve uniform size and be usable at the next stage • Dispose waste material in safe manner correctly as per organisational SOP • Ensure identification and traceability by batch marking/ coding for the right product as per instructions laid down by the company (in terms of batch number, colour, date stamp etc) • Send sample of specified compound/ batch in specified form to lab for testing • Send the remaining material to the designated storage area • Maintain protocol while the machine is in operation, like never reaching over the machine or machine guard to the point of operation • Ensure that there are no loose clothes around the conveyor belt. • Maintain the correct posture while undertaking physical activities such as lifting heavy objects (such as extrudate, if heavy) • Handle the hot extrudate properly using hand gloves and other safety equipment • Ensure that the direct exposure of the extrudate to the skin is minimized

	<ul style="list-style-type: none"> • Adhere to all safety norms (like wearing protective gloves, shoes etc.) • Comply with health, safety, environment guidelines, regulations etc. in accordance with international/national standards or organizational SOP
<p>Health and Safety</p> <p>Theory (hrs): 10</p> <p>Practical (hrs): 10</p> <p>Corresponding NOS Code: Bridge module</p>	<ul style="list-style-type: none"> • Identify different methods of first aid • Perform first aid • Understand CPR • Perform CPR in case of emergency
<p>Housekeeping</p> <p>Theory (hrs): 2</p> <p>Practical (hrs): 20</p> <p>Corresponding NOS Code: RSC/N5001</p>	<ul style="list-style-type: none"> • Inspect the area while taking into account various surfaces • Identify the material requirements for cleaning the areas inspected, by considering risk, time, efficiency and type of stain • Ensure that the cleaning equipment is in proper working condition • Select the suitable alternatives for cleaning the areas in case the appropriate equipment and materials are not available and inform the appropriate person • Plan the sequence for cleaning the area to avoid re-soiling clean areas and surfaces • Inform the affected people about the cleaning activity • Display the appropriate signage for the work being conducted • Ensure that there is adequate ventilation for the work being carried out • Wear the personal protective equipment required for the cleaning method and materials being used • Use the correct cleaning method for the work area, type of soiling and surface • Carry out cleaning activity without disturbing others • Deal with accidental damage, if any, caused while carrying out the work • Report to the appropriate person any difficulties in carrying out your work • Identify and report to the appropriate person any additional cleaning required that is outside one's responsibility or skill

	<ul style="list-style-type: none"> • Ensure that there is no oily substance on the floor to avoid slippage • Ensure that no scrap material is lying around • Maintain and store housekeeping equipment and supplies • Follow workplace procedures to deal with any accidental damage caused during the cleaning process • Ensure that, on completion of the work, the area is left clean and dry and meets requirements • Return the equipment, materials and personal protective equipment that were used to the right places making sure they are clean, safe and securely stored • Dispose the waste garnered from the activity in an appropriate manner • Dispose of used and un-used solutions according to manufacturer's instructions, and clean the equipment thoroughly • Maintain schedules and records for housekeeping duty • Replenish any necessary supplies or consumables
<p>Reporting and Documentation</p> <p>Theory (hrs): 8 Practical (hrs): 10 Corresponding NOS Code: RSC/N5002</p>	<ul style="list-style-type: none"> • Report data/problems/incidents as applicable in a timely manner • Report to the appropriate authority as laid down by the company • Follow reporting procedures as prescribed by the company • Identify documentation to be completed relating to one's role • Record details accurately an appropriate format • Complete all documentation within stipulated time according to company procedure • Ensure that the final document meets with the requirements of the persons who requested it or make any amendments accordingly • Make sure documents are available to all appropriate authorities to inspect • Respond to requests for information in an appropriate manner whilst following organizational procedures • Inform the appropriate authority of requests for information received

<p>Quality Checks</p> <p>Theory (hrs): 8 Practical (hrs): 10 Corresponding NOS Code: RSC/N5003</p>	<ul style="list-style-type: none"> • Ensure that total range of checks are regularly and consistently performed • Use appropriate measuring instruments, equipment, tools, accessories etc ,as required • Identify non-conformities to quality assurance standards • Identify potential causes of non-conformities to quality assurance standards • Identify impact on final product due to non-conformance to company standards • Evaluating the need for action to ensure that problems do not recur • Suggest corrective action to address problem • Review effectiveness of corrective action • Interpret the results of the quality check correctly • Take up results of the findings with QC in charge/appropriate authority. • Take up the results of the findings within stipulated time • Record of results of action taken • Record adjustments not covered by established procedures for future reference • Review effectiveness of action taken • Follow reporting procedures where the cause of defect cannot be identified
<p>Problem Identification and Escalation</p> <p>Theory (hrs): 10 Practical (hrs): 10 Corresponding NOS Code: RSC/N5004</p>	<ul style="list-style-type: none"> • Identify defects/indicators of problems • Identify any wrong practices that may lead to problems • Identify practices that may impact the final product quality • Identify if the problem has occurred before • Identify other operations that might be impacted by the problem • Ensure that no delays are caused as a result of failure to escalate problems • Take appropriate materials and sample, conduct tests and evaluate results to establish reasons to confirm suspected reasons for non-conformance (where required) • Consider possible reasons for identification of problems • Consider applicable corrections and formulate corrective action • Formulate action in a timely manner

	<ul style="list-style-type: none"> • Communicate problem/remedial action to appropriate parties • Take corrective action in a timely manner • Take corrective action for problems identified according to the company procedures • Report/document problem and corrective action in an appropriate manner • Monitor corrective action • Evaluate implementation of corrective action taken to determine if the problem has been resolved • Ensure that corrective action selected is viable and practical • Ensure that correct solution is identified to an identified problem • Take corrective action for problems identified according to the company procedures • Ensure that no delays are caused as a result of failure to take necessary action • Escalate problem as per laid down escalation matrix • Escalate the problem within stipulated time • Escalate the problem in an appropriate manner • Ensure that no delays are caused as a result of failure to escalate problems
<p>Soft Skills</p> <p>Theory (hrs): 5 Practical (hrs): 5 Corresponding NOS Code: Bridge module</p>	<ul style="list-style-type: none"> • Understand Art of Effective Communication. • Able to handle effective Communication with co-workers and their Family. • Able to handle effective Communication with Peers/colleagues using medical terminology in communication. • Learn basic reading and writing skills. • Follow basics of grooming and personal health • Effectively work in a team • Manage time effectively • Prepare for interviews
<p>IT Skills</p> <p>Theory (hrs): 5 Practical (hrs): 10 Corresponding NOS Code: Bridge module</p>	<ul style="list-style-type: none"> • Understand parts of a computer • Understand basics of computer and concept of motherboard • Use Microsoft Word • Use Microsoft PowerPoint • Use Microsoft Excel • Understand Internet and its uses

Quality Control Inspector - Extrusion – Trimester 4-6

Modules	Topics/Expected Key Learning outcomes
<p>Introduction</p> <p>Theory (hrs): 15 Practical (hrs): 0 Corresponding NOS Code: Bridge module</p>	<ul style="list-style-type: none"> • Explain history & evolution of Tyre / Rubber products • Describe current industrial scenario of Rubber and future prospects • Explain different sources of Rubber • Describe about major Rubber Associations • Explain ranges of Tyres & other Rubber products • Explain equipment used for Tyre / Rubber products finishing • Define Roles and responsibilities for Tyre / Rubber products finishing
<p>Prepare material, tools and machine for finishing</p> <p>Theory (hrs): 20 Practical (hrs): 30 Corresponding NOS Code: RSC/N3201</p>	<ul style="list-style-type: none"> • Explain Tools for Rubber products finishing & their working process • Demonstrate process of making Tools and machines ready for finishing process • Demonstrate parameter setting of Trimming Machine as per SOP • Demonstrate unfinished Rubber products receiving from stores for finishing • Demonstrate application of FIFO in Rubber products finishing
<p>Undertake finishing of tyres</p> <p>Theory (hrs): 25 Practical (hrs): 65 Corresponding NOS Code: RSC/N1509</p>	<ul style="list-style-type: none"> • Demonstrate Machine check-up points before starting Trimming machine operation • Demonstrate unfinished cured Tyre / Rubber products availability checking as per production plan • Describe importance of Machine & Tools cleaning & maintenance • Describe General operating instruction before finishing process • Explain Inspection process of Tyre • Describe preparation points before unfinished cured Tyre / Rubber products • Demonstrate the process for unfinished cured Tyre / Rubber products

	<ul style="list-style-type: none"> Describe the Safety Precautions to be taken during Tyre / Rubber products finishing. Define Do's and Don'ts for Tyre / Rubber products finishing
<p>Undertake finishing of non-tyre rubber products</p> <p>Theory (hrs): 25 Practical (hrs): 65 Corresponding NOS Code: RSC/N3203</p>	<ul style="list-style-type: none"> Demonstrate Rubber products finishing activities, such as – Putting identification tag on finished Rubber products, Keeping finished product in bins or racks, Packing of finished products, Demonstrate sample submission to quality person, Demonstrate handing over finished product to warehouse, Demonstrate disposal of rejected Rubber products, Describe the Quality issues in Rubber products finishing. Define the Countermeasures to be taken on quality issues related to Rubber products finishing. Demonstrate filling up production report.
<p>Carry out housekeeping in rubber product manufacturing</p> <p>Theory (hrs): 10 Practical (hrs): 15 Corresponding NOS Code: RSC/N5001</p>	<ul style="list-style-type: none"> Explain what is housekeeping Define importance of Housekeeping Describe purpose of Housekeeping Explain benefits of Housekeeping Explain what is '5S' Define each 'S' and its meaning Demonstrate cleaning of Tyre / Rubber products work area with specified equipment and material
<p>Carry out reporting and documentation</p> <p>Theory (hrs): 5 Practical (hrs): 5 Corresponding NOS Code: RSC/N5002</p>	<ul style="list-style-type: none"> Explain what is documentation Describe the importance of Documentation Define Purpose of Documentation Explain Type of Documentation Describe common Documentation used in Tyre Industry Explain what is reporting Describe importance of Reporting Explain about Government Act and Bylaws Describe about rules. Define meaning of Policies and Guidelines Describe meaning of Procedure Explain what is work instruction Define what is communication Describe communication process Explain problems in communication

	<ul style="list-style-type: none"> • Describe various communication barriers • Explain traits of Active Listening • Discuss points of good writing skill • Explain how to resolve conflict with team member • Discuss Organisational Procedures for Reporting and Documentation • Decide priority of work required to be done • Describe how to select work to do from pending work
<p>Carry Out Quality Checks</p> <p>Theory (hrs): 15 Practical (hrs): 20 Corresponding NOS Code: RSC/N5003</p>	<ul style="list-style-type: none"> • Define need of Quality Control in Tyre / Rubber products finishing • Discuss methodology of Problem solving • Describe implication of Tyre / Rubber products quality issues
<p>Carry out problem identification and escalation</p> <p>Theory (hrs): 5 Practical (hrs): 5 Corresponding NOS Code: RSC/N5004</p>	<ul style="list-style-type: none"> • Explain what is Problem • Describe how to identify Problem • Define Hierarchies • Discuss Hierarchy in tyre Industry • Explain how to escalate problem • Describe need for escalation
<p>Carry out health and safety</p> <p>Theory (hrs): 20 Practical (hrs): 5 Corresponding NOS Code: RSC/N5007</p>	<ul style="list-style-type: none"> • Describe the Hazards • Identify Hazard in Rubber Industry • Describe Chemical hazard • Describe Physical hazard • Describe Ergonomic hazard • Explain the health and safety requirements for Tyre Industry • Discuss health and safety procedure of organisation • Explain what is PPEs • Discuss requirement of PPE • Identify different types of PPEs used in Rubber Industry • Describe the purpose of various PPEs used in Rubber Industry • Demonstrate the Use of different PPEs.

	<ul style="list-style-type: none"> • Define what is emergency • Describe various emergency situations in Industry • Describe common injuries in industry • Describe First Aid box and its constituents • Demonstrate how to handle Fire Emergencies • Demonstrate how to use a multi- purpose Fire Extinguisher • Describe type and class of Fires • Describe suitable fire extinguisher as per fire type and class
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Quality Control Inspector - Calendaring – Trimester 7-9

Modules	Topics/Expected Key Learning outcomes
Introduction Theory (hrs): 25 Practical (hrs): 10 Corresponding NOS Code: Bridge module	<ul style="list-style-type: none"> • Describe current industrial scenario of rubber and prospects • Learn & explain different sources of rubber • Learn about major rubber associations • Learn & explain equipment used for Rubber Product-Quality Assurance process • Understand & define roles and responsibilities for Rubber Product-Quality Assurance Supervisor
Quality assurance at various stages of rubber production Theory (hrs): 30 Practical (hrs): 70 Corresponding NOS Code: RSC/N2402	<ul style="list-style-type: none"> • Identify the most appropriate equipment for testing as per the SOP • Calibrate/verify/validate the testing equipment periodically as per SOP • Identify defective equipment/apparatus and steps to be taken as per SOP • Draw sample of the material from the lot to be tested as per standard procedures (SOP) • Identify the sample by labeling/numbering as per SOP • Carry out testing of raw materials, rubber products (semi or finished), visual inspection as per the standards • Use statistical Quality Assurance procedures • Identify causes of defects to maintain product quality. • Interpret the results correctly. • Record dimensions on the check sheet • Carry out pre-shipment inspection and lot release • Record and maintain the data as per SOP and ensure that reports/records are accurate and clear
Carry out housekeeping in	<ul style="list-style-type: none"> • Learn what is housekeeping • Understand & define the importance & purpose of housekeeping

<p>rubber product manufacturing</p> <p>Theory (hrs): 10 Practical (hrs): 20 Corresponding NOS Code: RSC/N5001</p>	<ul style="list-style-type: none"> • Explain benefits of housekeeping • Explain what is '5S.' • Learn & define each 'S' and its meaning • Learn & practice cleaning of machine and work area with specified equipment and material
<p>Carry out reporting and documentation</p> <p>Theory (hrs): 10 Practical (hrs): 25 Corresponding NOS Code: RSC/N5002</p>	<ul style="list-style-type: none"> • Understand what is documentation • Learn & describe the importance of documentation. • Define the purpose of documentation • Learn the type of documentation • Describe common documentation used in the rubber industry • Explain what is reporting • Describe the importance of reporting • Explain about Government Acts and Bylaws • Describe the use of rules in an organization. • Understand the meaning of organization policies and guidelines • Describe the purpose of procedures in an organization • Explain what is work instruction • Define what is communication • Describe communication process • Explain problems in communication • Describe various communication barriers • Explain traits of active listening • Use points of good writing skill • Explain how to resolve conflict with a team member • Use organizational procedures for reporting and documentation • Decide priority of work from pending work list
<p>Carry Out Quality Checks</p> <p>Theory (hrs): 10 Practical (hrs): 15 Corresponding NOS Code: RSC/N5003</p>	<ul style="list-style-type: none"> • Learn need of quality control in rubber curing • Identify and define testing equipment for rubber curing • Use methodology of problem-solving • Describe implication of rubber curing quality issues

<p>Carry out problem identification and escalation</p> <p>Theory (hrs): 15 Practical (hrs): 10 Corresponding NOS Code: RSC/N5004</p>	<ul style="list-style-type: none"> • Explain what is defined as a problem in an organization • Describe how to identify a problem in an organization • Describe hierarchies • Define hierarchy in rubber curing industry • Explain how to escalate problem in an organization • Describe the need for escalation in an organization
<p>Carry out health and safety</p> <p>Theory (hrs): 20 Practical (hrs): 20 Corresponding NOS Code: RSC/N5007</p>	<ul style="list-style-type: none"> • Describe what is defined as the hazards in an organization • Identify hazard in a rubber industry • Describe chemical hazard in a rubber industry • Describe physical hazard in a rubber industry • Describe ergonomic hazard in a rubber industry • Explain the health and safety requirements for a rubber industry • Discuss health and safety procedure of organization • Explain what is Personal Protective Equipment (PPE) • Discuss requirement of Personal Protective Equipment (PPE) • Identify different types of Personal Protective Equipment (PPE) used in the rubber industry • Describe the purpose of various Personal Protective Equipment (PPE) used in the rubber industry • Demonstrate the use of different Personal Protective Equipment (PPE). • Define what is an emergency • Describe various emergency situations in Industry • Describe common injuries in the industry • Describe First Aid box and its constituents • Demonstrate how to handle Fire Emergencies • Demonstrate how to use a multi-purpose Fire Extinguisher • Describe type and class of fires • Describe suitable fire extinguisher as per fire type and class
<p>Develop entrepreneurship skills</p> <p>Theory (hrs): 20 Practical (hrs): 40</p>	<ul style="list-style-type: none"> • Describe different factor of production • Develop business plan • Acquire financial and material resources • Organize to hire experienced and efficient human resource

Corresponding NOS Code: RSC/N5013	<ul style="list-style-type: none"> • Raise capital from different sources keeping the interest cost at a minimum • Demonstrate cost-benefit analysis of the business opportunity
Quality assurance of latex products (Optional) Theory (hrs): 20 Practical (hrs): 40 Corresponding NOS Code: RSC/N2402	<ul style="list-style-type: none"> • Draw sample of the material from the lot to be tested as per SOP • Identify the sample by labelling/numbering as per SOP • Identify the most appropriate equipment for testing as per the SOP • Calibrate /verify/validate the testing equipment periodically as per SOP • Identify defective equipment/apparatus and steps to be taken as per SOP • Carry out testing of latex products as per the standards/testing manuals/SOP • Follow statistical Quality Assurance procedures • Carry out Inspection and packing controls and procedures • Record dimensions in the check sheet • Release or Hold the material as per finding for further processing. • Take up the results of the findings with supplier/QA in-charge/appropriate authority.

Mill Operator – Trimester 10-12

Modules	Topics/Expected Key Learning outcomes
Introduction and Orientation Theory (hrs): 2 Practical (hrs): 0 Corresponding NOS Code: Bridge module	<ul style="list-style-type: none"> • Importance of Rubber Sector • Role and responsibility of Mill Operator
Prepare mixing mill and accessories Theory (hrs): 28 Practical (hrs): 50 Corresponding NOS Code: RSC/N0101	<ul style="list-style-type: none"> • Ensure functioning of safety features of mixing mill (e.g. safety pad, safety bar) and other accessories • Ensure that the mixing mill is clean • Set parameters for the equipment (mixing cycle time, roll temperature and nip gap) , as per company's SOP • Keep all accessories (like cooling water,

	<p>hydraulic system, temperature control unit (TCU), lubrication system) and stock blender (if available) ready</p> <ul style="list-style-type: none"> • Keep all hand tools like mixing knife, cooling rack etc. ready • Ensure availability of pre-weighed, approved rubber and other ingredients to be fed as per recipe and batch size • Ensure that raw material to be fed is approved by laboratory as per SOP • Match the batch code of each raw material with the batch code on the job schedule given by the planning department • Ensure that all raw materials have been assembled/organized (in correct sequence, as per SOP) to be fed into mixing mill • Ensure housekeeping and safety in the Mixing mill area • Ensure that electrical devices that may be exposed to carbon black dust are sealed • Periodically blow the electrical devices with clean/dry compressed air. • Ensure that the exhaust systems are used to maintain the concentration levels of various particulate matters within limits as per SOP • Adhere to all safety norms (like wearing protective gloves, shoes, safety glasses etc.) • Comply with health, safety, environment guidelines, regulations etc. in accordance with international/national standards or organizational SOP
<p>Mix raw material in mixing mill to prepare rubber compound</p> <p>Theory (hrs): 35 Practical (hrs): 55 Corresponding NOS Code: RSC/N0102</p>	<ul style="list-style-type: none"> • Handle the rubber compound to avoid contamination • Ensure that batch size of rubber mix is as per company's SOP • Ensure that identified & approved materials are used • Ensure that the sequence in shift is based on raw material availability to maximize output • Add rubber and other ingredients in the mixing mill in the specified quantity add sequence as per company's SOP • Receive mixed batch dumped from intermix on the mill and form sheet • Allow the entire compound to pass through the nip gap of the rolls • Form a band on the front roll

	<ul style="list-style-type: none"> • Cut the compound and re-roll for at least three times • Pass the compound over the blender bar for better cooling and blending • Let out compound from mill in continuous sheet form and pass through cooling festoon and wig wag for stacking • Check and adjust cooling water flow rate as per SOP • Ensure proper rolling bank while mixing • Use stock blender, if available for better dispersion • Control mixing process and completion as per SOP (temperature or time or energy as programmed / specified) • Identify the batch as per SOP • Ensure maturation time for master batch and • Final batch before next usage • Ensure housekeeping and safety in the Mixing mill area • Ensure that the electrical devices that may be exposed to carbon black dust are sealed • Periodically blow the electrical devices with clean/dry compressed air • Ensure that the exhaust systems are used to maintain the concentration levels of various particulate matters remain within limits as per SOP • Adhere to all safety norms (like wearing protective gloves, shoes, safety glasses, etc.) • Comply with health, safety, and environment guidelines, regulations, etc. in accordance with international/national standards or organizational SOP
<p>Undertake post mixing mill activities Theory</p> <p>Theory (hrs): 25 Practical (hrs): 30 Corresponding NOS Code: RSC/N0103</p>	<ul style="list-style-type: none"> • Sheet off the compound followed by cooling • Ensure that no compound has been left inside in roller guides, stock blender and mill tray • Handover the equipment to the next operator in clean and good condition • Dispose waste material in safe manner as per company's SOP • Ensure identification and traceability by batch marking/ coding for the right product as per instructions laid down by the company (in terms of batch number, weight, colour, date stamp, etc.) • Send sample of specified compound/ batch in specified form to lab for testing • Send the remaining material to the designated storage area • Ensure that the electrical devices that may be exposed to carbon black dust are sealed.

	<ul style="list-style-type: none"> • Periodically blow the electrical devices with clean/dry compressed air. • Ensure that the exhaust systems are used to maintain the concentration levels of various particulate matters remain within limits. • Adhere to all safety norms (like wearing protective gloves, shoes, safety glasses etc.) • Comply with health, safety, environment guidelines, regulations etc. in accordance with international/national standards or organizational SOP
<p>Health and Safety Theory</p> <p>Theory (hrs): 15 Practical (hrs): 20 Corresponding NOS Code: Bridge module</p>	<ul style="list-style-type: none"> • Identify different methods of first aid. • Perform first aid. • Understand CPR. • Perform CPR in case of emergency.
<p>House Keeping</p> <p>Theory (hrs): 5 Practical (hrs): 10 Corresponding NOS Code: RSC/N5001</p>	<ul style="list-style-type: none"> • Inspect the area while taking into account various surfaces • Identify the material requirements for cleaning the areas inspected, by considering risk, time, efficiency and type of stain • Ensure that the cleaning equipment is in proper working condition • Select the suitable alternatives for cleaning the areas in case the appropriate equipment and materials are not available and inform the appropriate person • Plan the sequence for cleaning the area to avoid re-soiling clean areas and surfaces • Inform the affected people about the cleaning activity • Display the appropriate signage for the work being conducted • Ensure that there is adequate ventilation for the work being carried out • Wear the personal protective equipment required for the cleaning method and materials being used • Use the correct cleaning method for the work area, type of soiling and surface

	<ul style="list-style-type: none"> • Carry out cleaning activity without disturbing others • Deal with accidental damage, if any, caused while carrying out the work • Report to the appropriate person any difficulties in carrying out your work • Identify and report to the appropriate person any additional cleaning required that is outside one's responsibility or skill • Ensure that there is no oily substance on the floor to avoid slippage • Ensure that no scrap material is lying around • Maintain and store housekeeping equipment and supplies • Follow workplace procedures to deal with any accidental damage caused during the cleaning process • Ensure that, on completion of the work, the area is left clean and dry and meets requirements • Return the equipment, materials and personal protective equipment that were used to the right places making sure they are clean, safe and securely stored • Dispose the waste garnered from the activity in an appropriate manner • Dispose of used and un-used solutions according to manufacturer's instructions, and clean the equipment thoroughly • Maintain schedules and records for housekeeping duty • Replenish any necessary supplies or consumables
<p>Reporting and Documentation</p> <p>Theory (hrs): 2 Practical (hrs): 5 Corresponding NOS Code: RSC/N5002</p>	<ul style="list-style-type: none"> • Report data/problems/incidents as applicable in a timely manner • Report to the appropriate authority as laid down by the company • Follow reporting procedures as prescribed by the company • Identify documentation to be completed relating to one's role • Record details accurately an appropriate format • Complete all documentation within stipulated time according to company procedure • Ensure that the final document meets with the requirements of the persons who requested it or make any amendments accordingly • Make sure documents are available to all appropriate authorities to inspect • Respond to requests for information in an

	<p>appropriate manner whilst following organizational procedures</p> <ul style="list-style-type: none"> • Inform the appropriate authority of requests for information received
<p>Quality Checks</p> <p>Theory (hrs): 5 Practical (hrs): 10 Corresponding NOS Code: RSC/N5003</p>	<ul style="list-style-type: none"> • Ensure that total range of checks are regularly and consistently performed • Use appropriate measuring instruments, equipment, tools, accessories etc. ,as required • Identify non-conformities to quality assurance standards • Identify potential causes of non-conformities to quality assurance standards • Identify impact on final product due to non-conformance to company standards • Evaluating the need for action to ensure that problems do not recur • Suggest corrective action to address problem • Review effectiveness of corrective action • Interpret the results of the quality check correctly • Take up results of the findings with QC in charge/appropriate authority. • Take up the results of the findings within stipulated time • Record of results of action taken • Record adjustments not covered by established procedures for future reference • Review effectiveness of action taken • Follow reporting procedures where the cause of defect cannot be identified
<p>Problem Identification and Escalation</p> <p>Theory (hrs): 8 Practical (hrs): 10 Corresponding NOS Code: RSC/N5004</p>	<ul style="list-style-type: none"> • Identify defects/indicators of problems • Identify any wrong practices that may lead to problems • Identify practices that may impact the final product quality • Identify if the problem has occurred before • Identify other operations that might be impacted by the problem • Ensure that no delays are caused as a result of failure to escalate problems • Take appropriate materials and sample, conduct tests and evaluate results to establish reasons to confirm suspected reasons for non-conformance (where required) • Consider possible reasons for identification of problems

	<ul style="list-style-type: none"> • Consider applicable corrections and formulate corrective action • Formulate action in a timely manner • Communicate problem/remedial action to appropriate parties • Take corrective action in a timely manner • Take corrective action for problems identified according to the company procedures • Report/document problem and corrective action in an appropriate manner • Monitor corrective action • Evaluate implementation of corrective action taken to determine if the problem has been resolved • Ensure that corrective action selected is viable and practical • Ensure that correct solution is identified to an identified problem • Take corrective action for problems identified according to the company procedures • Ensure that no delays are caused as a result of failure to take necessary action • Escalate problem as per laid down escalation matrix • Escalate the problem within stipulated time • Escalate the problem in an appropriate manner • Ensure that no delays are caused as a result of failure to escalate problems
<p>Soft Skills</p> <p>Theory (hrs): 5 Practical (hrs): 5 Corresponding NOS Code: Bridge module</p>	<ul style="list-style-type: none"> • Understand art of effective communication. • Able to handle effective communication with co-workers and their family • Able to handle effective Communication with Peers/ colleagues using medical terminology in communication • Learn basic reading and writing skills • Follow basics of grooming and personal health • Effectively work in a team • Manage time effectively • Prepare for interviews
<p>IT Skills</p> <p>Theory (hrs): 10</p>	<ul style="list-style-type: none"> • Understand parts of a computer • Understand basics of computer and concept of motherboard

Practical (hrs): 15 Corresponding NOS Code: Bridge module	<ul style="list-style-type: none"> • Use Microsoft Word • Use Microsoft PowerPoint • Use Microsoft Excel • Understand Internet and its uses
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II. Practical/On the job Training component (Block II)

Extruder Operator (including pre and post) - Trimester 1-3

Units	Topics/Expected Key Learning outcomes
Prepare Extruder Theory (hrs): 8 Practical (hrs): 143 Corresponding NOS Code: RSC/N2601	<ul style="list-style-type: none"> • Inspect the extruder for cleanliness • Identify different emergency safety features of the machine (extruder, extruder feed system, extruder line and other ancillary units) • Prepare the feed mill and overhead conveyor for feeding the strip to the extruder in case of hot feed • Use pre-made strips for cold feed • Apply the correct die assembly on the extruder head • Manage parameters for the extruder (screw speed, temperature, conveyor speed) as per organizational SOP • Modify the online measurement system as per specifications and tolerances • Set up the cooling system (water sprays/immersible tanks) properly • Manage the water pH as per the specification/SOP • Set up the acid dosing system to correct cooling water pH is operational • Use laboratory approved rubber compounds • Collect all rubber compounds required for the production and store in designated areas • Match the batch code of each rubber compound with the batch code on the job schedule given by the planning department and also as per specification /SOP. Specification/SOP are considered as correct and planning schedule is only a guideline • Employ housekeeping in extruder area • Analyse upstream/ downstream equipment before starting the machine • Operate the conveyor belt within the speed limit at all times and always be aware of the upper limit • Implement all safety norms (like wearing protective gloves, shoes, safety goggle etc.)

	<ul style="list-style-type: none"> • Comply with the health, safety, environment guidelines, regulations etc. in accordance with international/national standards or organizational SOP
<p>Feed Rubber Compound to the Extruder and Perform Extrusion Operation</p> <p>Theory (hrs): 8 Practical (hrs): 143 Corresponding NOS Code: RSC/N2602</p>	<ul style="list-style-type: none"> • Use the rubber compound appropriately to avoid contamination • Select adequate amount of rubber compound for the extrusion process to meet the production schedule • Test if the released compound is fit for use • Select the correct compound • Feed the extruder with proper strip width and thickness of correct dimension as per specification • Identify the product of correct width, length thickness which should be free of lumps and torn edges • Identify the product/output weight through online weighing scale as per specification • Inspect the rubber strip visually, to make sure it is free from defects, meeting required specifications for further processing • Estimate the extrudate temperature • Measure the dimensions of the extrudate • Handle the extruded product carefully and free from contamination • Manage housekeeping in the extruder area • Manage the moving parts like the conveyor belts, the feed inlet and discharge port, belts, gears and other rotating parts when the machine is running • Use safety guards /covers(if any) in the all moving parts while in operation • Operate the conveyor belt within the speed limit at all times and always be aware of the upper limit • Implement protocols while the machine is in operation, like never reaching over the machine or machine guard to the point of operation • Use hand gloves and other safety equipment to handle hot extrudates • Implement all safety norms (like wearing protective gloves, shoe, safety goggles, etc.) • Operate the mill safety switch / safety bar in all mills
<p>Undertake Post Extrusion Activities</p> <p>Theory (hrs): 8</p>	<ul style="list-style-type: none"> • Collect the extruded product of specified length/width/weight correctly on the leaf truck/trolley/pallets • Operate online marking system for product identification • Examine if the product has achieved the specified ageing maturing time, uniform size, usable at the next stage

<p>Practical (hrs): 143 Corresponding NOS Code: RSC/N2603</p>	<ul style="list-style-type: none"> • Dispose waste material in safe manner correctly as per organisational SOP • Manage identification and traceability by batch marking/ coding for the right product as per instructions laid down by the company (in terms of batch number, colour, date stamp etc.) • Collect the sample of specified compound/ batch in specified form to be sent to the lab for testing • Collect the remaining material to be sent to the designated storage area • Use protocol while the machine is in operation, like never reaching over the machine or machine guard to the point of operation • Check that there are no loose clothes around the conveyor belt. • Identify the correct posture while undertaking physical activities such as lifting heavy objects (such as extrudate, if heavy) • Use hand gloves and other safety equipment while handling hot extrudate • Estimate the minimum distance to be maintained from the extrudate • Implement all the safety norms (like wearing protective gloves, shoes etc.)
<p>Health and Safety Theory (hrs): 8 Practical (hrs): 143 Corresponding NOS Code: Bridge module</p>	<ul style="list-style-type: none"> • Identify different methods of first aid. • Perform first aid. • Understand CPR. • Perform CPR in case of emergency
<p>Housekeeping Theory (hrs): 8 Practical (hrs): 142 Corresponding NOS Code: RSC/N5001</p>	<ul style="list-style-type: none"> • Inspect the area while taking into account various surfaces • Identify the material requirements for cleaning the areas inspected, by considering risk, time, efficiency and type of stain • Use cleaning equipment that are in proper working condition • Select the suitable alternatives for cleaning the areas in case the appropriate equipment and materials are not available and inform the appropriate person

	<ul style="list-style-type: none"> • Plan the sequence for cleaning the area to avoid re-soiling clean areas and surfaces • Inform the affected people about the cleaning activity • Use appropriate signage for the work • Arrange for proper ventilation system for the work being carried out • Use personal protective equipment required for the cleaning method and materials being used • Use the correct cleaning method for the work area, type of soiling and surface • Set up the cleaning activity without disturbing others • Implement preventive techniques in case of any accidental damage • Report any difficulties in carrying out your work • Identify if any additional cleaning is required that is outside one's responsibility or skill • Check if there is any oily substance on the floor to avoid slippage • Check if any scrap material is lying around • Manage housekeeping equipment and supplies • Use workplace procedures to deal with any accidental damage caused during the cleaning process • Check if the area is left clean and dry on completion of the work • Collect the equipment, materials and personal protective equipment that were used and send them back to the right places, making sure they are clean, safe and securely stored • Practice the disposal of the waste garnered from the activity in an appropriate manner • Practice the disposal of used and un-used solutions according to manufacturer's instructions, and clean the equipment thoroughly • Manage schedules and records for housekeeping duty • Assemble the necessary supplies or consumables
<p>Reporting and Documentation</p> <p>Theory (hrs): 8 Practical (hrs): 143 Corresponding NOS Code: RSC/N5002</p>	<ul style="list-style-type: none"> • Report data/problems/incidents as applicable in a timely manner • Report to the appropriate authority as laid down by the company • Implement reporting procedures as prescribed by the company • Identify documentation to be completed relating to one's role • Record details accurately in an appropriate format

	<ul style="list-style-type: none"> • Complete all documentation within stipulated time according to company procedure • Determine, if the final document has been amended as per requirements • Arrange for the availability of the documents to all appropriate authorities • Inform the appropriate authority of requests for information received
<p>Quality Checks</p> <p>Theory (hrs): 8 Practical (hrs): 143 Corresponding NOS Code: RSC/N5003</p>	<ul style="list-style-type: none"> • Perform regular checks • Use appropriate measuring instruments, equipment, tools, accessories etc. ,as required • Identify non-conformities to quality assurance standards • Identify potential causes of non-conformities to quality assurance standards • Identify impact on final product due to non-conformance to company standards • Evaluate the need for action to ensure that problems do not recur • Use corrective action to address problem • Review effectiveness of corrective action • Interpret the results of the quality check correctly • Discuss the results of the findings with QC in charge/appropriate authority. • Report the results of the findings within a stipulated time • Record the results of the action • Record adjustments, not covered by established procedures, for future reference • Review effectiveness of action taken • Implement reporting procedures where the cause of defect cannot be identified
<p>Problem Identification and Escalation</p> <p>Theory (hrs): 8 Practical (hrs): 143 Corresponding NOS Code: RSC/N5004</p>	<ul style="list-style-type: none"> • Identify defects/indicators of problems • Identify any wrong practices that may lead to problems • Restate the practices that may create an impact on the final product quality • Identify if the problem has occurred before • Analyse other operations that might be impacted by the problem • Check whether any delays are caused as a result of failure to escalate problems • Use appropriate materials and sample, conduct tests and evaluate results to establish reasons to confirm

	<p>suspected reasons for non-conformance (where required)</p> <ul style="list-style-type: none"> • Demonstrate possible reasons for identification of problems • Demonstrate applicable corrections and formulate corrective action • Formulate action in a timely manner • Communicate problem/remedial action to appropriate parties • Implement corrective action in a timely manner • Implement corrective action for problems identified according to the company's procedures • Report/document problem and corrective action in an appropriate manner • Inspect corrective action • Examine the implementation of corrective action taken to determine whether the problem has been resolved • Examine that the corrective action selected, is viable and practical • Provide proper solution to an identified problem • Apply preventive action for problems identified according to the company procedures • Escalate problem to the appropriate hierarchy • Escalate the problem appropriately within stipulated time
<p>Soft Skills</p> <p>Theory (hrs): 8 Practical (hrs): 142 Corresponding NOS Code: Bridge module</p>	<ul style="list-style-type: none"> • Communicate effectively with co-workers, peers/colleagues • Demonstrate basic reading and writing skills. • Use basics of grooming and personal health • Practice working effectively in a team • Manage time effectively • Prepare for interviews
<p>IT Skills</p> <p>Theory (hrs): 8 Practical (hrs): 142 Corresponding NOS Code: Bridge module</p>	<ul style="list-style-type: none"> • Demonstrate different parts of a computer • Demonstrate basics of computer and concept of motherboard • Use Microsoft office suite as per requirements • Demonstrate the uses of internet

Quality Control Inspector – Extrusion - Trimester 4-6

Units	Topics/Expected Key Learning outcomes
<p>Prepare material, tools and machine for finishing</p> <p>Theory (hrs): 8 Practical (hrs): 181 Corresponding NOS Code: RSC/N3201</p>	<ul style="list-style-type: none"> • Select appropriate tools for the finishing of rubber products • Prepare all tools and machines for the finishing process • Perform calibrations for the trimming machine as per SOP (standard operating procedures) • Record the receipt of unfinished rubber products from the stores • Complete finishing operations as per FIFO (first-in, first-out)
<p>Undertake finishing of tyres</p> <p>Theory (hrs): 8 Practical (hrs): 181 Corresponding NOS Code: RSC/N1509</p>	<ul style="list-style-type: none"> • Establish the check-up points before starting the trimming machine • Examine the availability of unfinished and cured tyre / rubber products as per the production plan • Perform basic cleaning and maintenance operations on finishing equipment, machines, and tools • Comply with general operating instructions (including safety precautions) before the finishing process • Establish preparation points for unfinished cured Tyre / Rubber products
<p>Undertake finishing of non-tyre rubber products</p> <p>Theory (hrs): 8 Practical (hrs): 181 Corresponding NOS Code: RSC/N3203</p>	<ul style="list-style-type: none"> • Perform rubber product finishing activities (like putting identification tag on finished rubber products, keeping finished product in bins or racks, packing of finished products, etc.) • Provide the quality personnel with samples • Provide the warehouse with finished products • Practise the recommended disposal of rejected rubber products • Prepare the production report as per the stipulated template
<p>Carry out housekeeping in rubber product manufacturing</p>	<ul style="list-style-type: none"> • Perform cleaning operations of the work area with specified equipment and material

<p>Theory (hrs): 8 Practical (hrs): 180 Corresponding NOS Code: RSC/N5001</p>	
<p>Carry out reporting and documentation</p> <p>Theory (hrs): 8 Practical (hrs): 180 Corresponding NOS Code: RSC/N5002</p>	<ul style="list-style-type: none"> • Comply with work instructions • Prepare appropriate documentation and reports as per stipulated templates • Demonstrate good communication skills at the workplace • Participate in discussions to assist in conflict resolution at the workplace • Prioritise work as per requirements
<p>Carry Out Quality Checks</p> <p>Theory (hrs): 8 Practical (hrs): 180 Corresponding NOS Code: RSC/N5003</p>	<ul style="list-style-type: none"> • Inspect finished tyres for visual defects • Apply remedial measures and preventive actions on defective tyres • Inspect finished non-tyre rubber products for visual defects • Apply remedial measures and preventive actions on defective non-tyre rubber products
<p>Carry out problem identification and escalation</p> <p>Theory (hrs): 8 Practical (hrs): 180 Corresponding NOS Code: RSC/N5004</p>	<ul style="list-style-type: none"> • Solve work-related problems within one's scope • Escalate problems to the appropriate personnel in the hierarchy

<p>Carry out health and safety</p> <p>Theory (hrs): 8 Practical (hrs): 180 Corresponding NOS Code: RSC/N5007</p>	<ul style="list-style-type: none"> • Compare various hazards (chemical, physical, ergonomic, etc.) in the rubber industry • Comply with health and safety procedure of the organisation • Select appropriate PPE (personal protective equipment) as per requirement • Use the PPE, thus selected, while performing work • Practise dealing with emergency situations at the workplace • Implement need-based first-aid techniques at the workplace • Participate in emergency drills (like fire drills) at the workplace • Select appropriate fire extinguishers as per the class of fire • Use multi-purpose fire extinguishers
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Quality Control Inspector - Calendaring - Trimester 7-9

Units	Topics/Expected Key Learning outcomes
<p>Quality assurance at various stages of rubber production</p> <p>Theory (hrs): 8 Practical (hrs): 181 Corresponding NOS Code: RSC/N2402</p>	<ul style="list-style-type: none"> • Select appropriate testing equipment as per SOP (standard operating procedures) • Calibrate the testing equipment periodically as per SOP (standard operating procedures) • Detect defective equipment/apparatus • Perform troubleshooting operations on defective equipment as per SOP • Collect samples of the test material, from a given batch, as per SOP • Identify the sample by labelling/numbering as per SOP • Examine raw materials and rubber products (semi-finished or finished) for quality issues as per the standards • Implement statistical quality assurance techniques on samples, thus collected • Record the causes of defects to maintain product quality • Interpret the test results correctly • Record dimensions on the check sheet • Perform pre-shipment inspection • Organise batch release after pre-shipment inspection
<p>Carry out housekeeping in rubber product manufacturing</p> <p>Theory (hrs): 8</p>	<ul style="list-style-type: none"> • Perform cleaning operations of the work area with specified equipment and material

<p>Practical (hrs): 181 Corresponding NOS Code: RSC/N5001</p>	
<p>Carry out reporting and documentation</p> <p>Theory (hrs): 8 Practical (hrs): 181 Corresponding NOS Code: RSC/N5002</p>	<ul style="list-style-type: none"> • Comply with work instructions • Prepare appropriate documentation and reports as per stipulated templates • Demonstrate good communication skills at the workplace • Participate in discussions to assist in conflict resolution at the workplace • Prioritise work as per requirements
<p>Carry Out Quality Checks</p> <p>Theory (hrs): 8 Practical (hrs): 180 Corresponding NOS Code: RSC/N5003</p>	<ul style="list-style-type: none"> • Determine the criteria for testing and quality control • Select appropriate testing equipment for rubber curing • Identify curing defects • Perform testing operations to ensure quality curing • Solve testing-related problems
<p>Carry out problem identification and escalation</p> <p>Theory (hrs): 8 Practical (hrs): 180 Corresponding NOS Code: RSC/N5004</p>	<ul style="list-style-type: none"> • Solve work-related problems within one's scope • Escalate problems to the appropriate personnel in the hierarchy

<p>Carry out health and safety</p> <p>Theory (hrs): 8 Practical (hrs): 180 Corresponding NOS Code: RSC/N5007</p>	<ul style="list-style-type: none"> • Compare various hazards (chemical, physical, ergonomic, etc.) in the rubber industry • Comply with health and safety procedure of the organisation • Select appropriate PPE (personal protective equipment) as per requirement • Use the PPE, thus selected, while performing work • Practise dealing with emergency situations at the workplace • Implement need-based first-aid techniques at the workplace • Participate in emergency drills (like fire drills) at the workplace • Select appropriate fire extinguishers as per the class of fire • Use multi-purpose fire extinguishers
<p>Develop entrepreneurship skills</p> <p>Theory (hrs): 8 Practical (hrs): 180 Corresponding NOS Code: RSC/N5013</p>	<ul style="list-style-type: none"> • Develop business plan • Prepare a plan for obtaining financial and material resources • Organise recruitment drives for experienced and efficient human resources • Devise strategies for raising capital from different sources at minimum interest cost • Compare the costs and benefits associated with a business opportunity
<p>Quality assurance of latex products (Optional)</p> <p>Theory (hrs): 8 Practical (hrs): 180 Corresponding NOS Code: RSC/N2402</p>	<ul style="list-style-type: none"> • Collect samples of the test material, from a given batch, as per SOP • Identify the sample by labelling/numbering as per SOP • Identify the most appropriate equipment for testing as per the SOP • Select appropriate testing equipment as per SOP (standard operating procedures) • Calibrate the testing equipment periodically as per SOP (standard operating procedures) • Detect defective equipment/apparatus • Perform troubleshooting operations on defective equipment as per SOP • Examine latex products for quality issues as per the standards/testing manuals/SOP • Implement statistical quality assurance techniques on samples, thus collected • Record the causes of defects to maintain product quality • Perform inspection and packing control procedures • Record dimensions on the check sheet • Interpret the test results correctly

	<ul style="list-style-type: none"> Decide, if the material needs to be released or held for further processing Report the test results with the supplier/QA in-charge/appropriate authority
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Mill Operator - Trimester 10-12

Units	Topics/Expected Key Learning outcomes
<p>Prepare mixing mill and accessories</p> <p>Theory (hrs): 8 Practical (hrs): 180 Corresponding NOS Code: RSC/N0101</p>	<ul style="list-style-type: none"> Examine, if the safety features (e.g. safety pad, safety bar) of the mixing mill, and other accessories, are functioning correctly Perform basic cleaning operations on the mixing mill and in the mixing area Set parameters for the equipment (mixing cycle time, roll temperature and nip gap) , as per company's SOP Prepare all accessories (like cooling water, hydraulic system, temperature control unit (TCU), lubrication system, etc.) and stock blender (if available) Prepare hand tools like mixing knife, cooling rack, etc. Feed the mill with pre-weighed and approved rubber, and other ingredients, as per recipe and batch size Determine, if the batch code of each raw material matches the batch code on the job schedule Organise/assemble all raw materials sequentially as per SOP Check, if electrical devices, exposed to carbon black dust, are sealed Blow the electrical devices with clean/dry compressed air Use exhaust systems to control the concentration levels of various particulate matters as per SOP Use personal protective equipment like protective gloves, shoes, safety glasses, etc.
<p>Mix raw material in mixing mill to prepare rubber compound</p> <p>Theory (hrs): 8 Practical (hrs): 180</p>	<ul style="list-style-type: none"> Practise handling the rubber compound safely to avoid contamination Check, if the batch size of rubber mix is as per the company's SOP Use approved materials and rubber mix Schedule the shift as per raw material availability to maximise output

<p>Corresponding NOS Code: RSC/N0102</p>	<ul style="list-style-type: none"> • Add rubber and other ingredients sequentially in the mixing mill, in the specified quantities, as per company's SOP • Collect the mixed batch dumped from intermix on the mill and form sheet • Check, if the entire compound passes through the nip gap of the rolls • Create a band on the front roll • Cut the compound and re-roll for at least thrice • Pass the compound over the blender bar for better cooling and blending • Eject the compound from the mill in the form of a continuous sheet • Pass the ejected sheet through cooling festoon and wig wag for stacking • Modify the flow rate of cooling water as per SOP • Check, if a proper rolling bank is in place while mixing • Use stock blender, if available, for better dispersion • Complete mixing process as per SOP (temperature, time, or energy as programmed / specified) • Identify the batch as per SOP • Check, if the master batch reaches the stipulated maturation time • Complete a batch before next usage
<p>Undertake post mixing mill activities Theory Theory (hrs): 8 Practical (hrs): 180 Corresponding NOS Code: RSC/N0103</p>	<ul style="list-style-type: none"> • Sheet off the compound followed by cooling • Inspect the roller guides, stock blender, and mill tray for leftover compound • Provide the next operator with a clean and operational equipment • Perform safe and correct disposal of waste material as per the company's SOP • Perform batch marking/coding for the right product as per the instructions laid down by the company (in terms of batch number, weight, colour, date stamp, etc.) • Provide the testing lab with samples of specified compound/ batch in specified forms • Arrange to send the remaining material to the designated storage area
<p>Health and Safety Theory (hrs): 8 Practical (hrs): 180</p>	<ul style="list-style-type: none"> • Implement various first-aid techniques as per need • Perform cardio-pulmonary resuscitation (CPR) in case of emergency

<p>Corresponding NOS Code: Bridge module</p>	
<p>House Keeping</p> <p>Theory (hrs): 8 Practical (hrs): 180</p> <p>Corresponding NOS Code: RSC/N5001</p>	<ul style="list-style-type: none"> • Inspect various surfaces in the work area • Identify the material requirements for cleaning the areas inspected (considering risk, time, efficiency and type of stain) • Check, if the cleaning equipment is functioning properly • Select the suitable alternatives for cleaning the areas in case the appropriate equipment and materials are not available • Plan the sequence for cleaning the area to avoid re-soiling clean areas and surfaces • Communicate effectively with the affected people regarding the cleaning activity • Display the appropriate signage for the work being conducted • Check, if there is adequate ventilation for the work being done • Use appropriate personal protective equipment During cleaning operations • Use the correct cleaning method for the work area, type of soiling, and surface • Examine the floor for oily substance and scrap material • Perform the disposal of used and unused solutions according to manufacturer’s instructions, and clean the equipment thoroughly • Replenish any necessary supplies or consumables
<p>Reporting and Documentation</p> <p>Theory (hrs): 8 Practical (hrs): 180</p> <p>Corresponding NOS Code: RSC/N5002</p>	<ul style="list-style-type: none"> • Report data/problems/incidents, as applicable, promptly as prescribed by the company • Identify documentation to be completed relating to one’s role • Record details accurately an appropriate format • Complete all documentation within stipulated time according to company procedures • Check, if the final document has been amended as per requirements • Provide the appropriate authorities with relevant documents for inspection
<p>Quality Checks</p> <p>Theory (hrs): 8 Practical (hrs): 180</p>	<ul style="list-style-type: none"> • Perform the entire range of quality checks regularly and consistently • Use appropriate measuring and testing instruments, equipment, tools, accessories, etc.as required • Identify non-conformities to quality assurance standards

<p>Corresponding NOS Code: RSC/N5003</p>	<ul style="list-style-type: none"> • Record potential causes of non-conformities to quality assurance standards • Determine the impact of non-conformance on the final product • Prepare a plan of action to avoid recurrence of problems • Suggest corrective actions to address problems
<p>Problem Identification and Escalation</p> <p>Theory (hrs): 8 Practical (hrs): 180 Corresponding NOS Code: RSC/N5004</p>	<ul style="list-style-type: none"> • Solve work-related problems within one's scope • Escalate problems to the appropriate personnel in the hierarchy
<p>Soft Skills</p> <p>Theory (hrs): 8 Practical (hrs): 180 Corresponding NOS Code: Bridge module</p>	<ul style="list-style-type: none"> • Communicate effectively with colleagues • Demonstrate basic reading and writing skills • Implement the basic knowledge of grooming and personal health • Practice working effectively in a team • Manage time effectively • Prepare for interviews
<p>IT Skills</p> <p>Theory (hrs): 8 Practical (hrs): 180 Corresponding NOS Code: Bridge module</p>	<ul style="list-style-type: none"> • Use different parts of a computer • Demonstrate basic knowledge of computer • Use Microsoft Office suite as per requirements • Demonstrate various uses of the internet

Annexure A

Attachment: List of Tools and Equipment

- Laptop/computer
- MS Office Suite
- Projector

- LCD screen
- Whiteboard
- Markers
- Black board
- Chalk
- Duster
- Flipcharts
- Participant Handbook
- Copies of hand-outs
- Extruder machine
- Dies, die heaters, and die holders
- Cooling tanks
- Skivers
- Blowers
- Tcus
- Finishing tools
- Extruded products
- Ruler
- Dial gauge
- Magnifying glass
- CPR mannequin
- First aid kit
- Reporting formats (like production report format) and registers
- Samples of unfinished cured tyre
- Trimming machine
- Racks
- Identification tags
- Material handling equipment
- Unfinished rubber products
- Procedure and work instructions
- Rubber products with different quality defects
- Magnifying glass
- Inspection table with appropriate light arrangement
- Sample of PPE – safety goggles, safety shoes, safety gloves, safety hat, mask, earmuff, first aid box, fire extinguisher
- Samples of RSS sheets, crepe rubber, TSR rubber, synthetic rubber, reclaimed rubber, rubber finished parts
- Rubber product-specific testing equipment like rubber hardness tester, tensile tester, rebound tester, ozone tester, oven, furnace, melting point tester, ash content testing equipment, mooney viscometer, rheometer
- Different cleaning equipment

- Cured rubber parts with different quality defects
- Latex rubber product finishing tools
- Latex product (gloves, balloons, condoms, etc.) specific testing equipment, like compress air testing machine for gloves, balloons and condoms
- Equipment for performing water leakage tests for condoms
- Rubber mixing mill of size 30cm x 75 cm or higher
- Auxiliary equipment and tools
- Lab model
- Rubber processing equipment such as mill
- Extruder
- Calendar
- Press
- Mould
- Samples of rubber compounding ingredients