COIR MATRESSES

1. INTRODUCTION:

Rubberized coir is a versatile product used largely as a less expensive substitute cushioning material for foam rubber in furniture, upholstery, mattresses. Rubberized coir is made from curled fiber, which should be free from dust. The coir is made into endless fleece which is conveyed to the first set of rubber latex spray gums. Thickness of sheets are built by fixing multi layers fleeces and spraying is repeated to get a good bonding of layers. Then the sheet is hydraulically pressed and vulcanized to set the fibers. Coired board provides the training for this project. There are good schemes are also available for development of this industries.

2. PRODUCT & ITS APPLICATION:

Rubberized Coir Mattress is made out of Rubberized Coir Sheets and Natural Latex Form Sheets. Rubberized Coir Mattress is appreciated due to its high strength and durability among the market. The advantages of coir mattresses over the conventional are Reliable, High strength, dimensionally accurate, Durable. The rubberized coir mattresses are widely accepted as bed for modern living style.

3. DESIRED QUALIFICATIONS FOR PROMOTER:

Graduate in any graduate.

4. MARKET POTENTIAL AND MARKETING ISSUES, IF ANY:

With the present growth of furniture industry and the high cost of foam rubber, there is a tremendous scope for the use of rubberized coir as a total substitute for foam rubber. For

mattresses and in upholstery, it can be used in combination with foam rubber. The total production of coir around 3 lakh tons valued at Ra.1000 crores.There is a huge potential to expand coir production because only 28% of the raw material is available for production. Coir geo-textiles have been used by Konkan Railways on the rail embankments. They have been used in some of the Kerala districts road embankments in Idduki, bunds in Kuttanad, Irrigation canals in Muvatuppuzha and for hardening the marshy land in the NH-bypass in Kozhikode. Driving factors for demand of rubberized coir is the present growth of furniture industry and the high cost of foam rubber for mattresses and in upholstery, it can be used in combination with foam rubber.

5. RAW MATERIAL REQUIREMENTS:

Coir fibers, centrifuged latex,sulphur, accelerator,anti-oxidants, zinc oxide, dispersing agent, caustic potash etc. The major raw materials required are coir fiber and compounded latex ready for spraying. Coir fiber is extracted from coconut flex, the outer fleshy part of the coconut. It is available abundantly, throughout the coastal parts in India particularly in Kerala State. Rubber is mainly of two finds, natural and synthetic rubber. Natural rubber is a latex of the rubber plant, which is cultivated in South India on large scale, particularly in Kerala. The rubber latex collected from the rubber plants is very dilute and roughly contains only 25% solid rubber and rest is water. This latex is concentrated by centrifugation, electrolysis and several other methods. The former method is most commonly used and concentration of latex up to 60% can be obtained by this method.

Rubberized coir formulation:-

Basis: for 100 Kgs DRC (dry rubber contents) or 167 kg rubber latex.

Chemicals	%
Chalk powder	12
Zinc oxide	3
Sulphur	2
Accinex B.Rods or HSL beads	1
Accinex ZDC or Vulcanite LDA	1
Accicure ZMBT or vulkacit 2M	5
Dispersal F or Balloid Td	4% of total chemical weight

Emulvin T	1.5
Calsolune oil	5

6. MANUFACTURING PROCESS:

Sulphur, accelerator,antioxidants, zinc oxide, dispersing agent, water etc. are put in the Ball mill and mixed and ground for 48 hours. Latex is poured into the mixing machine and caustic potash solution, stabilizer, antioxidant emulsion etc. are mixed. The filtered solution from the ball mill is poured slowly to this solution and stirred well. To this compound a watering agent is also added. Coconut fibers are cut long and curled into springs. This is then subjected to steam boiling and dried as curls. The curls are rearranged as fiber yarns and put in a spraying unit. The latex compound is sprayed from the top and bottom surface of the fibers and then heated to 60" centigrade for 30-60 minutes till the vulcanization is over. The product is ready for packing after sufficient cooling. The coir twisted ropes is treated with open steam. By this process, the fiber is moisturized by the steam and heated. This is done, so that the fiber acquires the permanent curved shape. The steam treated fiber is stored for a fortnight to dry up the moisturizedfiber. The completely dried and tempered fiber ropes are fed into untwisting machine to untwist the rope and this machine throws out the fiber in carded firms. This untwisted fiber is now fed into sheet machine. This machine further untwists the fiber and gives out on the conveyor belts, the fiber in continuous sheet forms of required width and density. The sheet is now sprayed with the rubber latex and chemicals such as sulphur, sodium silicofluoride, Diphenyl Guanidine, ZMBT, ZDC and Zinc oxide. The conveyor belt passes through a drying chamber, when the water part of the rubber latex evaporates and the fiber gets bonded with rubber. The sheet comes out on the other end of the drying chamber. One side sprayed sheet is turned to another following conveyor belt, which further enters into the drying chamber. Before entering into the chamber, the unsprayed side of the sheet is sprayed and dried up in dryer chamber, which is a repeat process. A continuous sheet of required width and completely bond bonded with rubber comes out from the sheet machine.

7. MANPOWER REQUIREMENT:

The enterprise requires 13 employees as detailed below**:**

Sr. No.	Designation of Employees	Salary Per Person	Monthly Salary ₹	Number of employees required				
				Year-1	Year-2	Year-3	Year-4	Year-5
1	Machine Operators	12,000	24000.00	2	2	2	2	2
2	Helpers	8,000	32000.00	4	5	5	6	6
1	Production supervisor	15,000	15000.00	1	1	1	1	1
2	Accounts/Stores Asst	12,500	25000.00	2	2	2	2	2
3	Office Boy	9,000	9000.00	1	1	1	1	1
	Total		105000.00	10	11	11	12	12

8. IMPLEMENTATION SCHEDULE:

The project can be implemented in 3 months' time as detailed below:

Sr. No.	Activity	Time Required *(in months)*
1	Acquisition of premises	1.00
2	Construction (if applicable)	1.00
3	Procurement & installation of Plant & Machinery	1.00
4	Arrangement of Finance	2.00
5	Recruitment of required manpower	1.00
	Total time required *(some activities shall run concurrently)*	3.00

9. COST OF PROJECT:

The project shall cost ₹ 37.50 lacs as detailed below:

Sr. No.	Particulars	₹in Lacs
1	Land	5.00
2	Building	15.00
3	Plant & Machinery	15.00
4	Furniture, Electrical Installations	3.00
5	Other Assets including Preliminary / Pre-operative expenses	1.50
6	Margin for Working Capital	15.00
	Total	**54.50**

10. MEANS OF FINANCE:

Bank term loans are assumed @ 75 % of fixed assets.

Sr. No.	Particulars	₹in Lacs
1	Promoter's contribution	13.63
2	Bank Finance	40.88
	Total	**54.50**

11. WORKING CAPITAL CALCULATION:

The project requires working capital of ₹ 7.20 lacs as detailed below:

Sr. No.	Particulars	Gross Amt	Margin %	Margin Amt	Bank Finance
1	Inventories	7.50	0.25	1.88	5.63
2	Receivables	3.75	0.25	0.94	2.81
3	Overheads	3.75	100%	3.75	0.00
4	Creditors	-		0.00	0.00
	Total	15.00		6.56	8.44

12. LIST OF MACHINERY REQUIRED:

Coir Sheet Machine (Sheeting Line)

This machine is used to process systematically, the coir fiber with the latex for manufacturing Rubberized Coir Fleeces of 1" thickness. These fleeces are piled to make the mattress and other allied items. This machine has speed controls throughout and is fully automatic state-of-the-art machine. This is manufactured in 3 different capacities. 1 meter width, wherein you can process a maximum width up to 3 feet, 1.4 meter width up to 4 feet and 2.2 meter width up to 6.5 feet.

Coir Rope Untwisting Machine

This machine is used to untwist the coir rope into the loose curled coir fiber. This has a capacity to untwist coir rope upto 250 Kgs. per hour.

Hydraulic Press

it operates hydraulically to press the coir fleeces to the exact thickness of the mattress made in solid MS Plates.

Band Saw Cutting Machines

this machine evens out the mattress to the exact length and width, by cutting unwanted parts.

Ball Mill

This is used to churn the chemicals to break them into fine powder before mixing it with the Latex.

Vulcanizing Chamber

This vulcanizes the mattresses at a very high temperature and pressure so as to dry of all the moisture contents. This is manufactured in different capacities.

Tank

This tank is used to store latex mixed with chemicals and is connected via pipes into the sheeting machine for free flow of latex mixed with chemicals on the coir sheet.

A detail of important machinery is given below: Power Requirement: 15 HP

Sr. No.	Particulars	UOM	Qtty	Rate (₹)	Value (₹in Lacs)
	Plant & Machinery / equipments				
a)	***Main Machinery***				
i.	Coir Sheet Machine	NOS.	1	550000	5.50
ii.	Coir Rope Untwisting Machine	Nos	1	300000	3.00
iii.	Hydraulic Press	Nos	2	100000	2.00
iv	Band Saw Cutting Machines				
v	Water tanks	Nos	1	60,000	0.60
vi	Ball Mill Vulcanizing Chamber, and other equipments	NOS.	1		4.90
	sub-total Plant & Machinery				**15.00**
	Furniture / Electrical installations				
a)	Office furniture	LS	1	1	1.00
b)	Stores Almirah	LS	1	1	1.00
c)	Computer & Printer	L. S.	1	1	1.00
	sub total				**3.00**
	Other Assets				
a)	preliminary and preoperative				1.50
	sub-total Other Assets				1.50
	Total				**19.50**

13. PROFITABILITY CALCULATIONS:

Sr. No.	Particulars	UOM	Year-1	Year-2	Year-3	Year-4	Year-5
1	Capacity Utilization	%	60%	70%	80%	90%	100%
2	Sales	₹. In Lacs	45.00	52.50	60.00	67.50	75.00
3	Raw Materials & Other direct inputs	₹. In Lacs	37.87	44.18	50.50	56.81	63.12
4	Gross Margin	₹. In Lacs	7.13	8.32	9.50	10.69	11.88
5	Overheads except interest	₹. In Lacs	7.10	7.55	8.44	8.70	8.88
6	Interest	₹. In Lacs	4.09	4.09	2.73	2.04	1.64
7	Depreciation	₹. In Lacs	10.50	7.50	5.25	3.75	3.38
8	**Net Profit before tax**	₹. In Lacs	**-14.56**	**-10.82**	**-6.91**	**-3.80**	**-2.01**

14. BREAKEVEN ANALYSIS:

The project shall reach cash break-even at % of projected capacity as detailed below:

Sr. No.	Particulars	UOM	Value
1	Sales at full capacity	₹. In Lacs	75.00
2	Variable costs	₹. In Lacs	63.12
3	Fixed costs incl. interest	₹. In Lacs	10.52
4	BEP = FC/(SR-VC) x 100 =	% of capacity	88.51%