

APPRENTICESHIP CURRICULUM

FOR

Injection Moulding Operator

SECTOR: Rubber Industry

BLOCK I (Basic Training):

COURSE NAME: Injection Moulding Operator

QP Name, QP Code and Version No., and NSQF Level: Injection
Moulding Operator, RSC/Q0207 V1.0,
NSQF Level 4

Training Duration: 350 Hrs (2 months)

BLOCK II (Training at Employer Location):

COURSE NAME: Injection Moulding Operator

QP Name, QP Code and Version No., and NSQF Level: Injection
Moulding Operator, RSC/Q0207 V1.0,
NSQF Level 4

Training Duration: 1440 Hrs (9 months)

TOTAL PROGRAM DURATION: 1790 Hrs (11 months)

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PROGRAM CURRICULUM

Program Name	Injection Moulding Operator		
Program Duration	1790 Hrs (11 months)		
Version No.	1.0	Version Update Date	06/03/19
Entry Qualification	Class VIII passed		
Educational and/or Technical Qualification Required	Class VIII passed		
Block I Training Outcomes for Injection Moulding Operator Course	<p>After completing this programme, participants will be able to:</p> <ul style="list-style-type: none"> Identify tools and equipment used in the rubber injection moulding operations. Determine the tools and materials as per work requirement. Use the tools and equipment in the rubber injection moulding operations. Demonstrate the preparation of rubber injection moulding and accessories. Demonstrate rubber injection moulding process. Demonstrate post rubber injection moulding activities. Identify defects generated during rubber injection moulding. 		
Block II Training Outcomes for Injection Moulding Operator Course	<p>After completing this programme, participants will be able to:</p> <ul style="list-style-type: none"> Select the tools and equipment relevant to the specified job of the rubber injection moulding operations Demonstrate the use of the tools and equipment in the rubber injection moulding operations. Evaluate the work for planning. Determine the tools and materials as per work requirement. Demonstrate the preparation of rubber injection moulding and accessories. Perform rubber injection moulding process. Perform quality tests on rubber injection moulding parts. Analyze defects generated during rubber injection moulding. Perform the corrective actions for various rubber injection moulding defects. Apply effectively the organizational rules and regulations at workplace with stakeholder, colleague and customers. Judge the abnormal situations for escalation to superiors. Apply best practices of health and safety at workplace. 		

Note: 1 week has 40 hours of learning (8 hrs a day x 5 days a week). For example:

S. No.	QP2 Durations (in hrs)	Weeks	Months
1	1440	36	9
2	960	24	6
3	2080	52	13

Block I: This is a training block done in the Instructor-Led training approach, with theory and practical sessions. The training sessions may be held at training provider’s premises.

Block II: This is a training block done at the Employer location. This is largely hands-on with inputs/ guidance provided by the on-site mentors and supervisors. The employer may conduct instructor-led sessions in classrooms/ workshops and may also look at new age – technology-based performance support tools for additional support.

Basic Training (Block I)

General Information

1. **Course Name:** Injection Moulding Operator
2. **QP Code with Version No. and QP Name:** RSC/Q0207 V1.0, Injection Moulding Operator
3. **NSQF Level:** 4
4. **Theory hours:** 140 Hrs
5. **Practical hours:** 210 Hrs
6. **Batch Size:** 30
7. **Power Norms:** 15 KW for Workshop
8. **Space Norms:** 30 x30=900sq feet
9. **Assessment:** QP based assessment is conducted by an Assessment Agency as deputed by the respective Sector Skill Council.
10. **Tools, Equipment, and Machinery required:** As per Annexure I
11. **Trainer Qualification:** Trainer Prerequisites for Course: Injection Moulding Operator

Sr. No.	Area	Details
1	Job Description	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack "RSC/Q0207", Version 1.0.
2	Personal Attributes	Aptitude for conducting training, and pre/post work to ensure competent, employable candidates at the end of the training. Strong communication skills, interpersonal skills, ability to work as part of a team; a passion for quality and for developing others; well-organized and focused, eager to learn and keep oneself updated with the latest in the mentioned field.
3	Minimum Educational Qualifications	Any Graduate preferably in rubber or polymer.
4a	Domain Certification	Certified for Job Role: Injection Moulding Operator mapped to QP: "RSC/Q0207, v1.0". Minimum accepted score as per SSC guidelines is 80% on the SSC prescribed online theory assessment test based on an industry validated question bank.
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "MEP/Q0102". Minimum accepted score for the trainer is 80% as per SSC guidelines.
5	Experience	5+ years of relevant work-experience, above supervisor level

Curriculum

Block I is aimed at training candidates for the course of an “Injection Moulding Operator”, in the “Rubber Industry” Sector/Industry and aims at building the following key competencies amongst the learner.

S. No.	Module Name	Key Learning Outcomes	Equipment Required
1.	Introduction Theory Duration (hh:mm) 16:00 Practical Duration (hh:mm) 8:00 Corresponding NOS Code: Bridge Module	<ul style="list-style-type: none"> Describe the history of the development of the rubber industry Describe the current scenario of rubber industry and its future prospects Identify rubber obtained from different sources. List major rubber associations. Explain role and responsibility of “Injection Moulding Operator”. Identify machines to be used for injection moulding. Identify different tools to be used for injection moulding. 	Laptop/PC, projector, rubber injection moulding machine, rubber compound feeding device, rubber injection moulding die, material handling equipment, cooling tower, temperature control unit, material storing bins, PPE - helmet, gloves, goggles etc., digital thermometers
2.	Prepare injection moulding machine Theory Duration (hh:mm) 24:00 Practical Duration (hh:mm) 32:00 Corresponding NOS Code: RSC/N0701	<ul style="list-style-type: none"> Demonstrate cleaning process of the rubber injection moulding machine. Identify the tools required for injection moulding machine preparation. Demonstrate the process of mould changing as per job sheet. Demonstrate the dry run cycle after mould loading. Demonstrate the machine parameter set up. Identify the raw material for process as per job sheet. 	Laptop/PC, projector, rubber injection moulding machine, rubber compound feeding device, rubber injection moulding die, material handling equipment, cooling tower, temperature control unit, material storing bins, PPE - helmet, gloves, goggles etc., digital thermometers
3.	Perform injection moulding operation Theory Duration (hh:mm) 24:00 Practical Duration (hh:mm) 48:00 Corresponding NOS Code: RSC/N0702	<ul style="list-style-type: none"> Demonstrate the activity of loading the raw material. Demonstrate the machine parameter control during rubber injection moulding operations. Demonstrate the rubber injection moulding as per the standard operating procedures (SOP). Apply all safety norms during injection moulding. 	Laptop/PC, projector, rubber injection moulding machine, rubber compound feeding device, rubber injection moulding die, material handling equipment, cooling tower, temperature control

			unit, material storing bins, PPE - helmet, gloves, goggles etc., digital thermometers
4.	<p>Undertake post injection moulding activities</p> <p>Theory Duration (hh:mm) 16:00</p> <p>Practical Duration (hh:mm) 32:00</p> <p>Corresponding NOS Code: RSC/N0703</p>	<ul style="list-style-type: none"> • Demonstrate the activity of cured product removal as per SOP. • Demonstrate the process of removing the compound flash after completing a cycle. • Demonstrate the trimming process to remove flash as per SOP. • Select sample of production to submit to quality department. • Demonstrate storing process of the quality approved parts to the designated storage area. • Demonstrate visual inspection of moulded parts. • Identify the defects in moulded parts. 	<p>Laptop/PC, projector, rubber injection moulding machine, rubber compound feeding device, rubber injection moulding die, material handling equipment, cooling tower, temperature control unit, material storing bins, PPE - helmet, gloves, goggles etc., digital thermometers</p>
5.	<p>Carry out housekeeping</p> <p>Theory Duration (hh:mm) 16:00</p> <p>Practical Duration (hh:mm) 24:00</p> <p>Corresponding NOS Code RSC/N5001</p>	<ul style="list-style-type: none"> • Describe what is housekeeping • Explain the importance and purpose of housekeeping • Explain the benefits of housekeeping • Describe the '5S.' • Define each 'S' and its meaning • Demonstrate the process of cleaning of the machine and the work area with specified equipment and material. 	<p>Laptop/PC, projector, cleaning equipment such as – floor cleaner, broom, dust pan, solvents, clothes for cleaning</p>
6.	<p>Carry out reporting and documentation</p> <p>Theory Duration (hh:mm) 8:00</p> <p>Practical Duration (hh:mm) 16:00</p> <p>Corresponding NOS Code RSC/N5002</p>	<ul style="list-style-type: none"> • Explain the importance of documentation. • Identify documentation to be completed relating to assigned role • Record details accurately in an appropriate format • information from documents. • Explain the importance of reporting. • Apply organization policies and guidelines in day-to-day work. • Describe the purpose and importance of procedures in an organization. • Use work instructions for working in an organization. • Use the communication process during day-to-day work. 	<p>Laptop/PC, projector</p>

7.	<p>Carry Out Quality Checks</p> <p>Theory Duration (hh:mm) 16:00</p> <p>Practical Duration (hh:mm) 16:00</p> <p>Corresponding NOS Code RSC/N5003</p>	<ul style="list-style-type: none"> Describe the need of quality control in rubber injection moulding operation. Identify the defects generated during rubber injection moulding. Demonstrate in-process inspection of rubber injection moulding Use methodology of problem-solving. Describe implication of quality issues. 	<p>Laptop/PC, projector, rubber injection moulding machine, rubber compound feeding device, rubber injection moulding die, material handling equipment, cooling tower, temperature control unit, material storing bins, PPE - helmet, gloves, goggles etc., digital thermometers</p>
8.	<p>Carry out problem identification and escalation</p> <p>Theory Duration (hh:mm) 8:00</p> <p>Practical Duration (hh:mm) 16:00</p> <p>Corresponding NOS Code RSC/N5004</p>	<ul style="list-style-type: none"> Describe the need for problem escalation. Identify indicators or any wrong practices that may lead to problems Demonstrate the process of escalating problems to supervisor Consider applicable corrections and formulate corrective and timely action Communicate problem/remedial action to appropriate authorities 	<p>Laptop/PC, projector</p>
9.	<p>Carry out health and safety</p> <p>Theory Duration (hh:mm) 12:00</p> <p>Practical Duration (hh:mm) 18:00</p> <p>Corresponding NOS Code RSC/N5007</p>	<ul style="list-style-type: none"> Describe various hazards in any rubber industry. Explain the health and safety requirements for a rubber industry. Describe requirement of Personal Protective Equipment (PPE) in rubber industry. Identify different types of Personal Protective Equipment (PPE) used in the rubber industry. Demonstrate the use of different Personal Protective Equipment (PPE). Describe various emergency situations in the industry. Describe common injuries in the industry. Describe the constituents of a first aid box. Demonstrate how to handle Fire Emergencies. Demonstrate how to use a multi-purpose Fire Extinguisher. Select suitable fire extinguisher as per fire type and class 	<p>Laptop/PC, projector, safety goggle, safety shoes, safety gloves, mask, earmuff, first aid box, fire extinguisher</p>

Grand Total Course Duration: 350 Hours, 0 Minutes

Hands-On at Employer Location (Block II)

General Information

1. **Name of the Course:** Injection Moulding Operator
2. **QP Code with Version No. and QP Name:** RSC/Q0207 V1.0, Injection Moulding Operator
3. **NSQF Level:** 4
4. **Training Duration:** 1440 Hrs
5. **Batch Size:** 30
6. **Assessment:** Rubber Skill Development Skill Council (RSDC) will conduct the assessment at the end of Block II.
7. **Tools, Equipment, and Machinery required:** As per Annexure II
8. **Trainer Qualification:** Trainer Prerequisites for course: Injection Moulding Operator

Sr. No.	Area	Details
1	Job Description	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack "RSC/0207", Version 1.0.
2	Personal Attributes	Aptitude for conducting training, and pre/post work to ensure competent, employable candidates at the end of the training. Strong communication skills, interpersonal skills, ability to work as part of a team; a passion for quality and for developing others; well-organized and focused, eager to learn and keep oneself updated with the latest in the mentioned field.
3	Minimum Educational Qualifications	Any Graduate preferably in rubber or polymer.
4a	Domain Certification	Certified for Job Role: Injection Moulding Operator mapped to QP: "RSC/Q0207, v1.0". Minimum accepted score as per SSC guidelines is 80% on the SSC prescribed online theory assessment test based on an industry validated question bank.
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "MEP/Q2601". Minimum accepted score for the trainer is 80% as per SSC guidelines.
5	Experience	5+ years of relevant work-experience, above supervisor level.

Curriculum

Block II is aimed at training candidates for the course of an “Injection Moulding Operator”, in the “Rubber” Sector/Industry and aims at building the following key competencies amongst the learner.

S. No.	Module Name	Key Learning Outcomes	Equipment Required
1.	Introduction Theory Duration (hh:mm) 24:00 Practical Duration (hh:mm) 40:00 Corresponding NOS Code: Bridge Module	<ul style="list-style-type: none"> Describe roles and responsibilities for “Injection Moulding Operator”. Apply safety rules during shop floor training. Use personal protective equipment (PPE) during shop floor training. Perform escalations for any abnormalities during shop floor training. Perform reporting as per company's standard operating procedure (SOP) during shop floor training Demonstrate how to handle fire emergencies Describe various emergency situations that can happen in an industry Describe common injuries that one may suffer from in the industry Describe a first aid box and its constituents 	Laptop/PC, projector, rubber injection moulding machine, rubber compound feeding device, rubber injection moulding die, material handling equipment, cooling tower, temperature control unit, material storing bins, digital thermometers, PPE - helmet, safety goggle, safety shoes, safety gloves, mask, earmuff, first aid box, fire extinguisher
2.	Prepare injection moulding machine Theory Duration (hh:mm) 16:00 Practical Duration (hh:mm) 200:00 Corresponding NOS Code: RSC/N0701	<ul style="list-style-type: none"> Perform cleaning of the rubber injection moulding machine and work area. Select the tools required for rubber injection moulding process. Perform the verification process of the rubber injection moulding machine and other support devices. Perform the process of arranging the raw material for the rubber injection moulding. Perform assembling of right mould and distribution system properly on the injection moulding machine Set parameters for the injection moulding equipment (injection cycle time, temperature and clamping pressure), as per company's SOP Evaluate that all the available material for the process of injection moulding is approved by the quality control department. Identify rubber compound strip or granule that are ready for feeding into the Injection Moulding machine for the entire shift 	Laptop/PC, projector, rubber injection moulding machine, rubber compound feeding device, rubber injection moulding die, material handling equipment, cooling tower, temperature control unit, material storing bins, digital thermometers, PPE - helmet, safety goggle, safety shoes, safety gloves, mask, earmuff, first aid box, fire extinguisher

		<ul style="list-style-type: none"> • Verify that the mould loaded on the machine is as per the production plan. • Perform mould change if required. • Perform parameters setting for the machine. • Ensure housekeeping/safety in the moulding area as per SOP • Operate lifting equipment such as forklift / trolleys for lifting heavy materials such as moulds and distribution systems to avoid physical injury. • Examine mould lifting/ ejection/ slide mechanism of the press are properly functioning • Set up signage indicating hot surfaces wherever necessary • Adhere to all safety norms (e.g. wearing protective gloves, shoes, safety glasses) • Comply with health, safety, environment guidelines, regulations in accordance with international/national standards or organizational SOP 	
3.	<p>Perform injection moulding operation</p> <p>Theory Duration (hh:mm) 16:00</p> <p>Practical Duration (hh:mm) 320:00</p> <p>Corresponding NOS Code: RSC/N0702</p>	<ul style="list-style-type: none"> • Perform the handling of rubber compound appropriately to avoid contamination. • Demonstrate the process of compound loading in the correct pattern as per the SOP to minimize material overflow/ wastage/ excess flash • Operate the injection moulding machine and feed the compound strip or granule along with other required raw material. • Ensure that moulding pressure and temperature is maintained during the curing cycle • Ensure mould lifting/ ejection/ slide mechanism of the press are properly functioning • Remove the cured product from the mould as per SOP • Ensure housekeeping and safety in mixing area • Adhere to all other safety norms (like wearing shoes) • Comply with health, safety, environment guidelines, regulations in accordance with international/national standards or organizational SOP 	<p>Laptop/PC, projector, rubber injection moulding machine, rubber compound feeding device, rubber injection moulding die, material handling equipment, cooling tower, temperature control unit, material storing bins, digital thermometers, PPE - helmet, safety goggle, safety shoes, safety gloves, mask, earmuff, first aid box, fire extinguisher</p>

4.	<p>Undertake post injection moulding activities</p> <p>Theory Duration (hh:mm) 16:00</p> <p>Practical Duration (hh:mm) 80:00</p> <p>Corresponding NOS Code: RSC/N0703</p>	<ul style="list-style-type: none"> • Perform the process of taking off cured compound product from the pot/ flow grooves and ensure clean mould for next cycle • Perform the trimming process to remove flash from moulded parts in an appropriate manner to avoid injury. • Apply identification and traceability by batch marking/coding for the right product by as per SOP. • Perform the activity of submitting the moulded product sample to lab for testing. • Perform the activity of storing of remaining material at the designated storage area. • Perform cleaning of rubber injection moulding machine work area. • Perform the activity of the equipment handover to the next shift operator. • Perform the activity of disposing off the waste material as per company's SOP. 	<p>Laptop/PC, projector, rubber injection moulding machine, rubber compound feeding device, rubber injection moulding die, material handling equipment, cooling tower, temperature control unit, material storing bins, digital thermometers, PPE - helmet, safety goggle, safety shoes, safety gloves, mask, earmuff, first aid box, fire extinguisher</p>
5.	<p>Carry out housekeeping</p> <p>Theory Duration (hh:mm) 16:00</p> <p>Practical Duration (hh:mm) 80:00</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 • Clean all the equipment used • Select the suitable alternatives for cleaning the areas in case the appropriate equipment and materials are not available and inform the appropriate person • Describe the sequence for cleaning the area to avoid re-soiling clean areas and surfaces • Display the appropriate signage for the work being conducted • Wear the personal protective equipment required for the cleaning method and materials being used • Identify the correct cleaning method for the work area, type of soiling and surface • Perform cleaning activity without disturbing others • Identify and report to the appropriate person for any additional cleaning required that is outside one's responsibility or skill 	<p>Laptop/PC, projector, cleaning equipment such as – floor cleaner, broom, dust pan, solvents, clothes for cleaning</p>

		<ul style="list-style-type: none"> • Store housekeeping equipment and supplies at the designated places • Explain workplace procedures to deal with any accidental damage caused during the cleaning process • Perform dispose of the waste garnered from the activity in an appropriate manner • Maintain schedules and records for housekeeping duty 	
6.	<p>Carry out reporting and documentation</p> <p>Theory Duration (hh:mm) 40:00</p> <p>Practical Duration (hh:mm) 80:00</p> <p>Corresponding NOS Code RSC/N5002</p>	<ul style="list-style-type: none"> • Report data/problems/incidents as applicable in a timely manner to the appropriate authority as laid down by the company • Report shift production details for management review. • Report any issue faced during rubber injection moulding operation to supervisor. • Report break down during rubber injection moulding operation to support departments. • Identify documentation to be completed related to the process • Record details accurately and in appropriate format • Apply organizational procedures in day to day work. • Practice work instructions for carrying out rubber injection moulding operation. • Use appropriate communication process during day to day work. • Use process of resolving conflict with a team member as and when required. • Determine priority of work from pending work list. • Perform reporting for daily operations independently without supervision. 	<p>Laptop/PC, projector, rubber injection moulding machine, rubber compound feeding device, rubber injection moulding die, material handling equipment, cooling tower, temperature control unit, material storing bins, digital thermometers, PPE - helmet, safety goggle, safety shoes, safety gloves, mask, earmuff, first aid box, fire extinguisher</p>
7.	<p>Carry Out Quality Checks</p> <p>Theory Duration (hh:mm) 16:00</p> <p>Practical Duration (hh:mm) 200:00</p> <p>Corresponding NOS Code RSC/N5003</p>	<ul style="list-style-type: none"> • Perform regular in-process inspection of rubber injection moulding machine. • Analyze the defects generated during rubber injection moulding. • Identify appropriate measuring instruments, equipment, tools, accessories etc ,as required • Select appropriate instrument for measurement and inspection. • Identify potential causes of non-conformities to quality assurance standards and impact on final product due to nonconformance to company standards 	<p>Laptop/PC, projector, rubber injection moulding machine, rubber compound feeding device, rubber injection moulding die, material handling equipment, cooling tower, temperature control unit, material storing bins, digital thermometers, PPE - helmet, safety</p>

		<ul style="list-style-type: none"> Evaluate the need for action to ensure that problems do not recur and suggest corrective action to address problem Report the findings and results to the QC in charge/appropriate authority 	goggle, safety shoes, safety gloves, mask, earmuff, first aid box, fire extinguisher
8.	Carry out problem identification and escalation Theory Duration (hh:mm) 16:00 Practical Duration (hh:mm) 120:00 Corresponding NOS Code RSC/N5004	<ul style="list-style-type: none"> Identify the problem encountered during injection moulding operations. Identify the reason of the problem encountered. Perform corrective action required to resolve the problem and keep the records in the prescribed format Evaluate the implementation of corrective action taken to determine if the problem has been resolved Ensure that no delays are caused as a result of failure to take necessary action Explain the reporting hierarchy of the organization. Evaluate the problem for escalation. Perform the escalation of the problems to supervisors if required 	Laptop/PC, projector
9.	Carry out health and safety Theory Duration (hh:mm) 40:00 Practical Duration (hh:mm) 120:00 Corresponding NOS Code RSC/N5007	<ul style="list-style-type: none"> Identify the hazards during injection moulding operations. Apply safety norms during injection moulding operation. Identify various Personal Protective Equipment (PPE) used in rubber industry. Select required Personal Protective Equipment (PPE) used in the rubber industry. Use selected Personal Protective Equipment (PPE) as per SOP. Identify emergency situations in industry. Use First Aid box as and when required. Select suitable fire extinguisher as per fire type and class. Use a multi-purpose Fire Extinguisher in case of fire. 	Laptop/PC, projector, safety goggle, safety shoes, safety gloves, mask, earmuff, first aid box, fire extinguisher

Grand Total Course Duration: 1440 Hours, 0 Minutes

Assessment Criteria

Job Role	Injection Moulding Operator
Qualification Pack	RSC/Q0207
Sector Skill Council	Rubber Skill Development Council

S. No.	Guidelines for Assessment
1	Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2	The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3	Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
4	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
5	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criterion. To pass the Qualification Pack, every trainee should score a minimum of 70% of aggregate marks to successfully clear the assessment.
6	To pass the Qualification Pack, every trainee should score a minimum of 70% of aggregate marks to successfully clear the assessment.
7	In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

Assessment Outcomes	Assessment Criteria for Outcomes	Total Marks (80+20)	Out Of	Theory	Skills Practical
RSC/N0701 Prepare injection moulding machine	PC1. Ensure that injection moulding machine is clean and fit for use as per SOP	100	5	3	2
	PC2. Ensure upstream feeding device is loaded and ready for operation		5	3	2
	PC3. Ensure emergency safety feature of machine is working		5	3	2
	PC4. Select the correct mould and distribution system (sprue, drop, runners & gates)		5	3	2
	PC5. Ensure that the mould is clean		5	3	2
	PC6. Ensure that barrel & distribution system (sprue, drop, runners & gates) are clean		5	3	2
	PC7. Assemble the mould & distribution system properly on the platen machine		5	3	2
	PC8. Load the mould and distribution system on the machine press for preheating		5	3	2

	PC9. Set parameters for the injection moulding equipment (injection cycle time, temperature and clamping pressure), as per company's SOP		5	3	2
	PC10. Keep all the accessories like cleaning brush, mould release lever (made of brass or aluminium flat), ready including mould release agent		5	3	2
	PC11. Apply the mould release agent appropriately as per SOP		5	3	2
	PC12. Ensure that identified rubber compound strip or granule is ready for feeding into the Injection Moulding machine for the entire shift		5	3	2
	PC13. Ensure that rubber compound strip or granule to be fed is approved by laboratory		5	3	2
	PC14. Match the batch code of each rubber compound with the batch code on the job schedule given by the planning department		5	3	2
	PC15. Ensure desired shape of rubber compound strip or granule for continuous feeding to Injection moulding machine.		5	3	2
	PC16. Ensure, by visual inspection, that rubber compound strip or granule is of desired quality(free of contamination/bloom)		5	3	2
	PC17. Ensure housekeeping/safety in the moulding area as per SOP		4	2	2
	PC18. Use lifting equipment such as forklift/Trolleys while lifting heavy materials such as moulds and distribution systems to avoid physical injury.		4	2	2
	PC19. Ensure mould lifting/ejection/slide mechanism of the press are properly functioning		3	2	1
	PC20. Ensure that signage indicating hot surfaces is put up wherever necessary		4	3	1
	PC21. Adhere to all safety norms(e.g. wearing protective gloves, shoes, safety glasses)		3	2	1
	PC22. Comply with health, safety, environment guidelines, regulations in accordance with international/national standards or organizational SOP		2	1	1
		Total	100	60	40
RSC/N0702 Perform injection moulding operation	PC1. Handle the rubber compound to avoid contamination	100	8	5	3
	PC2. Load the material in the correct pattern as per SOP to minimize material overflow/wastage/excess flash		9	5	4

	PC3. Check the identified feed strip for dimension uniformity/identified granules		8	5	3
	PC4. Make the rubber compound strip or granule ready for feeding into the machine		9	5	4
	PC5. Start the machine and feeding simultaneously		9	5	4
	PC6. Ensure that moulding pressure and temperature is maintained during the curing cycle		9	5	4
	PC7. Ensure mould lifting/ejection/slide mechanism of the press are properly functioning		9	5	4
	PC8. Cure the product as per SOP		9	5	4
	PC9. Remove the cured product from the mould as per SOP.		9	5	4
	PC10. Ensure Housekeeping and Safety in mixing area		7	5	2
	PC11. Adhere to all other safety norms(like wearing shoes)		7	5	2
	PC12. Comply with health, safety, environment guidelines, regulations in accordance with international/national standards or organizational SOP		7	5	2
		Total	100	60	40
RSC/N0703 Undertake post injection moulding activities	PC1. Remove cured product properly as per SOP	100	10	5	5
	PC2. Remove the cured compound from the pot/flow grooves and ensure clean mould for next cycle		10	5	5
	PC3. Trim the piece to remove flash in a manner that does not cause injury to the operator or the product		10	5	5
	PC4. Ensure finishing operation including surface treatment of the cured product if required as per SOP before sending to inspection/warehouse.		10	5	5
	PC5. Dispose waste material in safe manner as per company's SOP		5	5	0
	PC6. 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)		10	5	5
	PC7. Send sample of specified compound/ batch in specified form to lab for testing		9	4	5
	PC8. Send the remaining material to the designated storage area		9	4	5
	PC9. Ensure mould lifting/ejection/slide mechanism of the press are properly functioning		9	4	5

	PC10. Adhere to all safety norms (like wearing protective gloves, shoes, safety glasses)		9	4	5
	PC11. Comply with health, safety, environment guidelines, regulations in accordance with international/national standards or organizational SOP		9	4	5
		Total	100	50	50
RSC/N5001 Carry out housekeeping in rubber product manufacturing	PC1. Inspect the area while taking into account various surfaces	100	3	3	0
	PC2. Identify the material requirements for cleaning the areas inspected, by considering risk, time, efficiency and type of stain		3	3	0
	PC3. Ensure that the cleaning equipment is in proper working condition		3	3	0
	PC4. Select the suitable alternatives for cleaning the areas in case the appropriate equipment and materials are not available and inform the appropriate person		3	3	0
	PC5. Plan the sequence for cleaning the area to avoid re-soiling clean areas and surfaces		3	3	0
	PC6. Inform the affected people about the cleaning activity		3	3	0
	PC7. Display the appropriate signage for the work being conducted		5	5	0
	PC8. Ensure that there is adequate ventilation for the work being carried out		8	3	5
	PC9. Wear the personal protective equipment required for the cleaning method and materials being used		8	3	5
	PC10. Use the correct cleaning method for the work area, type of soiling and surface		3	3	0
	PC11. Carry out cleaning activity without disturbing others		3	3	0
	PC12. Deal with accidental damage, if any, caused while carrying out the work		8	3	5
	PC13. Report to the appropriate person any difficulties in carrying out your work		8	3	5
	PC14. Identify and report to the appropriate person any additional cleaning required that is outside one's responsibility or skill		8	3	5
	PC15. Ensure that there is no oily substance on the floor to avoid slippage		3	3	0
	PC16. Ensure that no scrap material is lying around		3	3	0

	PC17. Maintain and store housekeeping equipment and supplies		3	3	0
	PC18. Follow workplace procedures to deal with any accidental damage caused during the cleaning process		8	3	5
	PC19. Ensure that, on completion of the work, the area is left clean and dry and meets requirements		3	3	0
	PC20. Return the equipment, materials and personal protective equipment that		3	3	0
	were used to the right places making sure they are clean, safe and securely stored				
	PC21. Dispose the waste garnered from the activity in an appropriate manner		2	2	0
	PC22. Dispose of used and un-used solutions according to manufacturer's instructions, and clean the equipment thoroughly		2	2	0
	PC23. Maintain schedules and records for housekeeping duty		2	2	0
	PC24. Replenish any necessary supplies or consumables		2	2	0
	Total		100	70	30
RSC/N5002 Carry out reporting and documentation	PC1. Report data/problems/incidents as applicable in a timely manner	100	12	9	3
	PC2. Report to the appropriate authority as laid down by the company		12	9	3
	PC3. Follow reporting procedures as prescribed by the company		12	9	3
	PC4. Identify documentation to be completed relating to one's role		10	7	3
	PC5. Record details accurately an appropriate format		16	8	8
	PC6. Complete all documentation within stipulated time according to company procedure		14	8	6
	PC7. Ensure that the final document meets with the requirements of the persons who requested it or make any amendments accordingly		6	4	2
	PC8. Make sure documents are available to all appropriate authorities to inspect		6	4	2
	PC9. Respond to requests for information in an appropriate manner whilst following organizational procedures		6	6	0
	PC10. Inform the appropriate authority of requests for information received		6	6	0
	Total		100	70	30

RSC/N5003 Carry out quality checks	PC1. Ensure that total range of checks are regularly and consistently performed	100	24	15	9
	PC2. Use appropriate measuring instruments, equipment, tools, accessories etc ,as required		24	15	9
	PC3. Identify non-conformities to quality assurance standards		6	4	2
	PC4. Identify potential causes of non-conformities to quality assurance standards		5	3	2
	PC5. Identify impact on final product due to non-conformance to company standards		5	3	2
	PC6. Evaluating the need for action to ensure that problems do not recur		6	4	2
	PC7. Suggest corrective action to address problem		5	3	2
	PC8. Review effectiveness of corrective action		5	3	2
	PC9. Interpret the results of the quality check correctly		4	4	0
	PC10. Interpret the results of the quality check correctly		4	4	0
	PC11. Take up results of the findings with QC in charge/appropriate authority.		3	3	0
	PC12. Take up the results of the findings within stipulated time		3	3	0
	PC13. Record of results of action taken		3	3	0
	PC14. Record adjustments not covered by established procedures for future reference		3	3	0
	PC15. Review effectiveness of action taken		2	2	0
	Total	Total	100	70	30
RSC/N5004 Carry out problem identification and escalation	PC1. Identify defects/indicators of problems	100	7	4	3
	PC2. Identify any wrong practices that may lead to problems		6	3	3
	PC3. Identify practices that may impact the final product quality		6	3	3
	PC4. Identify if the problem has occurred before		5	3	2
	PC5. Identify other operations that might be impacted by the problem		6	4	2
	PC6. Ensure that no delays are caused as a result of failure to escalate problems		5	3	2
	PC7. Take appropriate materials and sample, conduct tests and evaluate results to establish reasons to confirm suspected reasons for non-conformance(where required)		8	5	3

	PC8. Consider possible reasons for identification of problems		8	5	3
	PC9. Consider applicable corrections and formulate corrective action		3	3	0
	PC10. Formulate action in a timely manner		3	3	0
	PC11. Communicate problem / remedial action to appropriate parties		7	5	2
	PC12. Take corrective action in a timely manner		2	2	0
	PC13. Take corrective action for problems identified according to the company procedures		2	2	0
	PC14. Report/document problem and corrective action in an appropriate manner		8	5	3
	PC15. Monitor corrective action		2	2	0
	PC16. Evaluate implementation of corrective action taken to determine if the problem has been resolved		2	2	0
	PC17. Ensure that corrective action selected is viable and practical		2	2	0
	PC18. Ensure that correct solution is identified to an identified problem		2	2	0
	PC19. Take corrective action for problems identified according to the company procedures		1	1	0
	PC20. Ensure that no delays are caused as a result of failure to take necessary action		1	1	0
	PC21. Escalate problem as per laid down escalation matrix		4	3	1
	PC22. Escalate the problem within stipulated time		4	3	1
	PC23. Escalate the problem in an appropriate manner		3	2	1
	PC24. Ensure that no delays are caused as a result of failure to escalate problems		3	2	1
	Total	Total	100	70	30
RSC/N5007 Carry Out Health and Safety	PC1. Undertake basic safety checks before operation of all machinery and equipment and report hazards to the appropriate supervisor	100	6	4	2
	PC2. Work for which protective clothing or equipment is required is identified and the appropriate protective clothing or equipment is used in performing these duties in accordance with workplace policy.		6	4	2
	PC3. Read and understand the hazards of use and contamination mentioned on the labels of chemicals, utilities etc		0	0	0

PC4. Prior to performing manual handling jobs, risk is assessed and work is carried out according to currently recommended safe practices.	6	4	2
PC5. Use equipment and materials safely and correctly and return the same to designated storage when not in use	3	2	1
PC6. Dispose off waste safely and correctly in a designated area	6	4	2
PC7. Risks to bystanders are recognized and action taken to reduce risk associated with jobs in the workplace	0	0	0
PC8. Perform work in a manner which minimizes environmental damage	0	0	0
PC9. All procedures and work instructions for controlling risk are followed closely.	0	0	0
PC10. Report any accidents, incidents or problems without delay to an appropriate person and take immediate necessary action to reduce further danger.	0	0	0
PC11. Follow procedures for dealing with accidents, fires and emergencies, including communicating location and directions to emergency.	6	4	2
PC12. Follow emergency procedures as per company standards and workplace requirements.	8	6	2
PC13. Use Emergency equipment in accordance with manufacturers' specifications and workplace requirements.	8	6	2
PC14. Provide treatment appropriate to the patient's injuries in accordance with recognized first aid techniques.	0	0	0
PC15. Recover (if practical), clean, inspect/test, refurbish, replace and store the first aid equipment as appropriate	0	0	0
PC16. Dispose off medical waste in accordance with workplace requirements	0	0	0
PC17. Report details of first aid administered in accordance with work place procedures.	7	4	3
PC18. Comply with general safety procedures	8	6	2
PC 19. Follow standard safety procedures while handling equipment, hazardous material or tool	0	0	0

	PC20. Check parts of the workplace and take preventive actions like spraying and other steps to protect from leakages, water logging, pests, fire, pollution, etc.		8	6	2
	PC21. Ensure no accidents and damages at the workplace, reporting of any breach of company safety procedure		0	0	0
	PC22. Keep the workplace organized, swept, clean and hazard free		8	6	2
	PC23. Attend fire drills and other safety related workshops organized at the workplace		4	3	1
	PC24. Be aware of first aid, evacuation and emergency procedures		4	3	1
	PC25. Be alert of any events and do not be negligent to any safety procedures to be followed		0	0	0
	PC26. Avoid accidents while using hazardous chemicals, machines, sharp tools and equipment		4	3	1
	PC27. Use safety materials such as protective gear, goggles, caps, shoes, etc.(as applicable with workplace)		4	2	2
	PC28. Handle heavy and hazardous materials with care and using appropriate tools and handling equipment such as trolleys, ladders		4	3	1
	Total	Total	100	70	30
	Grand Total		800	520	280
	Percentage Weightage:			<20%>	<80%>
	Minimum Pass % to qualify (aggregate):			<50%>	

Annexure I: Tools and Equipment for Basic Training (Block I)

Sector: Rubber Industry

Block I QP Code with Version No. or Course Code: RSC/Q0207, V1.0

Block I QP Name or Course Name: Rubber Injection Moulding Operator

Block I NSQF Level: 4

S. No.	Equipment Name	Minimum number of Equipment required (per batch of 30 trainees)	Unit Type	Is this a mandatory Equipment to be available at the Training Center (Yes/No)	Dimension/Specification /Description of the Equipment/ ANY OTHER REMARK
1	Laptop/PC	1		Yes	
2	projector	1		Yes	
3	Rubber injection moulding machine	1		Yes	Smaller size for sample production
4	Rubber injection moulding die	1		Yes	Single cavity die is also ok
5	Compound heating unit	1		Yes	
6	Automatic rubber compound feeder	1		No	
7	Mould release agent spray gun	1		Yes	
8	Material handling equipment	1		No	Since class-room sample will be small, hence not mandatory, however for showing the material handling equipment used in industry, we may have few of them
9	Cooling tower	1	As per injection moulding machine specification	No	

10	Temperature control unit	1		Yes	
11	Safety curtains (with auto cut off)	1		No	It is strongly recommended to avoid any accident but optional
12	Storing rack			No	Optional
13	Floor cleaner	1		No	
14	Broom	5		Yes	
15	Dust pan	5		Yes	
16	Cleaning solvents	1		Yes	
17	Rags for cleaning	As per practical requirement		Yes	
18	Safety goggle	5		Yes	
19	Safety shoes	5		Yes	
20	Safety gloves	30		Yes	
21	Mask	30		Yes	
22	Earmuff	30		Yes	
23	First aid box	1		Yes	
24	Fire extinguisher	1		Yes	For extinguishing A, B, C, D type fires

Annexure II: Tools and Equipment for Hands-On at Employer Location (Block II)

Sector: Rubber Industry

Block II QP Code with Version No. or Course Code: RSC/Q0207, V1.0

Block II QP Name or Course Name: Injection Moulding Operator

Block II NSQF Level: 4

S. No.	Equipment Name	Minimum number of Equipment required (per batch of 30 trainees)	Unit Type	Is this a mandatory Equipment to be available at the Training Center (Yes/No)	Dimension/Specification /Description of the Equipment/ ANY OTHER REMARK
1	Laptop/PC	1		Yes	
2	projector	1		Yes	
3	Rubber injection moulding machine	10		Yes	Full scale production machine
4	Rubber injection moulding die	10		Yes	Single cavity die & multi cavity die for providing overall industry experience
5	Compound heating unit	10		Yes	
6	Automatic rubber compound feeder	10		No	
7	Mould release agent spray gun	10		Yes	
8	Material handling equipment	10		Yes	
9	Cooling tower	1	As per injection moulding machine specification	No	
10	Temperature	1		Yes	

	control unit				
11	Safety curtains (with auto cut off)	1		No	It is strongly recommended to avoid any accident but optional
12	Storing rack			No	Optional
13	Floor cleaner	1		No	
14	Broom	5		Yes	
15	Dust pan	5		Yes	
16	Cleaning solvents	1		Yes	
17	Rags for cleaning	As per practical requirement		Yes	
18	Safety goggle	5		Yes	
19	Safety shoes	5		Yes	
20	Safety gloves	30		Yes	
21	Mask	30		Yes	
22	Earmuff	30		Yes	
23	First aid box	1		Yes	
24	Fire extinguisher	1		Yes	For extinguishing A, B, C, D type fires

Further Learning

Learning Pathways

After completion of apprenticeship training the candidates will have wide career choices available with them in the Rubber industry. A candidate after completing apprenticeship can be skilled horizontally in various segments such as rubber extruding, rubber curing, compression moulding, and can finally be vertically moved to heading the production unit.

The candidates after their tenure as apprentice may do any of the following:

- a. **Rubber Curing Operator – RSC/Q2201**: The apprentice will be capable of performing curing and vulcanization of the rubber products.
- b. **Rubber Compression Moulding Operator – RSC/Q0205**: The apprentice will be capable of operating the compression moulding machine and feeding the rubber compound and other required materials into the machine for making rubber parts.

Employment Opportunities

Apart from above mentioned avenues, the apprentice can always aspire to be one of the following:

1. **Rubber manufacturing units in India**: The apprentice may be employed with the biggest player of the trades and be a part of their manufacturing set and deliver quality work.
2. **Rubber Injection Moulding Unit**: The apprentice may be encouraged to set up their own rubber injection moulding unit and be able to sell injection moulded rubber parts.
3. **Education and Training**: They may also take up the role of the instructor in this field where they can impart their manufacturing knowledge to the aspiring students.