

2013



Rubber Skill Development Council

Skill Gap Analysis Across Sub-Segments (Tyre and Non-tyre) for Rubber Industry in Kerala State



ICRA Management Consulting Services Limited

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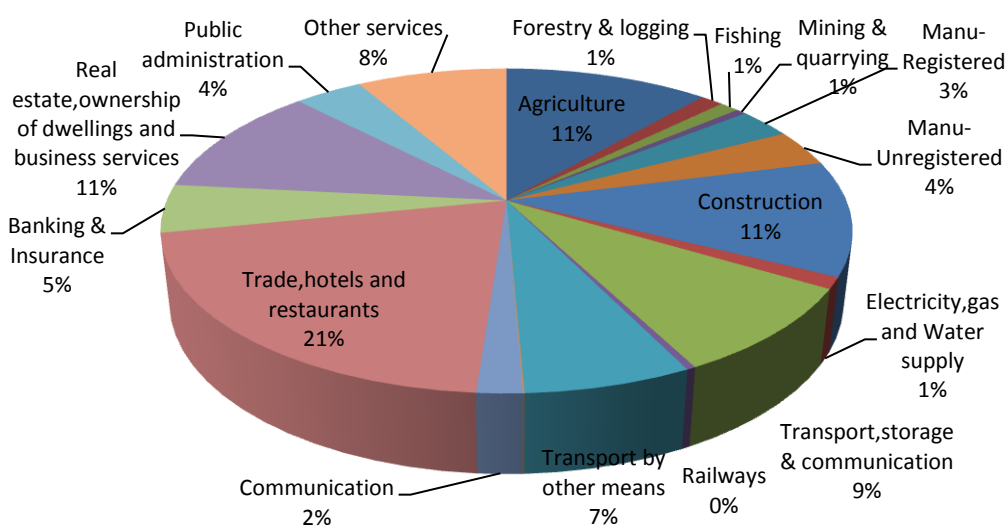
1. Skill Gap analysis – Kerala State

1.1 Kerala economy

Kerala with a total population of 3.33 crore¹ has high literacy rate of 93.9% reflecting healthy social status, high life expectancy of 71 years, low infant mortality rate of 12, and low school dropout rate. Per capita income in Kerala is Rs.56,107 as compared against the Rs.35,993 of India. As a result, Kerala tops all the other Indian states in the Human Development Index (HDI) score.

Kerala contributes to around 4% of the India's GDP, with a GSDP of Rs.326,693 crore in 2011-12. Though Kerala is agrarian driven economy, weak market information system and unpredictable weather has lead to volatility in farm production resulting in decrease in share of agriculture and allied activities to GSDP from 17.4% in 2004-05 to 10.5% in 2010-11. At the same time, secondary and tertiary sectors contribution has increased to around 20% and 69% of Kerala's GSDP. Manufacturing sector in Kerala has contributed to 9% of its GSDP with a grown rate of 8.7%, more than the country's growth rate of 8.2% in 2010-11. Similarly Kerala accounts for larger proportion of the NRI remittances that the country receives a reflection of the fact that a large number of people have been successfully employed outside India, especially Middle East.

Figure 1: Kerala economy – sectoral split-up (2011-12)



¹ Source: Census 2011

The state has traditionally enjoyed strong factor advantages in industries such as Rubber, Coir, Spices, Handlooms, Fisheries, Agro Processing, and Tourism. Furthermore, the Healthcare and Education sector has always been of importance in the Kerala's socio-economic milieu.

The importance of the rubber sector for Kerala cannot be stressed enough. This sector not only contributes to the manufacturing sector of the state but also to the bulk of the national produce in the rubber sphere. Kerala contributes to about 75 per cent of the planted area and about 89 per cent to the national production. To aid in the growth of the rubber sector, several research initiatives have been undertaken by the government including the establishment of the Rubber Park near Ernakulam which is home to several rubber units as well as research activities.

1.2 Rubber Units Distribution in Kerala

Kerala houses for around 800 rubber manufacturing units which are distributed across the tyre and non-tyre segments. The dominant segments in the state are tread rubber products, dipped goods, footwear, rubberized coir and rubber mattings.

Table 1: Product segment-wise units distribution in Kerala

S.No	Product Category	Micro	Small	Medium	Large	Total
1	Adhesives	22	2			24
2	Auto and Cycle Parts	10				10
3	Beltings	1	1	1		3
4	Dipped Goods	94	4	6	3	107
5	Extruded Rubber Goods	12	1			13
6	Foam Products	35	5	8	2	50
7	Foot Wear	80	8	4	2	94
8	Hoses	2				2
9	Latex Thread	10	1		2	13
10	Moulded Rubber Products	10	3	1		14
11	Rubber covered rollers	1	2	1		4
12	Rubber Linings	1				1
13	Rubber Mattings	102	7	3		112
14	Rubber Sheeting	2				2
15	Rubber Tubing			1		1
16	Rubberised Coir, Jute and Woolen Products	60	13	8	3	84
17	Sports Goods	1				1
18	Surgical and Pharmaceutical Products	2				2
19	Tread Rubber Products	150	61	26	4	241
20	Tubes & Flaps	9				9

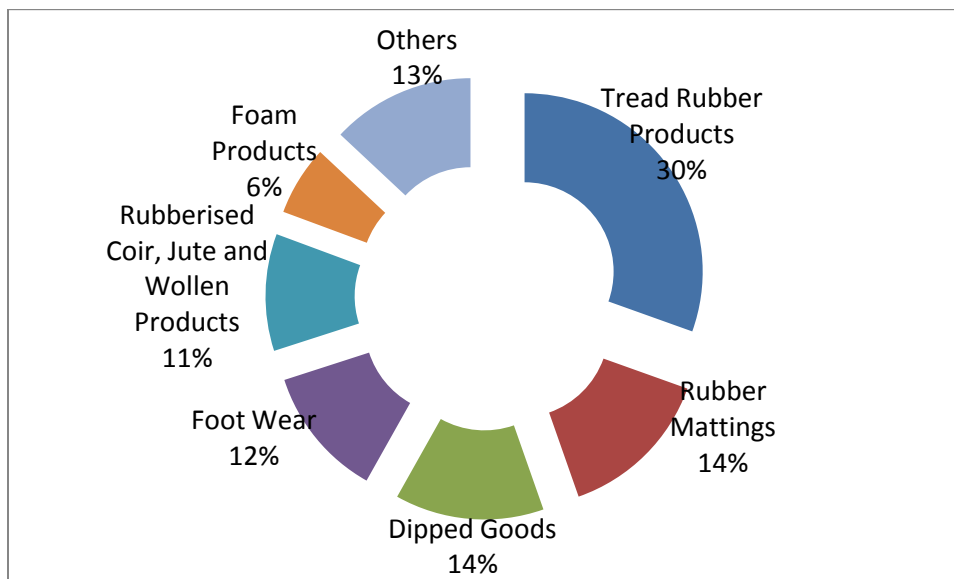
21	Tyre		1	5	6
22	Miscellaneous	8			8
Total		612	109	59	21
					801

Source: The Rubber Board;

Micro: Units below 50 MT usage, Small: Units from 50-149 MT usage; Medium: 150-499 MT usage and Large: Units over 500 MT usage

Major product segments are highlighted in the figure given below:

Figure 2: Major product segments in Kerala



Source: The Rubber Board;

Geographically, the main clusters where the units are concentrated are in Kottayam, Ernakulam, Alapuzha, Thrissur, Palakkad, Malapuram and Kozhikode.

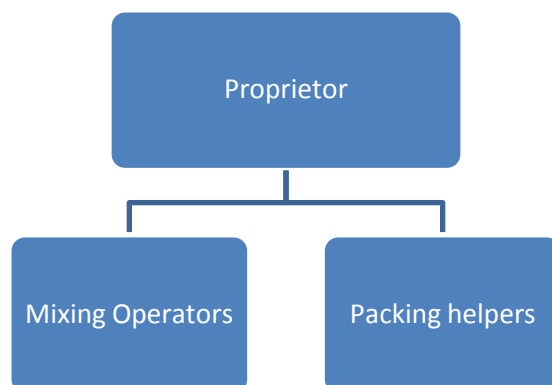
1.3 Skill gap analysis – Product segments in Kerala

1.3.1 Adhesives

An adhesive is any substance that, when applied to the surfaces of materials, binds the surfaces together and resists separation. There are only about 20 latex based adhesive manufacturing units in Kerala. This is one of the minor product categories in the state. Most of these manufacturing units are present in Kottayam and Kanjirappally region. The major consumers of this type of adhesive foot wear manufacturing units.

1.3.1.1 Organisation structure

Figure 3: Organisation structure of adhesive manufacturing units



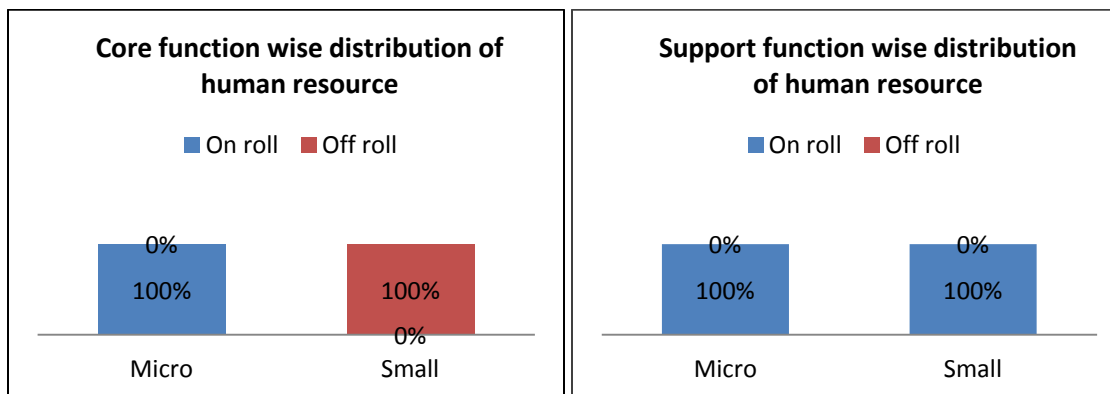
The activities of the human resource function and other support function is executed by the Proprietor.

Sample covered

	Micro	Small	Medium	Large	Total
No. of units	1	4	0	0	5

1.3.1.2 Function wise distribution of human resource

Figure 4: Function wise distribution of human resource



1.3.1.3 Job role wise distribution of human resource

The manufacturing of adhesive is a simple process and not many job role is involved. The two major job roles in the adhesive segment are mixing operator and finishing helper.

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Mixing	Supervisor	0	Accounts	Manager Accounts	0
	Mixing Operator	16		Accountant	1
	Helpers	0		Manager Purchase	0
Packaging and Dispatch	Supervisor	0	Purchase	Stores Assistant	0
	Helpers	12	Marketing	Manager Marketing	1
TOTAL		28	HR	HR Manager	0
			General	Proprietor/M D	6
				General Manager	0
			Production	Production Manager	1
				Shift In-charge	0

1.3.1.4 Qualification wise distribution of human resource

Table 2: Qualification wise distribution of human resource

Qualification	Micro	Small
Ph.D / Research	0%	0%
Engineers	0%	0%
BA / BSc/B Com	0%	15%
Diploma Engineers	0%	0%
ITI / Vocational Education	0%	0%
12th std / 10th std pass	0%	0%
Below 10th standard	100%	85%
Others (specify - Such as MBAs, CA, ICWA, CS, etc.)	0%	0%
TOTAL	100%	100%

1.3.1.5 Skill gap analysis

Table 3: Occupation wise distribution of job roles

Occupation	Management	Mixing	Packing and Dispatch
Job Roles	Proprietor	Mixing Operator	Packing Helper

Occupation: Management

Following job roles are involved in management occupation:

- Proprietor

Occupation: Management

Job Role: Proprietor

Qualification and Experience: 12th standard pass/ Graduate with over 15-20 years of experience in rubber industry.

Roles and Responsibilities:

- Responsible for running of unit and production
- Planning for production schedule
- Customer management
- Leading the compounding
- Heading the purchase and admin

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

Particulars	Micro	Small	Medium	Large
-------------	-------	-------	--------	-------

<ul style="list-style-type: none"> Understanding of latex properties Knowledge of chemicals used with latex like zinc compounds, etc Knowledge of weighing Knowledge of chemical addition sequence Knowledge of time between addition of chemicals Knowledge of storage techniques Knowledge about overall process <p>Managerial skills</p> <ul style="list-style-type: none"> People management skills Ability to lead and manage the financial aspects of the firm <p>Soft skills</p> <ul style="list-style-type: none"> Ability to liaison with latex selling units Ability to interface with customer 	<ul style="list-style-type: none"> Inadequate understanding on diversified and value added product 	M	L	N/A	N/A
--	---	---	---	-----	-----

H- High; M – Medium; L- Low

Occupation: Mixing

Following job roles are involved in mixing occupation:

- Operator

Occupation: Mixing

Job Role: Operator

Qualification and Experience: Minimally educated with about 1-3 years of experience

Roles and Responsibilities:

- Weighing the raw material
- Mix the chemicals
- Clean the tank

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Ability to load and unload the latex

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> Inadequate 	L	L	N/A	N/A

<ul style="list-style-type: none"> ▪ Cleaning the latex tank after mastication ▪ Ability to take the right quantity of latex from stored tanks ▪ Knowledge of additives like zinc compounds used in mixing ▪ Knowledge of the sequence of the additives ▪ Ability to follow the sequence of process ▪ Knowledge of the process parameters to be set in the mixing mill ▪ Knowledge of time for latex to masticate <p>Managerial skills</p> <ul style="list-style-type: none"> ▪ N/A <p>Soft Skills</p> <ul style="list-style-type: none"> ▪ Basic communication 	<p>understanding on the products and process followed</p> <ul style="list-style-type: none"> ▪ Not aware of latex properties 	M	M	N/A	N/A
--	---	---	---	-----	-----

H- High; M – Medium; L- Low

Occupation: Packing

Following job roles are involved in mixing occupation:

- Helper

Occupation: Finishing, Packing and Dispatch

Job Role: Helper

Qualification and Experience: 10th standard/school drop out

Roles and Responsibilities:

- Weigh the adhesive
- Pack the finish product
- Material movement
- Keeping the work environment clean

Knowledge and Skill Requirement

- Ability to use the weighing machine
- Knowledge of material movement
- Ability to pack as per specification
- Knowledge of material movement
- Loading the finished goods for dispatch according to orders
- Ability to maintain the workplace environment clean

Skill Gaps and Intensity level of skill gap

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ Inadequate motivation and casualness in the work 	M	M	N/A	N/A
<ul style="list-style-type: none"> ▪ Inadequate communication skills (listening) 	M	M	N/A	N/A

H – High; M – Medium; L – Low

Job role wise distribution in all the units for the product segment of Adhesive (Estimated)

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Mixing	<i>Supervisor</i>	2	Accounts	<i>Manager Accounts</i>	0
	<i>Mixing Operator</i>	38		<i>Accountant</i>	2
	<i>Helpers</i>	20		<i>Manager Purchase</i>	0
Packaging and Dispatch	<i>Supervisor</i>	2	Purchase	<i>Stores Assistant</i>	3
	<i>Helpers</i>	43	Marketing	<i>Manager Marketing</i>	2
TOTAL		98	HR	<i>HR Manager</i>	0
			General	<i>Proprietor/MD</i>	12
				<i>General Manager</i>	2
			Production	<i>Production Manager</i>	4
				<i>Shift In-charge</i>	2

Summary Sheet: Adhesives

Categories	Total no. of adhesive product manufacturing units in Kerala					24	Qualification wise distribution of human resource		
Dry rubber based Latex based	Distribution of units	Micro	Small	Medium	Large	Total	Ph.D / Research Engineers BA/B.Sc/B Com Diploma Engineers ITI/Vocational Education 12th std/10th std pass Below 10th std Others (MBAs, CA, ICWA, CS, etc.) Total	0% 0% 0% 0% 0% 10% 90% 0% 100%	
		92%	8%	0%	0%	100%			
	No. of people employed*	132	19	0	0	151			
	Manufacturing					Support			
	Total no. of occupations identified		1		1				
	Total no. of job roles identified		2		1				
User industry	Critical job roles (in terms of skill requirement)	Mixing Operator							
Linings Footwear									
	Industry Suggestions <ul style="list-style-type: none">Inputs on market trendsTraining on latex propertiesTraining modules on impact of chemicals						Function wise distribution of human resource		
								On roll	Off roll
							Core function	66%	34%
							Support function	100%	0%

1.3.2 Belting

A rubber belt is a loop which is used to link two or more pulleys. The primary objective of a belt is to transmit power or goods from one point to another point.

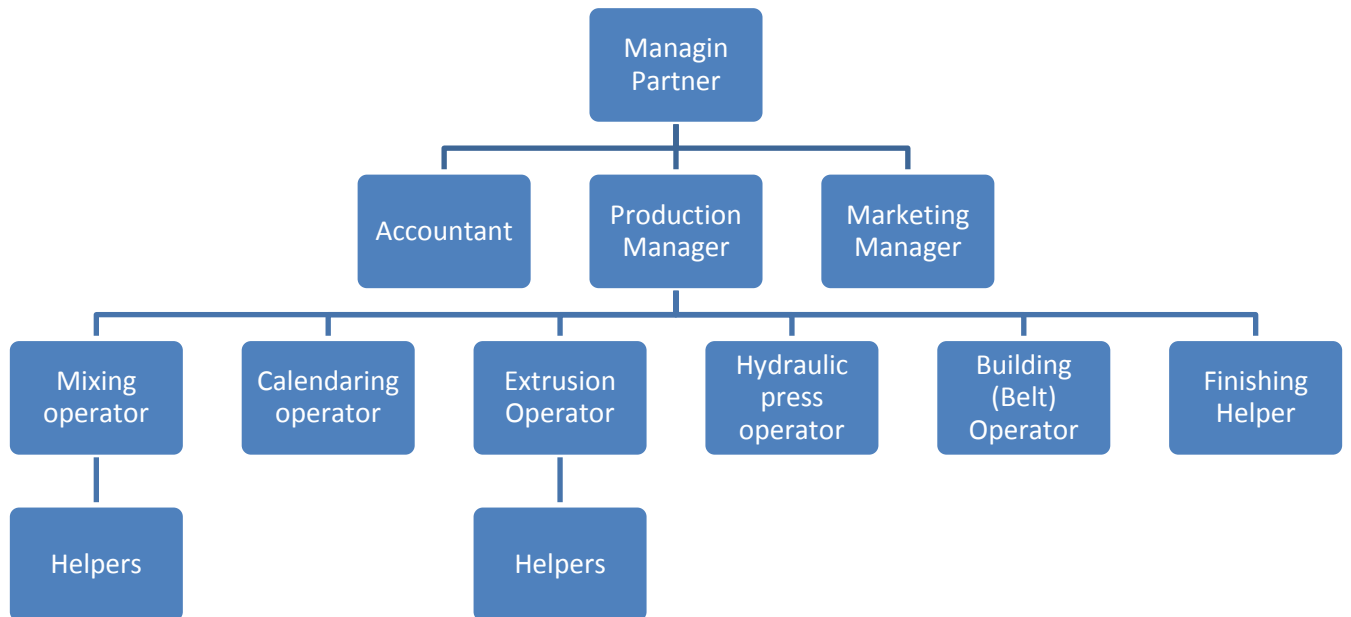
Types of sub product categories

- Conveyor belt
- Transmission belt
- Flat belt
- Fan Belt and V belt

This segment has only 3 manufacturing units in Kerala and is one of the minor segments in the state.

1.3.2.1 Organisation structure

Figure 5: Organisation structure



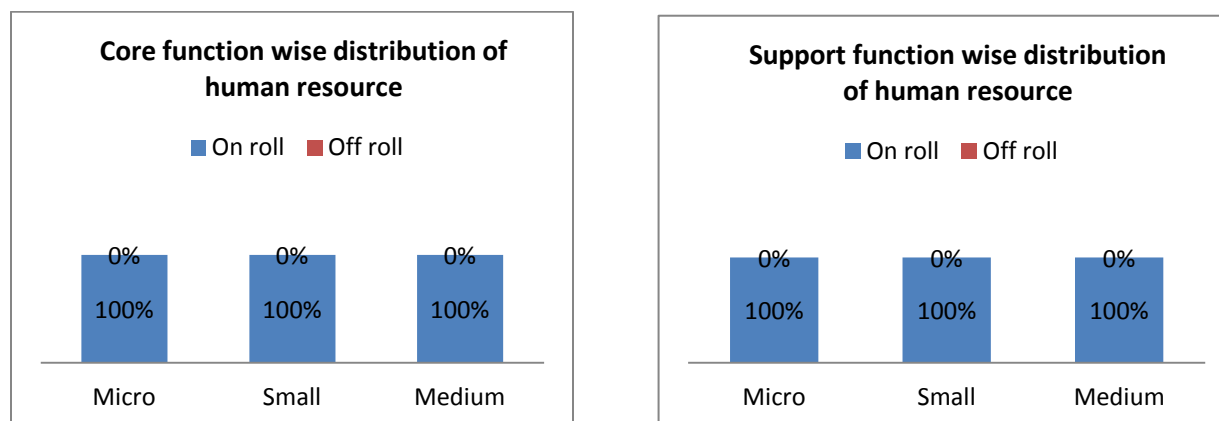
The occupation for a helper is not defined as the job which is to be executed by a helper is unskilled in nature. So, the helper would be working across different occupations depending upon the requirement of human resources in the production process.

Sample covered

	Micro	Small	Medium	Large	Total
No. of units	1	1	1		3

1.3.2.2 Function wise distribution of human resource

Figure 6: Function wise distribution of human resource



1.3.2.3 Job role wise distribution of human resource

Majority of the human resource deployed in belting units are under mixing mill operator, calendaring operator, extrusion operator, building operator, hydraulic press operator and helper.

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Mixing	Mixing Supervisor	2	Accounts	Manager Accounts	2
	Mixing Operator	7		Accountant	2
	Helpers	15	Purchase	Manager Purchase	1
Calendaring	Operators	7		Stores Assistant	3

Occupation	Job role	Number of people	Occupation	Job role	Number of people
	<i>Helpers</i>	15	Marketing	<i>Manager Marketing</i>	1
Building	<i>Building Supervisor</i>	1	HR	<i>HR Manager</i>	1
		0			0
	<i>Building Operator</i>	4	General	<i>Proprietor/MD</i>	2
Moulding	<i>Moulding Supervisor</i>	2		<i>General Manager</i>	3
	<i>Moulding Operator</i>	6		<i>Production Manager</i>	2
		0			0
	<i>Helpers</i>	11	Production	<i>Shift In-charge</i>	2
Finishing	<i>Finishing Supervisor</i>	2			
	<i>Finishing Operator</i>	7			
	<i>Helper</i>	10			
Packaging and Dispatch	<i>Packaging and Dispatch Supervisor</i>	6			
	<i>Helpers</i>	8			

1.3.2.4 Qualification wise distribution of human resource

Table 4: Qualification wise distribution of human resource

Qualification	Micro	Small	Medium
Ph.D / Research	0%	0%	0%
Engineers	0%	0%	5%
BA / BSc / B Com	10%	15%	15%
Diploma Engineers	0%	5%	5%
ITI / Vocational Education	0%	5%	5%
12th std / 10th std pass	40%	15%	25%
Below 10th standard	50%	60%	40%
Others (specify - Such as MBAs, CA, ICWA, CS, etc.)	0%	0%	5%
TOTAL	100%	100%	100%

1.3.2.5 Skill gap analysis

Table 5 : Occupation wise distribution of job roles

Occupation	Production Management	Mixing	Calendaring	Building	Curing	Quality control	Packaging
Job Roles	Plant Manager	Kneader operator	Calendaring operator	Building operator	Hydraulic press operator	Chemist	Helper
	Supervisor	Mixing mill operator					
		Helper					

Occupation: Production

Following job roles are involved in production occupation:

- Plant manager
- Supervisor

Occupation: Production

Job Role: Plant manager

Qualification and Experience:

- Large and medium industries: Engineer with more than 20 years of experience
- Small and micro industries: 10th/12th standard with more than 15 years of experience

Roles and Responsibilities:

- Monitor the production process of the required end product
- Ensure that the quality of the end product is as per the requirement
- Provide the required specifications to the supervisors
- Meet the production targets as specified by the management of the company
- Delegate work to the supervisors

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Particulars	Micro	Small	Medium	Large
-------------	-------	-------	--------	-------

Technical skills:

- Technical understanding of manufacturing process of different kinds of belting
- Ability to remain updated over the recent technological developments made in the belting market.
- Ability to troubleshoot issues relevant to production in the plant.
- Ability to provide required specifications to the machine operators in terms of time and temperature of mixing and curing, proportion of raw materials, etc.

Managerial Skills

- Ability to supervise the production process.
- Ability to delegate responsibilities to the supervisors.
- Ability to maximize returns from the available resources which could be in terms of capital, human and infrastructure.
- Ability to ensure smooth operations in the production process.
- Ability to coordinate with different departments so as to ensure adequate availability of raw materials.
- Ability to meet the production targets as required by the management.

Soft Skills

- Ability to communicate the requirement of resources to the management.

- | | | | |
|--|---|---|---|
| ▪ Lack of awareness and understanding of the latest technology used in rubber industry | M | M | L |
| • Inadequate troubleshooting skills, especially during production | M | L | L |

- Ability to provide training and guidance to the supervisors.
- Ability to develop and explain the plan to achieve the productions targets to his subordinates.
- Ability to resolve conflicts among his subordinates.

H- High; M – Medium; L- Low

Occupation: Production

Job Role: Supervisor

Qualification and Experience: Minimally educated/10th/12th standard with more than 10 years of experience

Roles and Responsibilities:

- Meet the production targets for the assigned process.
- Provide required specifications to the machine operators in terms of time and temperature of mixing and curing,
- Manage issues like absenteeism of workers and failure of machines
- Mentor machine operators and helpers

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Particulars	Micro	Small	Medium	Large
-------------	-------	-------	--------	-------

Technical skills:

- Technical understanding of
 - Manufacturing process of belting
 - Chemical properties of raw materials
 - Operation of different machines viz. mixing mill, kneader, calendar, hydraulic press, etc.
- Ability to troubleshoot issues in the operation of machines as and when required
- Ability to provide required specifications to the machine operators in terms of time and temperature of mixing and curing, proportion of raw materials, etc.
- Ability to inspect whether the end product from the machine is as per the specifications provided.

Managerial Skills

- Ability to independently solve basic problems like failure of machines, absenteeism of operators
- Ability to supervise the machine operators
- Ability to meet the production targets of the assigned process

Soft Skills

- Inadequate understanding of the chemical properties of the raw materials and identify the chemicals by colors.

L
L
L

- Ability to provide training and guidance to the machine operators and helpers
- Ability to communicate unresolved issues to the plant manager.
- Ability to resolve conflicts among his subordinates.

H- High; M – Medium; L- Low

Occupation: Mixing

Following job roles are involved in mixing occupation:

- Kneader operator
- Mixing mill operator
- Helper

Occupation: Mixing

Job Role: Kneader operator

Qualification and Experience: Minimally educated with more than 5 years of experience in rubber industry

Roles and Responsibilities:

- Mixing of raw materials in the kneader to make rubber compound
- Instruct the helpers to enable a smooth production process
- Operation of machine

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills

- Ability to operate the kneader machine
- Before starting the mixing process the operator must ensure that all the required raw materials for the mixing process are available.

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ The operator is not able to mix the raw materials as per the defined 	M	M	L	

- Ability to mix the raw materials as per the specified duration.
- Ensure that the kneader machine is used at the optimum level.
- Ability to weigh the raw materials as per the requirement.
- Ability to maintain adequate inflow and outflow of water in the kneader so as to maintain the temperature of the machine.
- Ability to mix the raw materials as per the required sequence.
- Ability to execute basic maintenance activity as required for example by regular oiling of the machine.
- Ability to instruct the helpers for cleaning, loading / unloading, etc.

Managerial skills

- Ability to instruct the helpers for cleaning, loading / unloading, etc.

Soft Skills

- Ability to coordinate work with his superiors and subordinates

sequence,
temperature and
duration.

- Inadequate communication skills

M

L

L

H- High; M-Medium; L-Low

Occupation: Mixing

Job Role: Mixing mill operator

Qualification and Experience: Minimally educated with more than 5 years of experience in rubber industry

Roles and Responsibilities:

- Mixing of raw materials in the mixing mill to produce the output in the form of sheet

- Instruct the helpers to enable a smooth production process
- Operation of mixing mill

Knowledge and Skill Requirement	Skill Gaps and Intensity level of skill gap				
	Particulars	Micro	Small	Medium	Large
Technical skills					
<ul style="list-style-type: none"> ▪ Ability to identify the raw materials and mix them as per the specified sequence, time and temperature ▪ Ability to operate the weighing machine so as to weigh the raw materials as per the requirement in the mixing process. ▪ Ability to set the required distance between the rollers of the mixing mill so as to produce the sheet as per the required width. ▪ Must be able to ensure that there is no oil leakage and the electrical wiring is intact. ▪ Ability to operate the mixing mill so as to produce the output in the form of a sheet. ▪ Ability to maintain adequate inflow and outflow of water in the mixing mill so as to maintain the temperature of the machine. ▪ Safety skills-Operator must be alert that his hands do not get between the rollers of the mixing mill. ▪ Ability to execute basic maintenance activity as required. ▪ Ability to instruct the helpers for cleaning, loading / unloading, etc. 	<ul style="list-style-type: none"> • Inability to mix the raw materials as per the specified time, temperature and sequence as provided by the supervisor. 	L	L	L	
Managerial skills					

- Ability to instruct the helpers for cleaning, loading / unloading, etc.

Soft Skills

- Ability to coordinate work with his superiors and subordinates

H- High; M-Medium; L-Low

Occupation: Mixing

Job Role: Helper

Qualification and Experience: Minimally educated

Roles and Responsibilities:

- Identify raw material used for mixing
- Loading unloading of raw materials and the end product from the machines

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills

- Ability to identify the raw materials and the end product produced from each of the machines used in the manufacturing process.
- Ability to carry the raw material to the required machine as specified by the operator.
- Comply with the safety procedures.

Managerial skills

NA

Soft skills

NA

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> • Inadequate knowledge of safety procedures. For example, the helper may try to operate the mixing machines which could lead to an accident as his hands may get inside the rollers of the mixing mil 	L	L	L	

H- High; M-Medium; L-Low

Occupation: Calendaring operator

Following job roles are involved in moulding occupation:

- Calendaring operator

Occupation: Calendaring

Job Role: Calendaring operator

Qualification and Experience: Minimally educated with more than 5 years of experience in rubber industry

Roles and Responsibilities:

- Produce homogeneously rubberised ply.
- Operate the calendaring machine

Knowledge and Skill Requirement	Skill Gaps and Intensity level of skill gap				
	Particulars	Micro	Small	Medium	Large
Technical skills: <ul style="list-style-type: none"> ▪ Ability to operate the machine. ▪ Ability to maintain the distance between the rolls (nip) of calendaring machine as specified so as to produce an evenly rubberized ply. ▪ Should be able to manufacture the required product as per the following specifications and its different parameters: <ul style="list-style-type: none"> ○ Belt specifications- Belt width, number of ply, rating, grade, cover (top, bottom), edge and length. ○ Belt constant- Raw width, carcass, fold and carcass build ○ Process details- Mould gap, gauge, steam press, pump, hydraulic press (Kg/cm square and other. ○ Fabric details- fabric code, roll number, length, S/C component code, standard quantity and cured 	.				
	<ul style="list-style-type: none"> • Inability to adequately follow the required specifications due to lack of experience on the calendar machines. 	L	L	L	

fabric details.

- Cover details- component code, standard quantity, actual quantity, top cover and belt cover
- Ability to maintain the inventory of the required quantity of ply.
- Ability to check whether the ply is properly rubberised or not.
- Safety skills-Operator must be alert that his hands do not get between the rollers of the mixing mill.
- Ability to execute basic maintenance activity as required.

Managerial skills

- Ability to instruct the helpers for cleaning, loading / unloading, etc.

Soft Skills

- Ability to coordinate work with his superiors and subordinates

H- High; M-Medium; L-Low

Occupation: Building

Following job roles are involved in mixing occupation:

- Building operator

Occupation: Building

Job Role: Building operator

Qualification and Experience: Minimally educated/10th standard with more than 5 years of experience

Roles and Responsibilities:

- Join the rubber sheets and rubberized plies as per the specification of the required quality and type of belt.

Knowledge and Skill Requirement	Skill Gaps and Intensity level of skill gap				
	Particulars	Micro	Small	Medium	Large
Technical skills <ul style="list-style-type: none"> Ability to place the rubber plies and rubber sheet evenly over each other. Ability to built the belt in a mould Knowledge of all the components required for belt building as per specification Ability to roll the uncured belt over cotton cloth Ability to join the required number of plies and rubber sheet 	<ul style="list-style-type: none"> Inconsistency in maintaining the specification as per the quality standard 	L	L	L	
Managerial skills <ul style="list-style-type: none"> Ability to instruct the helpers for cleaning, loading / unloading, etc. 					
Soft Skills <ul style="list-style-type: none"> Ability to coordinate work with his superiors and subordinates 					
H- High; M-Medium; L-Low					

Occupation: Curing

Following job roles are involved in moulding occupation:

- Hydraulic press operator

Occupation: Curing

Job Role: Hydraulic press operator

Qualification and Experience: Minimally educated/10th standard with more than 5 years of experience

Roles and Responsibilities:

- Adequate curing of belt

- Cleaning of mould
- Operation of hydraulic press

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Ability to adequately use the air gun to clean the die.
- Ability to pass the uncured belt through the hydraulic press.
- Ability to cure the rubberized ply in the hydraulic press as per the defined duration, temperature and pressure.
- Ability to operate the hydraulic press.
- Ability to execute basic maintenance activity as required.
- Ability to visually check the curing quality of the end product. If the belt is evenly rubberized than the press operator should be able to add rubber strips, wherever required and pass it again through the hydraulic press.
- Ability to remove flashes from the belt.

Managerial skills

- Ability to instruct the helpers for cleaning, loading / unloading, etc.

Soft Skills

- Ability to coordinate work with his superiors and subordinates

Particulars	Micro	Small	Medium	Large
-------------	-------	-------	--------	-------

- Inability to cure the rubberized ply as per the specified duration which could result to over curing or under curing of rubberized ply.

L

L

L

H- High; M-Medium; L-Low

Occupation: Quality control

Following job roles are involved in packing and dispatch occupation:

- Chemist

Occupation: Quality control

Job Role: Chemist

Qualification and Experience: Rubber technologist

Roles and Responsibilities:

- Develop the chemical formulation as per the specifications of the end product.
- Test the end product to check if its in line with the required specifications.

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills

- Should be able to develop the end product as per the defined standards (IS, ISO, Australian, etc.)
- Ability to develop chemical formulation for the specifications as required by the customer.
- Should be able to provide specification to the machine operators in terms of different parameters like time, temperature, pressure, weight etc.
- Capable to conduct various tests as per the grade (M-24, FR, SHRT-1, SHRT-2, Hygienic grade ,etc) of the end product:
 - Tear resistance test
 - Flame test
 - Drum friction test
 - Specific gravity test
 - Ozone test

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> • Not able to prepare the formulation based on the desired properties in the end product 	M	L	L	

- Ageing test
- Full strength test
- Adhesion test
- Rubber cover test
- Abrasion test

Managerial skills

NA

Soft skills

- Ability to communicate any deviation in the result of the tests to the management.

H-High; M-Medium; L-Low

Occupation: Packing

Following job roles are involved in packing and dispatch occupation:

- Helper

Occupation: Packing

Job Role: Helper

Qualification and Experience: Minimally educated

Roles and Responsibilities:

- Pack the finish product
- Loading of finished product

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills

- Ability to pack the finished end product in plastic bags or as required.
- Ability to load the finished product as per the specified instructions.

Managerial skills

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> • Inadequate communication skills: Inability to understand the instructions of his supervisors. 	L	L	L	

NA

Soft skills

NA

H-High; M-Medium; L-Low

Summary Sheet: Belting

Categories	Total no. of belting product manufacturing units in Kerala					3	Qualification wise distribution of human resource			
<ul style="list-style-type: none">• Conveyor belt• Transmission belt• Flat belt• Fan Belt and V belt	Distribution of units	Micro	Small	Medium	Large	Total	Ph.D / Research Engineers BA/B.Sc/B Com Diploma Engineers /Rubber technologist ITI/Vocational Education 12th std/10th std pass Below 10th std Others (MBAs, CA, ICWA, CS, etc.) Total		0%	
		33%	33%	33%	0%	100%			2%	
	No. of people employed*	30	22	96	0	148			14%	
	Manufacturing					Support			0%	
	Total no. of occupations identified		8		6				0%	
	Total no. of job roles identified		17		12				2%	
User industry	Critical job roles (in terms of skill requirement)	Mixing operator, calendaring operator and hydraulic press operator							81%	
<ul style="list-style-type: none">▪ Manufacturing industry▪ Power sector									0%	
									100%	0%
									100%	0%
									100%	0%

*Estimation based on sample data

1.3.3 Dipped Goods

Dipped rubber goods are thin-walled products which are manufactured by dipping a form in a suspension of rubber (latex), followed by drying and vulcanizing the resulting film.

Types of sub product categories

1. **Gloves** - A Glove is generally a garment covering the whole hand. Gloves protect and comfort hands against cold or heat, damage by friction, abrasion or chemicals, and disease; or in turn to provide a guard for what a bare hand should not touch. Latex disposable gloves are often worn by health care professionals as hygiene and contamination protection measures.

Types of Gloves:

- a. Examination Gloves
 - b. Household Gloves
 - c. Industrial Gloves
 - d. Surgical Gloves
2. **Rubber bands** - A rubber band, is a short length of rubber and latex, elastic in nature and formed in the shape of a circle which is commonly used to hold multiple objects together
 3. **Balloons** - A balloon is an inflatable flexible bag filled with a gas, such as helium, hydrogen, etc. Modern balloons can be made from materials such as rubber, latex or even nylon fabric. Balloons can be used for simple decorative purposes or for conducting experiments, meteorology, etc.
 4. **Condoms** – A condom is a flexible sheath, usually made of thin rubber or latex, designed to cover the penis during sexual intercourse for contraceptive purposes or as a means of preventing sexually transmitted diseases
 5. **Finger Stalls** - is a supply used to cover one or more fingers in situations where a full glove is unnecessary

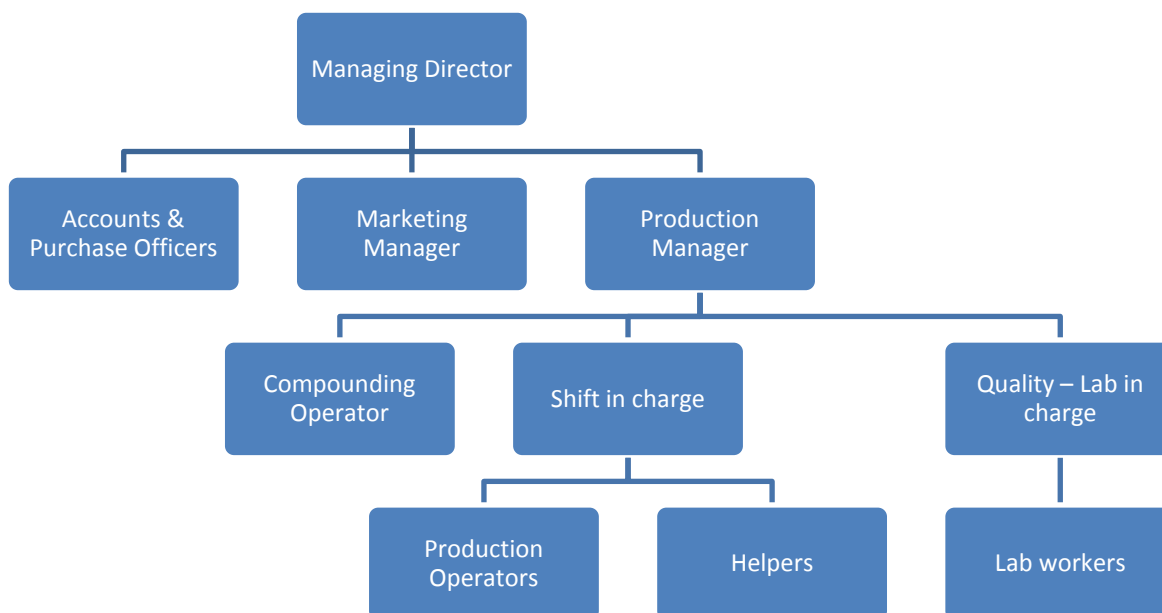
DIPPED GOODS



3.2.1.1 Organisation structure

3.2.1.1.1 Organisation structure for a Glove and condom making unit

Figure 7: Organisation structure of gloves and condom manufacturing units

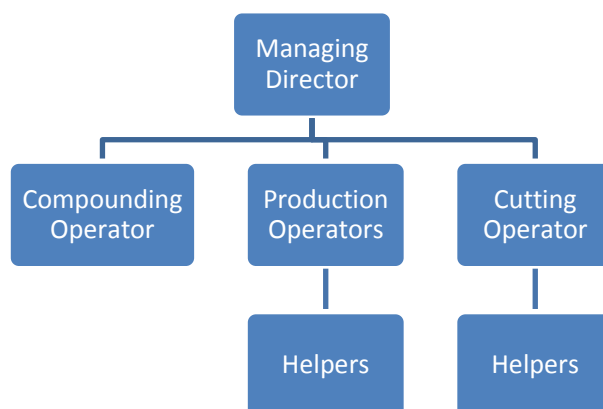


Note: The depicted organisation structure is for a medium sized unit

- Managing Director / Accounts Officer will be performing HR function

3.2.1.1.2 Organisation structure for a Rubber Band making unit

Figure 8: Organisation structure of Rubber Band manufacturing units



Note: The depicted organisation structure is for a micro sized unit

- Managing Director will be executing the support functions
- Production operators will be involved in dipping, vulcanisation and drying chamber operation
- Helpers will be performing multiple works in various stages of manufacture process as per requirement

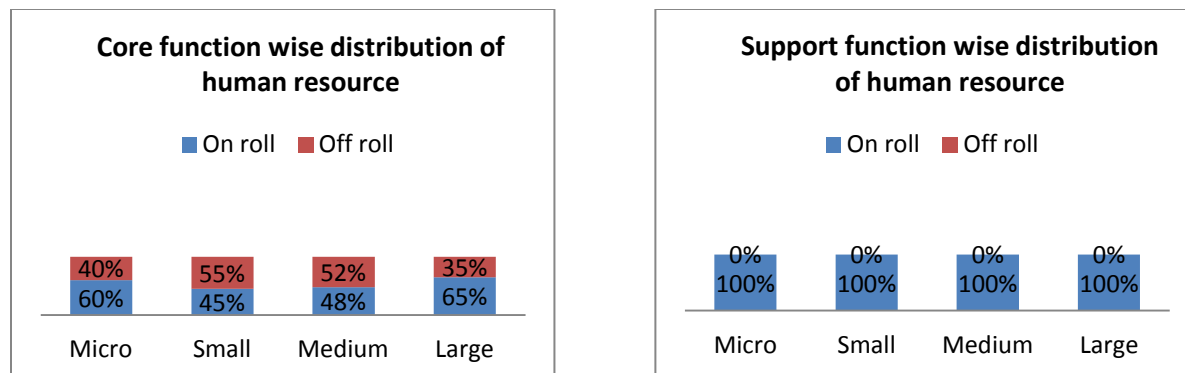
Sample covered

	Micro*	Small	Medium	Large	Total
No. of units	15	7	5	2	29

*includes 2 meeting of surgical and pharmaceutical product (Uri-cond) which is basically a dipped good.

3.2.1.2 Function wise distribution of human resource

Figure 9: Function wise distribution of human resource



3.2.1.3 Job role wise distribution of human resource

Majority of the human resource deployed in dipped goods units are under dipping operator and helper (Inspection) job role.

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Compounding	Compounding Supervisor	52	Accounts	Manager Accounts	24
	Compounding Operator	176		Accountant	32
	Helpers	264	Purchase	Manager Purchase	28
Dipping	Dipping Operators	196		Stores Assistant	28
	Helpers	280	Marketing	Manager Marketing	32
Drying	Helpers	36	Admin / HR	Admin / HR Officer	40
Vulcanising	Vulcanising / boiler Operator	96	General	Proprietor/MD	64
	Helper	4		General Manager	12
Stripping	Helpers	328	Production	Production Manager	24
Cutting	Helpers	24		Shift In-charge	44

Quality Check	QC in charge	32
	Lab assistant / helper	392
Packing and Dispatch	Supervisor	24
	Helpers	308

3.2.1.4 Qualification wise distribution of human resource

Table 6: Qualification wise distribution of human resource

Qualification	Micro	Small	Medium	Large
Ph.D / Research	0%	0%	0%	0%
Engineers	0%	5%	5%	5%
BA / BSc/B Com	5 - 10%	10%	15%	15%
Diploma Engineers	0%	5%	5%	5%
ITI / Vocational Education	0%	5%	5%	10%
12th std / 10th std pass	45 - 50%	10%	20%	40%
Below 10th standard	45%	65%	50%	20%
Others (specify - Such as MBAs, CA, ICWA, CS, etc.)	0%	0%	0%	5%
TOTAL	100%	100%	100%	100%

3.2.1.5 Skill gap analysis

I. Skill gap analysis for Gloves product segment

Table 7: Occupation wise distribution of job roles

Occupation	Production Management	Compounding	Dipping, Vulcanisation and Stripping	Quality Check	Packing and Dispatch
Job Roles	Production Manager	Compounding Operator	Operator	Lab in charge	Helper
	Shift in charge		Helpers	Lab assistant	

Occupation: Production

Following job roles are involved in production occupation:

- Production manager
- Shift in charge

Occupation: Production

Job Role: Production manager

Qualification and Experience: B.E (Production/Rubber Technology/etc) and 10 – 15 years of experience in rubber industry

Roles and Responsibilities:

- Monitor the production process
- Co ordinate with the departments in the unit for production
- Manage human resources in the shop floor
- Production planning and scheduling

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills

- Knowledge of glove production process
- Knowledge of properties of latex, chemicals, additives used, etc used in production process
- Knowledge about the glove making machine and its operation
- Knowledge of customer requirements (quality standards)
- Knowledge of Safety procedures
- Ability to call for preventive maintenance activity on glove making machine
- Ability to ensure availability of resources (men, material, etc) for smooth production process
- Basic knowledge on costing and finance
- Ability to resolve human resource issues
- Ability to do external reading and improve knowledge on latest trends, process improvements, etc.

Managerial Skills

- Ability to coordinate with different departments such as purchase, quality, etc.
- Decision making skills to improve productivity, resolving issues, etc.
- Ability to manage and resolve any issues of the people in shop floor
- Ability to monitor the production

Particulars	Micro	Small	Medium	Large
▪ Insufficient knowledge to implement new production techniques / Process improvement methods	NA	L	L	L
▪ Inadequate chemical properties knowledge	NA	M	L	L
▪ Inability to perform multiple managerial roles such as production, HR, etc	NA	L	L	L

process

- Ability to monitor and ensure that quality and safety procedures are followed
- Ability to plan and schedule production process

Soft skills

- Ability to interact and coordinate with department heads, operators and Shift in charge

H – High; M – Medium; L – Low

Occupation: Production

Job Role: Shift in charge

Qualification and Experience: Diploma (any specialisation) and 5 – 10 years of experience in rubber industry

Roles and Responsibilities:

- Monitor the production process
- Machine operation and calling for machine maintenance
- Training operators and helpers 'on the job'
- Co ordinate with operators and helpers on production

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills

- Knowledge of glove production process
- Knowledge of basic properties of latex, chemicals, additives used, etc used in production process
- Knowledge about the glove making machine and its operation
- Ability to set parameters in the machine (temperature, pressure, time, etc)
- Ability to constantly monitor the assembly line
- Ability to perform QC at various stages of production
- Ability to judge the performance and call for preventive maintenance activity on glove making machine
- Ability to do a production manager role in his absence

Particulars	Micro	Small	Medium	Large
▪ Inadequate chemical properties knowledge	NA	L	L	L
▪ Inadequate knowledge on machine maintenance	NA	M	M	L
▪ Insufficient decision making skills in the absence of production manager	NA	M	L	L
▪ Communication issues in	NA	M	L	L

<ul style="list-style-type: none"> Knowledge of Safety procedures Ability to train the operator on machine operation <p>Managerial Skills</p> <ul style="list-style-type: none"> Ability to coordinate with different departments such as purchase, quality, etc. Ability to manage and resolve any issues of the people (operators and helpers) Ability to monitor the production process Ability to monitor and ensure that quality and safety procedures are followed <p>Soft Skills</p> <ul style="list-style-type: none"> Ability to interact and coordinate with department heads and Production manager Ability to instruct operators and helpers 	interacting with migrant helpers
H – High; M – Medium; L – Low	

Occupation: Compounding

Following job roles are involved in compounding occupation:

- Compounding Operator

Occupation: Compounding

Job Role: Compounding Operator

Qualification and Experience: 10th/12th pass and 1-3 years experience in rubber industry

Roles and Responsibilities:

- Prepare compound for mixing
- Co ordinate with production manager and shift in charge on production requirement
- Inventory management of raw materials

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills

- Knowledge about different raw materials used for making compound
- Knowledge of basic properties of latex, chemicals, additives used, etc
- Ability to operate and maintain the

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> Inadequate knowledge of properties of chemicals used 	H	M	L	L

compound mixing machine ▪ Knowledge on the addition sequence of raw material for dispersion process ▪ Ability to check and ensure adequate raw material availability for mixing process ▪ Ability to weigh the quantities of different chemicals as per mixing specification Soft Skills ▪ Ability to communicate and instruct the helpers in loading and unloading of materials	▪ Inability to take corrective action when there is a problem in mixing ▪ Inability to communicate with migrant workers	H	L	L	L
		L	M	M	L

H – High; M – Medium; L – Low

Occupation: Dipping, Vulcanising and Stripping

Following job roles are involved in dipping, vulcanizing and stripping occupation:

- Operator
- Helper

Occupation: Dipping and Vulcanisation

Job Role: Operator

Qualification and Experience: 10th/12th pass and 1-3 years experience in rubber industry

Roles and Responsibilities:

- Monitor the production process in the assembly line
- Operate the machine and set parameters
- Ensure material availability (including quality of material) for the production process (in different chambers in the machine)
- Visual inspection of the product at various stage

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:	Particulars	Micro	Small	Medium	Large
▪ Knowledge on the sequence of entire production process	▪ Inadequate knowledge of properties of chemicals used	H	H	M	M
▪ Knowledge of basic properties of latex, chemicals, additives used, etc used in different chambers of glove making machine	▪ Inconsistency in performing visual checking which could reduce rejection rate	M	M	L	L
▪ Ability to operate and maintain the Glove making machine					
▪ Basic knowledge on the parameters of					

<p>various processes (For example: Temperature in vulcanising, leaching, etc.)</p> <ul style="list-style-type: none"> ▪ Ability to understand the process parameters and set them in the machine (from the process chart) ▪ Ability to check and ensure materials availability in different chambers of the glove making machine ▪ Ability to monitor the assembly line production process and visually do a quality check on the process ▪ Ability to visually check for quality of the product in different sections of the assembly line ▪ Ability to set parameters and operate the tumbling machine ▪ Ability to check machine periodically and call for maintenance <p>Soft Skills</p> <ul style="list-style-type: none"> ▪ Ability to communicate and instruct the helpers 	<ul style="list-style-type: none"> ▪ Insufficient knowledge on machine maintenance ▪ Inability to communicate with migrant workers (as most of the operators are from local area and helpers are migrants) 	M	L	L	L
		L	M	M	L

H – High; M – Medium; L – Low

Occupation: Former preparation, Dipping, Vulcanisation and Stripping

Job Role: Helper

Qualification and Experience: 8th/10th pass

Roles and Responsibilities:

- Material movement (Loading and Unloading of materials)
- Stripping of gloves
- Maintain the work environment clean
- Help operators and supervisors for production

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:	Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ Ability to identify different raw material ▪ Ability to use weighing scale ▪ Ability to fit the formers into assembly line ▪ Ability to clean the formers using cloth 	<ul style="list-style-type: none"> ▪ Inability to work in various process of production as per requirement ▪ Inadequate 	M	M	M	L

<ul style="list-style-type: none"> before fitting them in the assembly line ▪ Ability to strip all the gloves from the formers passing in the assembly line ▪ Ability to strip the gloves without damaging them ▪ Ability to weigh and pack the QC passed gloves in bags ▪ Knowledge of material handling during loading / unloading works ▪ Knowledge of basic quality and safety procedures <p>Soft skills</p> <ul style="list-style-type: none"> ▪ Listening skills (listen to the instructions from operator and perform work accordingly) 	<p>understanding of safety procedures (this is important because of heat and hazardous chemicals used)</p> <ul style="list-style-type: none"> ▪ Communication gap (as migrants cannot understand regional language) 	M	M	L	L
H – High; M – Medium; L – Low					

Occupation: Quality Check

Following job roles are involved in quality check occupation:

- Lab in charge
- Lab assistant

Occupation: Quality Check

Job Role: Lab in charge

Qualification and Experience: B.E (Rubber Technology / B.Sc (Chemistry) / M.Sc (Chemistry) with minimum 3 years experience)

Roles and Responsibilities:

- Perform quality check on incoming raw material, semi finished and finished products
- Comply with quality standards
- Co ordinate with production department to improve the quality

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:	Particulars	Skill Gaps and Intensity level of skill gap			
		Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ Knowledge of basic properties of latex, chemicals, additives used, etc used in the production process ▪ Ability to check physical and chemical properties of the materials 	<ul style="list-style-type: none"> ▪ Lacks adequate knowledge on properties of various chemicals 	NA	M	M	L

<ul style="list-style-type: none"> Knowledge of using testing equipments Ability to set quality parameters Ability to do a Sample Quality check on the chemicals used in the production chamber (mixing proportion) Ability to do measurement QC on finished gloves <p>Managerial skills</p> <ul style="list-style-type: none"> Ability to coordinate with production manager and supervisor and provide feedback on quality of materials Ability to train lab assistance on quality parameters <p>Soft skills</p> <ul style="list-style-type: none"> Ability to instruct lab assistants Motivating the assistants as the work is mechanical 	<ul style="list-style-type: none"> Lacks managerial skills like people management 	NA	L	L	L
--	--	----	---	---	---

H-High; M-Medium; L- Low

Occupation: Quality Check

Job Role: Lab assistant

Qualification and Experience: 10th/12th pass

Roles and Responsibilities:

- Inspect the finished gloves
- Perform all the testing parameters

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge of Quality Parameters
- Ability to use air pumps to find pinholes
- Ability to visually examine to check black marks, bead bend, etc.
- Ability to take a decision on to pass / reject a glove based on quality parameters
- Ability to do consistent QC on all gloves
- Ability to perform redundant work

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> Inconsistency in doing QC for all gloves as per the required parameters (due to redundant nature of work) 	M	M	L	L

H-High; M-Medium; L-Low

Critical Job Roles

Job Role	Reason for Criticality
Lab in charge	<ul style="list-style-type: none"> The end product's quality is determined by the quality of raw material used. The Quality of Raw materials (Latex and Chemicals) for gloves can be checked and qualified by only a technical lab person
Compounding Operator	<ul style="list-style-type: none"> Mixing of various raw materials in desired proportion determines the quality of the end product Any error in mixing would lead to wastage of raw materials
Shift Supervisor	<ul style="list-style-type: none"> The production process of gloves is mostly mechanical (in the assembly line) and automated. Therefore, monitoring the production process is crucial and is done by shift supervisor He is responsible for machine performance and maintenance

II. Skill gap analysis for Rubber band product segment – additional job roles

Occupation: Dipping and Vulcanising

Job Role: Dipping or (and) Vulcanising Operator

Qualification and Experience: 10th/12th pass and 1-3 years experience in latex based industry

Roles and Responsibilities:

- Perform dipping operation
- Vulcanise the rubber tube (case specific)
- Comply with process parameters
- Quality check on the products
- Co ordinate with helpers

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

	Particulars	Micro	Small	Medium	Large
Technical skills:	<ul style="list-style-type: none"> Knowledge of Rubber band production process 				
	<ul style="list-style-type: none"> Knowledge of automatic dipping machine operation and basic maintenance 				
	<ul style="list-style-type: none"> Knowledge of vulcanisation operation (ability to ensure that the compound tubes should not stick with each other in the process) 				
	<ul style="list-style-type: none"> Ability to dip the moulds appropriately in the coagulant and latex chamber / drum 				
	<ul style="list-style-type: none"> Failure to spot any patch (due to dust) / unevenness in the tube during dipping 	L	L	NA	
	<ul style="list-style-type: none"> Inadequate knowledge on the raw materials used and its affects 	M	L	NA	

- Ability to determine the number of dips required to get the desired width of the rubber band
- Ability to perform a visual examination during dipping process and ensure compound is evenly applied in the moulds
- Knowledge of raw materials used and appropriate process procedures (For example: the tubes needs to be dried under shade, etc.)

H-High; M-Medium; L-Low

Occupation: Cutting

Job Role: Cutting Operator

Qualification and Experience: 10th/12th pass and minimum 1year of experience in rubber band unit

Roles and Responsibilities:

- Cut the rubber tubes using cutting machine (to make rubber bands)
- Comply with process parameters and control on rejections

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical Skills:

- Ability to operate the cutting machine
- Ability to adjust and fix the cutting blade in the machine according to the desired width of the rubber band
- Ability to insert the rubber compound tube through the cutting machine straightly (If it is passed through in cross / diagonally, it will result in rejections)

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ Inability to consistently inserting the rubber tubes in appropriate position leading to rejections 	L	L	NA	

H-High; M-Medium; L-Low

Occupation: Production

Job Role: Helper

Qualification and Experience: 8th/10th pass (No experience required)

Roles and Responsibilities:

- Clean the moulds
- Dip the moulds manually
- Dry the rubber tubes in moulds

- Perform quality check on finished product
- Packing of finished goods
- Listen to the supervisor's instruction and perform work accordingly
- Maintain the work environment clean

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical Skills:

- Ability to use the moulds and dip them in the latex and coagulant solution
- Ability to do the exact number of dips as instructed by the operator
- Ability to strip the rubber tubes from the pipes without damaging them
- Ability to ensure that appropriate drying procedure is followed
- Ability to apply / spray silicon oil evenly in the rubber bands
- Ability to remove the cut rubber bands during quality check process
- Ability to use weighing machines and pack them in bundles

Particulars	Micro	Small	Medium	Large
▪ Inadequate knowledge on process parameters (such as drying methods, time to vulcanise, etc)	L	L	NA	
▪ Passing of few cut rubber bands during QC process	L	L	NA	

H-High; M-Medium; L-Low

Job role wise distribution in all the units for the product segment of Dipped Goods (Estimated)

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Compounding	Compounding Supervisor	88	Accounts	Manager Accounts	41
	Compounding Operator	299		Accountant	54
	Helpers	449		Manager Purchase	48
Dipping	Dipping Operators	333	Purchase	Stores Assistant	48
	Helpers	476	Marketing	Manager Marketing	54
Drying	Helpers	61	Admin / HR	Admin / HR Officer	68

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Vulcanising	<i>Vulcanising / boiler Operator</i>	163	General	<i>Proprietor/MD</i>	109
	<i>Helper</i>	7		<i>General Manager</i>	20
Stripping	<i>Helpers</i>	557	Production	<i>Production Manager</i>	41
Cutting	<i>Helpers</i>	41		<i>Shift In-charge</i>	75
Quality Check	<i>QC in charge</i>	54			
	<i>Lab assistant / helper</i>	666			
Packing and Dispatch	<i>Supervisor</i>	41			
	<i>Helpers</i>	523			

Summary Sheet: Dipped goods

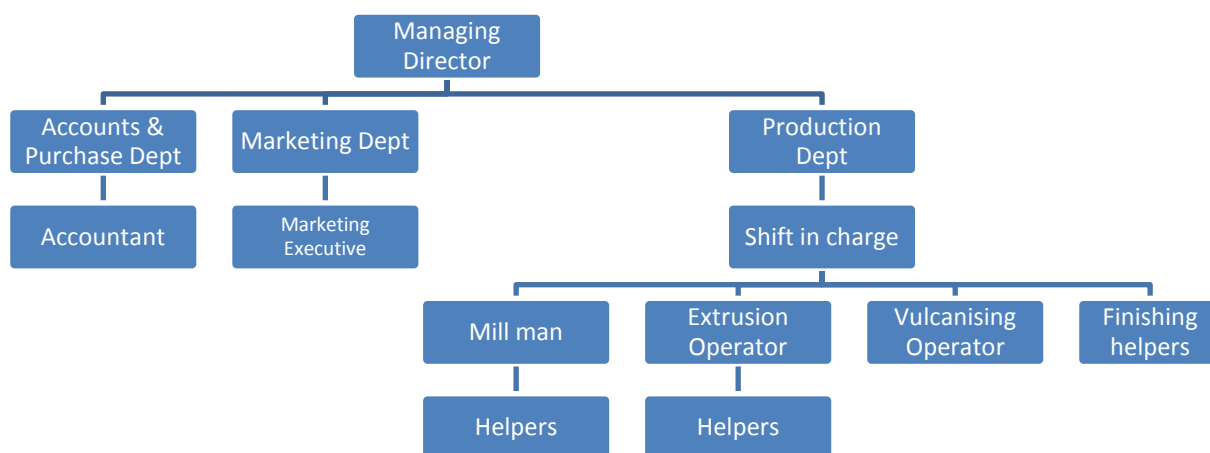
Categories	Total no. of dipped goods manufacturing units in Kerala					107	Qualification wise distribution of human resource					
<ul style="list-style-type: none">GlovesRubber bandsBalloonsCondomsFinger stalls	Distribution of units	Micro	Small	Medium	Large	Total	Ph.D / Research Engineers BA/B.Sc/B Com Diploma Engineers /Rubber technologist ITI/Vocational Education 12th std/10th std pass Below 10th std Others (MBAs, CA, ICWA, CS, etc.) Total	0%				
		88%	4%	6%	3%	100%		0%				
	No. of people employed*	1094	152	692	3240	5179		0%				
								13%				
	ManufacturingSupport							0%				
	Total no. of occupations identified							8	4	0%		
	Total no. of job roles identified							10	5	0%		
User industry	Critical job roles (in terms of skill requirement)	Dispersion operator, Dipping Operator and Inspection helper					6%					
<ul style="list-style-type: none">Manufacturing industry							79%					
							3%					
							100%					

1.3.4 Extruded Rubber Products

Extrusion products: An extruded rubber product is a continuous strip of rubber material which is produced as per end consumer requirement. An extruded rubber product differs from a molded rubber product in that the rubber is forced through a die of the desired cross section under pressure from an extruder. The extruded product leaves the extruder in a soft pliable unvulcanized state. The extruded product normally must be vulcanized before it is usable.

3.2.1.6 Organisation structure

Figure 10: Organisation structure of extruded rubber products manufacturing units



In case of small units, the activities of the human resource function are executed by Proprietor or Production Manager.

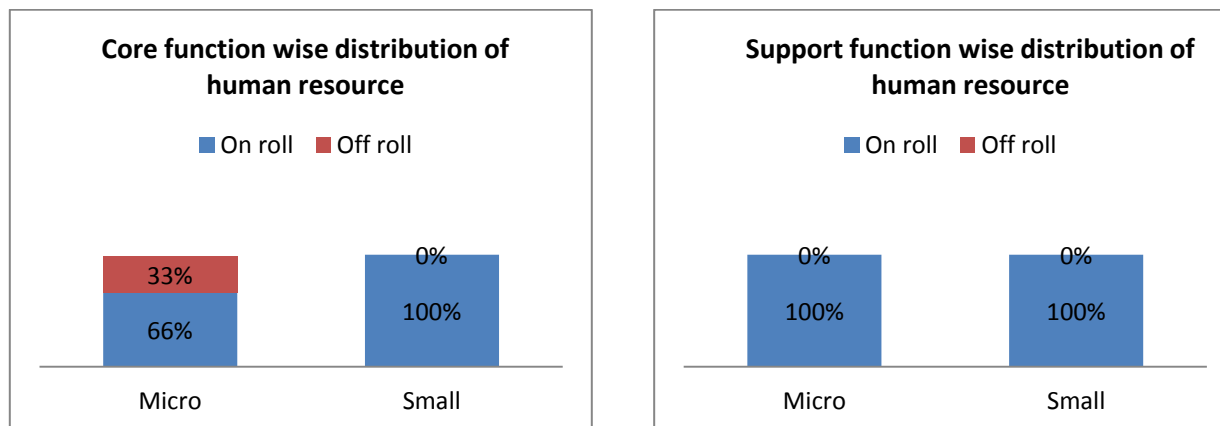
In case of a micro units, there are no supporting departments observed, the activities of the supporting functions are executed by Proprietor or Production Manager. There are no supervisory role observed, operator directly reports to production manager or proprietor.

Sample covered

	Micro	Small	Medium	Large	Total
No. of units	3	1	0	0	4

3.2.1.7 Function wise distribution of human resource

Figure 11: Function wise distribution of human resource



3.2.1.8 Job role wise distribution of human resource

Majority of the human resource deployed in extruded rubber product units are under extrusion operator and mixing operator job role.

Occupation	Job role	Number of employees	Occupation	Job role	Number of employees
Mixing	Mixing Supervisor	1	Accounts	Manager Accounts	1
	Mixing Operator	4		Accountant	3
	Helpers	4	Purchase	Manager Purchase	0
Extrusion	Extrusion Supervisor	1		Stores Assistant	0
	Operators	6	Marketing	Manager Marketing	2
	Helpers	4	HR	HR Manager	0
Vulcanising / Curing	Vulcanising Operator	3	General	Proprietor/MD	2
	Helpers	3		General Manager	1
Finishing	Helper	5	Production	Production Manager	1

Packaging and Dispatch	Packaging and Dispatch Supervisor	1			
	Helpers	4		Shift In-charge	1

3.2.1.9 Qualification wise distribution of human resource

Table 8: Qualification wise distribution of human resource

Qualification	Micro	Small
Ph.D / Research	0%	0%
Engineers	0%	0%
BA / BSc/B Com	10%	20%
Diploma Engineers	0%	0%
ITI / Vocational Education	0%	0%
12th std / 10th std pass	25%	30%
Below 10th standard	65%	40%
Others (specify - Such as MBAs, CA, ICWA, CS, etc.)	0%	0%
TOTAL	100%	100%

3.2.1.10 Skill gap analysis

Table 9: Occupation wise distribution of job roles

Occupation	Production Management	Mixing and milling	Extrusion	Vulcanising	Finishing, Packing and Dispatch
Job Roles	Shift in charge	Mill man	Extrusion Operator	Vulcanising Operator	Finishing helpers
		Helper	Helper		

Occupation: Production

Following job roles are involved in mixing (including milling) occupation:

1. Shift in charge

Occupation: Production

Job Role: Shift in charge

Qualification and Experience: Diploma / ITI (any specialisation) / 12th pass with 5 to 10 years of experience in rubber industry

Roles and Responsibilities:

- Response for overall production
- Plan for production schedule (daily and weekly)
- Manage people and material
- Perform quality check
- Monitor the production process

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical Skills:

- Process knowledge and good understanding about each process (reasons for why the chemicals, oils are used, technical details of extrusion process, etc)
- Knowledge on machineries used for production
- Knowledge on extrusion process and process parameters
- Ability to judge the performance of the machines and call for periodical maintenance activity
- Ability to take corrective actions in case of issues in production

Managerial:

- Decision making skills to improve productivity, resolving issues, etc.
- Ability to manage and resolve any issues of the people in shop floor
- Ability to monitor the production process
- Ability to monitor and ensure that quality and safety procedures are followed
- Ability to plan and schedule production process

Soft skills:

- Ability to interact and co ordinate with operators and helpers in all section

Particulars

Micro Small Medium Large

- Inability to contribute on process improvement and cost cutting measures M M
- Inability to resolve HR issues L L

H – High; M – Medium; L – Low

Occupation: Mixing

Following job roles are involved in mixing (including milling) occupation:

- Mill man
- Helper

Occupation: Mixing and Milling

Job Role: Mill man

Qualification and Experience: 12th/10th and minimum 1 year of experience in mixing and milling section

Roles and Responsibilities:

- Mixing of Rubber and other raw material to make rubber compound
- Co ordinate with shift in charge to understand production requirements
- Co ordinate with helpers for production process
- Machine operation and basic maintenance

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge about the mixing process – understanding on why the chemicals, oils and other raw materials are used in the process
- Knowledge about the mixing machine used (Judge the performance of machine, fixing minor issues, etc.)
- Knowledge of identification of various raw material and basic properties of the raw materials used such as natural rubber, fillers, etc.
- Ability to operate the mixing machine in the unit (kneader / open mixing mill)
- Ability to understand the formulation (required to make compound) and perform production accordingly
- Knowledge of order of addition of various

Particulars	Micro	Small	Medium	Large
▪ Excess / Inadequate addition of certain raw materials during mixing process	M	L		
▪ Inadequate knowledge on properties on raw materials used	M	M		
▪ Inability to take corrective action during issues in mixing	L	L		

raw material in the mixing process

- Knowledge of controls and options in the machine e.g. maintaining the temperature in the mixing mill, etc.
- Ability to warm the compound (which is prepared) using open mill
- Ability to cut the compound into pieces / strips from milling to use them in extrusion process
- Skills to perform quality check of the compound through visual examination for colour and air pocket
- Ability to check machines for issues and call for maintenance activity as required

Managerial skills:

- Raw material inventory management – ensuring that adequate rubber, chemicals, process oils, fillers are available for the day's production and informing to shift in charge for requisition
- Ability to train the helper / junior on mixing machine operation and compounding knowledge

Soft skills:

- Communication skills – to interact with shift in charge and helpers
- Ability to coordinate with departments in the units such as extrusion, etc
- Decision making ability – to decide on inventory level, etc.

H – High; M – Medium; L – Low

Occupation: Mixing

Job Role: Helper

Qualification and Experience: 10th / School drop outs (Experience not required)

Roles and Responsibilities:

- Identify raw material used for mixing, weigh them and prepare the batch
- Help operator with loading / unloading of materials for mixing process
- Maintain the work environment (cleaning the machines, floor, etc)

Knowledge and Skill Requirement	Skill Gaps and Intensity level of skill gap				
	Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none">▪ Ability to identify different raw materials (Read labels and names of the package)▪ Ability to use weighing scale▪ Ability to prepare a batch (required for one mixing process) according to proportion of raw materials to be used▪ Ability to use knives and cut the compound for milling in the desired shape▪ Knowledge of material placement (placing / loading material in the appropriate place for easy identification)▪ Knowledge of material handling▪ Ability to listen for instructions and perform work accordingly▪ Knowledge of safety procedures	<ul style="list-style-type: none">▪ Inadequate motivation to learn and improve the quality of work▪ Inadequate knowledge on quality and safety procedures	L	L		
H – High; M – Medium; L – Low					

Occupation: Extrusion

Following job roles are involved in mixing occupation:

- 1.1.1 Extrusion Operator
- 2.1.1 Helper

Occupation: Extrusion

Job Role: Extrusion Operator

Qualification and Experience: 12th/10th and minimum 1 year of experience in extrusion

Roles and Responsibilities:

- Perform extrusion process
- Operate extrusion machine and basic maintenance of the machine
- Operate the vulcanising machine (case specific)
- Train helpers on operating the extrusion machine

Knowledge and Skill Requirement	Skill Gaps and Intensity level of skill gap				
	Particulars	Micro	Small	Medium	Large

Technical skills:

- Knowledge of extrusion machine operation
- Knowledge of using / selecting the appropriate die as per finished product requirement
- Ability to fix the die in the extrusion machine
- Knowledge of machine specifications such as temperature control, controls, etc.
- Ability to maintain the specified temperature in the machine during machine operation
- Ability to insert (feed) the rubber compound strips continuously in the machine
- Knowledge of process and procedures to control wastage / rejections
- Ability to coordinate with mill man to get the compound strips continuously for production process
- Ability to do a visual examination of the extruded product and check for any quality issues
- Ability to take corrective action if there is a mismatch in the quality of the output

- Inadequate control on temperature in the extrusion machine leading to product rejection
- Damage in extruded product during collection of product from extruding machine

M L

L L

H – High; M – Medium; L – Low

Occupation: Extrusion

Job Role: Helper

Qualification and Experience: 10th/ School drop outs (Experience not required)

Roles and Responsibilities:

- Collect the extruded rubber product from the machine
- Assist extrusion operator in the production process
- Maintain cleanliness in the work environment

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

- Ability to collect the extruded rubber

Particulars Micro Small Medium Large

<ul style="list-style-type: none"> from the machine without damaging the product Knowledge of method of collection of the extruded product (e.g aluminium fabrication is collected in the form of circles in the tray) Ability to ensure that the extruded rubber does not stick together or cut during collection process Knowledge of material storage (how and where to store the extruded rubber collected before vulcanization process) Ability to place the extruded rubber in the vulcaniser (in trays) Ability to maintain the workplace clean 	<ul style="list-style-type: none"> Inadequate consistency in following the parameters in collection of extruded rubber products leading to damage / rejection of product (cut product / variation in width) 	M	L
--	--	---	---

H – High; M – Medium; L – Low

Occupation: Vulcanising

Following job roles are involved in mixing occupation:

1. Vulcanising Operator

Occupation: Vulcanising

Job Role: Vulcanising operator

Qualification and Experience: ITI/ 12th pass with relevant work experience (example: boiler operation)

Roles and Responsibilities:

- Vulcanise the extruded rubber product
- Vulcaniser machine operation and basic maintenance

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

	Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> Knowledge of vulcanization process Knowledge of vulcanising parameters such as temperature, time, etc. to be set in the machine Ability to a quality check on the product after vulcanization process Ability to judge the performance of the 	<ul style="list-style-type: none"> Inadequate knowledge on process parameters and specification for 	L	L		

vulcaniser and call for maintenance if required <ul style="list-style-type: none"> Ability to multi task and perform extrusion process (case specific) 	various types of products leading to delay in production process
H – High; M – Medium; L – Low	

Occupation: Finishing and Packing & Dispatch

Following job role is involved in mixing occupation:

1. Finishing helper

Occupation: Finishing and Packing & Dispatch

Job Role: Finishing helper

Qualification and Experience: 10th/ School drop outs (Experience not required)

Roles and Responsibilities:

- Perform finishing functions in the extruded rubber products such as trimming flashes, glazing, cutting, etc.
- Pack the finished goods
- Dispatch the goods as per delivery order

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

- Knowledge of material movement and material handling
- Ability to cut the extruded product according to specification (length according to end product)
- Ability to perform finishing function required (applying paints in certain areas for even colour appearance, applying silicon solution for glazing, etc)
- Ability to stick the labels in appropriate place of the product (case specific)
- Ability to store the materials in the right place according
- Ability to pack the finished product as per the assortment

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> Inconsistency in performing all the required finishing process (may leave out glazing some time, etc) Inability to place the finished good at appropriate area leading to mixing of goods 	M	L		
	L	L		

- Knowledge of dispatch of goods according to delivery order

H – High; M – Medium; L – Low

Job role wise distribution in all the units for the product segment of Extruded Rubber Products (Estimated)

Occupation	Job role	Number of employees	Occupation	Job role	Number of employees
Mixing	Mixing Supervisor	2	Accounts	Manager Accounts	3
	Mixing Operator	10		Accountant	8
	Helpers	10	Purchase	Manager Purchase	4
Extrusion	Extrusion Supervisor	2		Stores Assistant	2
	Operators	14	Marketing	Manager Marketing	4
	Helpers	10	HR	HR Manager	0
Vulcanising / Curing	Vulcanising Operator	7	General	Proprietor/MD	6
	Helpers	6		General Manager	1
Finishing	Helper	12		Production Manager	3
Packaging and Dispatch	Packaging and Dispatch Supervisor	2	Production	Shift In-charge	2
	Helpers	9			

Summary Sheet: Extruded Rubber Products

Categories	Total no. of extruded rubber product manufacturing units in Kerala						13	Qualification wise distribution of human resource					
NA	Distribution of units	Micro	Small	Medium	Large	Total	Ph.D / Research Engineers BA/B.Sc/B Com Diploma Engineers /Rubber technologist ITI/Vocational Education 12th std/10th std pass Below 10th std Others (MBAs, CA, ICWA, CS, etc.) Total	0%					
		92%	8%	0%	0%	100%		0%					
	No. of people employed*	106	29	0	0	134		0%					
								13%					
	ManufacturingSupport							0%					
	Total no. of occupations identified			5		3		0%					
	Total no. of job roles identified			7		3		0%					
User industry	Critical job roles (in terms of skill requirement)	Extruder operator and Mixing operator					79%						
▪ Manufacturing industry							3%						
							100%						
Industry Suggestions							Function wise distribution of human resource						
▪ The owner of small units requires awareness of the latest machinery available in the market and understanding of chemical properties so as to develop the required formulation.							On roll	Off roll					
						Core function	100%	0%					
						Support function	100%	0%					

1.3.5 Foam Products

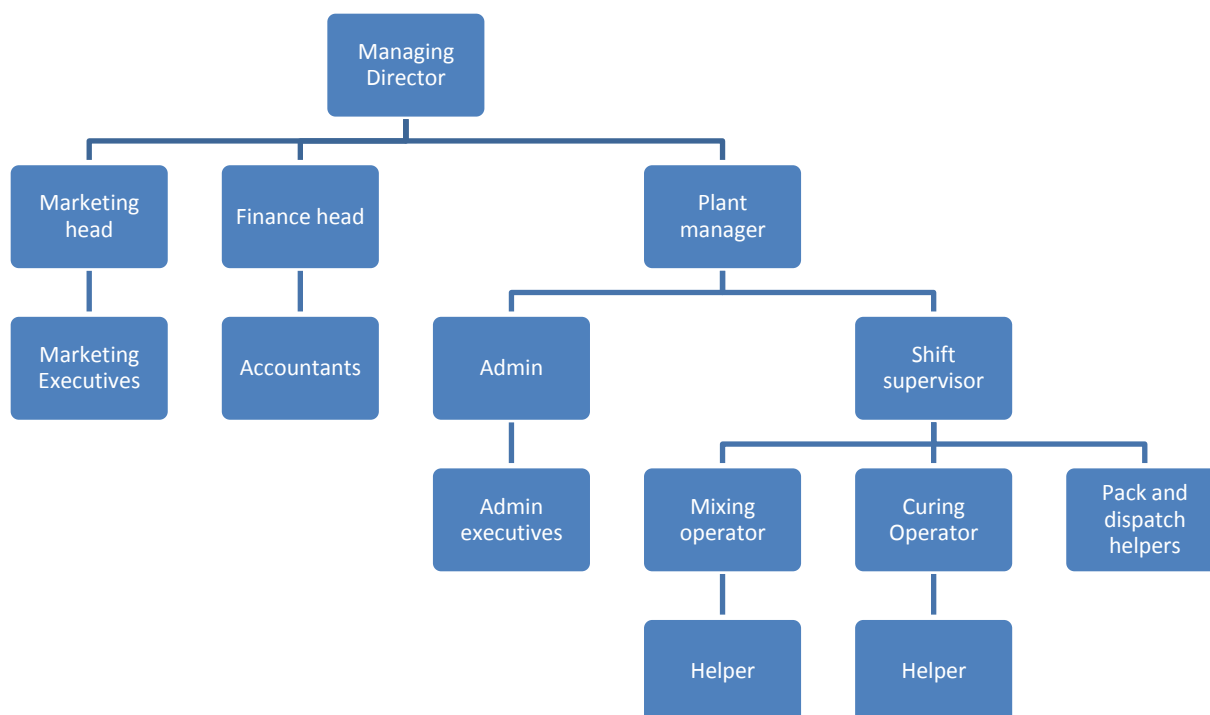
Foam is a lightweight and spongy rubber which provides a cushioning effect. It is used in mattresses, upholstery, insulation, etc. Foam is one of the major category in Kerala.

Types of sub product categories

- Latex rubber foam
- Rubberized coir foam

3.2.1.11 Organisation structure

Figure 12: Organisation structure of rubber matting manufacturing units



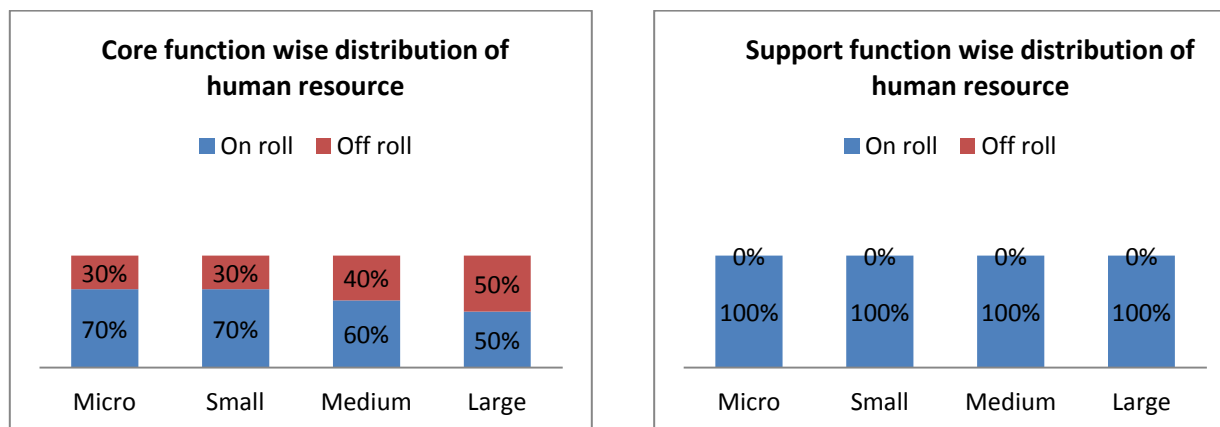
In case of small units, the activities of the human resource function are executed by Proprietor or Production Manager.

Sample covered

	Micro	Small	Medium	Large	Total
No. of units	2	5	4	3	14

Function wise distribution of human resource

Figure 13: Function wise distribution of human resource



Job role wise distribution of human resource

Majority of the human resource deployed in foam products units are in the finishing and packing occupation.

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Mixing	Mixing Supervisor	19	Accounts	Manager Accounts	10
	Mixing Operators	183		Accountant	19
	Mixing Helpers	67	Purchase	Manager Purchase	10
Moulding	Moulding Supervisor	19		Stores Assistant	38
	Moulding	212	Marketing	Manager Marketing	10
	Operator	0	HR	HR Manager	10
	Moulding Helpers	221	General	Proprietor/MD	67

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Vulcanising	Vulcanising Operator	58	Production	General Manager	29
	Vulcanising Helper	58		Production Manager	38
Washing	Washing Operator	10		Shift In-charge	19
	Washing Helper	67			
Drying	Drying Supervisor	10			
	Drying Operator	48			
	Drying Helper	67			
Packaging and Dispatch	Packaging and Dispatch Supervisor	10			
	Helpers	87			

Qualification wise distribution of human resource

Table 10: Qualification wise distribution of human resource

Qualification	Micro	Small	Medium	Large
Ph.D / Research	0%	0%	0%	0%
Engineers	0%	0%	5%	5%
BA / BSc/B Com	10%	15%	15%	20%
Diploma Engineers	0%	5%	5%	0%
ITI / Vocational Education	0%	5%	5%	10%
12th std / 10th std pass	50%	10%	20%	40%
Below 10th standard	40%	65%	50%	20%
Others (specify - Such as MBAs, CA, ICWA, CS, etc.)	0%	0%	0%	5%
TOTAL	100%	100%	100%	100%

Skill gap analysis

Table 11: Occupation wise distribution of job roles

Occupation	Production Management	Mixing	Milling	Moulding	Finishing, Packing and Dispatch
Job Roles	Production Manager	Mixing Supervisor	Milling Operator	Moulding Supervisor	Finishing Supervisor
		Mixing Operator		Moulding Operator	Helper
		Helper		Helper	

Occupation: Production

Following job roles are involved in mixing occupation:

1. Plant manager
2. Shift supervisor
3. Helper

Occupation: Production

Job Role: Plant manager

Qualification and Experience: Post graduate in rubber technology with over 10 years of experience in rubber industry

Roles and Responsibilities:

- Responsible for running of unit and production
- Planning for production schedule
- Maintain optimum inventory of raw materials
- Meet the production targets as required by the management of the company
- Consistently keep a check over the quality of the end product after each process

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge of the entire operation
- Knowledge of process parameters
- Knowledge of the rubber market and prices
- Knowledge of the rubber industry scenario in the cluster
- Knowledge of the typical line activities in

Particulars	Micro	Small	Medium	Large
Inadequate knowledge to perform multiple functions such as finance, HR, Planning, etc	M	M	L	L

<p>plant</p> <ul style="list-style-type: none"> ▪ Ability to plan the processes so that there is full utilization of the facilities ▪ Ability to monitor the operation ▪ Ability to lead in quality check of product ▪ Ability to plan the dispatch schedule ▪ Ability to evolve an error-free dispatch process ▪ Ability to plan inventory ▪ Ability to do logistics planning ▪ Ability to work-out cost effective transportation solution ▪ Ability to manage the supply chain ▪ Ability to instruct the team on logistic planning ▪ Ability to document the data related to logistics and delivery details <p>Managerial Skills</p> <ul style="list-style-type: none"> ▪ Ability to manage the workforce ▪ Ability to enforce industrial discipline ▪ Ability to enforce safety in the operators during the process <p>Soft Skills</p> <ul style="list-style-type: none"> ▪ Ability to interface with all the operators to gain understanding of the process ▪ Ability to interface with shift in-charge to understand the process across all the shifts 	
H- High; M – Medium; L- Low	

Occupation: Production

Job Role: Shift Supervisor

Qualification and Experience: Graduate with more than 8 years of experience in rubber industry

Roles and Responsibilities:

- Assist the plant head in managing the production process.
- Keep a check over the quality of the end product after each process
- Mentor machine operators and helpers

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

	Particulars	Micro	Small	Medium	Large
Technical skills:					
<ul style="list-style-type: none"> Knowledge of various chemical properties Knowledge of how much weighed chemicals to be used Knowledge of the properties of chemicals Knowledge on how it will impact the latex properties Knowledge on the beating process Knowledge on the properties and impact of foaming agents Knowledge on the properties and impact of gelling agents Knowledge on time and temperature parameters that need to be altered according to the mould type Ability to inspect the quality of the set final product 	Inability to resolve HR issues	M	L	L	L
	Inability take corrective action when the production gets delayed	M	M	M	L
Managerial Skills					
<ul style="list-style-type: none"> Ability to oversee the full process Ability to manage the workers Ability to reduce wastage 					
Soft Skills					
<ul style="list-style-type: none"> Ability to instruct and train the operators 					
H- High; M – Medium; L- Low					

Occupation: Production

Job Role: Helper

Qualification and Experience: Minimally educated

Roles and Responsibilities:

- Loading and unloading
- Help other operators as required

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

	Particulars	Micro	Small	Medium	Large
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<ul style="list-style-type: none"> Knowledge of location of chemicals Knowledge of basic weighing Ability to help transfer the latex emulsion to the beater Ability to aid in transfer of foamed latex to the mould Ability to aid in leveling Ability to aid in the cleaning process 	Inadequate safety knowledge	L	L	L	L
	Inability to work across shop floor as required	M	M	M	L
Managerial Skills					
<ul style="list-style-type: none"> N/A 					
Soft Skills					
<ul style="list-style-type: none"> N/A 					
H-High; M-Medium; L-Low					

Occupation: Mixing

Following job roles are involved in mixing occupation:

1. Mixing operator

Occupation: Mixing

Job Role: Mixing operator

Qualification and Experience: 12th pass with more than 5 years of experience

Roles and Responsibilities:

- Mixing the correct (indicated) proportion of inputs materials.
- Operate the mixing mill
- Regular maintenance of the mill
- Guide the helpers

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills	Particulars	Micro	Small	Medium	Large
	<ul style="list-style-type: none"> Ability to take the right quantity of latex from the stored tins based on instruction from shift supervisor 	M	M	L	L

<ul style="list-style-type: none"> Knowledge of additives like ammonia, zinc compounds, etc used in mixing Knowledge of the properties of the various additives like ammonia, zinc compounds, etc Knowledge of the sequence of the additives like ammonia, zinc compounds, etc Knowledge of the location of the chemicals in the mixing area Ability to explain the order to the helpers Knowledge of the process parameters to be set in the mill Ability to weigh the right quantities of the chemicals and additives like ammonia, zinc compounds, etc <p>Managerial Skills</p> <ul style="list-style-type: none"> Ability to manage the helpers <p>Soft Skills</p> <ul style="list-style-type: none"> Ability to communicate the location and basic properties to the helpers 	not the effect of any mistake
H- High; M-Medium; L-Low	

Occupation: Curing

Following job roles are involved in molding occupation:

1. Curing operator

Occupation: Curing

Job Role: Curing operator

Qualification and Experience: 12th pass with more than 5 years of experience in rubber industry

Roles and Responsibilities:

- Cure the foam product
- Monitor the parameters for curing

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Particulars	Micro	Small	Medium	Large

Technical skills:

- Ability to set the right temperature for the baking, depending on the mould type
- Ability to keep track of the time for the baking process, depending on the mould type
- Ability to stop the baking after the time period
- Ability to carefully remove the heated lid of the mould to visually check the product
- Ability to re-set the temperature and time in the oven for final setting, depending on the mould type
- Ability to peel off the final product carefully after the final set
- Ability to clean the mould with water and air

Managerial Skills

- Ability to manage the curing process when the supervisor is not available
- Ability to manage the helpers

Soft Skills

- Ability to provide training and guidance to the machine operators and helpers
- Ability to coordinate work with his superiors and subordinates.

Not exposed to operation on other machines

M

M

L

L

H- High; M-Medium; L-Low

Occupation: Beating and setting

Following job roles are involved in packing and dispatch occupation:

1. Operator

Occupation: Beating and setting

Job Role: Operator

Qualification and Experience: Minimally skilled with about 5 years experience

Roles and Responsibilities:

- Beat the foam
- Add the foaming and gelling agent

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

	Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> Ability to take the correct quantity of latex emulsion for foaming purposes Ability to know the properties of foaming agent Ability to put the foaming agent in right quantities Ability to beat the latex emulsion and the agent to the required consistency Knowledge on when to stop the beating to retain the consistency Ability to carefully transfer the foamed emulsion to the mould and pour it uniformly Ability to use levelers to even the foamed emulsion to prevent bunching of latex Knowledge on when to add the gelling agent Knowledge of adding the right quantity of gelling agent Ability to close the mould <p>Managerial Skills</p> <ul style="list-style-type: none"> Ability to motivate the helpers <p>Soft Skills</p> <ul style="list-style-type: none"> Ability to communicate the to the helpers whenever help is required 	Inadequate knowledge of the latest trends and technology in QC techniques	L	L	L	L
	Inconsistency in pouring the compound to the mould within the time	M	M	L	L
H-High; M-Medium; L-Low					

Occupation: Packing & Dispatch

Following job roles are involved in packing and dispatch occupation:

1. Helper

Occupation: Packing

Job Role: Helper

Qualification and Experience: Minimally educated

Roles and Responsibilities:

- Pack the finish product
- Loading of finished product

Knowledge and Skill Requirement	Skill Gaps and Intensity level of skill gap				
	Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> Ability to visually inspect the final product Ability to sort into batches Ability to mark the batch numbers Ability to cover the product with casing Ability to neatly store the product according to batches Ability to transfer the final product in batches to the vehicle 	Inadequate material handling knowledge	L	L	L	L
Managerial Skills					
<ul style="list-style-type: none"> N/A 					
Soft Skills					
<ul style="list-style-type: none"> N/A 					
H-High; M-Medium; L-Low					

Job role wise distribution in all the units for the product segment of Foam Products (Estimated)

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Mixing	Mixing Supervisor	24	Accounts	Manager Accounts	12
	Mixing Operators	227		Accountant	24
	Mixing Helpers	84	Purchase	Manager Purchase	12
Moulding	Moulding Supervisor	24		Stores Assistant	48
	Moulding	262	Marketing	Manager Marketing	12
	Operator	0	HR	HR Manager	12
	Moulding Helpers	274	General	Proprietor/MD	84
Vulcanising	Vulcanising Operator	72		General Manager	36
	Vulcanising Helper	72	Production	Production Manager	48

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Washing	<i>Washing Operator</i>	12		<i>Shift In-charge</i>	24
	<i>Washing Helper</i>	84			
Drying	<i>Drying Supervisor</i>	12			
	<i>Drying Operator</i>	60			
	<i>Drying Helper</i>	84			
Packaging and Dispatch	<i>Packaging and Dispatch Supervisor</i>	12			
	<i>Helpers</i>	107			

Summary Sheet: Foam products

Categories	Total no. of foam product manufacturing units in Kerala					50	Qualification wise distribution of human resource		
<ul style="list-style-type: none">Latex rubber foamRubberized coir foam	Distribution of units	Micro	Small	Medium	Large	Total	Ph.D / Research Engineers BA/B.Sc/B Com Diploma Engineers /Rubber technologist ITI/Vocational Education 12th std/10th std pass Below 10th std Others (MBAs, CA, ICWA, CS, etc.) Total	0% 0% 15% 0% 0% 13% 73% 0% 100%	
		70%	10%	16%	4%	100%			
	No. of people employed*	546	130	578	808	2062			
	Manufacturing					Support			
	Total no. of occupations identified		5		4				
	Total no. of job roles identified		7		4				
	User industry	Critical job roles (in terms of skill requirement)	Compounding operator and moulding operator						Function wise distribution of human resource
Used in mattresses, upholstery, insulation, etc.								On roll	Off roll
	Core function							100%	0%
	Support function							100%	0%
	Industry Suggestions <ul style="list-style-type: none">Proprietor of small units require training on industry trends and global cuesDevelopment of common testing centers for small and tiny units								

1.3.6 Foot wear products

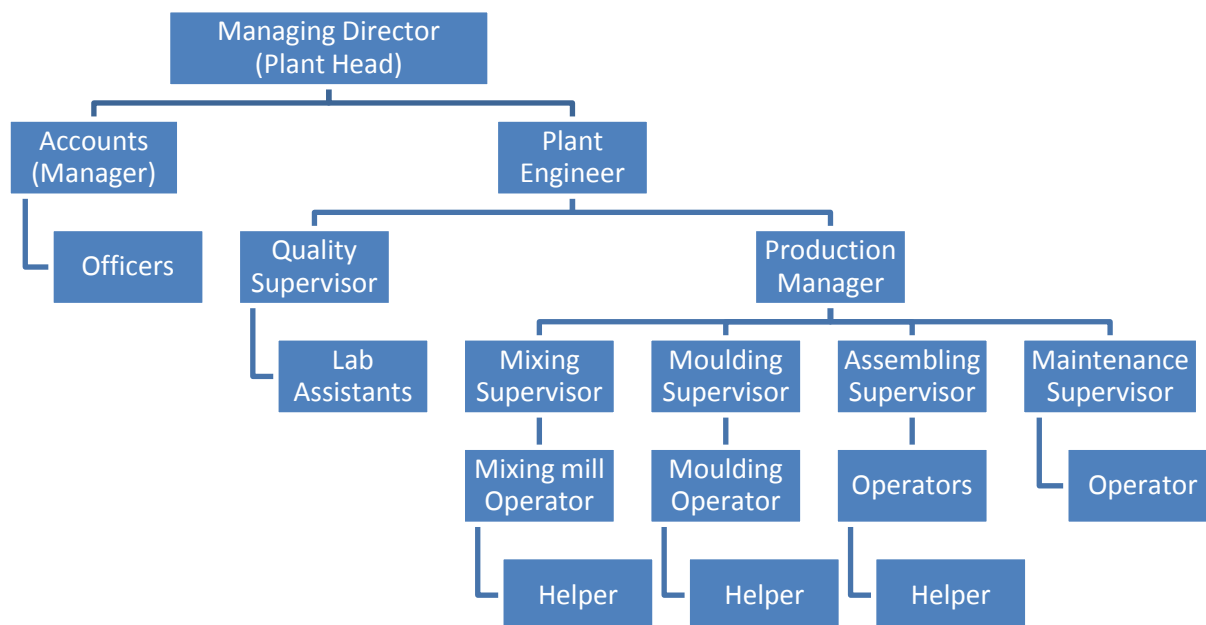
Kerala state is known for Hawai chappal footwear production and is one of the major product categories in the state. However, due to the advent of other types of chappals, the hawai chappal is losing its prominence and the numbers of units operating in this space have also come down.

Types of sub product categories

- **Bun war, Cattail and Neolith Sheets:** Bun war, Cattail and Neolith sheets are used for making the sole of the Footwears.
- **Hawai Chappals, Soles and Straps:** Flip-flops are a type of open-toed sandal worn in casual situations. Flip-flops are known as Hawaii chapels (which means “air sandal”) in India. They consist of a flat sole held loosely on the foot by a Y-shaped strap that passes between the first and second toes and around either side of the foot. Soles and Straps are the two parts of the Hawaii Chapels.
- **Industrial Footwear:** Industrial Footwears are worn for safety purpose (to prevent damages to nails and toe which are occurring due to heat/ oil/ acids/ alkali and abrasion, chemicals/ dropping of heavy objects, sharp objects, etc). There are different varieties of industrial foot wears namely general purpose safety shoes, heat and oil resistant safety shoes, chemical resistant safety shoes, light weight safety shoes, etc.
- **Microcellular Sheets:** Micro Cellular Rubber Sheets (MCR sheets) are used for making inter soles and soles for footwear. They are made in different designs and colors. MCR slippers are suitable for orthopedic, diabetic and leprosy patients as it gives them adequate comfort.
- **Shoes and Boots:** There are different varieties of shoes such as school shoes, canvas shoes, jungle boots, combat boots, etc manufactured for various purposes.

Organisation structure

Figure 14: Organisation structure of Hawai chappal manufacturing units



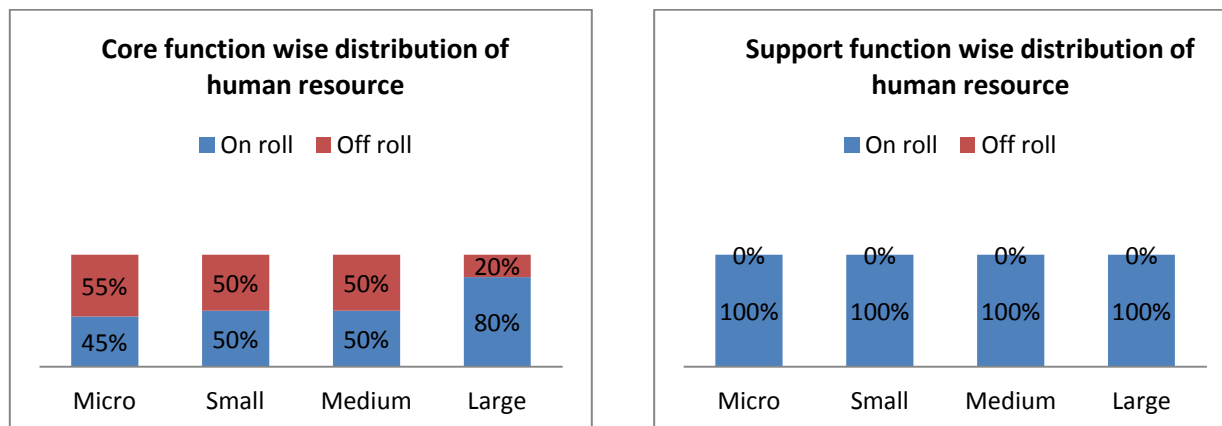
In case of small units, the activities of the human resource function are executed by Proprietor or Production Manager.

Sample covered

	Micro	Small	Medium	Large	Total
No. of units	17	2	5	1	25

Function wise distribution of human resource

Figure 15: Function wise distribution of human resource



Job role wise distribution of human resource

In footwear category, mostly human resource is equally distributed in mixing, moulding, finishing and packing occupations.

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Mixing	Mixing Supervisor	9	Accounts	Manager Accounts	3
	Mixing Operator	26		Accountant	7
	Helpers	6		Manager Purchase	3
Calendering	Operators	14	Purchase	Stores Assistant	7
	Helpers	10	Marketing	Manager Marketing	4
Moulding	Moulding Supervisor	0	Maintenance Operator	Operators	22
	Moulding Operator	119	HR	HR Manager	4
	Helpers	90			0
Finishing	Finishing Supervisor	9	General	Proprietor/MD	3
	Finishing Operator	26	Production	General Manager	1
				Production Manager	6

	Helper	98		Shift In-charge	22
Packaging and Dispatch	Packaging and Dispatch Supervisor	17			
	Helpers	103			

Qualification wise distribution of human resource

Table 12: Qualification wise distribution of human resource

Qualification	Micro	Small	Medium	Large
Ph.D / Research	0%	0%	0%	0%
Engineers	0%	0%	5%	5%
BA / BSc/B Com	10%	15%	15%	10%
Diploma Engineers	0%	5%	5%	5%
ITI / Vocational Education	0%	5%	5%	10%
12th std / 10th std pass	40%	15%	25%	30%
Below 10th standard	50%	60%	40%	35%
Others (specify - Such as MBAs, CA, ICWA, CS, etc.)	0%	0%	5%	5%
TOTAL	100%	100%	100%	100%

Skill gap analysis

Table 13: Occupation wise distribution of job roles

Occupation	Production Management	Mixing	Molding	Finishing	Quality control	Maintenance
Job Roles	Plant Head	Mixing Supervisor	Moulding Supervisor	Assembling Supervisor	Quality Supervisor	Maintenance Supervisor
	Production Manager	Mixing Mill Operator	Moulding Operator	Assembling Operator	Lab Assistants	Operator
	Plant Engineer					
	Helper					

Occupation: Production

Following job roles are involved in production occupation:

1. Plant Head
2. Production Manager
3. Plant Engineer
4. Helper

Occupation: Production

Job Role: Plant Head

Qualification and Experience: Engineering Graduate with 15 years of experience in rubber industry

Roles and Responsibilities:

- Monitor the entire plant operation and workforce
- Production planning
- Quality assurance
- Reporting to management team

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge of the entire operation
- Knowledge of process parameters
- Knowledge of the rubber market and prices
- Knowledge of regulatory aspects
- Ability to monitor the overall operation of the plant
- Ability to participate in QA of product

Managerial Skills

- Ability to manage the workforce and resolve HR problems
- Ability to enforce industrial discipline
- Ability to enforce safety in the operators during the process
- Negotiation skills

Soft Skills

- Ability to interface with all the department heads to gain understanding of the process
- Effective communication skills – to interact with customers and suppliers

Particulars	Micro	Small	Medium	Large
-------------	-------	-------	--------	-------

▪ Inadequate knowledge on product promotion	M	M	M	L
---	---	---	---	---

H- High; M – Medium; L- Low

Occupation: Production

Job Role: Production Head

Qualification and Experience: Engineering Graduate (Production/Mechanical) with 5 years of experience as production head

Roles and Responsibilities:

- Monitor the production of the company
- Worker planning and management
- Execute the production targets as planned by the management
- Quality check the product in different stages of processing
- Train machine operators and helpers

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Should have the technical understanding of the complete manufacturing process from maintaining the quality of raw material to packaging of end product.
- Knowledge on properties of rubber and chemicals used in the manufacturing process
- Should be able to provide required specifications to the Supervisors in terms of time, temperature, pressure, weight, proportion of raw materials, etc.
- Ability to monitor the complete manufacturing process
- Control and minimize the rejection rate
- Ability to implement process improvement plans
- Basic knowledge of costing

Managerial Skills

- Ability to manage the workforce and resolve HR problems
- Ability to enforce industrial discipline
- Ability to enforce safety in the operators during the process

Soft Skills

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ Not able to contribute on process improvement or new product designing 	N/A	N/A	L	L

- Ability to interface with supervisors of various process to monitor the production process
- Effective communication skills – to interact with suppliers and other department heads

H- High; M – Medium; L- Low

Occupation: Mixing

Following job roles are involved in mixing occupation:

1. Mixing Supervisor
2. Mixing Mill Operator

Occupation: Mixing

Job Role: Mixing Supervisor

Qualification and Experience: 10th/12th

Roles and Responsibilities:

- Inventory management
- Guide operators
- Estimate the production input requirements
- Manpower planning

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge of different types of rubber and properties
- Knowledge of raw material required for production (Chemical names, Process oils, fillers, master batch (colors), etc)
- Inventory control management – ability to maintain inventory at optimum level
- Ability to do a quality check at various stage of processing
- Knowledge of machine operation and maintenance (kneader machine)
- Basic knowledge on formulations (Compound)
- Ability to estimate requirements

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ Lacks adequate knowledge about various raw materials (physical and chemical properties) 			M	M
<ul style="list-style-type: none"> ▪ Inability to take corrective action when there is an issue in compounding 			M	L
<ul style="list-style-type: none"> ▪ Lack of professionalism in the work (due 			L	L

Managerial Skills	to the people are not well educated)
<ul style="list-style-type: none"> Ability to plan and schedule (Material, Men, etc) Ability to manage people in mixing dept (solve issues faced by employees) Coordinate with moulding supervisor in understanding their requirement 	
Soft Skills	
<ul style="list-style-type: none"> Ability to train the operators on process knowledge and machine operation 	
H- High; M – Medium; L- Low	

Occupation: Mixing

Job Role: Mixing Operator

Qualification and Experience: 10th/12th

Roles and Responsibilities:

- Mixing of raw materials to make rubber compound
- Instruct the helpers to enable a smooth production process
- Operation of kneader

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

	Particulars	Micro	Small	Medium	Large
Technical skills:	▪ Inadequate knowledge to identify all the raw material and take required materials for mixing	M	M	M	M
	▪ Knowledge on storage locations of the raw materials				
	▪ Ability to select the raw materials (like Rubber, Chemicals, Fillers, Oil, etc) as mentioned in the mill sheet by reading the labels in the raw material section				
	▪ Ability to weigh the required raw materials as specified in the mill sheet				
	▪ Ability to operate Kneader to form dough				
	▪ Ability to operate Milling /Calendar machine to generate rubber sheets based on the thickness requirement				
	▪ Knowledge on mixing order to be followed				
	▪ Ability to understand the instructions				
	▪ No basic knowledge on the properties of raw materials used	M	M	L	L
	▪ No compatibility to work in other department	M	L	L	L

<p>provided by the Supervisor</p> <ul style="list-style-type: none"> ▪ Knowledge on safety requirements ▪ Ability to roll out sheets from the rubber compound prepared ▪ Knowledge on operating the calendaring machine where the two different compounding sheets (of different colors) are placed one on the above ▪ Ability to do a quality check and reject the compounding sheets if it is not according to specification (measurement and weight) <p>Soft Skills</p> <ul style="list-style-type: none"> ▪ Communication skills to interact with Supervisors 	
H- High; M – Medium; L- Low	

Occupation: Moulding

Following job roles are involved in moulding occupation:

1. Moulding Supervisor
2. Moulding Operator

Occupation: Moulding

Job Role: Moulding Supervisor

Qualification and Experience: 10th/12th with 8 years of experience

Roles and Responsibilities:

- Coordinate with other departments
- Guide operators
- Manpower and material planning

Knowledge and Skill Requirement

Technical skills:

- Knowledge of hydraulic machine used for moulding
- Basic knowledge on properties of rubber and compound used for moulding
- Knowledge of physical properties of

Skill Gaps and Intensity level of skill gap

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ Inability to resolve human resource issues 			L	M

<p>rubber (hardness, tensile, etc)</p> <ul style="list-style-type: none"> ▪ Basic electrical knowledge ▪ Knowledge of curing process and specification (curing time and temperature) ▪ Ability to coordinate with maintenance department for preventive maintenance action <p>Managerial Skills</p> <ul style="list-style-type: none"> ▪ Ability to coordinate the production of sole and strap ▪ Ability to plan and schedule (Material, Men, etc) ▪ Ability to manage people in moulding dept (solve issues faced by employees) ▪ Coordinate with mixing supervisor (tell the requirement) <p>Soft Skills</p> <ul style="list-style-type: none"> ▪ Ability to train the operators on process knowledge and machine operation 	
H- High; M – Medium; L- Low	

Occupation: Moulding

Job Role: Moulding Operator

Qualification and Experience: 10th/12th

Roles and Responsibilities:

- Operation of hydraulic press
- Moulding process operation
- Cleaning of mould

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Particulars	Micro	Small	Medium	Large
<p>Technical skills:</p> <ul style="list-style-type: none"> ▪ Ability to operate Hydraulic Press, in terms of setting the requirements in temperature controller, pressure gauge and timer ▪ Moulding skills/equipment handling skills like fixing the rubber in the right mould/cavity, placing the mould in the 				
<ul style="list-style-type: none"> ▪ Lack of understanding of process parameters ▪ Inadequate basic maintenance skills ▪ Inadequate 	L	L	L	L
	M	M	M	M

<p>machine, extracting the mould on completion of the moulding time, etc</p> <ul style="list-style-type: none"> ▪ Ability to identify error in the moulded products (such as short fill/cut mark/air pockets/colour) through visual verification of moulded products and reporting to the supervisor in case of observation of any discrepancies from the required end product specifications ▪ Basic machine maintenance skill ▪ Ensure that adequate compound is available for the final output (needs to add additional compound pieces if it is low) ▪ Ability to follow the instructions of the supervisor <p>Soft Skills</p> <ul style="list-style-type: none"> ▪ Ability to converse with other departments like mixing, stores, etc 	<p>knowledge on safety skills</p> <p>M M L L</p>
---	--

H- High; M – Medium; L- Low

Occupation: Finishing

Following job roles are involved in finishing occupation:

1. Assembling Supervisor
2. Assembling Operator

Occupation: Finishing

Job Role: Assembling Supervisor

Qualification and Experience: 10th/12th

Roles and Responsibilities:

- Monitor finishing process
- Quality checking
- Coordinate with other departments
- Plan and prepare dispatch list
- Manage workers

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Particulars	Micro	Small	Medium	Large
<p>Technical skills:</p> <ul style="list-style-type: none"> ▪ Inability to resolve human 			M	L

<ul style="list-style-type: none"> Ability to monitor the finishing process such as cutting, Drilling, Strap attachment, checking and packing Ability to do a quality check of the finished products (check for colour, dimensions and measurements) 	resource issues
Managerial Skills <ul style="list-style-type: none"> Ability to plan and prepare dispatch list Ability to manage human resource in the department and resolve any minor issues 	
Soft Skills <ul style="list-style-type: none"> Co ordinate with the moulding supervisor to understand the production planning and schedule accordingly Ability to interact with customers and understand their order requirements 	
H- High; M – Medium; L- Low	

Occupation: Finishing

Job Role: Assembling Operator

Qualification and Experience: 10th/12th

Roles and Responsibilities:

- Cutting soles from the vulcanized rubber sheets
- Set the required die in the cutting machine
- Strap fitting

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Particulars	Micro	Small	Medium	Large
Technical skills: <ul style="list-style-type: none"> Ability to use the cutting machine which cuts the rubber sheets to chappal soles Ability to change the cutting blade size according to size of chappals and place the size stickers in the soles Ability to use drilling machine to put holes in the soles (for strap fitting) 				
<ul style="list-style-type: none"> Minor issues in adjusting the drills/ cutting blades according to size Compatibility to do different assembling work (cutter may not 	L	L	L	L
	L	L	M	M

<p>purpose)</p> <ul style="list-style-type: none"> ▪ Ability to adjust the size of drillers according to chappal size ▪ Ability to check the size of sole and strap before attaching them ▪ Ability to attach the strap into chappal (using a machine) ▪ Ability to a visual check (colour, cuts, size, sticker) before packing ▪ Packing in appropriate boxes (check for size, colour in the box label) ▪ Master packing in corrugated boxes as per assortment <p>Managerial Skills – NA</p> <p>Soft Skills – NA</p>	<p>be able to do strap fitting)</p> <ul style="list-style-type: none"> ▪ Minor issues in deflashing the straps (small flaps are left out) 	L	L	L	L
H- High; M – Medium; L- Low					

Occupation: Quality control

Following job roles are involved in quality control occupation:

1. Quality Supervisor
2. Lab Assistants

Occupation: Quality Control

Job Role: Quality Supervisor

Qualification and Experience: Rubber Technologist

Roles and Responsibilities:

- Check the quality of the inputs and end product as per the required specifications
- Perform physical and chemical property test

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge of Rubber properties (natural and synthetic)
- Knowledge of properties of various raw material used in processing
- Ability to do a quality check on incoming raw material, compound,

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ Inadequate knowledge on chemical properties 			M	L
<ul style="list-style-type: none"> ▪ Inability to develop a new 			--	M

semi finished and finished product ▪ Ability to perform physical and chemical property test ▪ Ability to perform test such as tensile, elongation, etc. ▪ Ability to set standards on compounding and prepare compounding chart ▪ Knowledge of quality standards ▪ Ability to operate various testing equipment Managerial Skills – NA Soft Skills – NA	compound
H- High; M – Medium; L- Low	

Occupation: Maintenance

Following job roles are involved in maintenance occupation:

1. Maintenance Supervisor
2. Operator

Occupation: Maintenance

Job Role: Maintenance Supervisor

Qualification and Experience: ITI with 10 years of experience

Roles and Responsibilities:

- Periodic machine maintenance
- Check the performance of machine
- Coordinate with various departments for machine maintenance

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

	Particulars	Micro	Small	Medium	Large
Technical skills:	<ul style="list-style-type: none"> ▪ Knowledge of machine operation and maintenance used in footwear industry 				
	<ul style="list-style-type: none"> ▪ Ability to perform repair and maintenance activities in the machines (mixing, curing, boiler, etc.) 				
	<ul style="list-style-type: none"> ▪ Ability to do a periodical check on the machines and judge their performance 				
	<ul style="list-style-type: none"> ▪ Ability to coordinate and understand the maintenance requirements from 				
	<ul style="list-style-type: none"> ▪ Lack in depth knowledge on the modern machined used in production 				M
	<ul style="list-style-type: none"> ▪ Inability to resolve human resource issues 				L

<p>different department supervisors</p> <ul style="list-style-type: none"> Ability to plan and schedule periodical maintenance activities for the plant <p>Managerial Skills</p> <ul style="list-style-type: none"> Human resource management Coordination with different department supervisors <p>Soft Skills</p> <ul style="list-style-type: none"> Human resource management 	
H- High; M – Medium; L- Low	

Occupation: Maintenance

Job Role: Maintenance Operator

Qualification and Experience: ITI

Roles and Responsibilities:

- Identify faults in the machines and correct it
- Coordinate with machine operators

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge of machine operation and maintenance
- Ability to find the fault / cause for malfunction and correct them accordingly
- Ability to handle / use different equipments and tools used for repair and maintenance
- Ability to listen to the supervisor's instruction and perform accordingly
- Ability to co ordinate with the respective machine operator and understand the problem

Managerial Skills – NA

Soft Skills – NA

H- High; M – Medium; L- Low

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> Lack adequate ability to perform maintenance / repair activity independently 				M

Job role wise distribution in all the units for the product segment of Footwear (Estimated)

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Mixing	<i>Mixing Supervisor</i>	26	Accounts	<i>Manager Accounts</i>	9
	<i>Mixing Operator</i>	78		<i>Accountant</i>	22
	<i>Helpers</i>	17	Purchase	<i>Manager Purchase</i>	9
Calendering	<i>Operators</i>	43		<i>Stores Assistant</i>	22
	<i>Helpers</i>	30	Marketing	<i>Manager Marketing</i>	13
Moulding	<i>Moulding Supervisor</i>	0	Maintenance Operator	<i>Operators</i>	65
	<i>Moulding Operator</i>	358	HR	<i>HR Manager</i>	13
		0			0
	<i>Helpers</i>	272	General	<i>Proprietor/MD</i>	9
Finishing	<i>Finishing Supervisor</i>	26		<i>General Manager</i>	4
	<i>Finishing Operator</i>	78		<i>Production Manager</i>	17
	<i>Helper</i>	293		<i>Shift In-charge</i>	65
Packaging and Dispatch	<i>Packaging and Dispatch Supervisor</i>	52			
	<i>Helpers</i>	311			

Summary Sheet: Foot Wear

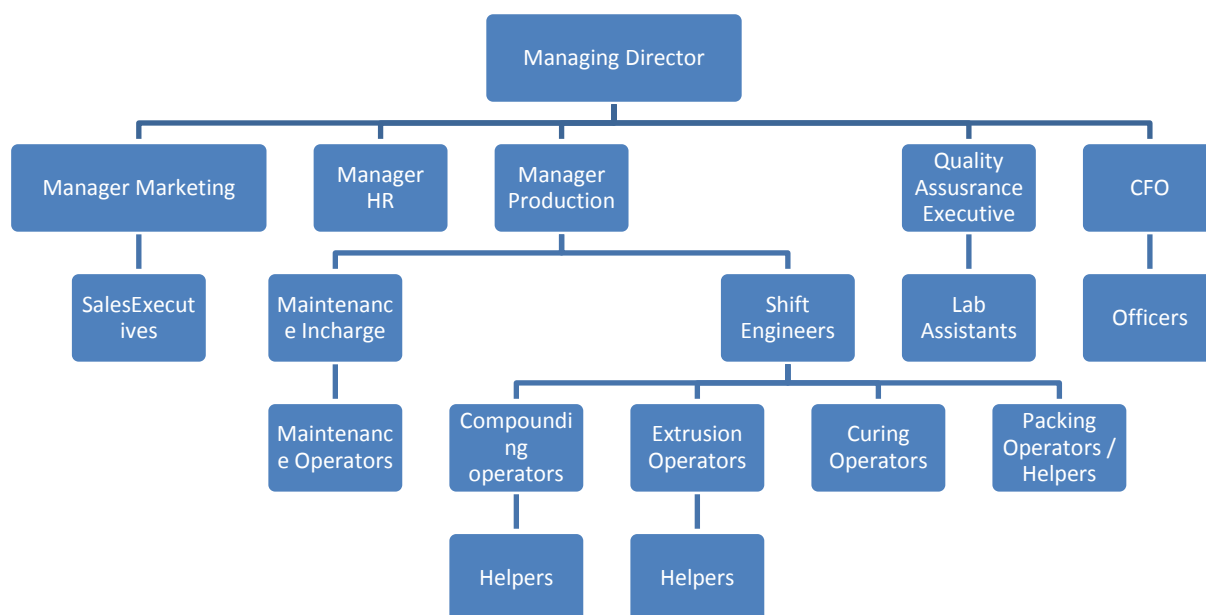
Categories	Total no. of footwear manufacturing units in Kerala					94	Qualification wise distribution		
<ul style="list-style-type: none">Bunwar, Kattai and Neolite SheetsHawai Chappals, Soles and StrapsIndustrial FootwearMicrocellular sheetShoes and Boots	Distribution of units	Micro	Small	Medium	Large	Total	of human resource		
		85%	9%	4%	2%	100%			
	No. of people employed*	1171	125	179	720	2195	Ph.D / Research	0%	
	ManufacturingSupport						Engineers	0%	
							BA/B.Sc/B Com	13%	
	Total no. of occupations identified73						Diploma Engineers /Rubber technologist	0%	
							ITI/Vocational Education	0%	
Total no. of job roles identified104						12th std/10th std pass	3%		
						Below 10th std	84%		
User industry	Critical job roles (in terms of skill requirement)		Mixing Operator, Curing Operator and Quality inspector				Others (MBAs, CA, ICWA, CS, etc.)	0%	
Total							100%		
<ul style="list-style-type: none">General publicManufacturing industriesFootwear industry	Industry Suggestions <ul style="list-style-type: none">Demand for Hawai chappal is decreasing and training may be provided on alternate chappal manufacturing process and machine operation using materials such PU, EVA, etc.						Function wise distribution of human resource		
								On	Off
							Core function	96%	4%
							Support function	100%	0%

1.3.7 Latex Thread

Latex thread is produced from latex compound. It is primarily used in clothing, hosiery, surgical and athletic goods. Kerala state has two major players in this product category.

Organisation structure

Figure 16: Organisation structure of rubber matting manufacturing units



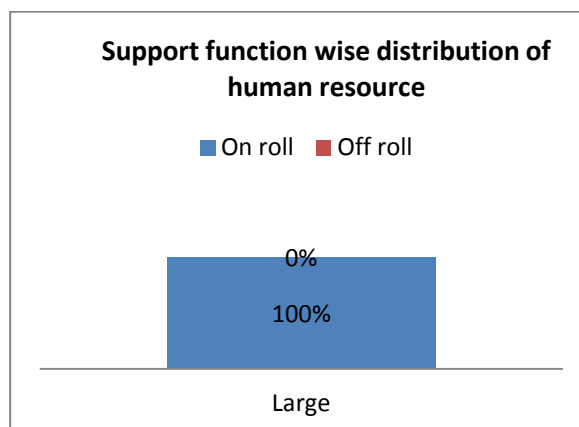
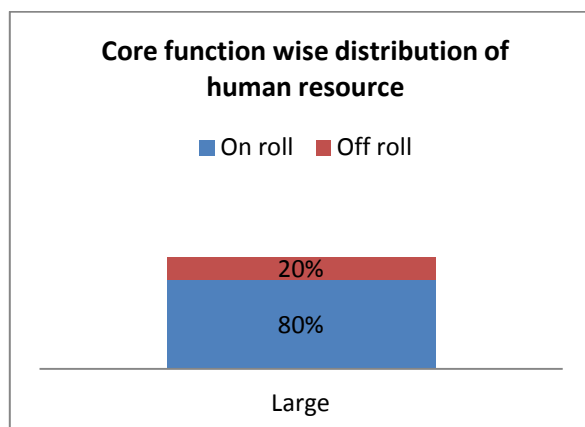
This chart is represented for a large sized unit

Sample covered

	Micro	Small	Medium	Large	Total
No. of units	0	0	0	2	2

Function wise distribution of human resource

Figure 17: Function wise distribution of human resource



Job role wise distribution of human resource

Majority of the human resource deployed in Latex Thread unit are under operator (extrusion and curing) job role.

Occupation	Job role	No. of people	Occupation	Job role	No. of people	Occupation	Job role	No. of people
Mixing	Mixing Operator	18	Accounts	Manager Accounts	6	General	Proprietor/MD	3
	Extrusion operator	25		Accountant	12		General Manager	2
Curing	Curing operator	13	Purchase	Manager Purchase	7	Production	Production Manager/Foreman	3
	Helpers	20		Stores Assistant	8		Shift In-charge	8
Testing	Chemist	18	Marketing	Manager Marketing	12	Production	Supervisor-labour/raw material	5
	Quality inspector	12	HR	HR Manager	2			

Qualification wise distribution of human resource

Table 14: Qualification wise distribution of human resource

Qualification	Large
Ph.D / Research	0%
Engineers	10%
BA / BSc/B Com	10%
Diploma Engineers	10%
ITI / Vocational Education	10%
12th std / 10th std pass	30%
Below 10th standard	30%
Others (specify - Such as MBAs, CA, ICWA, CS, etc.)	0%
TOTAL	100%

Skill gap analysis

Table 15: Occupation wise distribution of job roles

Occupation	Production Management	Compounding	Curing	Extrusion	Packing and dispatch	Maintenance
Job roles	Production Manager	Operator	Operator	Operator	Helper	Operators
	Shift Engineers	Helper	Helper	Helper		

Occupation: Management

Following job roles are involved in management occupation:

1. Shift Engineers

Occupation: Production

Job Role: Shift Engineers

Qualification and Experience: Engineering graduate with over 5 - 10 years of experience in rubber industry.

Roles and Responsibilities:

- Oversee the process of production of latex thread
- Manage the workforce
- Decide the compounding formula

Knowledge and Skill Requirement	Skill Gaps and Intensity level of skill gap				
	Particulars	Micro	Small	Medium	Large
Technical skills:					
<ul style="list-style-type: none"> Understanding of latex properties Knowledge of chemicals used with latex like zinc compounds, etc Knowledge of weighing Knowledge of chemical addition sequence Ability to manage the recruitment process Knowledge of the entire operation Knowledge of process parameters Knowledge of the financial aspects Knowledge of the rubber industry scenario in the cluster Knowledge of the typical line activities in plant Ability to plan the processes so that there is full utilization of the facilities Ability to monitor the operation Ability to lead in quality check of product Ability to plan inventory Ability to do logistics planning Ability to work-out cost effective transportation solution Ability to manage the compounding process Ability to fix the parameters in the entire process 	<ul style="list-style-type: none"> Inability to improvise the product through improvement in process 				L
Managerial skills					
<ul style="list-style-type: none"> Ability to manage the workforce Ability to enforce industrial discipline Ability to enforce safety in the operators during the process 					

Soft skills

- Ability to interface with all the operators to gain understanding of the process

H- High; M – Medium; L- Low

Occupation: Compounding

Following job roles are involved in mixing occupation:

- Operator

Occupation: Compounding

Job Role: Operator

Qualification and Experience: Minimally educated with about 1-3 years of experience

Roles and Responsibilities:

- Weighing the raw materials
- Mix the chemicals
- Clean the tank

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Ability to take the right quantity of latex from the stored tins based on instruction from supervisor
- Ability to de-ammonize the latex to the right extent
- Ability to set the stirrer parameters
- Knowledge of additives like sulphur, zinc compounds, etc used in mixing
- Knowledge of the properties of the various additives like sulphur, zinc compounds, etc
- Knowledge of the sequence of the additives like sulphur, zinc compounds, etc
- Knowledge of the location of the chemicals in the mixing area
- Ability to explain the order to the helpers

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ Not able to set the mixing machine parameters without guidance from supervisor / shift engineer ▪ The effect of chemicals used with latex – like sulphur or zinc based compounds – is not known very well 				L

<ul style="list-style-type: none"> Knowledge of the process parameters to be set in the mill Ability to weigh the right quantities of the chemicals and additives like sulphur, zinc compounds, etc 	M
Managerial skills <ul style="list-style-type: none"> Ability to motivate the helpers 	
Soft Skills <ul style="list-style-type: none"> Ability to communicate the location and basic properties to the helpers 	
H- High; M – Medium; L- Low	

Occupation: Extrusion

Following job roles are involved in mixing occupation:

- Operator

Occupation: Extrusion

Job Role: Operator

Qualification and Experience: Minimally educated with about 1-3 years of experience

Roles and Responsibilities:

- Set the extruder parameters
- Monitor the extrusion process

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Ability to set the extruder parameters
- Ability to keep the compound at constant level to ensure constant rate of extrusion
- Knowledge of the usual thread density that has to be achieved to set the extruder parameters
- Knowledge of the extrusion process
- Ability to visually check the process

Managerial skills

- Ability to motivate the helpers

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> Not able to set the parameters to ensure constant rate of extrusion 				M

Soft Skills

- Ability to communicate the location and basic properties to the helpers

H- High; M – Medium; L- Low

Occupation: Curing

Following job roles are involved in mixing occupation:

- Operator

Occupation: Curing

Job Role: Operator

Qualification and Experience: Minimally educated with about 1-3 years of experience

Roles and Responsibilities:

- Set the curing parameters
- Monitor the curing process

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Ability to set the right temperature for the curing
- Ability to keep track of the time for the curing process, depending on the thread properties
- Ability to stop the curing after the time period
- Ability to visually check the cured thread
- Ability to alert the supervisor if any deviation is observed

Managerial skills

- Ability to motivate the helpers

Soft Skills

- Ability to communicate the location and basic properties to the helpers

H- High; M – Medium; L- Low

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ Lack the skill of knowing what temperature and time to be adhered when threads of varying counts are made 				M

Occupation: Packing and dispatch

Following job roles are involved in mixing occupation:

- Helper

Occupation: Packing and dispatch

Job Role: Helper

Qualification and Experience: Minimally educated with about 1-3 years of experience

Roles and Responsibilities:

- Visually inspect the final thread
- Sort and pack

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Ability to visually inspect the final product
- Ability to sort into batches
- Ability to mark the batch numbers
- Ability to cover the product with casing
- Ability to neatly store the product according to batches
- Ability to transfer the final product in batches to the vehicle

Managerial skills

- N/A

Soft Skills

- Basic communication skill

Particulars

Micro

Small

Medium

Large

- As the nature of the job does not involve any technical skill, there are no skill gaps observed

L

H- High; M – Medium; L- Low

Occupation: Production

Following job roles are involved in mixing occupation:

- Helper

Occupation: Production

Job Role: Helper

Qualification and Experience: Minimally educated with about 0-1 years of experience

Roles and Responsibilities:

- Aid the operators in production process
- Loading and un-loading of materials

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge of location of chemicals
- Knowledge of basic weighing
- Ability to help transfer the latex to tanker
- Ability to aid operators during the process

Managerial skills

- N/A

Soft Skills

- Basic communication skill

Particulars	Micro	Small	Medium	Large
Inadequate compliance towards quality and safety procedures				M

- Inadequate compliance towards quality and safety procedures

M

H- High; M – Medium; L- Low

Occupation: Maintenance

Following job roles are involved in maintenance occupation:

- Operator

Occupation: Maintenance

Job Role: Maintenance Operator

Qualification and Experience: ITI

Roles and Responsibilities:

- Identify faults in the machines and correct it
- Coordinate with machine operators

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge of machine operation and maintenance
- Ability to find the fault / cause for malfunction and correct them accordingly
- Ability to handle / use different

Particulars	Micro	Small	Medium	Large
Lack adequate ability to perform maintenance / repair activity independently				M

- Lack adequate ability to perform maintenance / repair activity independently

M

equipments and tools used for repair and maintenance

- Ability to listen to the supervisor's instruction and perform accordingly
- Ability to co ordinate with the respective machine operator and understand the problem

Managerial Skills – NA

Soft Skills – NA

H- High; M – Medium; L- Low

Summary Sheet: Latex thread

Categories	Total no. of latex thread product manufacturing units in Kerala					13	Qualification wise distribution of human resource		
NA	Distribution of units	Micro	Small	Medium	Large	Total	Ph.D / Research Engineers BA/B.Sc/B Com Diploma Engineers ITI/Vocational Education 12th std/10th std pass Below 10th std Others (MBAs, CA, ICWA, CS, etc.) Total	0%	
		77%	8%	0%	15%	100%		0%	
	No. of people employed*	0	0	0	229	229		0%	
		Manufacturing				Support		0%	
	Total no. of occupations identified		4		1			0%	
	Total no. of job roles identified		11		1			0%	
User industry	Critical job roles (in terms of skill requirement)	Compounding and extrusion				1	80%		
Hosieries Sports goods							0%		
							100%		
							100%		
Industry Suggestions							Function wise distribution of human resource		
<ul style="list-style-type: none">▪ RSDC can conduct training programs targeted to the proprietor in terms of<ul style="list-style-type: none">○ Creating awareness about the latest machinery and raw materials which are used in the rubber industry.○ Technical training which can provide an understanding to develop the chemical formulation as per the required end product.○ R&D related inputs								On roll	Off roll
							Core function	100%	0%
							Support function	100%	0%

*Estimated based on sample data

1.3.8 Moulded Rubber Product

Moulded rubber product is one of the commonly known rubber based product and is widely used by many industries.

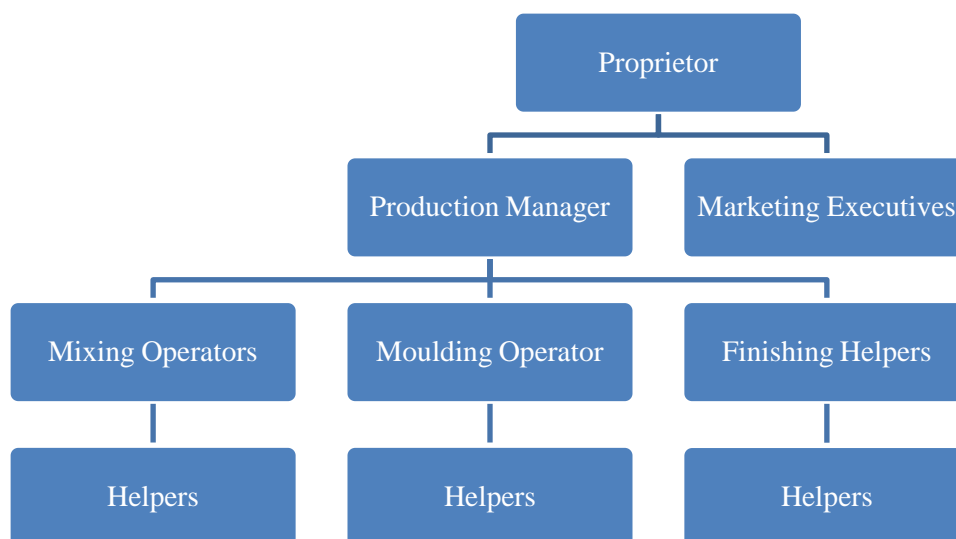
Many other product categories also follow similar manufacturing process of the moulded rubber product. Such product categories are included in this chapter as the skill requirement and job roles are similar to requirement of moulded rubber product. The product categories that are grouped under moulded rubber product for Kerala state are as follows:

1. Auto and Cycle parts
2. Rubber tubing (moulded tubing)
3. Sports goods (moulded balls)
4. Rubber sheeting (moulded rubber sheeting)

The above mentioned product categories have a minor presence in the state of Kerala (the total units is less than 5) and separate skilling focus for these product group currently may not be appropriate. As their process is similar to that of moulded and the job compatibility rate is high among these product categories, they are grouped under “Moulded rubber products”

Organisation structure

Figure 18: Organisation structure of moulded product manufacturing units



In case of small units, the activities of the human resource and the accounts function are executed by Proprietor or Production Manager.

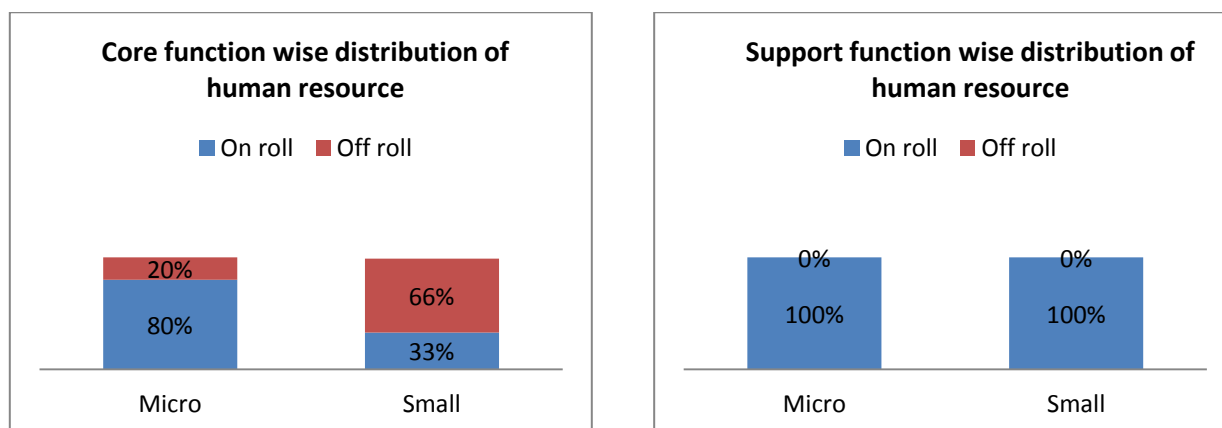
In case of a micro units, there are no supporting departments observed, the activities of the supporting functions are executed by Proprietor or Production Manager. There are no supervisory role observed, operator directly reports to production manager or proprietor.

Sample covered

	Micro	Small	Medium	Large	Total
No. of units	16	4	1	0	26

Function wise distribution of human resource

Figure 19: Function wise distribution of human resource



Job role wise distribution of human resource

Majority of the human resource deployed in moulded rubber product units are under moulding operator and finishing operator / helper job role.

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Mixing	Mixing Supervisor	15	Accounts	Manager Accounts	8
	Mixing Operator	38		Accountant	13
	Helpers	54	Purchase	Manager Purchase/Dispatch	6
Moulding	Moulding Supervisor	13		Stores Assistant	8
	Moulding Operator	59	Marketing	Manager Marketing	4
		0			0
	Helpers	50	Admin / HR	Admin / HR Manager	5
Finishing	Finishing Supervisor	8	General	Proprietor/MD	23
	Finishing Operator	27		General Manager	13
	Helper	54	Production	Production Manager	9
Packaging and Dispatch	Packaging and Dispatch Supervisor	9		Shift In-charge	9
	Helpers	40			

Qualification wise distribution of human resource

Table 16: Qualification wise distribution of human resource

Qualification	Micro	Small
Ph.D / Research	0%	0%
Engineers	0%	0%
BA / BSc/B Com	20 - 25%	15%
Diploma Engineers	0%	0%
ITI / Vocational Education	0%	0%
12th std / 10th std pass	35 - 40%	40%
Below 10th standard	40%	45%
Others (specify - Such as MBAs, CA, ICWA, CS, etc.)	0%	0%
TOTAL	100%	100%

Skill gap analysis

Table 17: Occupation wise distribution of job roles

Occupation	Production Management	Mixing	Moulding	Finishing, Packing and Dispatch
Job Roles	Production Manager	Mixing Operator	Moulding Operator	Finishing Helper
		Helper	Helper	Helper

Occupation: Production Management

Following job roles are involved in production occupation:

Occupation: Management**Job Role: Production manager**

Qualification and Experience: Minimally educated/ 10th standard/ 12th standard / Graduate with over 10 years of experience in rubber industry.

Roles and Responsibilities:

- Responsible for running of unit and production
- Planning for production schedule
- People management and time management (Decision on number of people required, no of shifts, etc)

- Random quality checking
- Managing suppliers and customers
- Liaison with customer to get more orders

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge of international competitive prices
- Adequate understanding about each process (reasons for why the chemicals, oils are used and technical details about the raw materials used)
- Inventory control management – ability to maintain inventory at optimum level
- Understand about new trends in manufacturing followed in the industry
- Ability to do a quality check at various stage of processing
- Basic knowledge of machine operation
- Basic knowledge on formulations (Compound)

Managerial skills

- Leadership and mentoring qualities
- Ability to handle crises situations
- Ability to enforce discipline at work place
- Time management skills
- Planning for human resource requirement and recruiting the required resource

Soft skills

- Ability to understand the clarifications/help sought by the subordinates and offer solutions
- Ability to communicate the requirements / expectations from the subordinates in a

Particulars	Micro	Small	Medium	Large
-------------	-------	-------	--------	-------

- | | | | | |
|---|---|---|-----|-----|
| <ul style="list-style-type: none"> • Lack of knowledge of the latest machinery and raw materials which could enhance the efficiency of the production process and the quality of the end product respectively. | M | M | N/A | N/A |
|---|---|---|-----|-----|

clear and complete manner

- Ability to be flexible and open to ideas

H- High; M – Medium; L- Low

Occupation: Mixing

Following job roles are involved in mixing occupation:

Mixing Operator

Occupation: Mixing

Job Role: Mixing operator

Qualification and Experience: Minimally educated with more than 5 years of experience

Roles and Responsibilities:

- Weighing the raw material
- Mixing and producing sheets from the rubber compound as per the instruction provided by the owner

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Ability to weigh the raw materials as per the requirement.
- Ability to mix the raw materials in the mixing mill as per the pre defined time, order and temperature.
- Ability to produce rubber sheets from the mixing mill
- Ability to operate and maintain the mixing mill.
- Safety skills – Ability to be alert about the safety of his hands as they may get between the rollers of mixing mill.

Managerial skills

- Ability to instruct the helpers for cleaning, loading/unloading, etc.

Soft Skills

- Ability to coordinate work with his superiors and subordinates

Particulars	Micro	Small	Medium	Large
Inability to mix the raw materials as per the specified proportion and duration.	L	L	L	

H- High; M – Medium; L- Low

Occupation: Mixing

Job Role: Helper

Qualification and Experience: 10th/ School drop outs

Roles and Responsibilities:

- Identify raw material used for mixing, weigh them and prepare the batch
- Help operator with loading / unloading of materials for mixing process
- Maintain the work environment (cleaning the machines, floor, etc)

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

	Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ Ability to identify different raw materials (Read labels and names of the package) ▪ Ability to use weighing scale ▪ Ability to use knives and cut the compound for sizing in the desired shape ▪ Knowledge of material handling ▪ Ability to listen for instructions and perform work accordingly ▪ Knowledge of safety procedures 	<ul style="list-style-type: none"> ▪ Inadequate knowledge on quality and safety procedures 	M	M		
	<ul style="list-style-type: none"> ▪ Inability to work in different sections of production (lack multi skilling) as required 	M	M		

H – High; M – Medium; L – Low

Occupation: Moulding

Following job roles are involved in moulding occupation:

2. Moulding Supervisor
3. Moulding Operator
4. Helper

Occupation: Moulding

Job Role: Moulding Operator

Qualification and Experience: ITI/ 12th/10th with minimum 1 year of experience in rubber industry

Roles and Responsibilities:

- Perform moulding process
- Operate hydraulic press machine and basic maintenance of the machine
- Perform finishing function such as trimming of flashes (case specific)

- Train helpers on operating the press machine

Knowledge and Skill Requirement	Skill Gaps and Intensity level of skill gap				
	Particulars	Micro	Small	Medium	Large
Technical skills: <ul style="list-style-type: none"> Ability to operate the hydraulic pressing machine Understanding the specifications of the machine (power, temperature, curing time, press, etc) Ability to place the required compound (which is cut and in shape) between the moulds Ability to remove the products from the mould safely (usage of gloves as it will be hot) Identify mistakes/excessive wastages in the output and inform to supervisor to correct the compound formulation Ability to remove the flaps from the finished product (case specific) 	<ul style="list-style-type: none"> New operators lacks adequate process knowledge a(Usage of hydraulic press to take out products) and takes time to understand (around 6 months to 1 year) Lack of adequate in-depth understanding of Curing specifications (Curing time and temperature for different types of moulded products) 	M	M		
Soft skills: <ul style="list-style-type: none"> Communication skills – to interact with supervisor and helper 		M	M		

H – High; M – Medium; L – Low

Occupation: Moulding

Job Role: Helper

Qualification and Experience: 10th/ School drop outs

Roles and Responsibilities:

- Co ordinate with operator for moulding process
- Listen for instruction and work accordingly
- Maintain the work environment clean (including machines)

Knowledge and Skill Requirement	Skill Gaps and Intensity level of skill gap				
	Particulars	Micro	Small	Medium	Large
Technical skills: <ul style="list-style-type: none"> Ability to collect the required compound (in sheet form) from milling section to 	<ul style="list-style-type: none"> Inability to follow the instructions accurately and 	M	M		

moulding section <ul style="list-style-type: none"> Ability to place the compound appropriately to assist the operator for smooth moulding process Knowledge of material movement (where to move the moulded mats) Ability to maintain the workplace clean 	misplacement of goods <ul style="list-style-type: none"> Inadequate knowledge on quality standards
H – High; M – Medium; L – Low	

Occupation: Finishing, Packing & Dispatch

Following job roles are involved in finishing, packaging and dispatch occupation:

2. Helper

Occupation: Finishing, Packing and Dispatch

Job Role: Helper

Qualification and Experience: 10th standard/school drop out

Roles and Responsibilities:

- Understand finishing requirement and finish (trimming, painting, etc) the moulded products
- Pack the finish product
- Material movement

Knowledge and Skill Requirement

- Ability to trim the excess/additional rubber in the moulded product (Process of deflashing)
- Usage of knives and scissors to deflash
- Ability to trim only the additional rubber else may lead to rejection of the piece
- Finishing work such as painting in the soul may also be done
- Sorting and packing (Bundling)
- Loading the finished goods for dispatch according to orders

Skill Gaps and Intensity level of skill gap

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> Inadequate understanding of finishing requirement for various types of moulded product 	M	M		
<ul style="list-style-type: none"> Inadequate communication skills (listening) 	M	M		

H – High; M – Medium; L – Low

Job role wise distribution in all the units for the product segment of Moulded Rubber Products (Estimated)

Occupation	Job role	Number of people	Occupation	Job role	Number of people
------------	----------	------------------	------------	----------	------------------

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Mixing	Mixing Supervisor	17	Accounts	Manager Accounts	9
	Mixing Operator	44		Accountant	15
	Helpers	63	Purchase	Manager Purchase/Dispatch	7
Moulding	Moulding Supervisor	15		Stores Assistant	9
	Moulding Operator	69	Marketing	Manager Marketing	5
		0			0
	Helpers	58	Admin / HR	Admin / HR Manager	6
Finishing	Finishing Supervisor	9	General	Proprietor/MD	26
	Finishing Operator	31		General Manager	15
	Helper	63	Production	Production Manager	10
Packaging and Dispatch	Packaging and Dispatch Supervisor	10		Shift In-charge	10
	Helpers	46			

Summary Sheet: Moulded Rubber Products

Categories	Total no. of moulded* rubber product manufacturing units in Kerala					39	Qualification wise distribution of human resource		
NA	Distribution of units	Micro	Small	Medium	Large	Total	Ph.D / Research Engineers BA/B.Sc/B Com Diploma Engineers ITI/Vocational Education 12th std/10th std pass Below 10th std Others (MBAs, CA, ICWA, CS, etc.) Total	0%	
		71%	21%	7%	0%	100%		0%	
	No. of people employed*	160	109	0	0	269		2%	
		Manufacturing			Support			0%	
	Total no. of occupations identified		6		4			7%	
	Total no. of job roles identified		9		9			44%	
User industry	Critical job roles (in terms of skill requirement)	Mixing Operator and Moulding Operator				Total	47%		
Automotive and engineering industries							0%		
	Industry Suggestions <ul style="list-style-type: none">Training required on modern moulded products used in various industries such as construction, automobile, etc.						Function wise distribution of human resource		
								On roll	Off roll
							Core function	73%	27%
							Support function	100%	0%

*note-Moulded rubber product includes auto and cycle parts, rubber sheeting, rubber tubing, surgical products, sports goods and tyre flaps

1.3.9 Rubber Matting

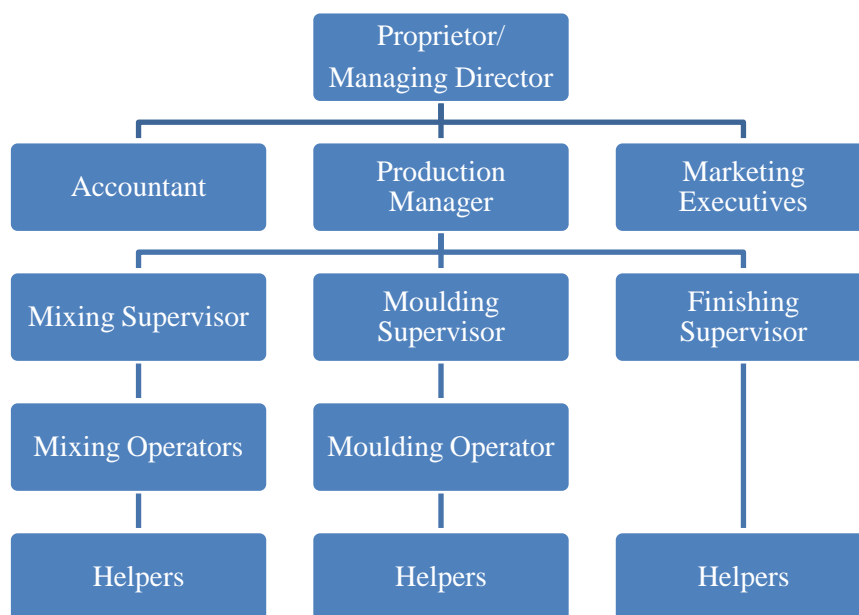
Rubber mat is a piece of flat rubber, generally placed on a floor or other flat surface to cover the surface, to provide insulations, to avoid dust, etc. There are more than 110 rubber mat manufacturing units in Kerala. Major clusters for rubber mat manufacturing units in Kerala are Kottayam (Poovanthruthu) and Changanacherry.

Types of sub product categories

There are no sub product categories in Rubber matting product segment. However, Rubber mats are used for various purposes and the utilities differ based on the end consumer.

3.2.1.12 Organisation structure

Figure 20: Organisation structure of rubber matting manufacturing units



In case of small units, the activities of the human resource function are executed by Proprietor or Production Manager.

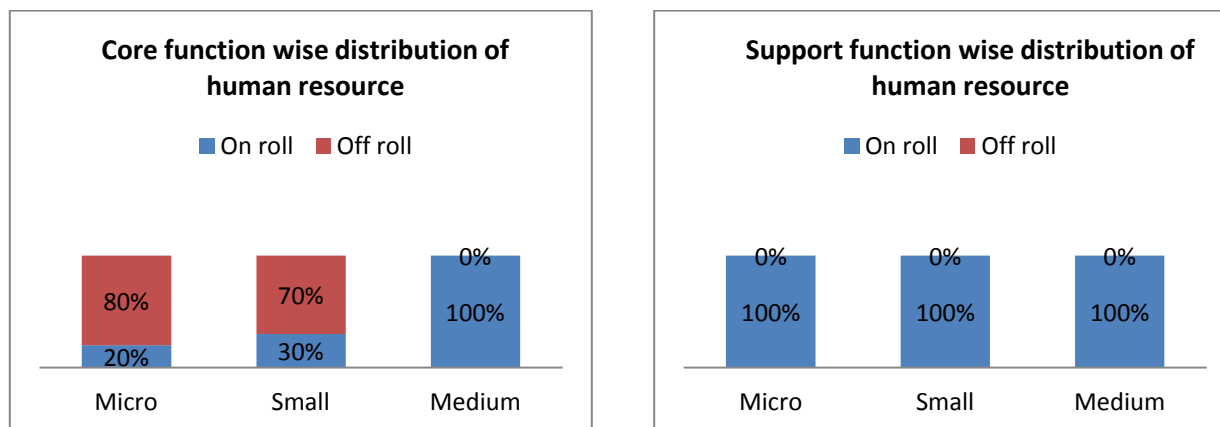
In case of a micro units, there are no supporting departments observed, the activities of the supporting functions are executed by Proprietor or Production Manager. There are no supervisory role observed, operator directly reports to production manager or proprietor.

Sample covered

	Micro	Small	Medium	Large	Total
No. of units	32	5	2	0	39

Function wise distribution of human resource

Figure 21: Function wise distribution of human resource



3.2.1.13 Job role wise distribution of human resource

Majority of the human resource deployed in rubber matting units are under moulding operator and finishing helper job role.

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Mixing	Mixing Supervisor	25	Accounts	Manager Accounts	13
	Mixing Operator	65		Accountant	21
	Helpers	92		Manager Purchase/Dispatch	11
Moulding	Moulding Supervisor	22	Purchase	Stores Assistant	14
	Moulding Operator	101	Marketing	Manager Marketing	7
	Helpers	85	Admin / HR	Admin / HR Manager	9

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Finishing	Finishing Supervisor	14	General	Proprietor/MD	38
	Finishing Operator	45		General Manager	22
	Helper	92		Production Manager	15
Packaging and Dispatch	Packaging and Dispatch Supervisor	15	Production	Shift In-charge	15
	Helpers	68			

Qualification wise distribution of human resource

Table 18: Qualification wise distribution of human resource

Qualification	Micro	Small	Medium
Ph.D / Research	0%	0%	0%
Engineers	0%	0%	5%
BA / BSc/B Com	10%	15%	15%
Diploma Engineers	0%	5%	5%
ITI / Vocational Education	0%	5%	5%
12th std / 10th std pass	50%	20%	25%
Below 10th standard	40%	55%	40%
Others (specify - Such as MBAs, CA, ICWA, CS, etc.)	0%	0%	5%
TOTAL	100%	100%	100%

Skill gap analysis

Table 19: Occupation wise distribution of job roles

Occupation	Production management	Mixing	Milling	Moulding	Finishing, Packing and Dispatch
Job Roles	Production Manager	Mixing Supervisor	Milling Operator	Moulding Supervisor	Finishing Supervisor
		Mixing Operator		Moulding Operator	Helper
		Helper		Helper	

Occupation: Production Management

Following job roles are involved in production occupation:

- Production manager

Occupation: Production Management

Job Role: Production Manager

Qualification and Experience: B.E (Mechanical/Rubber Technology/etc) with 10 to 15 years of experience in rubber industry

Roles and Responsibilities:

- Monitor the production process
- Co ordinate with the other departments
- Recruit and manage human resources in the shop floor
- Production planning and scheduling
- Quality checking

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:	Particulars	Micro	Small	Medium	Large
	<ul style="list-style-type: none"> ▪ In depth knowledge about production process ▪ Knowledge on properties of various raw materials used for production ▪ Basic knowledge of machine operation ▪ Basic knowledge on formulations (Compound) ▪ Ability to take corrective actions if there is an issue in the production process ▪ Inventory control management – ability to maintain inventory at optimum level ▪ Knowledge on new industry trends in manufacturing ▪ Ability to do a quality check at various stage of processing 	M	M	M	
Managerial skills:	Particulars	Micro	Small	Medium	Large
	<ul style="list-style-type: none"> ▪ Ability to coordinate with supervisors to ensure smooth production process 				

- People management skills – to manage the employees and address their issues if any
- Ability to plan and schedule (men, material and production)
- Ability to take decisions for corrective action / improvement

Soft skills:

- Communication skills – to interact with senior management and operators. Hindi language is required as workers are from northern states
- Conflict resolution skills

H – High; M – Medium; L – Low

Occupation: Mixing

Following job roles are involved in mixing occupation:

- Mixing Supervisor
- Mixing Operator
- Helper

Occupation: Mixing

Job Role: Mixing Supervisor

Qualification and Experience: Diploma / ITI (any specialisation) with 5 to 10 years of experience in rubber industry

Roles and Responsibilities:

- Supervise the mixing process
- Inventory management
- Production planning for mixing (requirement based on the output of finished products)
- Training operators on mixing machine operation and process
- Call for maintenance activity of machine as and when required
- Quality check of compound

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge about the process – understanding on why the chemicals, oils and other raw materials are used in the process

Particulars	Micro	Small	Medium	Large
▪ Inadequate process knowledge (Not keen on understanding in-	NA	L	M	

<ul style="list-style-type: none"> ▪ Knowledge on the machines used for production and machine operation ▪ Knowledge about the mixing machine used (Judge the performance of machine, fixing minor issues, etc.) ▪ Ability to understand the formulation (required to make compound) ▪ Instruct the operator/helper on mixing proportion ▪ Skills to perform quality check of the compound through visual examination for colour and air pocket ▪ Ability to check machines for issues and call for maintenance activity as required <p>Managerial skills:</p> <ul style="list-style-type: none"> ▪ Raw material inventory management – ensuring that adequate rubber, chemicals, process oils, fillers are available for the day's production and informing to manager for requisition ▪ Ability to monitor the work process viz. mixing and calendaring ▪ Ability to train the operator on mixing machine operation and compounding knowledge <p>Soft skills:</p> <ul style="list-style-type: none"> ▪ Communication skills – to interact with operators ▪ Ability to coordinate with departments in the units such as purchase, moulding, etc ▪ Decision making ability – to decide on inventory level, etc. 	<p>depth process details such as preparation of rubber compound in accurate proportion which can reduce wastage and improve quality)</p> <ul style="list-style-type: none"> ▪ Lack of attitudinal flexibility to adapt and accept any new technology or newer methods. This is because of their experience and accustomed to traditional methods ▪ Supervisor is a local person and not able to converse in Hindi and not able to effectively communicate with workers from northern states
H – High; M – Medium; L – Low	M to L L
	M M

Occupation: Mixing

Job Role: Mixing Operator

Qualification and Experience: ITI/ 12th/10th and minimum 1 year of experience in rubber industry

Roles and Responsibilities:

- Mixing of Rubber and other raw material to make rubber compound
- Co ordinate with Supervisor to understand production requirements
- Co ordinate with helpers for production process

- Machine operation and basic maintenance

Knowledge and Skill Requirement	Skill Gaps and Intensity level of skill gap				
	Particulars	Micro	Small	Medium	Large
Technical skills: <ul style="list-style-type: none">▪ Basic knowledge on the properties of raw materials used▪ Knowledge about the mixing machine, its controls and basic maintenance▪ Ability to understand the formulation given in the sheet – name of raw materials and desired quantity▪ Ability to mix in the order of addition as follows – Natural Rubber → chemicals → fillers → Sulphur▪ Ability to control the machine operation – adjusting mixing time according to output, usage of emergency stop button, other control options▪ Ability to judge the quality of the compound through visual examination▪ Ability to make the compound to sheets using the open mixing mill based on the desired thickness levels	<ul style="list-style-type: none">▪ New operators lacks adequate process knowledge and takes time to understand the process (typically 6 months to 1 year to work independently)▪ Lack of adequate knowledge about the machine and require maintenance team help to fix minor problems	M	M	L	
		M	L	L	
Soft skills: <ul style="list-style-type: none">▪ Communication skills – to interact with supervisor and helper	<ul style="list-style-type: none">▪ Operators from northern states such as Assam and Odisha are not able to communicate well with supervisors (local people – south states) and there is a delay in work due to this	H	H	H	

H – High; M – Medium; L – Low

H – High; M – Medium; L – Low

Occupation: Mixing

Job Role: Helper

Qualification and Experience: 10th/ School drop outs

Roles and Responsibilities:

- Identify raw material used for mixing, weigh them and prepare the batch
- Help operator with loading / unloading of materials for mixing process
- Maintain the work environment (cleaning the machines, floor, etc)

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ Ability to identify different raw materials (Read labels and names of the package) ▪ Ability to use weighing scale ▪ Ability to use knives and cut the compound for sizing in the desired shape ▪ Knowledge of material handling ▪ Ability to listen for instructions and perform work accordingly ▪ Knowledge of safety procedures 	<ul style="list-style-type: none"> ▪ Inadequate knowledge on quality and safety procedures ▪ Inability to work in different sections of production (lack multi skilling) as required 	M	M	L

H – High; M – Medium; L – Low

Occupation: Milling

Following job roles are involved in milling occupation:

3.1.1 Milling Operator

Occupation: Milling

Job Role: Milling Operator

Qualification and Experience: ITI/ 12th/10th and minimum 1 year of experience in rubber industry

Roles and Responsibilities:

- Warm and mill the compound for moulding process
- Operate milling machine
- Co ordinate with mixing and moulding section on production requirement

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Particulars	Micro	Small	Medium	Large
Technical skills: <ul style="list-style-type: none"> ▪ Knowledge of open mixing mill machine operation ▪ Ability to maintain the temperature of the machine as per process parameter ▪ Ability to understand the measurement specification and make sheets accordingly ▪ Ability to use the gauge in the machine to roll out sheets in the specified width ▪ Ability to coordinate with mixing operator 	<ul style="list-style-type: none"> ▪ Inability to control temperature consistently in machine leading to damage in compound 	M	L	L

and moulding operator to understand the requirement and plan work accordingly

H – High; M – Medium; L – Low

Occupation: Moulding

Following job roles are involved in moulding occupation:

5. Moulding Supervisor
6. Moulding Operator
7. Helper

Occupation: Moulding

Job Role: Moulding Supervisor

Qualification and Experience: Diploma / ITI (any specialisation) with 5 to 10 years of experience in rubber industry

Roles and Responsibilities:

- Supervise the moulding process
- Production planning for moulding (as per number unit of output of finished products)
- Training operators on hydraulic press machine operation and process
- Call for maintenance activity of machine when required
- Co ordinate with mixing and finishing section to understand requirement
- Quality check of moulded product

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Overall process knowledge
- Knowledge about the hydraulic press machine and ability to operate
- Knowledge about curing
- Knowledge of requirement of curing temperature and curing time according to various products
- Ability to perform quality check of the compound through visual examination
- Ability to coordinate with other department supervisors for scheduling the work
- Ensuring safety in the workplace (example: ensuring that press operators wears gloves)
- Ability to check machines for issues and

Particulars	Micro	Small	Medium	Large
▪ Inadequate people management skills		M	L	

call for maintenance activity as required

Managerial skills:

- Monitoring the curing process
- Train the operators on any new methods and improve their understanding

Soft skills:

- Communication skills – to interact with operators
- Ability to coordinate with departments in the units such as mixing, finishing, etc

H – High; M – Medium; L – Low

Occupation: Moulding

Job Role: Moulding Operator

Qualification and Experience: ITI/ 12th/10th with minimum 1 year of experience in rubber industry

Roles and Responsibilities:

- Perform moulding process
- Operate hydraulic press machine and basic maintenance of the machine
- Perform finishing function such as trimming of flashes (case specific)
- Train helpers on operating the press machine

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Ability to operate the hydraulic pressing machine
- Understanding the specifications of the machine (power, temperature, curing time, press, etc)
- Ability to place the required compound (which is cut and in shape) between the moulds
- Ability to remove the mats from the mould safely (usage of gloves as it will be hot)
- Identify mistakes/excessive wastages in the output and inform to supervisor to correct the compound formulation
- Ability to remove the flaps from the finished product (case specific)

Soft skills:

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ New operators lacks adequate process knowledge a(Usage of hydraulic press to take out moulded mats) and takes time to understand (around 6 months to 1 year) ▪ Lack of adequate in-depth understanding of Curing specifications 	M	M	L	
	M	M	L	

- Communication skills – to interact with supervisor and helper
- (Curing time and temperature for different types of mats)

H – High; M – Medium; L – Low

Occupation: Moulding

Job Role: Helper

Qualification and Experience: 10th/ School drop outs

Roles and Responsibilities:

- Co ordinate with operator for moulding process
- Listen for instruction and work accordingly
- Maintain the work environment clean (including machines)

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Ability to collect the required compound (in sheet form) from milling section to moulding section
- Ability to place the compound appropriately to assist the operator for smooth moulding process
- Knowledge of material movement (where to move the moulded mats)
- Ability to maintain the workplace clean

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> Inability to follow the instructions accurately and misplacement of goods Inadequate knowledge on quality standards 	M	M		
	M	L		

H – High; M – Medium; L – Low

Occupation: Finishing, Packing & Dispatch

Following job roles are involved in finishing, packaging and dispatch occupation:

- Finishing Supervisor
- Helper

Occupation: Finishing, Packing and Dispatch

Job Role: Finishing Supervisor

Qualification and Experience: ITI /12th/10th with 5 years of experience in rubber industry

Roles and Responsibilities:

- Supervise the finishing and packing process
- Co ordinate with moulding section
- Co ordinate with logistics for delivery of goods

- People management in the finishing section
- Random quality checking

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Ability to understand the order requirement and ensuring the availability of finished goods to deliver on time
- Ability to follow up with the production department on the production status
- Ability to maintain adequate inventory for ready dispatch
- Monitor the finishing and packing process
- Ability to do a random quality check by visual examination of the finished product
- Ability to understand the packing requirements' from customer and deliver them accordingly
- Ability to coordinate with transportation/ logistics partner and ensure timely dispatch of goods
- Knowledge on document required for dispatch such as delivery order, etc.

Managerial skills:

- Monitoring the work process
- Ability to get required human resources when required

Soft skills:

- Communication skills – to interact with operators
- Ability to resolve human resource issues

Particulars	Micro	Small	Medium	Large
▪ Inadequate ability to coordinate with other department (the finishing process starts after production process and needs to follow up constantly with production supervisors on the production schedule)	M	L	L	
▪ Inadequate planning skills (number of people required for finishing according to production – as this is a manual process)	M	L	L	

H – High; M – Medium; L – Low

Occupation: Finishing, Packing and Dispatch

Job Role: Helper

Qualification and Experience: 10th standard/school drop out

Roles and Responsibilities:

- Understand finishing requirement and finish (trimming, painting, etc) rubber mats
- Pack the finish product

Material movement

Knowledge and Skill Requirement

- Ability to trim the excess/additional rubber in the mats (Process of deflashing)
- Usage of knives and scissors to deflash
- Ability to trim only the additional rubber else may lead to rejection of the piece
- Finishing work such as painting in the soul may also be done
- Sorting and packing (Bundling)
- Loading the finished goods for dispatch according to orders

Skill Gaps and Intensity level of skill gap

Particulars	Micro	Small	Medium	Large
Inadequate understanding of finishing requirement for various types of rubber mats	M	M	M	
Inadequate communication skills (listening)	M	M	L	

H – High; M – Medium; L – Low

Job role wise distribution in all the units for the product segment of Rubber Matting (Estimated)

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Mixing	Mixing Supervisor	57	Accounts	Manager Accounts	29
	Mixing Operator	144		Accountant	47
	Helpers	206	Purchase	Manager Purchase/Dispatch	24
Moulding	Moulding Supervisor	49		Stores Assistant	31
	Moulding Operator	225	Marketing	Manager Marketing	16
	Helpers	190	Admin / HR	Admin / HR Manager	20
Finishing	Finishing Supervisor	31	General	Proprietor/MD	86
	Finishing Operator	100		General Manager	49
	Helper	206	Production	Production Manager	33

Packaging and Dispatch	Packaging and Dispatch Supervisor	33			
	Helpers	152		Shift In-charge	33

Summary Sheet: Rubber Matting

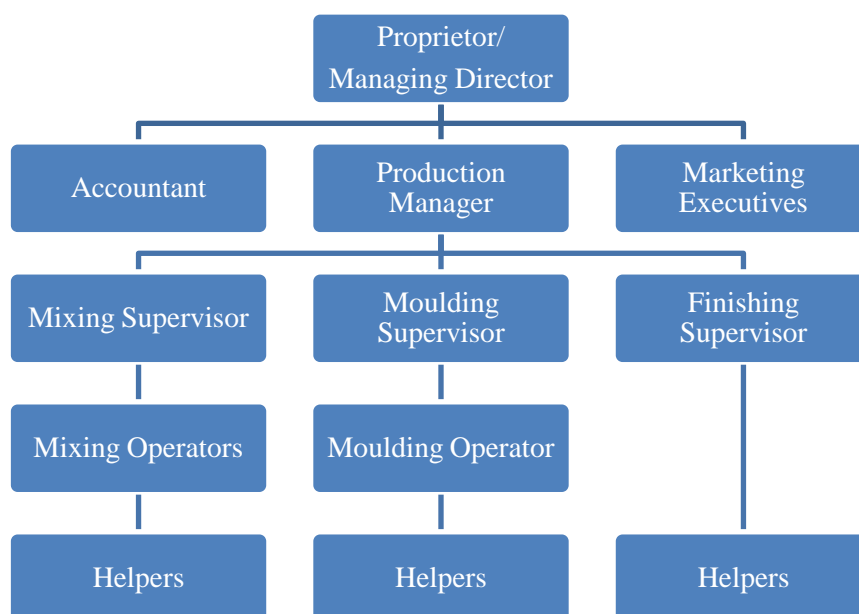
Categories	Total no. of rubber matting product manufacturing units in Kerala					112	Qualification wise distribution of human resource		
N/A	Distribution of Sheeting units	Micro	Small	Medium	Large	Total	Ph.D / Research Engineers BA/BSc/B Com Diploma Engineers ITI/Vocational Education 12th std/10th std pass Below 10th std Others (MBAs, CA, ICWA, CS, etc.) Total	0%	
		91%	6%	3%	0%	100%		0%	
	No. of people employed	1393	388	334	0	2114		5-10%	
	Manufacturing					Support		1%	
	Total no. of occupations identified		8		6	1%			
	Total no. of job roles identified		21		12	40-45%			
User industry	Critical job roles (in terms of skill requirement)	Mixing operator, calendaring operator and finishing operator					45-55%		
<ul style="list-style-type: none">HouseholdIndustrial use							0%		
	Industry Suggestions <ul style="list-style-type: none">Exposure to machine operation has to be given at training stage especially for calendaring						Function wise distribution of human resource		
								On roll	Off roll
							Core function	72%	28%
							Support function	100%	0%

1.3.10 Rubberised Coir, Jute and Woolen Product

Rubberised Coir, Jute and Woolen products are the products which use rubber and one of the materials (coir / jute / etc) to manufacture a product. These are similar to the rubber mats. These products are quite popular in the home furnishing industry.

Organisation structure

Figure 22: Organisation structure of rubber matting manufacturing units



In case of small units, the activities of the human resource function are executed by Proprietor or Production Manager.

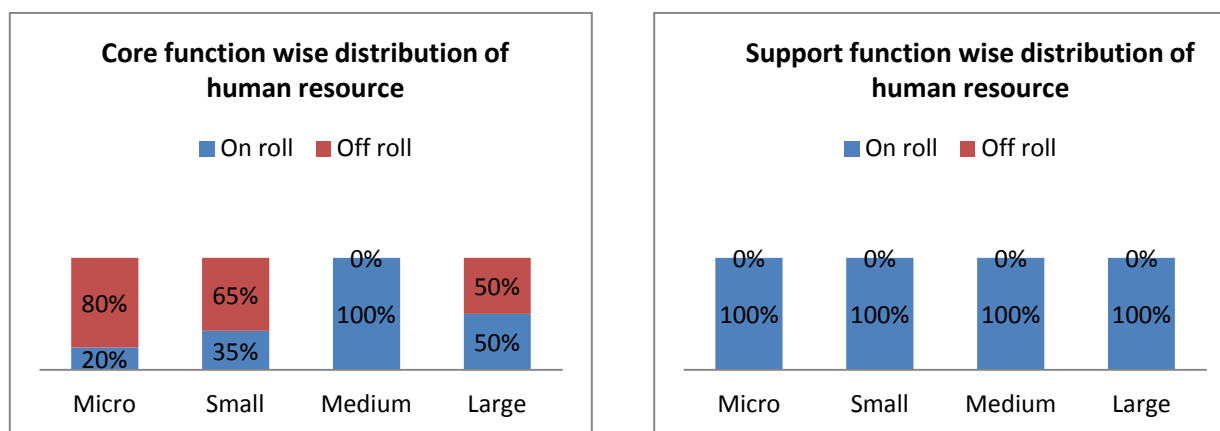
In case of a micro units, there are no supporting departments observed, the activities of the supporting functions are executed by Proprietor or Production Manager. There are no supervisory role observed, operator directly reports to production manager or proprietor.

Sample covered

	Micro	Small	Medium	Large	Total
No. of units	17	3	2	1	23

Function wise distribution of human resource

Figure 23: Function wise distribution of human resource



Job role wise distribution of human resource

Majority of the human resource deployed in rubberized coir, jute and woolen product units are under moulding operator and finishing operator job role.

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Mixing	Mixing Supervisor	37	Accounts	Manager Accounts	19
	Mixing Operator	95		Accountant	31
	Helpers	135		Manager Purchase/Dispatch	16
	Moulding Supervisor	32	Purchase	Stores Assistant	20
Moulding	Moulding Operator	147	Marketing	Manager Marketing	11
	Helpers	125	Admin / HR	Admin / HR Manager	13
Finishing	Finishing Supervisor	20	General	Proprietor/MD	56

Occupation	Job role	Number of people	Occupation	Job role	Number of people
	Finishing Operator	66	Production	General Manager	32
	Helper	135		Production Manager	22
Packaging and Dispatch	Packaging and Dispatch Supervisor	22		Shift In-charge	22
	Helpers	100			

Note – Helpers involve in multiple work. They also involve in cutting coir, etc.

Qualification wise distribution of human resource

Table 20: Qualification wise distribution of human resource

Qualification	Micro	Small	Medium	Large
Ph.D / Research Engineers	0%	0%	0%	0%
BA / BSc/B Com	10%	15%	15%	15%
Diploma Engineers	0%	5%	5%	5%
ITI / Vocational Education	0%	5%	5%	5%
12th std / 10th std pass	40%	15%	25%	40%
Below 10th standard	50%	60%	40%	25%
Others (specify - Such as MBAs, CA, ICWA, CS, etc.)	0%	0%	5%	5%
TOTAL	100%	100%	100%	100%

Skill gap analysis

Table 21: Occupation wise distribution of job roles

Occupation	Production Management	Mixing	Milling	Moulding	Finishing, Packing and Dispatch
Job Roles	Production Manager	Mixing Supervisor	Milling Operator	Moulding Supervisor	Finishing Supervisor
		Mixing Operator		Moulding Operator	Helper
		Helper		Helper	

Occupation: Production Management

Following job roles are involved in production occupation:

- Production manager

Occupation: Production Management

Job Role: Production Manager

Qualification and Experience: B.E (Mechanical/Rubber Technology/etc) with 10 to 15 years of experience in rubber industry

Roles and Responsibilities:

- Monitor the production process
- Co ordinate with the other departments
- Recruit and manage human resources in the shop floor
- Production planning and scheduling
- Quality checking

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- In depth knowledge about production process
- Knowledge on properties of various raw materials used for production
- Basic knowledge of machine operation
- Basic knowledge on formulations (Compound)
- Ability to take corrective actions if there is an issue in the production process
- Inventory control management – ability to maintain inventory at optimum level
- Knowledge on new industry trends in manufacturing
- Ability to do a quality check at various stage of processing

Managerial skills:

- Ability to coordinate with supervisors to ensure smooth production process

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> Lack of adequate knowledge on new industry trends in manufacturing process 	M	M	NA	NA

- People management skills – to manage the employees and address their issues if any
- Ability to plan and schedule (men, material and production)
- Ability to take decisions for corrective action / improvement

Soft skills:

- Communication skills – to interact with senior management and operators. Hindi language is required as workers are from northern states
- Conflict resolution skills

H – High; M – Medium; L – Low

Occupation: Mixing

Following job roles are involved in mixing occupation:

- Mixing Supervisor
- Mixing Operator
- Helper

Occupation: Mixing

Job Role: Mixing Supervisor

Qualification and Experience: Diploma / ITI (any specialisation) with 5 to 10 years of experience in rubber industry

Roles and Responsibilities:

- Supervise the mixing process
- Inventory management
- Production planning for mixing (requirement based on the output of finished products)
- Training operators on mixing machine operation and process
- Call for maintenance activity of machine as and when required
- Quality check of compound

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge about the process – understanding on why the chemicals, oils and other raw materials are used in the

Particulars	Micro	Small	Medium	Large
▪ Inadequate process knowledge (Not keen on	NA	L		

<p>process</p> <ul style="list-style-type: none"> Knowledge on the machines used for production and machine operation Knowledge about the mixing machine used (Judge the performance of machine, fixing minor issues, etc.) Ability to understand the formulation (required to make compound) Instruct the operator/helper on mixing proportion Skills to perform quality check of the compound through visual examination for colour and air pocket Ability to check machines for issues and call for maintenance activity as required <p>Managerial skills:</p> <ul style="list-style-type: none"> Raw material inventory management – ensuring that adequate rubber, chemicals, process oils, fillers are available for the day's production and informing to manager for requisition Ability to monitor the work process viz. mixing and calendaring Ability to train the operator on mixing machine operation and compounding knowledge <p>Soft skills:</p> <ul style="list-style-type: none"> Communication skills – to interact with operators Ability to coordinate with departments in the units such as purchase, moulding, etc Decision making ability – to decide on inventory level, etc. 	<p>understanding in-depth process details such as preparation of rubber compound in accurate proportion which can reduce wastage and improve quality)</p> <ul style="list-style-type: none"> Lack of attitudinal flexibility to adapt and accept any new technology or newer methods. This is because of their experience and accustomed to traditional methods Supervisor is a local person and not able to converse in Hindi and not able to effectively communicate with workers from northern states 	<p>M to L</p> <p>M</p>
H – High; M – Medium; L – Low		

Occupation: Mixing

Job Role: Mixing Operator

Qualification and Experience: ITI/ 12th/10th and minimum 1 year of experience in rubber industry

Roles and Responsibilities:

- Mixing of Rubber and other raw material to make rubber compound

- Co ordinate with Supervisor to understand production requirements
- Co ordinate with helpers for production process
- Machine operation and basic maintenance

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Basic knowledge on the properties of raw materials used
- Knowledge about the mixing machine, its controls and basic maintenance
- Ability to understand the formulation given in the sheet – name of raw materials and desired quantity
- Ability to mix in the order of addition as follows – Natural Rubber → chemicals → fillers → Sulphur
- Ability to control the machine operation – adjusting mixing time according to output, usage of emergency stop button, other control options
- Ability to judge the quality of the compound through visual examination
- Ability to make the compound to sheets using the open mixing mill based on the desired thickness levels

Soft skills:

- Communication skills – to interact with supervisor and helper

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ New operators lacks adequate process knowledge and takes time to understand the process (typically 6 months to 1 year to work independently) 	M	M		
<ul style="list-style-type: none"> ▪ Lack of adequate knowledge about the machine and require maintenance team help to fix minor problems 	M	L		
<ul style="list-style-type: none"> ▪ Operators from northern states such as Assam and Odisha are not able to communicate well with supervisors (local people – south states) and there is a delay in work due to this 	H	H		

H – High; M – Medium; L – Low

Occupation: Mixing

Job Role: Helper

Qualification and Experience: 10th/ School drop outs

Roles and Responsibilities:

- Identify raw material used for mixing, weigh them and prepare the batch
- Help operator with loading / unloading of materials for mixing process
- Maintain the work environment (cleaning the machines, floor, etc)

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

- Ability to identify different raw materials (Read labels and names of the package)
- Ability to use weighing scale
- Ability to use knives and cut the compound for sizing in the desired shape
- Knowledge of material handling
- Ability to listen for instructions and perform work accordingly
- Knowledge of safety procedures

Particulars	Micro	Small	Medium	Large
▪ Inadequate knowledge on quality and safety procedures	M	M		
▪ Inability to work in different sections of production (lack multi skilling) as required	M	M		

H – High; M – Medium; L – Low

Occupation: Milling

Following job roles are involved in milling occupation:

4.1.1 Milling Operator

Occupation: Milling

Job Role: Milling Operator

Qualification and Experience: ITI/ 12th/10th and minimum 1 year of experience in rubber industry

Roles and Responsibilities:

- Warm and mill the compound for moulding process
- Operate milling machine
- Co ordinate with mixing and moulding section on production requirement

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge of open mixing mill machine operation

Particulars	Micro	Small	Medium	Large
▪ Inability to control temperature	M	L		

- Ability to maintain the temperature of the machine as per process parameter
- Ability to understand the measurement specification and make sheets accordingly
- Ability to use the gauge in the machine to roll out sheets in the specified width
- Ability to coordinate with mixing operator and moulding operator to understand the requirement and plan work accordingly

consistently in machine leading to damage in compound

H – High; M – Medium; L – Low

Occupation: Moulding

Following job roles are involved in moulding occupation:

8. Moulding Supervisor
9. Moulding Operator
10. Helper

Occupation: Moulding

Job Role: Moulding Supervisor

Qualification and Experience: Diploma / ITI (any specialisation) with 5 to 10 years of experience in rubber industry

Roles and Responsibilities:

- Supervise the moulding process
- Production planning for moulding (as per number unit of output of finished products)
- Training operators on hydraulic press machine operation and process
- Call for maintenance activity of machine when required
- Co ordinate with mixing and finishing section to understand requirement
- Quality check of moulded product

Knowledge and Skill Requirement

Technical skills:

- Overall process knowledge
- Knowledge about the hydraulic press machine and ability to operate
- Knowledge about curing
- Knowledge of requirement of curing temperature and curing time according to various products
- Ability to perform quality check of the compound through visual examination

Skill Gaps and Intensity level of skill gap

Particulars	Micro	Small	Medium	Large
▪ Inadequate people management skills		M		

- Ability to coordinate with other department supervisors for scheduling the work
- Ensuring safety in the workplace (example: ensuring that press operators wears gloves)
- Ability to check machines for issues and call for maintenance activity as required

Managerial skills:

- Monitoring the curing process
- Train the operators on any new methods and improve their understanding

Soft skills:

- Communication skills – to interact with operators
- Ability to coordinate with departments in the units such as mixing, finishing, etc

H – High; M – Medium; L – Low

Occupation: Moulding

Job Role: Moulding Operator

Qualification and Experience: ITI/ 12th/10th with minimum 1 year of experience in rubber industry

Roles and Responsibilities:

- Perform moulding process
- Operate hydraulic press machine and basic maintenance of the machine
- Perform finishing function such as trimming of flashes (case specific)
- Train helpers on operating the press machine

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Ability to operate the hydraulic pressing machine
- Understanding the specifications of the machine (power, temperature, curing time, press, etc)
- Ability to place the required compound (which is cut and in shape) between the moulds
- Ability to remove the mats from the mould safely (usage of gloves as it will be

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ New operators lacks adequate process knowledge a(Usage of hydraulic press to take out moulded mats) and takes time to understand 	M	M		
	M	M		

hot) <ul style="list-style-type: none"> Identify mistakes/excessive wastages in the output and inform to supervisor to correct the compound formulation Ability to remove the flaps from the finished product (case specific) Soft skills: <ul style="list-style-type: none"> Communication skills – to interact with supervisor and helper 	(around 6 months to 1 year) <ul style="list-style-type: none"> Lack of adequate in-depth understanding of Curing specifications (Curing time and temperature for different types of mats)
H – High; M – Medium; L – Low	

Occupation: Moulding

Job Role: Helper

Qualification and Experience: 10th/ School drop outs

Roles and Responsibilities:

- Co ordinate with operator for moulding process
- Listen for instruction and work accordingly
- Maintain the work environment clean (including machines)

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:	Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> Ability to collect the required compound (in sheet form) from milling section to moulding section Ability to place the compound appropriately to assist the operator for smooth moulding process Knowledge of material movement (where to move the moulded mats) Ability to maintain the workplace clean 	<ul style="list-style-type: none"> Inability to follow the instructions accurately and misplacement of goods Inadequate knowledge on quality standards 	M	M		
		M	L		
H – High; M – Medium; L – Low					

Occupation: Finishing, Packing & Dispatch

Following job roles are involved in finishing, packaging and dispatch occupation:

- Finishing Supervisor
- Helper

Occupation: Finishing, Packing and Dispatch

Job Role: Finishing Supervisor

Qualification and Experience: ITI /12th/10th with 5 years of experience in rubber industry

Roles and Responsibilities:

- Supervise the finishing and packing process
- Co ordinate with moulding section
- Co ordinate with logistics for delivery of goods
- People management in the finishing section
- Random quality checking

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Ability to understand the order requirement and ensuring the availability of finished goods to deliver on time
- Ability to follow up with the production department on the production status
- Ability to maintain adequate inventory for ready dispatch
- Monitor the finishing and packing process
- Ability to do a random quality check by visual examination of the finished product
- Ability to understand the packing requirements' from customer and deliver them accordingly
- Ability to coordinate with transportation/ logistics partner and ensure timely dispatch of goods
- Knowledge on document required for dispatch such as delivery order, etc.

Managerial skills:

- Monitoring the work process
- Ability to get required human resources when required

Soft skills:

- Communication skills – to interact with operators
- Ability to resolve human resource issues

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ Inadequate ability to coordinate with other department (the finishing process starts after production process and needs to follow up constantly with production supervisors on the production schedule) 	M	L		
<ul style="list-style-type: none"> ▪ Inadequate planning skills (number of people required for finishing according to production – as this is a manual process) 	M	L		

H – High; M – Medium; L – Low

Occupation: Finishing, Packing and Dispatch

Job Role: Helper

Qualification and Experience: 10th standard/school drop out

Roles and Responsibilities:

- Understand finishing requirement and finish (trimming, painting, etc) rubber mats
- Pack the finish product
- Material movement

Knowledge and Skill Requirement

- Ability to trim the excess/additional rubber in the mats (Process of deflashing)
- Usage of knives and scissors to deflash
- Ability to trim only the additional rubber else may lead to rejection of the piece
- Finishing work such as painting in the soul may also be done
- Sorting and packing (Bundling)
- Loading the finished goods for dispatch according to orders

Skill Gaps and Intensity level of skill gap

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> Inadequate understanding of finishing requirement for various types of rubber mats 	M	M		
<ul style="list-style-type: none"> Inadequate communication skills (listening) 	M	M		

H – High; M – Medium; L – Low

Current training practices

Particulars	Micro	Small	Medium	Large
Existence of training department/external training programs conducted	Nil	Nil	NA	NA
Areas of training			NA	NA
Duration				
Training coverage				
On the job training	Yes	Yes	NA	NA
Job roles considered	All the job roles at floor level	All the job roles at floor level		

Job role wise distribution in all the units for the product segment of Rubberised Coir, Jute and woolen products (Estimated)

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Mixing	Mixing Superviso	123	Accounts	Manager Accounts	64

Occupation	Job role	Number of people	Occupation	Job role	Number of people
	<i>r</i>				
	<i>Mixing Operator</i>	314		<i>Accountant</i>	103
	<i>Helpers</i>	449		<i>Manager Purchase/Dispatch</i>	52
Moulding	<i>Moulding Supervisor</i>	107	Purchase	<i>Stores Assistant</i>	68
	<i>Moulding Operator</i>	489	Marketing	<i>Manager Marketing</i>	36
	<i>Helpers</i>	413	Admin / HR	<i>Admin / HR Manager</i>	44
Finishing	<i>Finishing Supervisor</i>	68	General	<i>Proprietor/MD</i>	187
	<i>Finishing Operator</i>	219		<i>General Manager</i>	107
	<i>Helper</i>	449		<i>Production Manager</i>	72
Packaging and Dispatch	<i>Packaging and Dispatch Supervisor</i>	72	Production	<i>Shift In-charge</i>	72
	<i>Helpers</i>	330			

Summary Sheet: Rubberised Coir, Jute and Woolen Products

Categories	Total no. of rubberized coir, jute and woolen product manufacturing units in Kerala					84	Qualification wise distribution of human resource		
N/A	Distribution of Sheeting units	Micro	Small	Medium	Large	Total	Ph.D / Research Engineers BA/BSc/B Com Diploma Engineers ITI/Vocational Education 12th std/10th std pass Below 10th std Others (MBAs, CA, ICWA, CS, etc.) Total		0%
		71%	15%	10%	4%	100%			0%
	No. of people employed	768	1872	163	1800	4603			10%
		Manufacturing				Support			5%
	Total no. of occupations identified		8		6				5%
	Total no. of job roles identified		21		12				40%
User industry	Critical job roles (in terms of skill requirement)	Mixing operator, calendaring operator and finishing operator						40%	
<ul style="list-style-type: none">HouseholdIndustrial use								0%	
	Industry Suggestions <ul style="list-style-type: none">Exposure to machine operation has to be given at training stage						Function wise distribution of human resource		
								On roll	Off roll
							Core function	70%	30%
							Support function	100%	0%

1.3.11 Tread Rubber

3.2.1.14 Segment Overview

The tread of a tire or track refers to the patterns on its rubber circumference that makes contact with the road. There are broadly two types of tread rubber namely hot tread and cold or precured tread rubber.

Hot Tread Rubber



Cold / Precured Tread Rubber

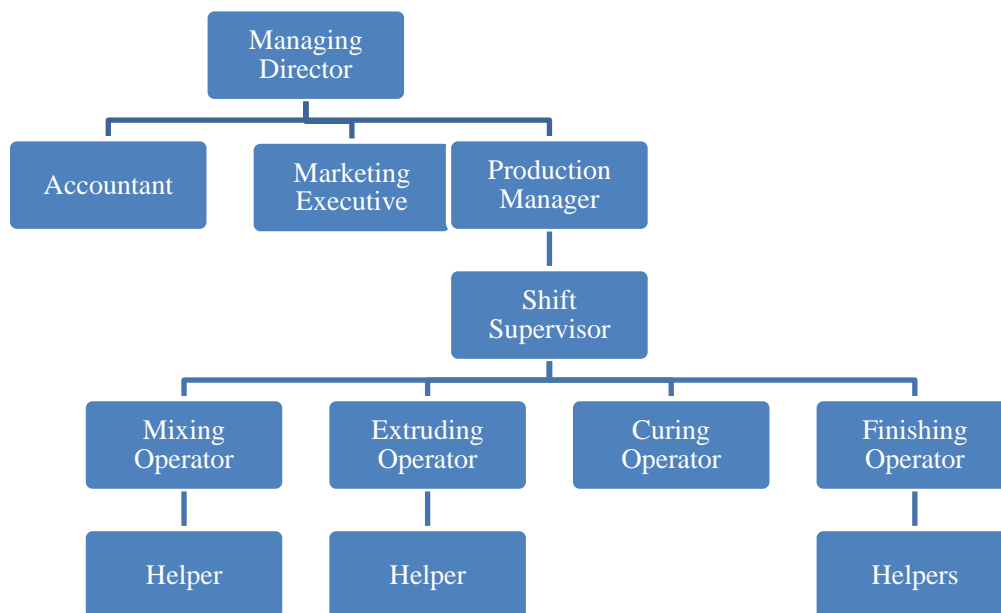


Types of sub product categories

1. Hot / Conventional / Camel back tread Rubber
2. Precured / Cold tread Rubber
3. Precured patches for Tyres
4. Cushion Gum Compound
5. Retreading Cement & Solution

Organisation structure

Figure 24: Organisation structure of tread rubber manufacturing units



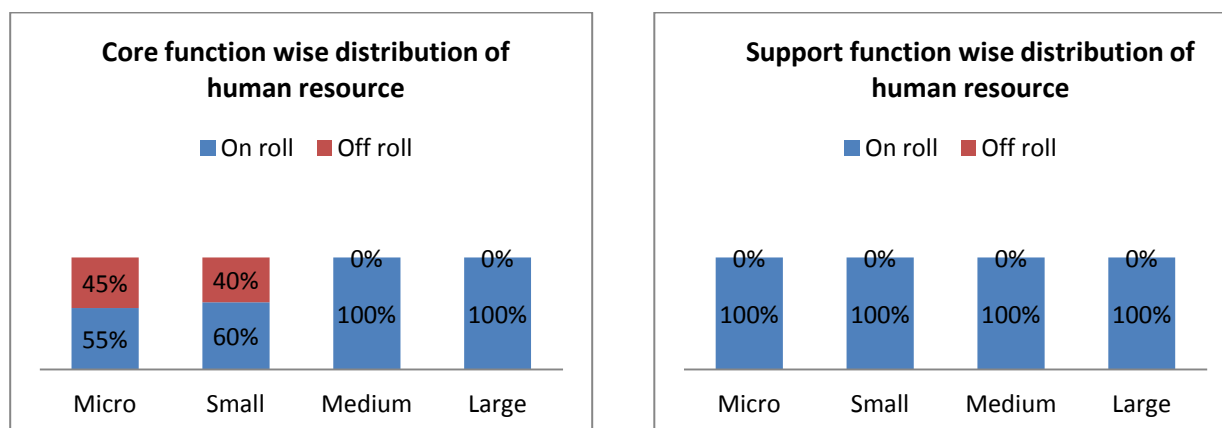
Sample covered

	Micro	Small	Medium	Large	Total
No. of units	37	28	2	3	70

In case of micro units, there are no supporting departments observed. The activities of the supporting department are executed by Proprietor/ Production Manager, who will be managing the Operators and Helpers.

Function wise distribution of human resource

Figure 25: Function wise distribution of human resource



Job role wise distribution of human resource

Majority of the human resource deployed in tread rubber products units are under extrusion operator and mixing operator job role.

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Mixing	Mixing Supervisor	21	Accounts	Manager Accounts	2
	Mixing Operator	124		Accountant	21
	Helpers	35		Manager Purchase	4
Milling	Operators	6	Purchase	Stores Assistant	21
	Helpers	21	Marketing	Manager Marketing	10
Extrusion	Extrusion Supervisor	10	HR	HR Manager	2
	Extruding Operator	155	General	Proprietor/MD	25
		0			0
	Helpers	52		General Manager	21
Moulding / Curing	Moulding Operator	41	Production	Production Manager	21
	Helper	62		Shift In-charge	14

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Sanding	Sanding Operator	10			
	Helper	6			
Finishing	Helper	64			
Quality check	Quality incharge	10			
Packaging and Dispatch	Packaging and Dispatch Supervisor	21			
	Helpers	135			

Qualification wise distribution of human resource

Table 22: Qualification wise distribution of human resource

Qualification	Micro	Small	Medium	Large
Ph.D / Research	0%	0%	0%	0%
Engineers	0%	0%	0%	0%
BA / BSc/B Com	15%	10%	20%	30%
Diploma Engineers	0%	0%	0%	0%
ITI / Vocational Education	1%	2%	0%	0%
12th std / 10th std pass	28%	57%	60%	30%
Below 10th standard	56%	31%	20%	40%
Others (specify - Such as MBAs, CA, ICWA, CS, etc.)	0%	0%	0%	0%
TOTAL	100%	100%	100%	100%

Skill gap analysis

Table 23: Occupation wise distribution of job roles

Occupation	Production	Mixing	Milling	Extrusion	Curing	Finishing, Sandering and Packing
Job Roles	Production Manager	Mixing Operator	Millman	Extrusion Operator	Curing Operator	Finishing Operator
	Shift Supervisor	Helper		Helper		Helper

Occupation: Production

Following job roles are involved in production occupation:

1. Production Manager
2. Shift Supervisor

Occupation: Production

Job Role: Production Manager

Qualification and Experience: B.E (Mechanical/Rubber Technology/etc) / Diploma with 10 to 15 years of experience in rubber industry

Roles and Responsibilities:

- Monitor the production process
- Coordinate with other departments
- Manage human resources in the shop floor
- Production planning and scheduling
- Ensure adequate availability of raw materials
- Quality checking

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- In depth knowledge about production process
- Knowledge on properties of various raw materials used for production
- Basic knowledge of machine operation
- Basic knowledge on formulations (Compound)
- Knowledge of tyre industry and it's trends
- Ability to take corrective actions if there is an issue in the production process
- Inventory control management – ability to maintain inventory at optimum level
- Knowledge on new industry trends in manufacturing
- Ability to do a quality check at various stage of processing
- Basic knowledge on finance and purchase

Managerial Skills

- Ability to coordinate with supervisor and operators to ensure smooth production process

Particulars	Micro	Small	Medium	Large
Lack of adequate knowledge on new industry trends (including tyre and retreading industry) in manufacturing	M	L	L	L

- People management skills – to manage the employees and address their issues if any
- Ability to plan and schedule (men, material and production)
- Ability to take decisions for corrective action / improvement

Soft Skills

- Ability to interact and co ordinate work with senior management and operators
- Conflict resolution skills

H- High; M – Medium; L- Low

Occupation: Production

Job Role: Shift in charge

Qualification and Experience: Diploma / ITI (any specialisation) with 5 – 10 years of experience in rubber industry

Roles and Responsibilities:

- Plan for production schedule (daily and weekly)
- Manage people and material
- Perform quality check
- Monitor the production process
- Perform the role of manager in his absence

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Process knowledge and good understanding about each process (reasons for why the chemicals, oils are used, technical details of extrusion process, etc)
- Knowledge on machineries used for production
- Knowledge on different
- Knowledge on extrusion and curing process and process parameters
- Ability to judge the performance of the machines and call for periodical maintenance activity
- Ability to take corrective actions in case

Particulars	Micro	Small	Medium	Large
▪ Lack adequate ability to make the operators to comply with quality and safety standards	M	L	L	L
▪ Lack adequate machine maintenance knowledge	M	M	L	L
▪ Lack of adequate people management skills (relying on	-	L	L	L

of issues in production	manager)
Managerial skills	
<ul style="list-style-type: none"> Decision making skills to improve productivity, resolving issues, etc. Ability to manage and resolve any issues of the people in shop floor Ability to monitor the production process Ability to monitor and ensure that quality and safety procedures are followed Ability to plan and schedule production process 	
Soft skills	
<ul style="list-style-type: none"> Ability to interact and co ordinate with operators and helpers in all section 	
H- High; M – Medium; L- Low	

Occupation: Mixing

Following job roles are involved in mixing occupation:

- Mixing Operator
- Helper

Occupation: Mixing

Job Role: Mixing Operator

Qualification and Experience: ITI/ 12th/10th with minimum 1 year of experience in rubber industry

Roles and Responsibilities:

- Mixing of Rubber and other raw material to make rubber compound
- Co ordinate with shift in charge to understand production requirements
- Co ordinate with helpers for production process
- Machine operation and basic maintenance

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

	Particulars	Micro	Small	Medium	Large
Technical skills					
<ul style="list-style-type: none"> Knowledge about the process – understanding on why the chemicals, oils and other raw materials are used in the process 	<ul style="list-style-type: none"> Inconsistency in order of addition 	M	L	L	L
<ul style="list-style-type: none"> Knowledge on the machines used for mixing (open mixing mill / kneader / intermix machine) and basic maintenance skills 	<ul style="list-style-type: none"> Issues in mixing various raw materials (adding twice the same material or leaving out one 	M	M	L	L

- Ability to understand the formulation (required to make compound)
- Ability to mix in the order of addition
- Ability to control the machine operation – adjusting mixing time according to output, usage of emergency stop button, other control options
- Skills to perform quality check of the compound through visual examination
- Ability to check machines for issues and call for maintenance activity as required
- Ability to get work from helpers for weighing, cleaning, loading / unloading, etc.

of the raw material during mixing process)

H- High; M-Medium; L-Low

Occupation: Mixing

Job Role: Helper

Qualification and Experience: 10th/ School drop outs

Roles and Responsibilities:

- Identify raw material used for mixing, weigh them and prepare the batch
- Help operator with loading / unloading of materials for mixing process
- Maintain the work environment (cleaning the machines, floor, etc)

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

- Ability to identify different raw materials (Read labels and names of the package)
- Ability to use weighing scale
- Ability to use knives and cut the compound for sizing in the desired shape
- Knowledge of material handling
- Ability to listen for instructions and perform work accordingly
- Knowledge of safety procedures

Particulars	Micro	Small	Medium	Large
▪ Inadequate knowledge on quality and safety procedures	M	L	L	L
▪ Inability to work in different sections of production (lack multi skilling) as required	M	L	L	L

H- High; M-Medium; L-Low

Occupation: Milling

Following job roles are involved in milling occupation:

2. Millman

Occupation: Milling

Job Role: Millman

Qualification and Experience: ITI/ 12th/10th with minimum 1 year of experience in rubber industry

Roles and Responsibilities:

- Warm and mill the compound for moulding process
- Operate milling machine
- Co ordinate with mixing and extrusion section on production requirement

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

	Particulars	Micro	Small	Medium	Large
Technical skills:					
<ul style="list-style-type: none"> ▪ Knowledge of open mixing mill machine operation ▪ Ability to understand the measurement specification and make sheets accordingly ▪ Ability to use the gauge in the machine to roll out sheets in the specified width ▪ Ability to coordinate with mixing operator and extrusion operator to understand the requirement and plan work accordingly 	Inability to maintain temperature consistently in the machine leading to damage in compound	M	L	L	L

H- High; M-Medium; L-Low

Occupation: Extrusion

Following job roles are involved in extrusion occupation:

1. Extrusion Operator
2. Helper

Occupation: Extrusion

Job Role: Extrusion Operator

Qualification and Experience: ITI/ 12th/10th with minimum 1 year of experience in rubber industry

Roles and Responsibilities:

- Perform extrusion process

- Operate extrusion machine and basic maintenance of the machine
- Train helpers on operating the extrusion machine

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Extrusion machine operation knowledge and basic maintenance skills
- Ability to monitor and maintain the temperature in the extrusion machine
- Ability to fix the appropriate die in the extrusion machine as per the required output
- Ability to insert the pieces / strips of rubber compound consistently in the machine for desired output
- Ability to monitor the tread coming out of the machine for consistent weight, width and length
- During manual rolling of the tread, operator need the ability to pull the tread without elongating it
- Ability to visually check the extruded tread for qualities such as width, length and shape
- Knowledge of safety procedures to be followed and comply them

Particulars	Micro	Small	Medium	Large
▪ Inadequate control on temperature in the extrusion machine leading to product rejection	L	L	L	L
▪ Damage in extruded product during collection of product from extruding machine	M	L	L	L

H-High; M-Medium; L-Low

Occupation: Extrusion

Job Role: Helper

Qualification and Experience: 10th/ School drop outs

Roles and Responsibilities:

- Collect the extruded tread rubber product from the machine
- Assist extrusion operator in the production process
- Maintain cleanliness in the work environment

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Ability to collect the extruded rubber from the machine without damaging the

Particulars	Micro	Small	Medium	Large
Inadequate consistency in following the	M	L	L	L

<p>product</p> <ul style="list-style-type: none"> Knowledge of method of collection of the extruded product (e.g aluminium fabrication is collected in the form of circles in the tray) Ability to ensure that the extruded rubber does not stick together or cut during collection process Knowledge of material storage (how and where to store the extruded rubber collected before vulcanization process) Ability to place the extruded rubber in the vulcaniser (in trays) Ability to maintain the workplace clean 	<p>parameters in collection of extruded rubber products leading to damage / rejection of product</p>
H-High; M-Medium; L-Low	

Occupation: Curing

Following job roles are involved in curing occupation:

1. Curing Operator
2. Helper

Occupation: Curing

Job Role: Curing Operator

Qualification and Experience: ITI/ 12th/10th with minimum 1 year of experience in rubber industry

Roles and Responsibilities:

- Perform moulding process
- Operate hydraulic press machine and basic maintenance of the machine
- Perform finishing function such as trimming of flashes (case specific)
- Train helpers on operating the press machine

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

		Particulars	Micro	Small	Medium	Large
Technical skills:		▪ New operators				
▪ Ability to operate the hydraulic pressing machine ▪ Ability to set the moulds as per required size ▪ Understanding the specifications for the curing process (Power, temperature, curing time, press, etc) ▪ Ability to place the required compound		lacks adequate process knowledge a(Usage of hydraulic press) and takes time to understand (around 6	M	L	L	L

(which is cut and in shape) between the moulds <ul style="list-style-type: none"> ▪ Ability to remove the treads from the mould safely without damage ▪ Ability to remove the flaps from the finished product (case specific) ▪ Ability to comply with quality and safety standards ▪ Ability to check machines for issues and call for maintenance activity as required ▪ Ability to do a visual check for quality on the moulded tread 	months to 1 year) <ul style="list-style-type: none"> ▪ Lack of adequate in-depth understanding of Curing specifications (Curing time and temperature for different types of mats)
H-High; M-Medium; L-Low	

Occupation: Finishing, Sandering and Packing & Dispatch

Following job roles are involved in finishing, sandering and packing and dispatch occupation:

1. Finishing Operator
2. Helper

Occupation: Sandering

Job Role: Finishing Operator

Qualification and Experience: ITI/ 12th/10th and minimum 1 year of experience in rubber industry

Roles and Responsibilities:

- Perform finishing function
- Operate sandering machine
- Quality check on the product

Knowledge and Skill Requirement

- Ability to use the sandering machine for finishing operation
- Knowledge to ensure that the tread is cooled enough and sandering process can be undertaken
- Ability to sand the tread as required (without damaging the tread)
- Ability do a quality check visually on the finished product
- Knowledge of packing and assortment procedures

Skill Gaps and Intensity level of skill gap

Particulars	Micro	Small	Medium	Large
New operators may damage the tread during sandering process	M	L	L	L

- Ability to dispatch finished products as per the order

H-High; M-Medium; L-Low

Occupation: Finishing, Packing and Dispatch

Job Role: Helper

Qualification and Experience: 10th/ School drop outs

Roles and Responsibilities:

- Understand finishing requirement and finish rubber mats
- Pack the finish product
- Material movement

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

- Ability to cut the additional flaps in the cured tread using knives
- Ability to sort and do packing (Bundling)
- Knowledge of material handling and movement
- Loading the finished goods for dispatch according to orders

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> Inadequate knowledge on quality parameters 	M	M	L	L

H-High; M-Medium; L-Low

Job role wise distribution in all the units for the product segment of Tread Rubber Products (Estimated)

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Mixing	Mixing Supervisor	86	Accounts	Manager Accounts	9
	Mixing Operator	518		Accountant	86
	Helpers	147	Purchase	Manager Purchase	17
Milling	Operators	26		Stores Assistant	86
	Helpers	86	Marketing	Manager Marketing	43
Extrusion	Extrusion Supervisor	43	HR	HR Manager	9
	Extruding	647	General	Proprietor/MD	104
	Operator	0			0

Occupation	Job role	Number of people	Occupation	Job role	Number of people
	<i>Helpers</i>	216		<i>General Manager</i>	86
Moulding / Curing	<i>Moulding Operator</i>	173	Production	<i>Production Manager</i>	86
	<i>Helper</i>	259		<i>Shift In-charge</i>	60
Sanding	<i>Sanding Operator</i>	43			
	<i>Helper</i>	26			
Finishing	<i>Helper</i>	268			
Quality check	<i>Quality incharge</i>	43			
Packaging and Dispatch	<i>Packaging and Dispatch Supervisor</i>	86			
	<i>Helpers</i>	561			

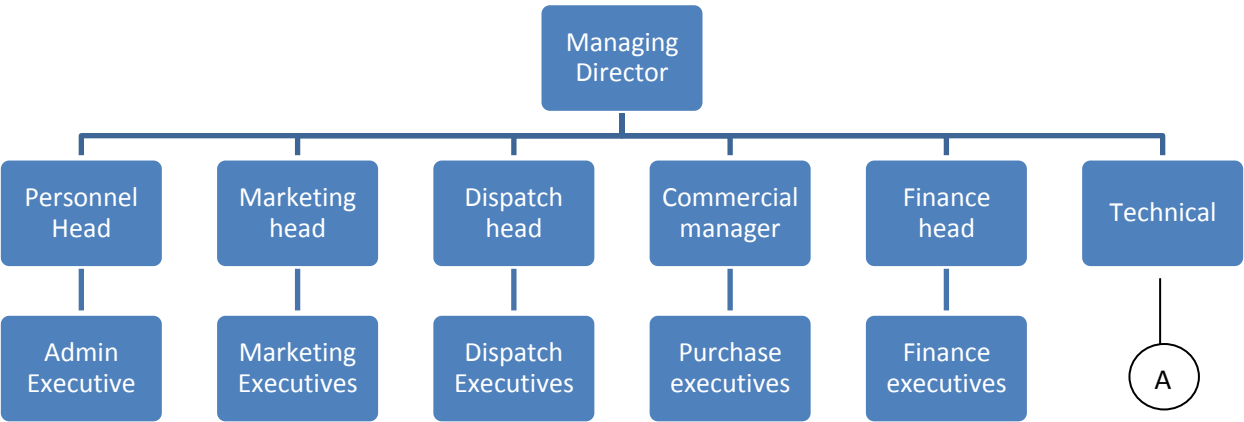
Summary Sheet: Tread Rubber Products

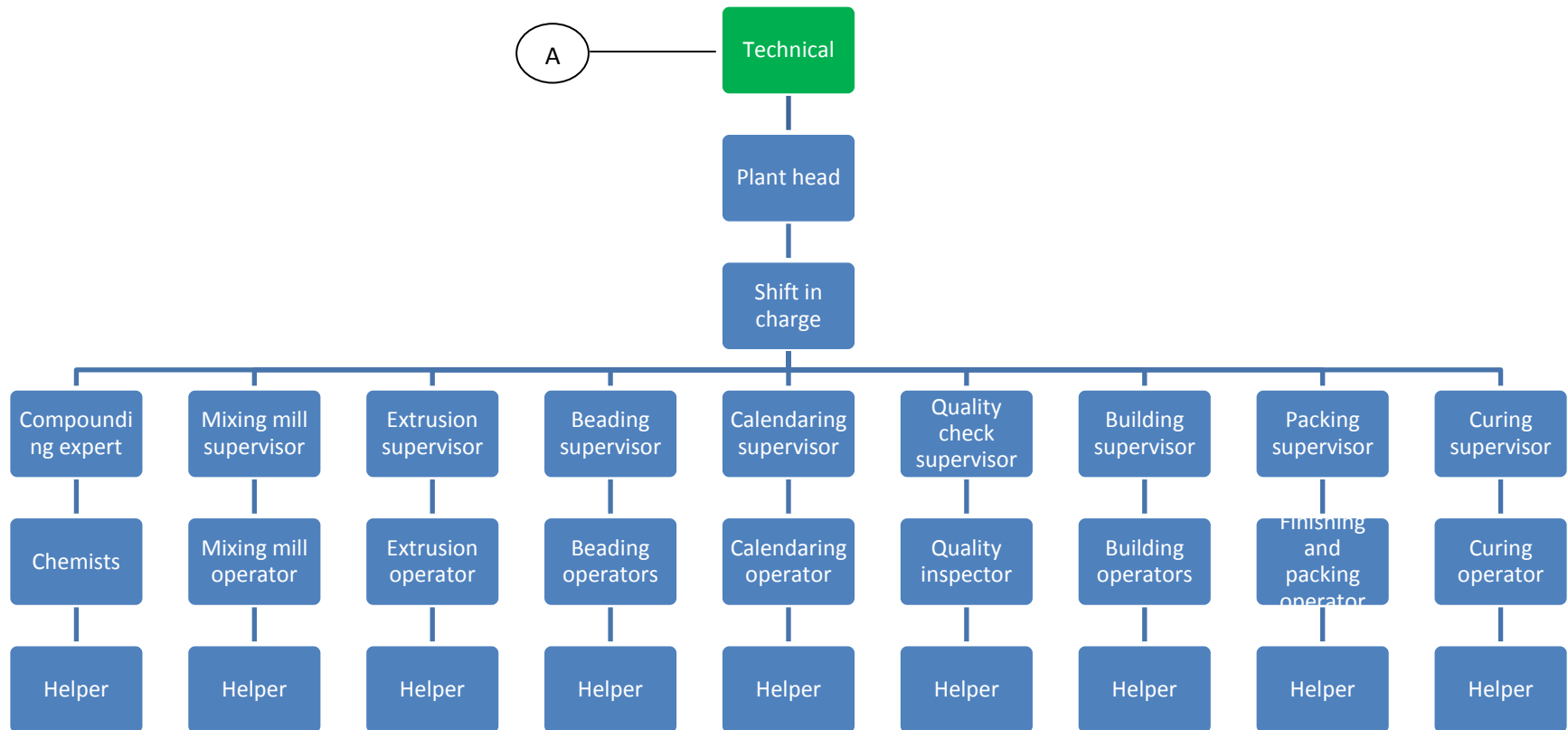
Categories	Total no. of tread rubber product manufacturing units in Kerala					241	Qualification wise distribution of human resource		
N/A	Distribution of Sheeting units	Micro	Small	Medium	Large	Total	Ph.D / Research Engineers BA/BSc/B Com Diploma Engineers ITI/Vocational Education 12th std/10th std pass Below 10th std Others (MBAs, CA, ICWA, CS, etc.) Total	0% 2% 10% 5% 5% 40% 38% 0% 100%	
		62%	25%	11%	2%	100%			
	No. of people employed	1560	1356	1326	336	4578			
	Manufacturing				Support				
	Total no. of occupations identified		8		6				
	Total no. of job roles identified		21		12				
	User industry	Critical job roles (in terms of skill requirement)	Mixing operator, calendaring operator and finishing operator						
<ul style="list-style-type: none">HouseholdIndustrial use									
	Industry Suggestions <ul style="list-style-type: none">Exposure to machine operation has to be given at training stage especially for calendaring						Function wise distribution of human resource		
		On roll	Off roll						
	Core function	72%	28%						
	Support function	100%	0%						

1.3.12 Tyre, Tubes and Flaps

Organisation structure

Figure 26: Organisation structure for tyre manufacturing





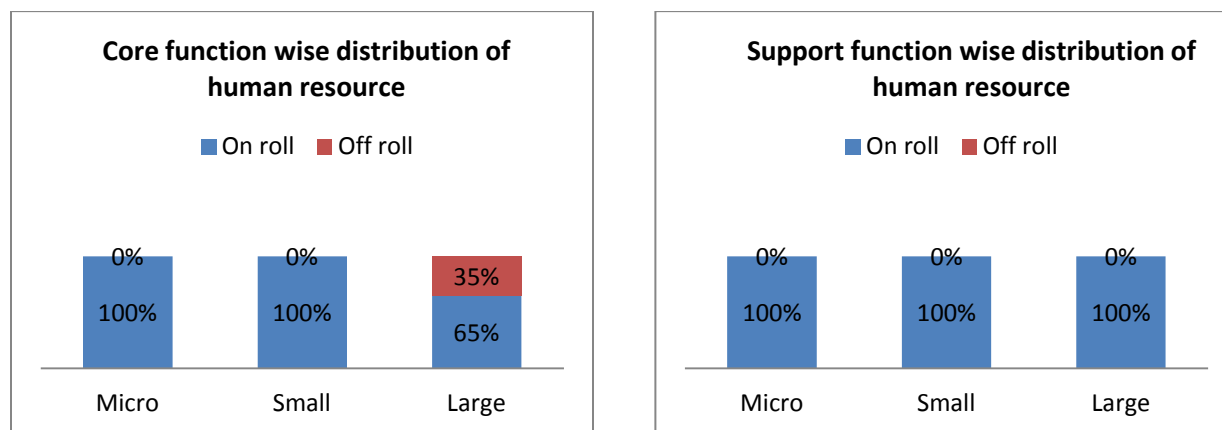
Note: This organization structure is for a large unit

Sample covered

	Micro	Small	Medium	Large	Total
No. of units	5		1	1	7

Function wise distribution of human resource

Figure 27: Function wise distribution of human resource



Job role wise distribution of human resource

Human resource for tyre segment is distributed across various job roles as tyre making requires various processes such as mixing, calendaring, extrusion, beading, building, etc. Distribution is not skewed on a particular job role.

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Mixing	Mixing Supervisor	117	Accounts	Manager Accounts	8
	Mixing Operator	433		Accountant	75
	Helpers	492		Manager Purchase	12
Calendaring	Operators	83	Purchase	Stores Assistant	80
	Helpers	133	Marketing	Manager Marketing	25
Extruder	Extrusion Operator	342	HR	HR Manager	25
Building	Building Operator	200	General	Proprietor/M D	100
Moulding	Moulding Supervisor	108		General Manager	12

	<i>Moulding Operator</i>	483	Production	<i>Production Manager</i>	80
	<i>Helpers</i>	375		<i>Shift In-charge</i>	33
Finishing	<i>Finishing Supervisor</i>	20			
	<i>Finishing Operator</i>	288			
	<i>Helper</i>	250			
Packaging and Dispatch	<i>Packaging and Dispatch Supervisor</i>	67			
	<i>Helpers</i>	333			

Qualification wise distribution of human resource

Table 24: Qualification wise distribution of human resource

Qualification	Micro	Small	Large
Ph.D / Research	0%	0%	0%
Engineers	0%	0%	5%
BA / BSc/B Com	10%	15%	10%
Diploma Engineers	0%	5%	5%
ITI / Vocational Education	0%	5%	10%
12th std / 10th std pass	40%	15%	30%
Below 10th standard	50%	60%	35%
Others (specify - Such as MBAs, CA, ICWA, CS, etc.)	0%	0%	5%
TOTAL	100%	100%	100%

*Large will be added based on further meetings

Skill gap analysis

Table 25: Occupation wise distribution of job roles

Occupation	Management	Lab	Mixing and Milling	Calendarin g	Extrusion	Beading	Building	Curing	Quality Check	Finishing and Packing
Job roles	Plant Head	Compoundi ng Expert	Mixing Mill Supervisor	Calendarin g Supervisor	Extrusion supervisor	Beading Supervisor	Building Supervisor	Curing Supervisor	QC Supervisor	Superviso r
	Shift-in Charge	Chemist	Mixing Mill Operator	Calendarin g Operator	Extrusion operator	Beading Operator	Building Operator	Curing Operator	QC Inspector	Finishing and Packing Operator
			Helpers	Helper			Helper	Helper		Helper

Occupation: Management

Following job roles are involved in management occupation:

- Plant Head
- Shift-in Charge

Occupation: Management

Job Role: Plant Head

Qualification and Experience: Engineering and/or management and about 10-12 years experience in industry for large players and in micro and small 12th pass and have over 15 years experience

Roles and Responsibilities:

- Oversee the activities in plant
- Manage the human resource
- Maintain productivity
- Manage the core and non-core activities
- Get involved in R&D
- Lead the QC

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge of the entire operation
- Knowledge of process parameters
- Knowledge of the rubber market and prices
- Knowledge of the rubber industry scenario in the cluster
- Knowledge of the typical line activities in plant
- Ability to monitor the operation
- Ability to participate in QC of product

Managerial skills

- Ability to manage the workforce

Particulars	Micro	Small	Medium	Large
▪ Leadership skills training				L
▪ Lean management techniques training				L
▪ Total productivity management to improve the process efficiency with latest technology				L

<ul style="list-style-type: none"> ▪ Ability to enforce industrial discipline ▪ Ability to enforce safety in the operators during the process <p>Soft skills</p> <ul style="list-style-type: none"> ▪ Ability to interface with all the supervisors to gain understanding of the process ▪ Ability to interface with shift in-charge to understand the process across all the shifts 	<p>knowledge</p> <ul style="list-style-type: none"> ▪ Not able to determine the reasons for final product quality gaps <p>L</p>
H- High; M – Medium; L- Low	

Occupation: Management

Job Role: Shift-in Charge

Qualification and Experience: Diploma holder and about 5 years experience in industry

Roles and Responsibilities:

- Manage the shift activities
- Manage the particular shift related human resource
- Improve the shift performance

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge of the entire operation
- Knowledge of process parameters
- Ability to inspect visually the entire production line
- Inventory control management

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ Inadequate knowledge on various techniques such as lean 				L

<ul style="list-style-type: none"> ▪ Knowledge of lean manufacturing techniques ▪ Ability to enforce safety ▪ Quality check of the sub process outputs through visual examination ▪ Ability to document and communicate the process on a daily basis to the plant manager 	<p>management, total productivity management</p> <ul style="list-style-type: none"> ▪ Inadequate leadership qualities 	L
<p>Managerial skills</p> <ul style="list-style-type: none"> ▪ Ability to manage the workforce ▪ Ability to enforce industrial discipline ▪ Ability to enforce safety in the operators during the process 		
<p>Soft skills</p> <ul style="list-style-type: none"> ▪ Ability to interface with all the supervisors to gain understanding of the process 		
H- High; M – Medium; L- Low		

Occupation: Lab

Following job roles are involved in lab occupation:

- Compounding expert
- Chemist

Occupation: Lab

Job Role: Compounding expert

Qualification and Experience: B.E/ M.E (Mechanical/Rubber Technology/etc) with 15– 20 years of experience in rubber industry

Roles and Responsibilities:

- Lead the formulation
- Focus on R&D to improve the formulation

- Train chemists

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge of additives used in mixing
- Knowledge of the functions of the additives and their effect on rubber
- Knowledge of the properties of the various additives
- Ability to alter the composition of the additives based on the required characteristic of the tyre
- Designing the compounding to make it cost competitive and to give high performance
- Ability to alter the composition of the compounding based on the QA team feedback to get the desired properties
- Knowledge of chemistry related effects like impact of molecular weight, filling, etc on the rubber when the additives are added
- Knowledge of process parameters like temperature, pressure
- Ability to operate equipments like rheometer, viscometer, etc
- Ability to prepare mixing chart to detail the sequence of the compounding operation with chemical name, timings, quantity, etc
- Knowledge on latest trends and technology in rubber compounding

Managerial skills - NA

Soft skills

- Ability to communicate the sequence of

Particulars	Micro	Small	Medium	Large
-------------	-------	-------	--------	-------

- | | | | | |
|---|-----|-----|---|---|
| <ul style="list-style-type: none"> Not completely aware of the additives and their impact on the formulation | N/A | N/A | L | L |
|---|-----|-----|---|---|

addition of the compounds to the Mixing Supervisor

- Ability to explain the impact of each of the compounds to the Chemists

H- High; M – Medium; L- Low

Occupation: Lab

Job Role: Chemist

Qualification and Experience: Graduation in chemistry with minimum 2 years experience in rubber industry

Roles and Responsibilities:

- Aid in formulation
- Aid in R&D related to formulations

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge of additives used in mixing
- Knowledge of the functions of the additives and their effect on the natural rubber
- Knowledge of the properties of the various additives
- Ability to follow the compounding instructions from the Compounding Head
- Ability to alter the composition of the compounding based on the input from the Compounding Head
- Knowledge of chemistry related effects like impact of molecular weight, filling, etc on the rubber when the additives are added

Managerial skills - NA

Soft skills

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ Not able to communicate to helpers ▪ Not being aware of the impact of additives ▪ Not able to think laterally to tweak the compound based on the required end result 				L L L

- Ability to communicate the compounding process to the Helpers
- Ability to guide the Helpers in knowing about the relevant chemicals
- Ability to explain the impact of each of the compounds to the Supervisor

H- High; M – Medium; L- Low

Occupation: Mixing and Milling

Following job roles are involved in mixing and milling occupation:

- Mixing mill supervisor
- Mixing mill operator
- Helper

Occupation: Mixing and milling

Job Role: Mixing mill supervisor

Qualification and Experience: 10th/12th pass/diploma with 5-10 years experience in rubber industry

Roles and Responsibilities:

- Supervise the milling operation
- Manage the milling section

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge of additives used in mixing
- Knowledge of the properties of the various additives
- Knowledge of the sequence of the additives
- Knowledge of the location of the chemicals in the store

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ They supervisors are not able to communicate the process to the operators 			L	L
<ul style="list-style-type: none"> ▪ Not aware completely aware 			L	L

<ul style="list-style-type: none"> Ability to explain the order to the Mill Operators Knowledge of the process parameters to be set in the mixing mill Ability to spot if there is something wrong with the process <p>Managerial skills</p> <ul style="list-style-type: none"> Ability to motivate the Operators Ability to enforce safety in the Operators during the process <p>Soft skills</p> <ul style="list-style-type: none"> Ability to communicate the process to the Operators by preparation of mill sheet 	<p>of chemical properties</p> <p>L</p>
--	--

H- High; M – Medium; L- Low

Occupation: Mixing and milling

Job Role: Mixing and milling operator

Qualification and Experience: Minimally educated/10th/12th pass with 1-3 years experience in rubber industry

Roles and Responsibilities:

- Assists in production implementation
- Responsible for mixing processes.
- Coordinate with supervisor and helpers for further production activities.
- Supervision of helpers
- Management of mixing machines in terms of speed and running timing of machines.

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge of additives used in mixing
- Knowledge of the properties of the various additives
- Knowledge of the sequence of the

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> Do not have sufficient knowledge about safety skills and 	L		L	L

<p>additives</p> <ul style="list-style-type: none"> Knowledge of the location of the chemicals in the store Ability to follow the sequence of process Knowledge of the process parameters to be set in the mixing mill Knowledge of how to operate the mixers Ability to weigh the right quantities of the chemicals, in case of manual weighing Knowledge of safety procedures <p>Managerial skills - NA</p> <p>Soft skills</p> <ul style="list-style-type: none"> Ability to communicate the process to the helpers 	<p>this is important for milling operator as he is generally exposed to heat, noise and effects of reaction of chemicals</p> <ul style="list-style-type: none"> Inadequate knowledge on the process parameters
H- High; M – Medium; L- Low	

Occupation: Mixing and milling

Job Role: Helper

Qualification and Experience: Minimally skilled/10th/12th pass with 1-3 years experience in rubber industry

Roles and Responsibilities:

- Aid the operators in mixing process

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge of additives used in mixing
- Knowledge of the basic properties of the various additives
- Ability to follow the sequence from the Chemists
- Ability to identify the various compounds
- Knowledge of safety skills

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> Not able to identify the assortment of chemicals used in compounding 	L		L	L
<ul style="list-style-type: none"> Not being aware of the basic 	L		L	L

Managerial skills - NA	properties of additives			
Soft skills - NA	▪ Communication skills are missing	L	L	L
▪ Ability to communicate the process				
H- High; M – Medium; L- Low				

Occupation: Calendaring

Following job roles are involved in calendaring occupation:

- Calendaring and extrusion supervisor
- Calendaring and extrusion operator
- Beading supervisor
- Beading operator
- Fabric calendaring supervisor
- Fabric calendaring operator
- Helper

Occupation: Calendaring

Job Role: Calendaring supervisor

Qualification and Experience: 10th/12th pass with 5-10 years experience in rubber industry

Roles and Responsibilities:

- Manage the extrusion and calendaring process
- Manage the calendaring and extrusion operators

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge of process parameters such as speed for rollers, pressures, temperatures, dimensions, and flow of materials
- Ability to prepare the process chart with clear instructions

Particulars	Micro	Small	Medium	Large
▪ Not able to implement lean management techniques and build on latest technological	M		L	L

- Knowledge of the correct composition of talc and solvents that are used in the process
- Ability to troubleshoot when notified by the operators that the process is not going as planned

Managerial skills

- Ability to motivate the Operators
- Ability to enforce safety in the Operators during the process

Soft skills

- Ability to communicate the process to the Operators by preparation of process sheet

advancements

H- High; M – Medium; L- Low

Occupation: Calendaring

Job Role: Calendaring operator

Qualification and Experience: Minimally educated/10th/12th pass with 3-5 years experience in rubber industry

Roles and Responsibilities:

- Operate the calendar and extrusion machine
- Set the parameters
- Interface with helpers

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Adjust machine components to regulate speeds, pressures, temperatures, dimensions, and flow of materials
- Press control buttons to activate machinery and equipment.

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ Do not have sufficient knowledge about safety skills and this is important 	M		L	L

<ul style="list-style-type: none"> Turn controls to adjust machine functions, such as regulating air pressure, creating vacuums, etc Ability to follow the Supervisor instructions Notify Supervisor when there is non-conformance to the process Knowledge of safety skills <p>Managerial skills - NA</p> <p>Soft skills</p> <ul style="list-style-type: none"> Ability to communicate the process to the helpers 	<p>for extrusion and calendaring operator as he is generally exposed to chemicals like solvents and talcs</p> <ul style="list-style-type: none"> Are not able to understand the process parameters 	L	L	L
H- High; M – Medium; L- Low				

Occupation: Beading

Job Role: Beading supervisor

Qualification and Experience: 10th/12th pass with 5-7 years experience in industry

Roles and Responsibilities:

- Supervise the beading process
- Instruct operators and helpers on the beads, plies, etc required for the process

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge of process parameters to be set
- Knowledge of the various beads, plies, etc required for the process
- Ability to prepare the process chart with clear instructions
- Ability to explain the beading process to Calendar Operators
- Ability to set the amount of rubber that

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> Not able to implement lean management techniques 	L		L	L

can be coated on the fabric

- Ability to troubleshoot when notified by the Operators that the process is not going as planned

Managerial skills

- Ability to motivate the Operators
- Ability to enforce safety in the Operators during the process

Soft skills

- Ability to communicate the process to the Operators by preparation of process sheet

H- High; M – Medium; L- Low

Occupation: Beading

Job Role: Beading operator

Qualification and Experience: Minimally educated/10th/12th pass with 2-3 years experience in industry

Roles and Responsibilities:

- Bead calendaring machine operation
- Manage the helpers

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Adjust machine components to regulate speeds, pressures, and temperatures, and amounts, dimensions, and flow of materials
- Press control buttons to activate machinery and equipment.
- Turn controls to adjust machine functions, such as regulating air pressure, creating vacuums, etc

Particulars	Micro	Small	Medium	Large
▪ Less knowledge on safety skills	M		L	L
▪ Inadequate knowledge on the process parameters	M		L	L
▪ Inadequate ability to handle the calendaring	M		L	L

<ul style="list-style-type: none"> ▪ Ability to follow the supervisor instructions ▪ Notify supervisor when there in non-conformance to the process ▪ Knowledge of safety skills <p>Managerial skills - NA</p> <p>Soft skills</p> <ul style="list-style-type: none"> ▪ Ability to communicate the process to the helpers 	machine
H- High; M – Medium; L- Low	

Occupation: Calendaring

Job Role: Helper

Qualification and Experience: 10th pass/less than 10th and about 1-3 years experience in industry

Roles and Responsibilities:

- Aid the operators in the calendaring process
- Communicate any process deviations to the operator

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Basic knowledge of the process
- Ability to handle the equipment if required
- Ability to follow instruction from operator
- Ability to notify the operator when required
- Knowledge of safety skills

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ Less knowledge on safety parameters ▪ Not able to understand instructions 	M		L	L
	M		L	L

Managerial skills - NA

Soft skills – NA

H- High; M – Medium; L- Low

Occupation: Building

Following job roles are involved in building occupation:

- Building supervisor
- Building operator
- Helper

Occupation: Building

Job Role: Building Supervisor

Qualification and Experience: Diploma and about 5 years experience in industry

Roles and Responsibilities:

- Manage the building process
- Communicate the sequence to the operators
- Visually inspect the green tyre
- Manage the operators and helpers in building section

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge of the sequence of the building process
- Knowledge of the components for building required
- Knowledge of the location of the building materials
- Ability to prepare the process chart with clear instructions

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ At times not able to communicate the sequence to the operators 				L

- Ability to communicate to keep the green tyre from sticking to the mould after the building
- Knowledge of solvents that need to be used to keep the green tyre from sticking to the mould
- Ability to troubleshoot when notified by the Operators that the process is not going as planned

Managerial skills

- Ability to motivate the Operators
- Ability to enforce safety in the Operators during the process

Soft skills

- Ability to communicate the process to the Operators by preparation of the building process chart

H- High; M – Medium; L- Low

Occupation: Building

Job Role: Building Operator

Qualification and Experience: Minimally educated/10th pass/12th pass/ITI and over 3-5 years experience in industry

Roles and Responsibilities:

- Build the green tyre
- Follow the building process
- Manage the helpers
- Communicate with supervisor and helper

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Particulars	Micro	Small	Medium	Large
-------------	-------	-------	--------	-------

Technical skills:

<ul style="list-style-type: none"> Knowledge of all the components required to assemble the green tyre Knowledge of the sequence of the building operation Knowledge of the location of the components in the building area Ability to follow the sequence of process given by Building Supervisor Ability to carry out the repetitive nature of the actions in the building area Knowledge on how to spray the solvents on the green tyre to prevent sticking Knowledge of safety procedures <p>Managerial skills - NA</p> <p>Soft skills</p> <ul style="list-style-type: none"> Ability to communicate the process to the helpers 	<ul style="list-style-type: none"> As the nature of the building activity is repetitive, the skill gaps here are more towards sequence adherence At times, place more of the tread component than what is required 	<p>L</p> <p>L</p>
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H- High; M – Medium; L- Low

Occupation: Building

Job Role: Building Helper

Qualification and Experience: 10th pass/less than 10th and about 1-2 years experience in industry

Roles and Responsibilities:

- Aid the building operators
- Communicate any process deviations

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Basic knowledge of the process
- Knowledge of the basic building process sequence
- Ability to handle the equipment if

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> Not able to understand instructions at times 				L

required

- Ability to follow instruction from Operator
- Ability to notify the Operator when required
- Knowledge of safety skills

Managerial skills - NA

Soft skills – NA

H- High; M – Medium; L- Low

Occupation: Curing

Following job roles are involved in curing occupation:

- Curing Supervisor
- Curing Operator
- Helper

Occupation: Curing

Job Role: Curing Supervisor

Qualification and Experience: Diploma and about 3-5 years experience in industry

Roles and Responsibilities:

- Oversee the curing process
- Communicate the relevant process parameters to cure the green tyre
- Manage the curing operators and helpers

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Process knowledge
- Understanding of the machines used for curing
- Knowledge about the Hydraulic press machine used

Particulars	Micro	Small	Medium	Large
▪ Not able to implement lean management techniques	L		L	L

- Knowledge on the temperature, pressure that needs to be set to convert the green tyre to tyre
- Ability to vary the above parameters depending on the type of tyre
- Quality check of the compound through visual examination
- Knowledge of various chemical exposures that can happen during curing

Managerial skills

- Ability to motivate the Operators
- Ability to enforce safety in the Operators during the process

Soft skills

- Ability to communicate the process to the Operators by preparation of the curing process chart

H- High; M – Medium; L- Low

Occupation: Curing

Job Role: Curing Operator

Qualification and Experience: Minimally educated/10th pass/12th pass/ITI and over 3-5 years experience in industry

Roles and Responsibilities:

- Handle the curing presses
- Set the relevant parameters
- Manage the helpers

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

	Particulars	Micro	Small	Medium	Large
Technical skills:					
▪ Ability to operate the hydraulic pressing	▪ Less knowledge	L		L	L

<p>machine</p> <ul style="list-style-type: none"> Understanding of the process parameters (Power, temperature, curing time, press, etc) Ability to place green tyre between the curing moulds Knowledge of safety to protect from the chemical exposure Monitor the pressing function and release the press after the curing time Ability to carefully lift the set tyre after the curing process <p>Managerial skills - NA</p> <p>Soft skills</p> <ul style="list-style-type: none"> Ability to communicate the process to the helpers 	<p>on safety skills</p> <ul style="list-style-type: none"> At times, the operator over cures or under cures the green tyre 	L	L	L
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H- High; M – Medium; L- Low

Occupation: Curing

Job Role: Helper

Qualification and Experience: 10th pass/less than 10th and about 1-2 years experience in industry

Roles and Responsibilities:

- Aid the curing operators
- Communicate relevant process related inputs to the operator

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Basic knowledge of the process
- Ability to handle the equipment if required
- Ability to follow instruction from operator

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> Not able to understand instructions at times 	L		L	L

- Ability to notify the operator when required
- Knowledge of safety skills

Managerial skills - NA

Soft skills – NA

H- High; M – Medium; L- Low

Occupation: Finishing and Packing

Following job roles are involved in finishing and packing occupation:

- Finishing and Packing Supervisor
- Finishing and Packing Operator
- Helper

Occupation: Finishing and Packing

Job Role: Finishing and Packing Supervisor

Qualification and Experience: 12th pass/Diploma and about 3-5 years experience in industry

Roles and Responsibilities:

- Oversee the finishing and packing process
- Visual examination of tyre
- Manage the finishing and packing helpers

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Ability to understand the packing operation
- Knowledge of finishing techniques to be employed
- Ability to prepare finishing chart to instruct the operators on the finishing skills

Particulars	Micro	Small	Medium	Large
▪ Not able to implement lean management techniques	L		L	L

- Quality check of the final product through visual examination
- Ability to document and communicate the results of the visual inspection

Managerial skills

- Ability to motivate the operators
- Ability to enforce safety in the operators during the process

Soft skills

- Ability to communicate the process to the operators by preparation of the finishing and packing process chart

H- High; M – Medium; L- Low

Occupation: Finishing and Packing

Job Role: Finishing and Packing Operator

Qualification and Experience: Minimally educated/10th pass/less than 10th and about 1-2 years experience in industry

Roles and Responsibilities:

- De-flash the cured tyre
- Sort and pack according to instructions

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Ability to trim the excess/additional rubber in the cured tyres (Process of deflashing)
- Usage of knives and scissors to deflash
- Ability to trim only the additional rubber and not parts of the tread

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ New finishers do not have the ability to de-flash neatly. At times, they might also damage the 	L		L	L

- Sorting and packing (Bundling)

Managerial skills - NA

Soft skills

- Ability to communicate the process to the helpers

product

- Lack the ability to fluently explain the process to the helpers

L

L

L

H- High; M – Medium; L- Low

Occupation: Finishing and Packing

Job Role: Helper

Qualification and Experience: 10th pass/less than 10th and about 1 year experience in industry

Roles and Responsibilities:

- Aid the finishing and de-flashing operators in the process
- Fetching the right instrument when asked by the operators

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Basic knowledge of the process
- Ability to de-flash, if required
- Ability to follow instruction from Operator
- Ability to bundle the tyres
- Ability to aid in packing the tyres
- Ability to notify the operator when required
- Knowledge of safety skills

Managerial skills - NA

Soft skills - NA

Particulars

Micro

Small

Medium

Large

- Inability to bundle the tyres at required rate due to repetitive nature of job

L

L

L

H- High; M – Medium; L- Low

Occupation: Quality Control

Following job roles are involved in quality control occupation:

- QC Supervisor
- Chemist

Occupation: Quality Control

Job Role: QC Supervisor

Qualification and Experience: Rubber/Polymer technologist and about 10 years experience in industry

Roles and Responsibilities:

- Lead the QC process
- Evolve stringent QC methodologies
- Instruct the QC team on the methodologies
- Evolve documentation procedures for the QC

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge of the QC procedures
- Knowledge of various tests like elongation, breaking load, etc
- Ability to use advanced testing equipment like rheometer, viscometer, etc
- Knowledge of testing parameters
- Ability to interpret the results
- Ability to analyze which aspect of the compound is impacting the test results
- Ability to think laterally to cross-analyze the test results
-

Managerial skills

- Ability to manage the QC Supervisors
- Ability to enforce safety in the Operators

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ Not able to link the QC results and the production process 				L

during the process

Soft skills

- Ability to interface with all the supervisors to understand the process and how it impacts the final QC
- Ability to communicate the results to Shift in-charge and Plant Manager
- Ability to maintain the record of the results by documentation

H- High; M – Medium; L- Low

Occupation: Quality Control

Job Role: QC Inspector

Qualification and Experience: B. Sc/M. Sc Chemistry and about 2-3 years experience

Roles and Responsibilities:

- Follow the QC procedures
- Document the results
- Use various test equipments

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

	Particulars	Micro	Small	Medium	Large
Technical skills: <ul style="list-style-type: none">▪ Knowledge of the QA procedures▪ Knowledge of various tests like elongation, breaking load, etc▪ Ability to use advanced testing equipment like rheometer, viscometer, etc▪ Knowledge of testing parameters	<ul style="list-style-type: none">▪ Not able to handle advanced equipment				L
	<ul style="list-style-type: none">▪ Not aware of the impact of properties on final product				L
	<ul style="list-style-type: none">▪ Not able to				

- Ability to interpret the results
- Ability to analyze which aspect of the compound is impacting the test results
- Ability to think laterally to cross-analyze the test results
- Ability to follow the instructions from QA Supervisor

Managerial skills

- Ability to guide the Helpers

Soft skills

- Ability to maintain the record of the results by documentation

analyze laterally the impact of properties

- Documentation skills are not upto the mark

L

L

H- High; M – Medium; L- Low

Job role wise distribution in all the units for the product segment of Tyre (Estimated)

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Mixing	Mixing Supervisor	281	Accounts	Manager Accounts	20
	Mixing Operator	965		Accountant	180
	Helpers	1056		Manager Purchase	10
Calendaring	Operators	200	Purchase	Stores Assistant	120
	Helpers	321	Marketing	Manager Marketing	60
Extruder	Extrusion Operator	822	HR	HR Manager	60
Building	Building Operator	481	General	Proprietor/MD	241
Moulding	Moulding Supervisor	261		General Manager	10
	Moulding Operator	960		Production Manager	120
	Helpers	902	Production	Shift In-charge	80

Occupation	Job role	Number of people	Occupation	Job role	Number of people
Finishing	<i>Finishing Supervisor</i>	555			
	<i>Finishing Operator</i>	350			
	<i>Helper</i>	601			
Packaging and Dispatch	<i>Packaging and Dispatch Supervisor</i>	160			
	<i>Helpers</i>	802			

Summary Sheet: Tyre, Tubes and Flaps

Categories	Total no. of tyre related product manufacturing units in Kerala					16	Qualification wise distribution of human resource		
<ul style="list-style-type: none">TyresTubes	Distribution of units	Micro	Small	Medium	Large	Total	Ph.D / Research Engineers BA/B.Sc/B Com Diploma Engineers /Rubber technologist ITI/Vocational Education 12th std/10th std pass Below 10th std Others (MBAs, CA, ICWA, CS, etc.) Total		
		60%	7%	0%	33%	100%			
	No. of people employed*	80	300	0	11100	11480			
	Manufacturing					Support			
	Total no. of occupations identified		8		5				
	Total no. of job roles identified		22		10				
User industry	Critical job roles (in terms of skill requirement)	Mixing Operator, Building operator and Quality Check					Others (MBAs, CA, ICWA, CS, etc.)		
<ul style="list-style-type: none">Automobile ownersAutomobile industry									
							Function wise distribution of human resource		
								On roll	Off roll
							Core function	97%	3%
							Support function	100%	0%

1.4 Support function skill gap mapping

This section outlines the skill gaps in the various support functions.

Boiler attendant is a job role present across most of the rubber product units. Boiler operation is a part most of the rubber product manufacturing process. Boilers are used for heating process (vulcanisation / curing) in the production process. The skill gap of Boiler attendant is presented below:

Occupation: Boiler Operation

Occupation: Boiler Operation

Job Role: Boiler Attendant

Qualification and Experience: ITI / 12th pass with boiler operation license

Roles and Responsibilities:

- Operate the boiler
- Perform maintenance of boilers in the unit
- Take precautionary safety measures
- Comply with safety policy of the company

Knowledge and Skill Requirement

Skill Gaps and Intensity level of skill gap

Technical skills:

- Knowledge of boiler operation
- Knowledge of various types of boilers
- Knowledge of using diesel, coke, fire wood, etc as input for boiler
- Ability to set parameters in the boiler such as temperature, pressure, etc
- Knowledge of controls in boiler machine
- Knowledge of safety and precautionary measures to be taken
- Ability to check for faults in the machine
- Ability to perform preventive maintenance of boiler
- Ability to use controls for controlling

Particulars	Micro	Small	Medium	Large
<ul style="list-style-type: none"> ▪ Not able to multitask – work in rubber product machineries 		M	L	L

<p>steam output to various machines</p> <ul style="list-style-type: none"> ▪ Knowledge of cooling agents in machines ▪ Knowledge of vulcanising machines used in rubber industry such as auto clave, vulcanising chambers, hydraulic press machines, etc. <p>Managerial skills</p> <ul style="list-style-type: none"> ▪ Ability to coordinate with production department to understand requirement ▪ Ability to enforce safety in the Operations during the process <p>Soft skills</p> <ul style="list-style-type: none"> ▪ Ability to interface with all the supervisors to understand the process and their requirement ▪ Ability to communicate the safety measures related details to all operator ▪ Ability to maintain the record of fuel as required by company 	
H- High; M – Medium; L- Low	

The other support functions are across the key areas of marketing, purchase, accounts and Human Resource.

Table 26: Occupation wise distribution of job roles

Occupation	Sales and marketing	Purchase	Human resource	Accounts and finance
Job Roles	Marketing Head	Purchase Manager	Personnel Manager	Accounts Head
	Marketing Manager	Purchase Executive	Personnel Executive	Accounts Manager
	Marketing Executive			Accountant/Finance Executive

Variation in the existence of the above listed job roles across various categories of companies – micro, small, medium and large are depicted below:

Table 27: Support function profiling across micro, small, medium and large

Occupations	Job roles	Large	Medium	Small	Micro
Sales and Marketing	Marketing Head				
	Marketing Manager				
	Marketing Executive			In some cases done by Owner/Production Manager	Mostly done by the Owner
Purchase	Purchase Manager				
	Purchase executive			Mostly done by Admin Executive/Production Manager/Owner	Mostly done by Owner/Production Supervisor
Human Resource	Personnel Manager				
	Personnel Executive			Mostly done by Admin Executive/Production Manager/Owner	Mostly done by Owner / Production Supervisor
Accounts and Finance	Accounts Head				
	Accounts Manager		Observed in limited number of companies		
	Accounts/Finance Executive			Mostly outsourced / done by Admin Executive	Mostly outsourced

Note: Cells highlighted in blue defines the existence of job role in the company

Occupation: Sales and Marketing

Following job roles are involved in sales and marketing occupation:

- Marketing Head
- Marketing Manager
- Marketing Executive

Occupation: Sales and Marketing

Job Role: Marketing Head

Qualification and Experience: MBA (Marketing) / any graduate with 5 to 10 years of experience

Roles and Responsibilities:

- Develop marketing strategy and annual marketing plans
- Solicit business for the company
- Understanding current and potential customer requirements
- Customer relationship management
- Researching and reporting on business opportunities
- Building competitive intelligence
- Brand development
- Drive sales team to achieve the target
- Reporting to management team on performance

Skill Requirement

Skill Gaps

	Particulars	Micro	Small	Medium	Large
▪ Ability to understand the market trends	▪ Limited understanding on market trends and competitiveness	M	M	M	L
▪ Ability to understand the market structure of the segment in which the company is operating					
▪ Ability to develop marketing strategies and plan in coordination	▪ Inadequate product knowledge and their	M	M	M	L

<p>with production department</p> <ul style="list-style-type: none">▪ Ability to evaluate the strategies of competitors▪ Brand development skills▪ Ability to identify business opportunities (domestic and export) and highlight it to the management team at a appropriate time▪ Adequate knowledge on products offered and their specifications▪ Ability to maintain good working relationship with the existing customers▪ Ability to understand the market and target the right location and customer segment▪ Transfer the market requirements/ trends information to production team and facilitate for making changes in production accordingly▪ Ability to talk with prospect customers (through calls, meetings, stalls, etc) and converting them as customers▪ Managing the sales team to achieve the sales target▪ Excellent communication (to interact with customers from various locations)▪ Understanding on the commercial aspects of transaction and pricing techniques for negotiation	<p>technical specification</p>
---	--------------------------------

- Ability to coordinate with Packing & Dispatch Supervisor to ensure that goods are delivered as per customer requirements
- Reporting skills

H – High; M – Medium; L – Low

Occupation: Sales and Marketing

Job Role: Marketing Manager

Qualification and Experience: Any graduate with 1 to 2 years of experience

Roles and Responsibilities:

- Assist in developing marketing strategy and annual marketing plans
- Solicit business /assist in soliciting the business for the company
- Understand current and potential customer requirements
- Customer relationship management
- Understand customer concerns and coordinate with Production Manager to address the concern

Skill Requirement

Skill Gaps

- Ability to assist Marketing Head/Management team in developing marketing strategy/plan
- Knowledge on competition and industry trends
- Ability to talk with prospect customers (through calls, meetings, stalls, etc) and converting them as customers

Particulars	Micro	Small	Medium	Large
▪ Inadequate product knowledge and their specifications	M	M	M	L
▪ Limited knowledge of competition and industry trends	M	M	M	L
▪ Inadequate communication (verbal and non-verbal) and negotiation skills	M	M	L	L

- Ability to maintain good working relationship with the existing customers which will help in getting repeat orders
- Ability to understand the concerns of the customers and to work with Production Manager in addressing the issue
- Adequate product related knowledge
- Ability to understand and transfer the market requirements/ trends information to production team and make changes in production accordingly
- Good communication skills (to interact with customers from various locations)
- Negotiation skills
- Ability to coordinate with packing & dispatch supervisor to ensure that goods are delivered as per customer requirements

- Inability to make effective sales pitch

L

L

L

L

H – High; M – Medium; L – Low

Occupation: Sales and Marketing

Job Role: Marketing Executive

Qualification and Experience: Any graduate with 0 to 1 years of experience

Roles and Responsibilities:

- Solicit business /assist in soliciting the business for the company
- Understand current and potential customer requirements
- Customer relationship management
- Understand customer concerns and coordinate with Production Manager to address the concern
- Ensure timely delivery of the end product

Skill Requirement

Skill Gaps

	Particulars	Micro	Small	Medium	Large
▪ Good verbal and written communication skills to interact with customers from various locations	▪ Inadequate communication skills	M	M	L	L
▪ Ability to understand the market	▪ Lack basic knowledge about the rubber sector	M	M	L	L
▪ Ability to share the market knowledge with the Manager / Management team	▪ Inability to maintain proper records	H	H	M	L
▪ Negotiation skills	▪ Inadequate negotiation skills				
▪ Ability to talk with prospect customers to close deals		L	L	L	L
▪ Ability to interface with compounding, production department and finishing departments to ensure timely delivery of the end product to the customers					
▪ Ability to maintain records as per the company protocol					

H – High; M – Medium; L – Low

Occupation: Purchase

Following job roles are involved in purchase occupation:

- Purchase Manager / Purchase Executive / Admin Executive

Occupation: Purchase

Job Role: Purchase Manager / Purchase Executive / Admin Executive

Qualification and Experience: Any degree with 1 to 3 years of relevant experience

Roles and Responsibilities:

- Placing of orders for raw materials based on requirement
- Liaison and coordination with the vendors
- Maintain the store records
- Ensure timely availability of raw materials and other tools/materials that are used in production

Skill Requirement

Skill Gaps

	Particulars	Micro	Small	Medium	Large
▪ Knowledge on various types of raw materials such as rubber, chemicals (Zinc Oxide, Stearic Acid, Sulphur, etc), fillers and oil.	▪ Inadequate awareness about the rubber commodities market	L	L	L	L
▪ Procedural knowledge for placing purchase order	▪ Inability to efficiently monitor the inventories in stores	L	L	L	L
▪ Understanding the market trends and ability to understand its impact on the raw material prices	▪ Inability to maintain records in disciplined manner	M	M	L	L
▪ Ability to ensure that raw materials are received on time					
▪ Ability to decide the quantum of raw material requirement in coordination with other departments such as production and marketing					
▪ Ability to negotiate for better price					
▪ Ability to follow the formalities to					

check the quantity and quality of raw materials once received

- Ability to stock all the requisite raw materials and chemicals with prior planning
- Ability to understand the supplier capacity and plan for alternative suppliers in case of crises situation
- Ability to maintain inventory of raw materials to ensure continuous production
- Knowledge of the position of various raw materials in the store
- Ability to organize the store
- Ability to monitor and document daily raw material consumption
- Good interpersonal skills
- Ability to manage the material movement
- Good communication skills to understand the material performance from production side
- Ability to track the commodities market
- Basic knowledge on export related transaction and foreign currency conversion rates (for export based units)

H – High; M – Medium; L – Low

Following job roles are involved in human resource occupation:

- Personnel Manger / Personnel Executive / Admin Executive

Occupation: Human Resource

Job Role: Personnel Manager/ Personnel Executive / Admin Executive

Qualification and Experience: Any degree / specialization in HR with 1-3 years of industry experience

Roles and Responsibilities:

- Plan for human resource requirements
- Manage workforce (including contractual employees)
- Process payroll
- Structure training modules to build the competencies

Skill Requirement

Skill Gaps

	Particulars	Micro	Small	Medium	Large
▪ Good verbal and written communication	▪ Inadequate people management skills	M	M	M	L
▪ Ability to plan and manage the workforce – especially during the season where the contractual labour will exhibit absenteeism	▪ Inadequate ability to assess the training requirements of the employees	M	M	L	L
▪ Ability to organize training and development modules (including safety and hygiene) for the employees	▪ Failing to get adequate contract labour during crises situation which leads to under utilization of production capacity	M	M	L	L
▪ Ability to interface with compounding and production department to understand the various competencies required					
▪ Ability to process payroll					
▪ Establish and maintain contacts with					

various sources for getting contract employees for the organisation

- Ability to maintain the shift details
- Interpersonal skills

H – High; M – Medium; L – Low

Occupation: Accounts and Finance

Following job roles are involved in accounts and finance occupation:

- Accounts/Finance Head
- Accounts/Finance Manager
- Accountant/Finance Executive

Occupation: Accounts and Finance

Job Role: Accounts/Finance Head/Manager/Executive

Qualification and Experience:

- Head / Manager: CA / Post graduate in finance/accounts with 10 years of experience
- Executive: Degree in finance/accounts with 1 to 3 years of experience

Roles and Responsibilities:

- Maintain accounts
- Preparation of budgets
- Issue purchase order and invoice for sales
- Reporting to management team/owner
- Collecting payments from customers and making payments to vendors

Skill Requirement

Skill Gaps

- Ability to plan the budget
- Ability to be aware of the raw

Particulars	Micro	Small	Medium	Large
▪ Difficulty in planning the budget	M	M	L	L

material prices to aid in the purchasing at the right time	▪ Inadequate system knowledge like book keeping, transaction recording, etc	M	M	L	L
▪ Knowledge on book keeping (recording of transactions and maintain the books of accounts)	▪ Inadequate IT skills like Tally, etc	M	M	L	L
▪ Knowledge of accounting software such as tally					
▪ Knowledge of issuing purchase order, invoice, etc.					
▪ Maintaining the bank accounts and ensure payments for loans on time					
▪ Ability to interact with customers and receive the payment during credit period					
▪ Ability to interface with the shift in charge and plant manager to understand the process and to know where to cut costs					
▪ Maintaining the bank accounts and ensure payments for loans on time					
▪ Ability to do analysis on the financial performance of the company and update the management team at periodical intervals					

H – High; M – Medium; L – Low

1.5 Estimation of Current Human Resource in Rubber Industry for Kerala

We have estimated the current human resource in rubber industry for Kerala state based on the sample companies visited as shown in table 28.

Table 28: Number of Human Resource (Product category and size wise) in the sample units visited

S.No	Product Category	Micro	Small	Medium	Large	Total
1	Adhesives	6	37	0	0	43
2	Auto and Cycle Parts	12	0	0	0	12
3	Beltings	30	22	96	0	148
4	Dipped Goods	198	114	577	2160	3049
5	Extruded Rubber Goods	26	29	0	0	55
6	Foam Products	31	130	289	1212	1662
7	Foot Wear	220	16	134	360	730
8	Hoses	41	0	0	0	41
9	Latex Thread	0	0	0	229	229
10	Moulded Rubber Products	208	109	0	0	317
11	Rubber covered rollers	0	23	0	0	23
12	Rubber Linings	14	0	0	0	14
13	Rubber Mattings	424	277	222	0	923
14	Rubber Sheeting	12	0	0	0	12
15	Rubber Tubing	0	0	80	0	80
16	Rubberised Coir, Jute and Wollen Products	192	576	20	600	1388
17	Sports Goods	60	0	0	0	60
18	Surgical and Pharmaceutical Products	7	0	0	0	7
19	Tread Rubber Products	312	600	102	84	1098
20	Tubes & Flaps	44	0	0	0	44
21	Tyre	0	300	0	4440	4740
Total		1837	2232	1522	9085	14676

Table 29: Number of Human Resource (Product category and size wise) for Rubber Industry² in Kerala – Estimated based on sample units visited

S.No	Product Category	Micro	Small	Medium	Large	Total
1	Adhesives	132	19	0	0	151
2	Auto and Cycle Parts	120	0	0	0	120
3	Beltings	30	22	96	0	148
4	Dipped Goods	1094	152	692	3240	5179
5	Extruded Rubber Goods	106	29	0	0	134
6	Foam Products	546	130	578	808	2062
7	Foot Wear	1171	125	179	720	2195
8	Hoses	41	0	0	0	41
9	Latex Thread	0	0	0	229	229
10	Moulded Rubber Products	160	109	0	0	269
11	Rubber covered rollers	0	16	0	0	16
12	Rubber Linings	14	0	0	0	14
13	Rubber Mattings	1393	388	334	0	2114
14	Rubber Sheeting	24	0	0	0	24
15	Rubber Tubing	0	0	80	0	80
16	Rubberised Coir, Jute and Woolen Products	768	1872	163	1800	4603
17	Sports Goods	60	0	0	0	60
18	Surgical and Pharmaceutical Products	7	0	0	0	7
19	Tread Rubber Products	1560	1356	1326	335	4577
20	Tubes & Flaps	80	0	0	0	80
21	Tyre	0	300	0	11100	11400
Total		7307	4517	3449	18232	33504

² The human resource estimate comprises only for the direct employment generated by the Rubber industry. There are indirect employment generated and is not considered for estimation.

2. Human Resources Supply in Kerala

2.1 Socio-Economic Profile of Kerala

The State is divided into 14 revenue districts, 21 revenue divisions, 63 taluks and 1453 revenue villages. There are 14 District Panchayats, 152 Block Panchayats, 978 Grama Panchayats, 60 Municipalities, 5 Corporations and 1 Township.

On the basis of geographical, historical and cultural similarities, the districts are generally grouped into North Kerala (Kasaragod, Kannur, Wayanadu, Kozhikode, and Malappuram), Central Kerala (Palakkad, Thrissur, Ernakulam, Idukki) and South Kerala (Thiruvananthapuram, Kollam, Alappuzha, Pathanamthitta, Kottayam).

2.2 Demography

As of 2011 Census, the State has a population of 3.3 crore persons. In the last ten years, the State's population has grown at a decadal growth rate of 4.86 per cent, as compared to 17.64 per cent All-India growth rate.

Table 30: Key demographic indicators

Indicator	Year	Kerala	India
Population, No.	2011	3,33,87,677	1,210,193,422
Decadal growth rate of population, %	2001-11	4.86%	17.64%
Urban population as a percentage of total population, %	2011	47.72%	31.2%
Sex ratio, No. of females per 1000 males	2011	1084	940
Population density, per sq. km.	2011	859	382
Literacy rate, %	2011	93.91%	74%
Working age population* as a percentage of total population, %	2001	63%	57%
Work participation rate^, %	2001	34.8%	39%

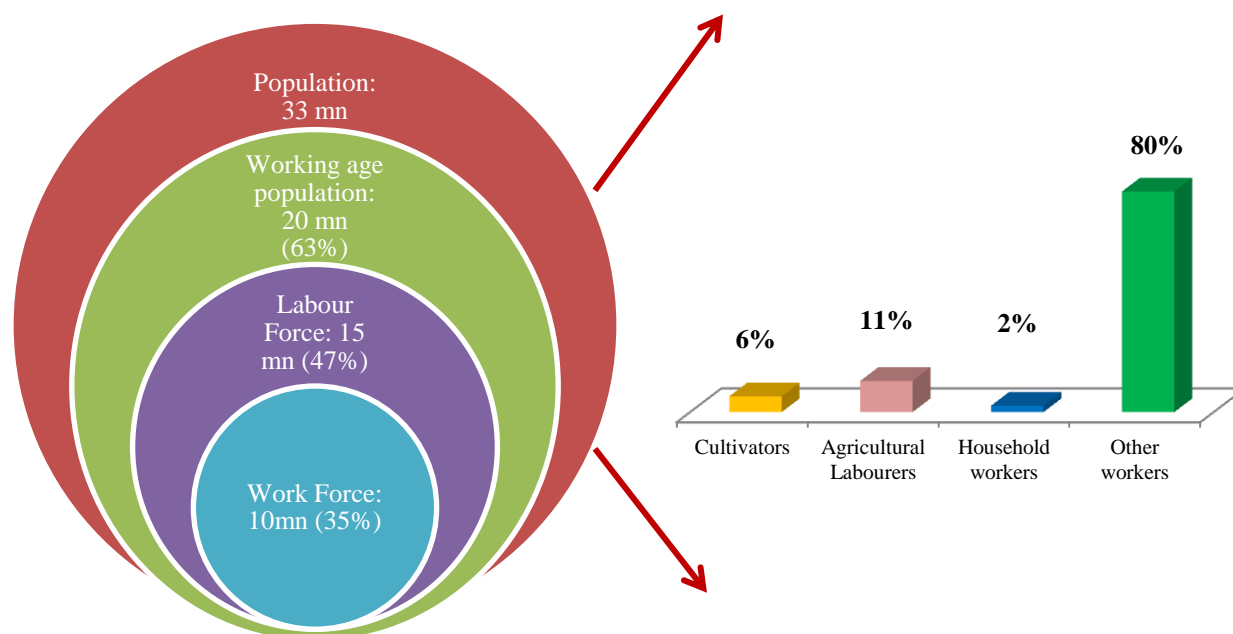
**Working age population is the population in the age-group of 15 to 59 years. ^ Work participation rate is defined as the percentage of total workers (main and marginal workers) to total population. It is also known as the labour force participation rate. Source: Census 2001, Census 2011*

As of Census 2011, the State has a literacy rate of 93.91 per cent, which is higher than the All-India

average of 74 per cent. Compared across districts, Pathanamthitta district has the highest literacy rate in the State at 96.93% per cent, while Palakkad district has the lowest literacy rate at 88.49 per cent.

As of 2011, the State's workforce is estimated at 10 million persons. Majority of these are employed in other sectors at 80 per cent, 17 per cent as agricultural labourers and cultivators and 2% as household workers.

Figure 28: Demographic and worker profile of Kerala

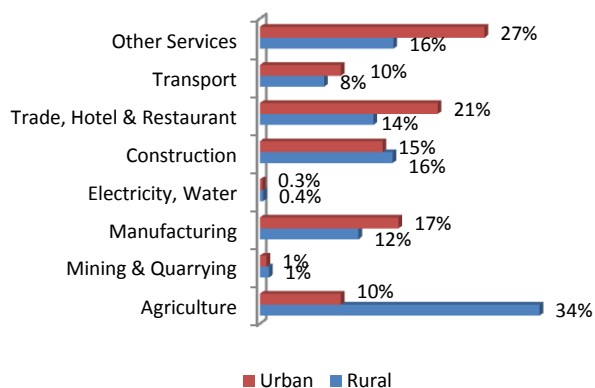


HHI: Household Industry; Other workers include all government servants, municipal employees, teachers, factory workers, plantation workers, those engaged in trade, commerce, business, transport banking, mining, construction, political or social work, priests, entertainment artists, etc. In effect, all those workers other than cultivators or agricultural labourers or household industry workers, are 'Other Workers'.

Source: Census 2001, Census 2011, NSSO 66th Round

According to NSSO 66th round on 'Employment and Self-Employment' conducted in 2009-10, around 34% of the workers in Kerala in rural areas are in agriculture and allied activities. While in urban areas, around 17% of the workers are in 'manufacturing' and 48% cent in 'trade, hotels and restaurants' and 'other services'.

Figure 29: Distribution of usually working persons in the principal status and subsidiary status by broad industry division



Source: NSSO 66th Round

2.3 Education and Training Infrastructure

Kerala's education infrastructure consists of 9 universities, 150 arts & science colleges with seating capacity of 1.96 lakh, 153 engineering colleges with enrollment of 49000, 43 polytechnic institutions with student strength of 32000, ITI and ITC with capacity of 86145 and 14479 schools with enrollment of 45 lakh students

Table 31: Education infrastructure in Kerala, as of 2011-12

#	Category	Number	Enrollment, in 'Lakh
1	Primary (I to VIII)	9776	28
2	Secondary & Higher Secondary (IX to XII)	4719	17
A	Total Schools	14479	45
B	ITI and ITC	577	0.86
C	Polytechnic	43	0.30
D	Engineering	153	0.49
E	Arts & Science Colleges	150	1.96

Source: General Education Department, Economic Survey, Govt of Kerala. Provisional data

2.4 Rubber Specific Training Infrastructure

Rubber specific training infrastructure is restricted to few polytechnics and engineering colleges, and rubber board specific training programme. Following are the Rubber specific training infrastructures available in Kerala:-

Table 32: List of training providers in Kerala State

#	Name of the Institute	Course	Capacity
1	Polytechnic – Pathanamthitta, Kottayam, Thrissur	Diploma in Polymer Technology	189
2	Cochin University of Science & Technology	B. Tech in Polymer Science and Engineering	20
3	University College of Engineering, Thodupuzha	B. Tech in Polymer Engineering	60
4	Rubber Training Institute	Short Term Training Programme <p>Rubber Plantation Development Programmes</p> <ul style="list-style-type: none"> • Short term training on rubber cultivation for small growers • Short term training on rubber cultivation for estate sector • Short term training on rubber cultivation for growers from NE/NT reg • Advanced training on rubber cultivation and rubber plantation management • Specialized training on rubber plantation management <p>Rubber Processing and Quality Improvement Programmes</p> <ul style="list-style-type: none"> • Short term training on rubber processing and quality control • Training on sheet rubber preparation and grading • Specialized training on processing of block rubber/cenex • Training on total quality management and ISO 9000 quality system • Training on effluent treatment and pollution control <p>Rubber Industrial Development Programmes</p> <ul style="list-style-type: none"> • Short term training on latex goods manufacture and testing • Short term training on dry rubber goods manufacture • Advanced training on rubber products development and manufacture • Specialized training on testing and quality control of rubber and rubber products 	

#	Name of the Institute	Course	Capacity
		<ul style="list-style-type: none"> • Specialized training on latex and dry rubber products • Entrepreneur development programme <p>Training Programmes for Students</p> <ul style="list-style-type: none"> • Short term training on rubber products manufacture and testing • Training in rubber technology for B.Tech. students • Training in rubber technology for M.Tech. students • Short term training on rubber cultivation and plantation management • Specialised training in rubber technology for students • Specialized training in rubber technology for PG diploma students <p>Market and Export Development Programmes</p> <ul style="list-style-type: none"> • Short term training on marketing export management • Training on export management <p>Leadership Development Programmes for RPS</p> <ul style="list-style-type: none"> • Training for Director Board members of RPS • Training for RPS members on business management skills <p>General Training Programmes</p> <ul style="list-style-type: none"> • Training on beekeeping in rubber plantations • Training on mushroom culture • Training on spraying and maintenance of sprayers • Training on biogas generation from effluents • Training on latex harvest technology • Training on nursery management • Training on pest and disease control • Training on budding techniques in rubber • Training on modern clones • Training on rubber wood processing, furniture making and quality control • Training on Root Trainer plants • Training on clone identification • Training on rain guarding • Training on low frequency and controlled upward tapping • Training on manuring in rubber • Training on lining, pitting, terracing and planting • Training on intercropping in rubber • Training on planting and up-keep <p>Out Station Training Programmes</p> <ul style="list-style-type: none"> • Training at RPS centres • Training for SC/ST women • Orientation training on rubber based industry • Training on quality control of different marketable forms of NR and other 	

#	Name of the Institute	Course	Capacity
		<p>topics</p> <p>Visit Cum Training Programmes</p> <ul style="list-style-type: none"> • Sastra darshan • Trainees of TT School <p>International Training Programmes</p> <ul style="list-style-type: none"> • Advanced training on rubber cultivation and plantation management • Advanced training on rubber products manufacture and testing 	
5	Common Facility Centre, Changanessery	Entrepreneurship Development Programme	30
6	Common Facility Centre, Manjeri	Entrepreneurship Development Programme	25

Note: Polymer technology / science courses includes content on plastic, rubber and other composites

Table 33: Feedback from training providers' interaction in Kerala State

Parameter	Engineering Colleges	Polytechnics	Others
Student Mobilization	Announcements in newspapers, magazines, etc.	Announcement from Directorate of Technical Education	Advertisements and announcements in newspapers, magazines, rubber related magazines (Rubber Asia), etc.
Student Selection	State / National level common entrance test and counseling process	School / ITI percentage	Students meeting eligibility criteria for the courses
Curriculum	University approved curriculum	DoTE approved curriculum	Indigenous curriculum developed
Training	<ul style="list-style-type: none"> ▪ Combination of theory and practical ▪ Project work with an organisation during final year ▪ Smaller projects are 	<ul style="list-style-type: none"> ▪ Combination of theory and practical ▪ Practical Industrial Training 	<ul style="list-style-type: none"> ▪ Combination of classroom and practical sessions ▪ Training Composition (Theory and

	undertaken throughout the course duration		Practical) is decided as per batch requirement
	<ul style="list-style-type: none"> Industrial visits 		
Infrastructure availability	<ul style="list-style-type: none"> Rubber related infrastructure includes: <ul style="list-style-type: none"> Operation machines such 2 roll mill machine, Hydraulic press machine, etc. Testing equipments such as Viscometer, Abrasion tester, etc. Other general infrastructure – Classrooms, lab, auditorium, hostels, etc. 	<ul style="list-style-type: none"> Rubber related infrastructure includes: <ul style="list-style-type: none"> Operation machines such 2 roll mill machine, Hydraulic press machine, etc. Testing equipments such as Abrasion tester, etc. Other general infrastructure – classrooms, lab, hostels, etc. 	Rubber related infrastructure includes: <ul style="list-style-type: none"> Operation machines such 2 roll mill machine, Hydraulic press machine, etc. Testing equipments such as Viscometer, Abrasion tester, Chemical testing equipments and apparatus, etc.
Certification	Recognised Degree Certificate approved by University	Recognised Diploma Certificate approved by State Government	Certificates from recognized institutional bodies, industry association, etc.
Placement percentage	More than 80 per cent	Around 70 per cent	Most of the trainees attain skill upgradation / self entrepreneurship
Placement Companies (Indicative list)	Trainees are placed mostly in tyre companies such as Apollo, Ceat, JK tyres, etc.	Most of the trainees are placed in rubber based units especially in tyre companies such as Apollo, MRF and few in non tyre companies such as Paragon, Glenrock, etc.	N/A
Placement Location	More than 60 per cent	Most students (around	Mostly local

	trainees are placed outside the state	60 per cent) are placed outside the state	entrepreneurs (and employees) and few trainees from outside the state attend the training program
Indicative average Salary of trainees	<ul style="list-style-type: none"> Rs. 20,000 – 30,000 during training period (1 year) after completion of course successfully Rs. 35,000 and above after the training period in the organisation 	<ul style="list-style-type: none"> Around Rs. 8,000 during training period (1 year) after completion of course successfully Rs. 15,000 and above after the training period in the organisation 	Around Rs. 6,000 for lab technicians
Faculty Profile	Lecturer – M.Tech in Polymer technology / Ph. D	<ul style="list-style-type: none"> Lecturer – B. Tech in Polymer Science / Rubber Technology Demonstrator – Diploma in plastic / rubber technology 	Trainers from reputed institutes, industry experts are involved as faculties for training
Qualitative feedback on Faculties	<ul style="list-style-type: none"> Faculties with over 10 years of teaching experience is recruited and the quality is observed to be good Faculties needs to be provided with refresher training modules with reference to advancement in technology and modern processes 	<ul style="list-style-type: none"> Teaching abilities of faculty is observed to be good Some of the faculties do not have adequate industrial exposure Faculties needs to be provided with refresher training modules with reference to advancement in technology and modern processes 	<ul style="list-style-type: none"> As the faculties are from renowned institutions and major organisations, their quality is good
Importance of non technical skills	Trainees are educated on communication, IT and other soft skills to fulfill the organisational requirements	Trainees are educated on communication and other soft skills to fulfill the organisational requirements	N/A

Some of the other key comments shared by the training providers in the state are as follows:

- Some of the courses that can be introduced for mutual benefit for industries and trainees are rubber related machinery instrumentation, machinery repairing, machine operator course (for various machines), quality testing (raw material, rubber compounds and final product), etc.
- Entrepreneurship Development Program on value added products or new products can be taught to improve the entrepreneurs rate in the state
- Training providers are facing issues in procuring advanced machineries for practical sessions due to the expensive cost of machines. The stakeholders of the industry may aid them by sharing the machine for training purpose
- Most of the trainees in polymer related courses are placed in rubber based companies. In specific, they are placed in tyre companies such as Apollo, MRF, JK Tyres, etc. as the salary package offered is considerably higher than other industries.

3. Job-role Compatibility Matrix

This section profiles the compatibility of the job roles in the rubber sector across the key product groups. The compatibility has been defined as the measure of the amount of internal training an organization has to invest in when an operator moves across the product groups. The lower is the training/mentoring duration; the more compatible is the operator across the product groups.

This has been done across dry rubber based and latex based units.

The dry rubber based compatibility chart shows that the mixing operators and curing operators are compatible across most product groups.

Figure 30: Compatibility matrix – Dry rubber based units

		Occupations									
#	Job roles	Mixing Operator	Extrusion Operator	Calendering Operator	Sandblasting Operator	Grinding Operator	Moulding Operator	Vulcanizing/ Curing Operator	Finishing Operators	Braiding Operators	Building Operator
	Product Group										
1	Auto & Cycle Parts										
2	Beltings										
3	Cables										
4	Ebonite Products										
5	Extruded Rubber Goods										
6	Footwear Products										
7	Hoses										
8	Leather Board										
9	Moulded Rubber Products										
10	Rubber Covered Rollers										

		Occupations									
#	Job roles	Mixing Operator	Extrusion Operator	Calendaring Operator	Sandblasting Operator	Grinding Operator	Moulding Operator	Vulcanizing/Curing Operator	Finishing Operators	Braiding Operators	Building Operator
	Product Group										
11	Rubberised Coir, Jute & Woollen Products										
12	Rubberised Fabric Products										
13	Rubber Linings										
14	Rubber Mattings										
15	Rubber Sheetings										
16	Rubber Tubings										
17	Sports Goods										
18	Surgical & Pharmaceutical Products										
19	Tread Rubber Products										
20	Flaps										
21	Tyres										

The job role is compatible and the operator with minimum training can move across the product groups

Note:

- 1 Production management job roles such as Production Manager and Shift in charge not covered and are applicable for all the product groups.

- 2 Quality related job roles such as Quality in charge and lab assistants are not covered and are applicable for all the product groups.

The compatibility matrix for latex based units show that the dispersion operator is the most compatible across the latex based product groups.

Figure 31: Compatibility matrix – Latex based units

#	Job roles	Occupations								
		Compounding (Dispersion) Operator	Dipping Operator	Extrusion Operator	Stripping Operators	Moulding (Pressing) Operator	Vulcanizing Operator	Cutting Operator	Finishing Supervisor	Others
	Product Group									
1	Adhesives									
2	Adhesive Tapes									
3	Dipped Goods									
4	Foam Products									Beating and foaming Operator
5	Latex Thread									
6	Rubberised Coir, Jute & Woollen Products									
7	Sports Goods									
8	Surgical & Pharmaceutical Products									

The job role is compatible and the operator with minimum training can move across the product groups

Note:

1 Production management job roles such as Production Manager and Shift in charge not covered and are applicable for all the product groups.

2 Quality related job roles such as Quality in charge and lab assistants are not covered and are applicable for all the product groups.

4. Human Resource estimation for Kerala state

Based on our forecasts, we estimate that between 2012-13 and 2017-18, an incremental human resource (cumulative for five years) of about 7,898 persons will be generated in Kerala.

Maximum demand will be generated for product segment tyres and tubes and employment fall will be expected in segments like footwear, latex foam and dipped goods.

The fall in footwear is expected due to the lesser demand and for the latter two segments the fall is anticipated due to the rise in automation that will lead to higher productivity without increasing the human resource number.

Table 34: Projected human resource requirement for Rubber Industry in Kerala state till 2018

S. No	Product group	2012 - 13	2017 - 18	Incremental
1	Tyre and Tube	11,480	14,249	2,769
2	Camel back	4,578	5,238	661
3	Footwear	2,195	1,801	-
4	Belt and hose	188	188	-
5	Latex foam	2,442	1,906	-
6	Dipped goods	5,179	5,073	451
7	Others	7,443	11,460	4,017
Total		33,504	39,915	7,898

Source: IMaCS Analysis. Camelback comprises of tread rubber products. Footwear comprises of footwear products and leather boards. Latex foam comprises of foam products, adhesives, adhesive tapes, latex thread. Cables and wires comprise of cables and rubber tubings. Battery boxes comprise of ebonite products. Others comprise of moulded rubber products, rubber linings, rubber covered rollers, rubber matting, rubber sheeting, sports goods, flaps, auto and cycle parts, extruded goods, rubberized coir and rubberized fabric

4.1 Job Role-wise Incremental Human Resource estimation for Kerala

This section will outline the job role-wise HR requirement in Kerala. The training ecosystem has to be built keeping in mind the compatibility of the job roles. For the state, these numbers have been given for dry rubber based and latex based job roles.

For the dry rubber based job role number computation, product segments Tyres, Camelback, Others, Belts and Hoses have been considered. Footwear has not been taken into account due to reduction in human resources (as outlined above).

In Kerala, for the dry rubber based there are maximum operators required in the Helpers, Curing Operator, Calendaring Operator and Mixing Operator. This is in line with the rubber manufacturing structure in the state which has higher focus on Tread rubber products, matting and tyre products. The helpers will be involved across occupations in the production area.

Table 35: Kerala job role-wise numbers – Dry Rubber based

Job roles	Incremental HR Requirement	%
Mixing Supervisor	130	1.7%
Mixing Operator	686	9.2%
Extruding Supervisor	40	0.5%
Extruding Operator	410	5.5%
Calendaring Supervisor	60	0.8%
Calendaring Operator	660	8.9%
Beading Supervisor	3	0.0%
Beading Operator	20	0.3%
Building Supervisor	10	0.1%
Building Operator	100	1.3%
Curing Supervisor	285	3.8%
Curing Operator	1410	18.9%
Helpers	2150	28.9%

Job roles	Incremental HR Requirement	%
Inspection / finishing	460	6.2%
QC	244	3.3%
Support	782	10.5%
TOTAL	7,447	100.0%

Source: IMaCS Analysis

In Kerala, the latex based job roles show an increment only in inspection helpers and finishing and packing helpers (the reason for decrease in numbers overall has been outlined above). This again echoes the movement of latex based industry to modern manufacturing technologies. The job roles of inspection helpers and finishing helpers alone rise due to the increased output due to reason such as automated process, whatever be the end product.

Table 36: Kerala job role-wise numbers – Latex based

Job roles	Incremental HR	%
Inspection (Helper)	222	49%
Helpers	229	51%
Total	451	100%

Source: IMaCS Analysis

In addition to the above mentioned core functions, the industry also requires skilled maintenance operators (mechanics). Based on the industry players' interaction and our analysis, it is observed that the maintenance operation will gain more importance in the coming days with increased mechanization and automation in the manufacturing process. Equipped operators are required for maintenance activity to be performed. Therefore, we have estimated the requirement of maintenance operators for the rubber manufacturing units. These operators are acting as a third party service provider to the manufacturing units and generally provide service to multiple units. Generally large companies have their own maintenance team and these services are usually provided to Micro, Small and Medium enterprises.

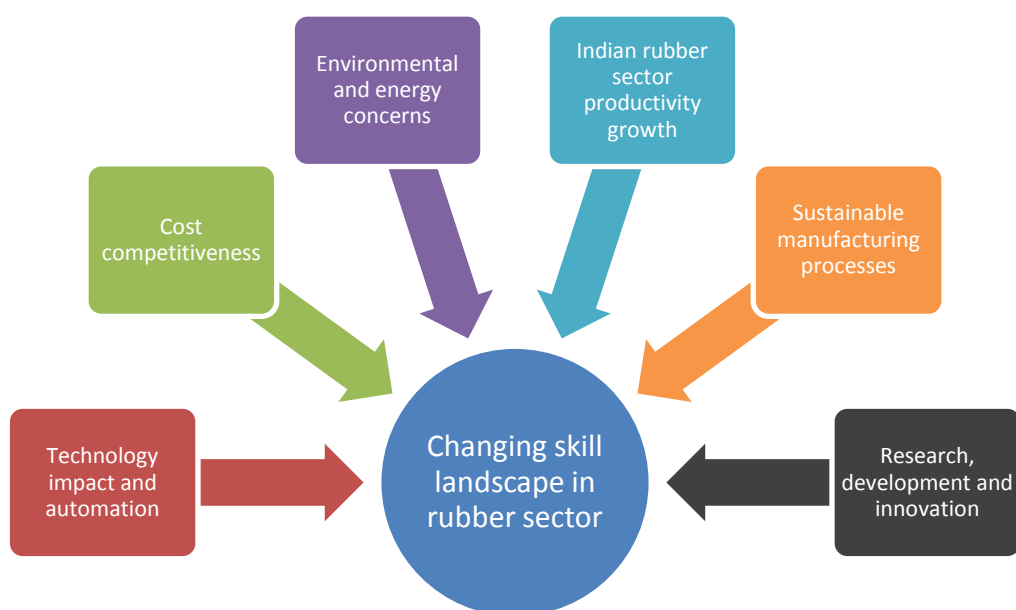
Kerala has around 800 rubber product manufacturing units. These units require around 500 operators to perform the maintenance operation. In the next five years, considering the increase in output, the number may increase to around 600 operators. The maintenance operator requirement is calculated based on industry interaction and IMaCS analysis considering parameters such as no. of maintenance activity undertaken (break down maintenance and periodical maintenance) and man hours required for performing the maintenance activity.

5. Recommendations

5.1. Introduction

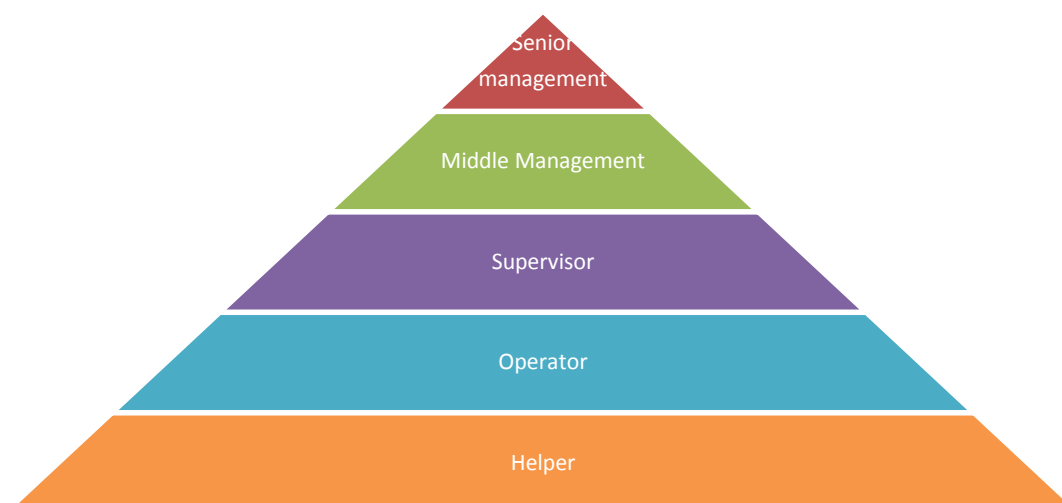
The skilling landscape for the rubber sector has undergone significant changes. There are several factors that have been attributed to this change; of course the mainstay being the dynamic nature of the sector both in terms of the manufacturing process and technology. Some of the predominant points that have impacted the skill landscape are depicted in figure 49.

Figure 32: Factors that have changed the skill landscape in rubber



Thus, there is a heightened need to revisit the skilling initiatives that are currently used in the rubber sector, across all the employee profiles to ensure holistic development.

Predominantly, the human resource in the rubber sector can be classified in the following manner based on their experience and skill level.



Thus, based on this division, the skilling requirement and themes will also vary. These themes will address both the skilling and upskilling necessities of the sector.

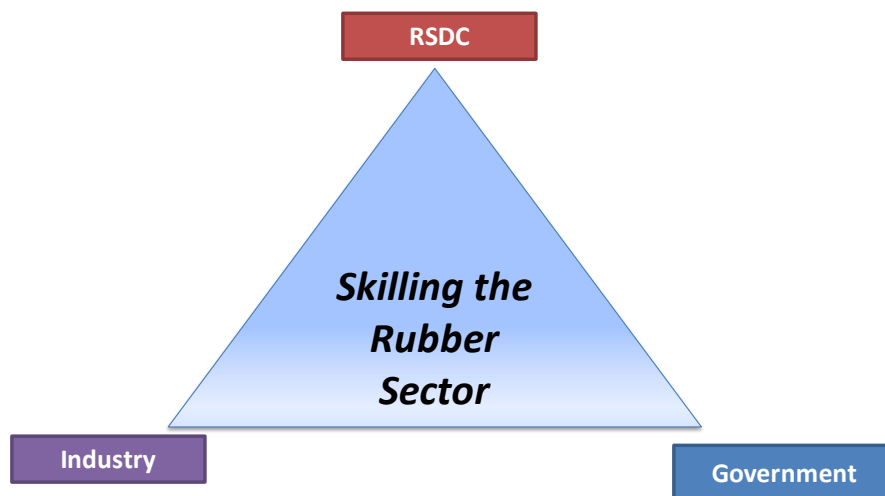
Table 37: Rubber sector skilling themes

Skilling theme	Brief description	Target human resource profile
Building systems for manufacturing excellence	These skills are aimed at building the expertise across several ambits like lean manufacturing, Kaizen, Corrective Action Preventive Action (CAPA), Total Productivity Management (TPM), and Six Sigma amongst others, which will change manufacturing scenario that is followed in most rubber units in India.	Supervisors, Middle Management, Senior management
Building skills for technical competency	These skills are predominantly for the operators of the various machines used in manufacturing	Operators, Helpers
Building skills for maintenance	These skills will target the supervisor grade personnel who will need not only understanding on machine operation but also know the properties and the basic preventive maintenance sequences.	Operators, Helpers
Building skills for research and	This again will fall under the ambit of up-skilling where personnel with over 10-12 years of experience in the	Senior management,

Skilling theme	Brief description	Target human resource profile
innovation	industry can be encouraged and skilled to pursue research	Middle Management
Soft skill development	The industry has the big challenge of migrant workforce and people who are minimally educated who need to be skilled with communication and soft skills so that they can adapt to the shop-floors quickly and also have basic industrial discipline/culture	Supervisors, Operators, Helpers

Given this background and need for skilling, there needs to be synergy with all the stakeholders involved in the rubber sector to achieve the skill targets.

Figure 33: Synergy between stakeholders



The recommendations thus, have been outlined based on the role each stakeholder has to play in the skill sphere. In addition, some Best Case examples in the training sphere have also been outlined.

5.2. For RSDC

This section will focus on recommendations for the RSDC. The recommendations for the RSDC will focus on the following modules:

- 1. Identification of critical job roles and training mechanism of Kerala**
- 2. Upskilling the human resource**
- 3. Train the trainer**
- 4. Recognizing the skill gleaned through prior experience**
- 5. Focus on building maintenance skills**

This first sub-section will highlight the technical skills competency that needs to be built for Kerala state for both dry rubber and latex based products.

5.2.1. Kerala – Identification of critical job roles and training mechanism of Kerala

Kerala houses over 1,000 rubber manufacturing units which are distributed across the tyre and non-tyre segments. The dominant segments in the state are tread rubber products, footwear, dipped goods, rubberized coir and rubber mattings.

The industry feedback in Kerala has been analyzed to reveal what are the job roles across the product segments that require interventions. This has been depicted in the form of a heat map where three dimensions are analyzed:

- 1. The criticality of the job role**
 - a. In terms of the end product quality
 - b. In terms of the continuity of the manufacturing line
- 2. Availability of the human resource for that particular job role**
- 3. Intensity of the skill gap exhibited (across 3 variations, as in the skill gap section)**
 - a. Mismatch between expected competency for that job role and what skill the personnel exhibits is high

- b. Mismatch between expected competency for that job role and what skill the personnel exhibits is medium
- c. Mismatch between expected competency for that job role and what skill the personnel exhibits is low

This is done for dry rubber based units and latex units in Kerala.

(a) Dry rubber based units

Figure 34: Heat map for Kerala – Dry rubber based

	Occupation	Mixing	Extrusion	Calendering	Moulding	Finishing	Vulcanising/ Curing	Quality Check	Building	Beading
S. No.	Products Category	Mixing and Milling operator	Extrusion operator	Calendering operator	Moulding operator	Finishing operator	Vulcanising/Curing operator	Quality Check In-charge Quality check Operator	Building operator	Beading Operator
1	Auto & Cycle Parts									
2	Beltings									
3	Extruded Rubber Goods									
4	Footwear Products									
5	Hoses									
6	Moulded Rubber Products									
7	Rubber Covered Rollers									
8	Rubber Linings									
9	Rubber Mattings									
10	Rubber Sheetings									
11	Rubber Tubings									
12	Rubberised Coir, Jute & Woolen Products									
13	Sports Goods									
14	Tread Rubber Products									
15	Flaps									
16	Tyres									

Legend

Criticality/intensity high



S. No.	Products Category	Mixing and Milling operator	Extrusion operator	Calendaring operator	Moulding operator	Finishing operator	Vulcanising/Curing operator	Quality Check In-charge	Quality check Operator	Building operator	Beading Operator
	Criticality/intensity medium										
	Criticality/intensity low										

The key takeaways from the above heat map lead to identification of critical roles. Based on primary survey, IMaCS proposes indicative training mechanism for these dry rubber based job roles in Kerala, which the RSDC can build an ecosystem for by partnering the stakeholders:

Table 38: Identification of critical job roles and indicative training mechanism for Kerala – Dry rubber based units

Critical job role	Rationale for criticality*	Indicative training mechanism	Other comments from industry
Mixing and milling operator	<ul style="list-style-type: none"> The compounding/formulation are the most critical process for the entire manufacturing cycle. The operators involved should understand the basics of raw material properties and follow the sequence and weighing to the last detail 	<ul style="list-style-type: none"> Class room module on basics of raw material properties Practical sessions on mixing operations Scenario based training on how to manage the corrective actions Safety skills exposure Soft skills 	<p>“In addition must invest in basic machine maintenance as this would definitely help the overall productivity and reduce costs. Also, for majority of small units, if mixing goes wrong we only find it in the end after the final product comes.”</p>
Extrusion operator	<ul style="list-style-type: none"> Right parameters like temperature need to be maintained to prevent curing of compound in the extruder When the product comes out of the extruder, the operator must be able to judge the quality of the product The feeding needs to be done consistently to avoid non-uniform extruded product 	<ul style="list-style-type: none"> Practical sessions on extrusion operations. This should form bulk of training Scenario based training on how to manage the corrective actions Soft skills 	<p>“The experienced and sufficiently skilled extruder operators are difficult to find.”</p>
Moulding operator	<ul style="list-style-type: none"> Right parameters like temperature need to be maintained to prevent over-curing/ under-curing of compound Productivity numbers finally rest with this operator 	<ul style="list-style-type: none"> Practical sessions on moulding operations. This should form bulk of training Scenario based training on how to manage the 	<p>“The availability of skilled moulding operators is a challenge. Most of them tend to leave the job.”</p>

Critical job role	Rationale for criticality*	Indicative training mechanism	Other comments from industry
	<ul style="list-style-type: none"> The curing operator judges the final quality of the product from the mould and should be able to flag off the issues encountered 	<ul style="list-style-type: none"> corrective actions Safety skills exposure Soft skills 	
Finishing operator	N/A	<ul style="list-style-type: none"> Basics of rubber industry Motivation modules Communication skills 	<p>“The bulk of the HR is in finishing and packing. These people are usually helpers. But, they become very critical because they complete the chain of manufacturing. The biggest challenge is that they are low on motivation and hence there are not many available for this role. Women can be targeted and can be attracted to this.”</p>
Building operator	<ul style="list-style-type: none"> Building is the most critical function in tyre manufacturing Quality of the green tyre is dependent on the correctness of building 	<ul style="list-style-type: none"> Class room module on the tyre manufacturing and building general steps Simulation based training Physical fitness modules – as strength is required in the process Soft skills 	<p>“Experienced and skilled builders are tough to find.”</p>

* based on industry feedback

(b) Latex based units

Figure 35: Heat map for Kerala – Latex based

	Occupation	Compounding	Dipping	Extrusion	Vulcanising/ Curing	Finishing	Quality Check and Inspection	
S. No.	Products Category	Compounding Operator	Dipping operator	Extrusion operator	Vulcanising/ Curing operator	Finishing operator	Quality Check In charge	Quality check helper / operator
1	Adhesives							
2	Dipped Goods							
3	Foam Products							
4	Latex Thread							
5	Surgical & Pharmaceutical Products							

Legend

Criticality/intensity high

Criticality/intensity medium

Criticality/intensity low



The key takeaways from the above heat map lead to identification of critical roles. Based on primary survey, IMACS proposes indicative training mechanism for these latex based job roles in Kerala, which the RSDC can build an ecosystem for by partnering the stakeholders:

Table 39: Identification of critical job roles and indicative training mechanism for Kerala – Latex based units

Critical job role	Rationale for criticality*	Indicative training methodology	Other comments from industry
Dipping operator	<ul style="list-style-type: none"> If the dipping is uneven, the product will be rejected. Dipping parameters like coagulant, leaching, etc have to be adhered to for quality of output 	<ul style="list-style-type: none"> Class room modules to know about processes like leaching, dipping, etc and also chemicals and material handling Orientation training to familiarize with 	“Dipping operators must be able to monitor the process and this happens only if they are well versed in the basics”

Critical job role	Rationale for criticality*	Indicative training methodology	Other comments from industry
		<ul style="list-style-type: none"> the production line ▪ In case of manual dipping practical modules ▪ Basic safety module ▪ Communication module 	
Finishing operator/Helper	N/A	<ul style="list-style-type: none"> ▪ Basics of rubber industry ▪ Motivation modules ▪ Communication skills ▪ Material handling ▪ Safety modules 	"To attract the HR is a challenge. They are also 'casual' in their attitude"
Quality check in charge	<ul style="list-style-type: none"> ▪ Quality of the product (raw material, semi finished, finished) is determined by him ▪ Proper corrective action not taken will impact the entire manufacturing process 	<ul style="list-style-type: none"> ▪ Basics on chemistry ▪ New testing methods exposure ▪ Knowledge sharing workshops exposure 	"Though they have the expected degree, they lack in-depth knowledge. This has to be bridged."
Compounding operator	<ul style="list-style-type: none"> ▪ The compounding/is the most critical process for the entire manufacturing cycle. The operators involved should understand the various chemicals and raw materials. ▪ They should also know dispersion, effects of chemical mixing, etc 	<ul style="list-style-type: none"> ▪ Class room modules on properties of latex and other chemicals used ▪ Material handling modules ▪ Practical training on the mill machine and mixer ▪ Communication skills 	"Currently the industry has 1 or 2 experienced personnel. The pipeline of skilled HR has to be built for the future."

* based on industry feedback

5.2.2. Up-skilling potential

This section will detail the upskilling potential for various profiles of job roles in the rubber sector.

The rubber sector requires not only a pipeline of human resource skilled in equipment usage and various other basics but also the up-skilling of the personnel currently working in the sector.

Skill gaps identified in the IMaCS primary survey bring to the fore that the current workers recruited have generic employability skills and not specific task skills/knowledge. This further gains import for the rubber sector as new technology, increasing compliance requirements, global pressures to increase productivity and new work practices all keep changing significantly.

This up-skilling recommendation will need proactive participation from the industry to aid the RSDC to successfully facilitate the same.

The indicative up-skilling areas for the RSDC where they can build a training ecosystem are:

Human resource profile	Indicative topics
Operators	<ul style="list-style-type: none"> ▪ Latest advancements in rubber sphere ▪ Advanced equipment handling ▪ Basic management modules ▪ Maintenance of apparatus ▪ Refresher module on rubber and chemical basics
Supervisors	<ul style="list-style-type: none"> ▪ Leadership modules ▪ Lean manufacturing techniques ▪ Total Productivity Management principles ▪ Production planning modules ▪ QC tools
Senior management	<ul style="list-style-type: none"> ▪ New product development ▪ Value addition techniques ▪ Development of QC systems ▪ Global best production practices

5.2.3. Training of trainer

There needs to be an adequate trainer pool built to offer the training programs to the skilling and upskilling modules.

The RSDC can partner the industries to have a mechanism like guest faculty who know the topics through both theory knowledge and practical experiences. In fact, several industry experts can regularly have ToT sessions to keep the faculty abreast of the developments and the RSDC can create the ecosystem for the same.

5.2.4. Recognizing the training already gleaned

Many workers in the rubber are classified as minimally skilled due to their low qualification (below Xth pass in most cases). However, once they are on-the-job, they tend to acquire skills simply through experience. However, there is no certification which is provided for such skills acquired. When these workers move from one unit to another, they have no proof of the skills acquired.

Thus, there is a need to recognise such skills also, for the benefit of the workers in the rubber sector. The RSDC can introduce certification programmes, wherein such workers can sit for examinations (with greater focus on practical) and get certified for their skills, if they pass the exam.

By doing so, they also get slotted as skilled personnel and will be eligible for upskilling going forward.

5.2.5. Focus on maintenance

The rubber industry utilizes several machinery and equipment across the product segments. Some of the commonly used equipments in manufacturing are:

- Open mixing mill
- Intermix
- Ban bury mixer
- Kneader
- Calendar
- Cold feed extruder
- Extruder

- Hydraulic press – for compression moulding, transfer moulding, injection moulding
- Rotocuring machine
- Autoclave vulcanizer
- Dispersion mixer
- Cryogenic machine
- Auto vacuum machine
- Ball milling machine
- Dipped goods manufacturing line
- Tumbling machine
- Boilers

This translates to active machine maintenance.

The consistent feedback received from the industry the IMaCS team visited is the difficulty in engaging personnel for the maintenance of the machines and equipments used in the shop floor.

Thus, the RSDC can focus on identifying ITI and polytechnic which in turn can offer maintenance training by tying up with the polytechnics and ITI in the manufacturing clusters. Specifically, the electrical and mechanical trades can be targeted for this.

As the equipments are of high criticality, the types of maintenance modules that can be offered for training include:

1. Breakdown Maintenance or Operate to Failure or Unplanned Maintenance
2. Preventive or Scheduled Maintenance
3. Predictive or Condition Based Maintenance

In addition to the above, new strategies concepts such as Proactive Maintenance, Reliability Centred Maintenance (RCM), Total Productive Maintenance (TPM), etc. have recently been evolved to look it from different perspectives and this has helped in developing effective maintenance. In proactive maintenance, the aim is identify what can go wrong, i.e. by monitoring of parameters that can cause failures.

In RCM, the type of maintenance is chosen with reliability of the system in consideration, i.e. system functions, failures relating to those functions and effects of the dominant functional system failures.

These advanced modules can also be offered as upskilling.

5.3. Industry

This section will focus on recommendations for the industry. The recommendations for the industry will focus on the following modules:

1. *Strategies to mitigate the current challenges faced by industries*
2. *Mechanism to have constant upskilling*
3. *Knowledge sharing*
4. *Support of RSDC LMIS*

5.3.1. Challenges faced by industries

Based on the interaction with the industry, certain common challenges have been identified:

- Attracting the Human Resource to the sector
- Retaining the existing Human Resource
- Providing the on the job training (OJT) to make them shop-floor ready
- Attracting women to the sector

Going forward, strategies will be outlined to address these challenges.

Challenge	Industry feedback	Strategy
1. Attracting HR to be a part of the rubber sector	“The primary concern in the rubber sector is that we are finding it extremely difficult to attract HR. Once the HR is there only we can think about training, skilling and upskilling”	<ul style="list-style-type: none"> ▪ Healthier work environment has to be implemented. The perception in the HR that rubber is ‘dirty’ and ‘unhealthy’ can be rooted out by following fundamental facility maintenance doctrines like 5S. ▪ The AIRIA should take steps with RSDC to educate the small, tiny and medium entrepreneurs the importance of 5S in cluster level workshops. The implementation

Challenge	Industry feedback	Strategy
		phases for 5S with success case examples should be highlighted.

5S --- The Mantra for Organized and Healthy Work Environment

The 5S-operation model is one part of the Lean model. It is just one of the many tools which the Lean-ideology includes. 5S consists of five (5) different phases and it was also created in Japan. The names of the phases come from Japanese and all of them begin with the letter s. That is where the name 5S stems from. The phases are:

- ✚ Seiri = Sort
- ✚ Seiton = Stabilize/Set in order
- ✚ Seiso = Shine/Sweep
- ✚ Seiketsu = Standardize
- ✚ Shitsuke = Sustain

Cleanliness and order characterize significant issues both for customers and potential labor force. The starting point is that profitable and high quality tasks can be conducted only in a clean environment. The basic idea is to increase productivity, to improve the level of quality and to raise work ethic. These factors are reached when the working environment is clean and in good order.

Exhibit 1: Rubber Seals before 5S and after 5S



2. Retaining the existing HR	<p>“Attrition is the biggest problem. This affects the productivity planning, the output, and the organization vision.”</p> <ul style="list-style-type: none"> ▪ One of the means to combat attrition will be to clearly spell out the career graph of the person who walks in as a helper. Giving the blueprint for the growth to the person will enable him to better productivity and tie him to the organization. ▪ To retain workers, employers should consider offering nationally recognized qualifications aligning
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Challenge	Industry feedback	Strategy
		<p>with RSDC.</p> <ul style="list-style-type: none"> Employees may see the chance to gain qualifications as a good reason to stay with an employer. Once a qualification has been gained, they can be offered the next qualification level.

Case Study: Ireland Manufacturing Industry Career Path

Internationally, there are clear paths in many countries for career progression from operative level up to senior roles in manufacturing, linked to their systems of training, education and qualifications. Industry takes the lead role in establishing and developing these career paths in collaboration with education and training providers.

Ireland does not have a comparable resource at present.

The most significant gap in the system is the lack of a clear framework for training at operative level, and for progressing from operative level. There are existing elements to the system which function well; there are discrete sector level initiatives for operative level training that might fit well into an overarching framework; and there are examples of very good practice on career paths within individual firms. The challenge is to build on good work that is already being done.

Key features of a career path framework for manufacturing at this range of levels would include:

- ✚ Establishing competency frameworks for the main occupations, mapped to the National Framework of Qualifications;
- ✚ Establishing learning pathways for the skills associated with each occupation, and for progression between occupations, that meet the needs of both industry and employees, and are robust in terms of learning and qualifications; and
- ✚ Facilitating both college-based and industry-based learning pathways where these meet industry and learner needs, with cross-linkages and even joint provision between the two types of pathway.
- ✚ Consideration should be given to the possibility of an industry-based track to qualifications for higher level occupations, comparable to German Meister or time-served engineer.

Recommendations:

The Manufacturing Development Forum should lead a review of manufacturing career paths. It should engage industry, employee representatives and relevant providers of education and training and the qualifications bodies including Industry Representatives, Further Education providers, FÁS/SOLAS, Skillnets and Higher Education representatives.

Source: Report on Future Skills Requirement in Manufacturing Industry 2020

Challenge	Industry feedback	Strategy
3. Providing OJT	“The operators, helpers and any other new entrant have to be given OJT. This OJT at times takes weeks with the older operator teaching the newer operators and this reduces the productivity. Of course, with the attrition factor this becomes a frequent event for us ”	<ul style="list-style-type: none"> ▪ The industries in a cluster can come together and with the RSDC offer standard training modules with defined time schedules. ▪ With the professional training and certification given by RSDC, there will be less lead time in an employee adapting to the shop floor.
4. Attracting women to the rubber sector	“Women perceive this sector as a man’s domain. There are job roles where women can definitely play a part ”	<ul style="list-style-type: none"> ▪ Awareness spread on certain job roles like QC, packing, etc where the role of women is heightened ▪ In addition women can be trained to be active part of the shop floor in highly automatized production lines ▪ To retain the women in the industry employers could consider providing flexible work conditions ▪ Many women have childcare responsibilities and are therefore not able to engage in full time employment. If affordable, 24/7 childcare in close proximity to the rubber unit can be organized to provide the support

5.3.2. Mechanism for upskilling

In addition to combating the above outlined challenges, the industries have to proactively pitch for the notion of upskilling. Rubber is a sector which requires a lot of internal learning to be competitive in a segment that has rising input costs and shrinking margins. Thus, this ideology of upskilling assumes tantamount importance.

Industries have to employ a periodic means to evaluate their HR and make sure each and every personnel is exposed to the modern technology upgradation in the rubber sphere.

Some of the action points for the industry in upskilling could be:

- Identify progressive skilling opportunities for the operators/helpers in the organization and periodically conduct tests to ascertain their level of competency
- Develop and roll-out an operative accredited upskilling programmes – joining hands with the RSDC
- Internally develop a skill competency framework and keep track on the expected competency vis-a-vis the actual performance

Infact, this initiative to frequently skill and arm the employees with newer skill sets will arrest the tendency to quit the organization.

Case Study: Lake Region Medical

Lake Region Medical is an Original Development Manufacturer of minimally invasive devices and components with clinically-focused product innovations with facilities in Wexford and Galway. In 2012, Lake Region Medical became the first company in the Republic of Ireland—and the first medical device manufacturer in Europe—to be awarded a global standard in Operational Excellence—the prestigious Shingo Accreditation Bronze Medallion.

Lake Region has developed a system to select production operators who had the potential and drive to become maintenance fitters and put them through a national apprenticeship program. Lake Region views the main benefits from this initiative as:

- ✚ Internal candidates (because they have worked for a number of years in production) bring a culture of flexibility & accountability to their new position. They also bring a thorough understanding of Lake Region Medical equipment, systems & processes.
- ✚ Once the apprentice is fully qualified it creates an opportunity to train and promote an experienced fitter to an engineering role as vacancies arise, therefore creating a pipeline of talent right from operations up through engineering and potentially to management one day.
- ✚ Turnover within the maintenance department has effectively ceased since 2007, which Lake Region consider remarkable given the number of blue chip medical device companies operating within the catchment area.

1.2.3 Knowledge sharing

Rubber being a sector that is evolving and being put through new technology dimensions, there should be consistent knowledge sharing among the cluster industries.

Industry feedback	Strategy
Lack of experience sharing	<ul style="list-style-type: none">▪ Encourage subject specific competition for sharing of knowledge and experience in the rubber manufacturing cluster▪ Specific targets for experienced employees in engaging with local educational institutions, publishing thought leadership articles and journals

5.3.3. Support of private training providers in rubber sector

The industries' biggest contribution to the ecosystem of training will be the support they can lend to the private training providers setup in their cluster. The type of support the industries can provide will lead to the development of human resources who know the work environment in the rubber sector as well as being familiar with the machines.

Some of the indicative ways in which the industry can become supportive of any private training provider in the rubber sector in a particular cluster are:

- ✓ Offering internship opportunities
- ✓ Exposure to shop-floor with industry visits
- ✓ Utilization of facilities (under supervision) after shift hours
- ✓ Guest lectures by industry personnel
- ✓ Mentoring of students by industry personnel

5.3.4. RSDC Labour Market Information System (LMIS) Support

One of the critical mandates of RSDC is the Labour Market Information System (LMIS). This system will become a repository of information on industries, job seekers and educational institutions for the rubber sector. Thus the system will present a holistic picture of the sector as a whole.

Once the system is fully developed, it can be used as a tool for conducting real-time job role wise gap analysis in the rubber sector across the national scene.

But, for this to happen, full compliance from industry is required. Some of the key areas where the industry has to have a periodic feedback/response to the RSDC for the LMIS are:

- Updating the real time job number requirements
- Updating the job qualifications requirement
- Updating on the replacement demand that could arise due to retiring personnel
- Updating on the internship opportunities
- Updating on the skills pipeline that can be built with the changing technology

5.4. Government

The recommendations for the government focus on setting more infrastructures to cater to the rubber sector – namely by setting up more rubber parks and rubber zones to aid in manufacturing.

Rubber Parks

India has two rubber parks – in Ernakulam (Kerala) and in Bodhunagar (Tripura). The salient features of the Ernakulam rubber park are³:

- Fully integrated office space
- An efficient network of internal roads.
- A full service bank, Extension Counters and ATMs
- Guest suites
- Fully equipped Testing and Certification and Research center : "J J Murphy Research Centre"
- Bachelor accommodation for executives
- Dormitory for workers Dispensary and medicare
- State of the art communication facilities
- Tooling and support service at the Rapid Prototype Development Center
- Quality power & water – Any amount of uninterrupted power at 11kV
- Common Effluent Treatment & Total Waste Management
- Executive Board Room
- Training Room
- Shopping Mall
- Library– packed with journals, books and magazines of real value to the industry
- Convention Centre
- Humidity and temperature controlled warehouse for Natural Rubber

The Rubber Park in Tripura has been inaugurated in early 2012. The park is a joint venture between the Tripura Industrial Development Corporation (TIDC) and the Rubber Board. At least 20 rubber-based industrial projects would be set up in the park in the next few years. The rubber park was built on an area of about 58 acres of land in the Bodhunagar industrial growth centre in western Tripura and over Rs.75 crore is expected to be invested in the park over a period of three years.

³ Source: The Rubber Park, Ernakulam

Similar rubber parks like these which have an integrated training, testing and tooling centers will aid in more units being set up. This is especially important as in the last few years; the number of the rubber units is coming down.

Shared Service Model

The shared service model proposed in this sub-section builds on the synergy between the key stakeholders in the rubber sector namely the RSDC, Government, Industry, Employees (for upskilling avenues) and students (to get skilled).

This model gains greater significance for the rubber sector due to the dearth of a formal system which ensures constant mechanism for skilling, upskilling, apprentice-ship and placement avenues.

This type of a system has to be implemented in key rubber manufacturing clusters to ensure that the captive and cluster specific unique requirements in terms of skills and numbers are met.

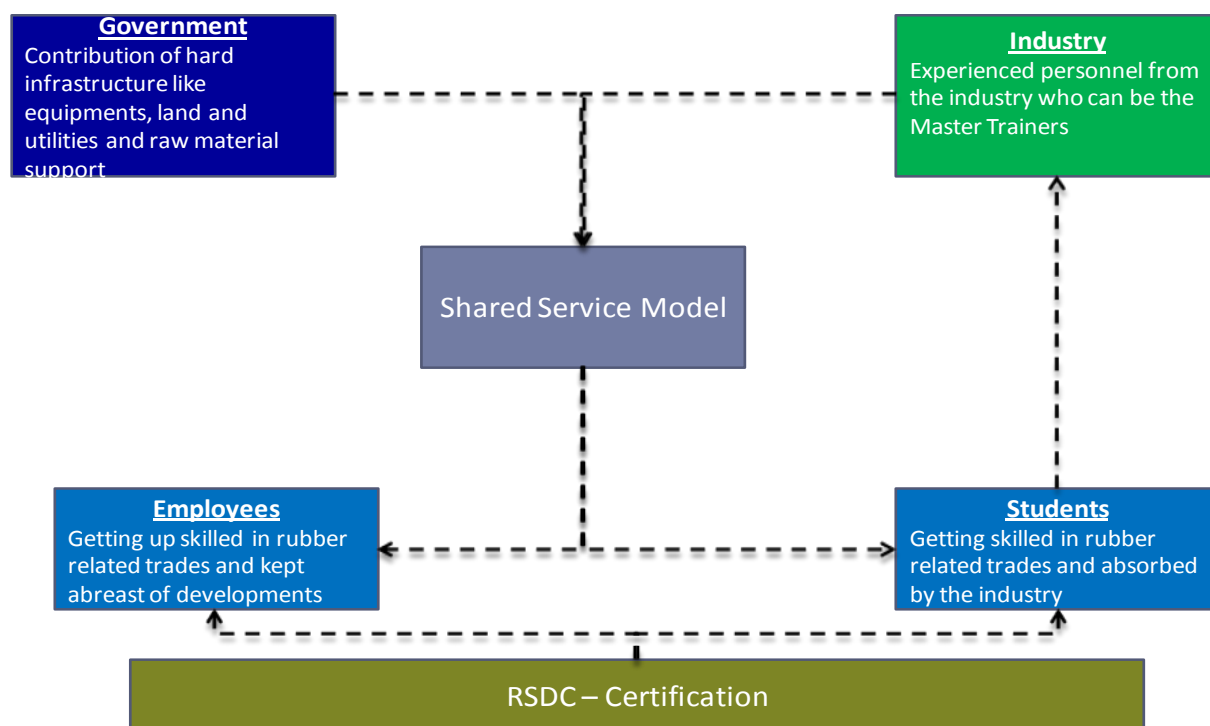
Salient Features of the Shared Service Model

As depicted in the figure, the shared service draws on the strengths of the key stakeholders.

- The Government to provide infrastructure and raw material support
- The Industry to provide experienced personnel as master trainer
- The RSDC to issue the certification

The students and employees will be appropriately skilled and up-skilled in the cluster specific skills.

Figure 36: Depiction of Shared Service Model for the Rubber Sector



5.5. Best Case Examples

This section will outline some of the best case examples and models adopted in the training sphere in India and abroad.

5.5.1. CIPET Model

CIPET is an ISO 9001:2008 QMS, NABL, ISO/IEC 17020 accredited premier national Institution devoted to Academic, Technology Support & Research (ATR) activities for the growth of Polymer & allied industries in the country. CIPET operates on hub & spokes model with 23 locations spread across the country. CIPET has centres at Ahmedabad, Amritsar, Aurangabad, Bhopal, Bhubaneswar, Chennai, Guwahati, Hyderabad, Hajipur, Haldia, Imphal, Jaipur, Kochi, Lucknow, Mysore and Panipat. All the CIPET centres have infrastructural facilities in the areas of Design, CAD/CAM/CAE, Tooling & Mould Manufacturing, Plastics processing, Testing and Quality control to cater to the needs of Polymer & allied industries in the country.

The objectives of CIPET are⁴:

- Development of skilled Human Resource for plastics industries.
- Upgradation of technical knowledge through advanced training programmes
- Quality control and standardization of plastics materials and products.
- Technical consultancy and advisory services for enhancing techno-commercial competitiveness of the industries.
- Design and development of moulds, dies for plastics industries.
- Research and Application development in the areas of Plastics Engineering & Technology.

The success of CIPET in aiding the HR growth in the plastic industry is due to the twin factors of courses and infrastructure for training. Courses are designed to produce technically trained manpower for ready immediate work on the shop floor with minimum training. The infrastructure facilities in terms of machinery and equipment are continuously upgraded or modernized to match with the technological development and needs of the industry globally. To keep the industries abreast with the new technological developments and update the skill levels of the personnel working in the industry, short-term programmes, tailor-made programmes, modular training programmes, technical seminars are conducted on Design, Tooling, Plastics Processing, Plastics Testing and Quality Assurance.

⁴ Source: CIPET

CIPET also lends itself to technology support with the following functions:

- Testing and standardization for plastics materials and products
- Material selection for new applications or substitution of conventional material
- Machinery and equipment selection
- Setting up of tool room / processing industries & testing laboratories
- Technical Support to the industry in product design / mould / dies / tools design, product failure analysis with the aid of CAD / CAM / CAE
- Undertaking job works in all the areas of Plastics Engineering & Technology

CIPET also two dedicated R&D Wings where integrated Research Programmes are undertaken in the Polymeric Materials & Product Design and Development areas.

In addition to these, CIPET engages in industry training. CIPET conducts industry specific/oriented Short-term technology up-gradation/ modular/ tailor-made programs for updating the knowledge of technical personnel working in different fields of Plastics and allied industries. Depending upon the need of the industries and development of new technology in the field, short-term courses are tailored in such a way that the industries could derive maximum benefits out of it. Through such programs, personnel from plastics industries acquaint themselves with the latest trends in technology and get their technical problems solved through interaction and exchange of ideas with CIPET faculty. CIPET thus has courses for the industry across the following prongs:

- Short Term Programs
- Modular Training Programs
- Entrepreneurship Development Programs

CIPET model takeaway for the rubber sector:

Factor	Takeaway	Why it will work in rubber sector
Geographical spread	Working across India, they are able to cater to the local needs. Also, the visibility of the institute is high where	The rubber sector also needs regional institute of excellence that operates on a hub and spoke model. The RSDC can aid in the replication of this model to build the trained HR pipeline.

Factor	Takeaway	Why it will work in rubber sector
	the personnel interested in plastic become a part of this institute	
Thrust on industrial training	The short term, modular and entrepreneurial courses offered for the industry cater to the upskilling	Rubber sector personnel also require constant upskilling to keep abreast with the technology changes and global market movement. Thus, industrial courses on similar lines can be offered to the existing personnel to up skill them and refresh their knowledge.
R&D focus	The R&D wings have programmes in polymeric material, product design, etc	The industry's constant feedback on the R&D efforts in the rubber sector has been discouraging. Thus, a nodal institute that has specialized efforts for R&D will augur good for rubber. In fact, retiring industry experts can also be made part timers here whose knowledge will not be fossilized after their retirement but will continue to aid the sector in some way.
Technology support	CIPET offers technology support to the industries across several domains like equipment testing, material testing, etc	The industry will benefit tremendously from technology help in terms of common testing centers, equipment centers, etc in key clusters. Thus, in key rubber manufacturing clusters, similar technology support centers can be established

5.5.2. Industry training models

Established industries can also offer training to people aspiring to get employable skills in the rubber sector. In many countries across the globe, these reputed organizations offer courses in their traditional

areas of expertise. These courses offered by the industry giants serve the twin purposes of improving the employability of the workforce and enhancing the industry's visibility.

Example: Gates Corporation⁵

Gates Corporation is a global diversified industrial company that provides advanced power transmission and fluid transfer solutions by engineering products and services that reduce the total cost of ownership for a wide variety of applications.

They operate across several segments like:

- Energy/Exploration/Extraction (Oil & Gas)
- Infrastructure & Agriculture (Construction)
- Transportation (Fleet)
- Automotive
- Process & Specialty (Manufacturing)

The Gates Corporation offers training programmes across several topics. One of their flagship programs is the Hydraulic Training Program.

The program was designed to help counter personnel, store managers, technicians and outside sales people increase their hydraulic knowledge to help grow the business. The training schedule offered three dates schedules. The sessions combined classroom training with individual hands-on activities and group problem solving projects.

They also design a program specifically for any company's needs. The courses are designed to cover equipment, safety, sales, basic knowledge and any other need that has to be bridged by training.

5.5.3. Education Institute-led Training

The education institute led training usually is upskilling modules that are offered to the personnel. They usually combine the academic rigour with the industry expectations. The success of these courses are high as the key points of any course are offered to the employees in short capsules.

⁵ Source: The Gates Corporation

Example: The University of Akron⁶

The Akron Polymer Training Center specializes in customized training developed specifically for employees. Depending on a company's particular needs, the courses can be taught on site at the location, or at their state-of-the-art facility on the campus of The University of Akron.

The programs are designed to enhance on-the-job effectiveness for all professionals working in the polymer field. The indicative list of courses offered by the Akron University in the rubber sphere is:

- Advanced Color Technologies
- Automotive Elastomers
- Color Matching and Correction
- Injection Molding of Elastomers
- Principles of Color Technologies
- Rubber Compounding for Performance
- Rubber Technicians Training Course
- Solving Problems in Rubber Compounding and Processing
- Testing of Rubber Processability and Dynamic Properties

⁶ Source: The University of Akron

Annexure

Human resource forecasting Methodology

As a part of the study, we have forecasted the employment numbers for the rubber sector from 2012-13 to 2017-18. For forecasting the human resources in the industry, variables such as consumption of rubber by product groups, growth rate of rubber consumption (product category-wise), growth rate of rubber units, current human resource employed and consumption of rubber/employee are considered. The employment number forecasts help determine the potential gaps (quantitative) in the rubber sector in Kerala.

For the current employment numbers the industry responses have been analyzed and projected to the hundred per cent sample size in the state and 20 percent additional workforce were included for contract workforce and casual labour as per stakeholders discussion. The product category-wise consumption pattern, unit distribution and product category dynamics have been used in the projection.