

TYRE RETREADING

1. INTRODUCTION:

Tyre Retreading is a new technology, where the old tyres are made serviceable by removing worn out and damaged treads and replacing it with new treads. New treads are available in the market in form of rolls and inbred if, in can be put on old tyre and cured with the help of steam. Similar to the new tyres, the treated tyres can be very well used on all vehicles, irrespective of light or heavy vehicles. With a safe and new technology, which is being adopted now-a-days, it will be more easy and economical to produce tyres. Retreading of damaged tyre is done by conventional hot matrix curing in most cases. But recently a new technology has been developed called "Pre-cured Tread Rubber Retreading Process" which is commonly known as "Cold Process Retreading". In this process, the Pre-cured Tread Rubber already has a tread pattern on it eliminating the need for a tread matrix at vulcanizing stage. Tread Rubber is pre-cured along with other raw materials and manufactured in the factory under controlled conditions and given a well-researched pattern ensuring that the transporter gets a reliable perfectly finish product. Retreading Tyre by pre-cured method gives 50% more mileage than the tyre retreaded by conventional process.

2. PRODUCT & ITS APPLICATION:

Tread assumes importance in either technology, hot or cold. It is that portion of the tyre, which is in contact with the road surface. It comprises of 20-25 per cent of the whole tyre body. The tyre body commands 75 to 80 per cent of the manufacturing cost of a tyre. Applying a new tread on the body of a worn tyre, gives it a fresh life. This fresh life, estimate industry experts, comes at half the price of a new tyre. An important criteria for retreading is however the quality of the fabric. If the core fabric of the tread is too damaged or already over used, retreading may not be possible. There are thus technological limitations too.

However, if the core fabric is in a good condition, the tyre is identified for potential retreading. Retreading is done either through a conventional method or a pre-cure method. The conventional method is sometimes referred to as the mould cure or hot cure process. An un-vulcanized rubber strip, after going through the process of vulcanization adapts to the mould, is applied to the buffed casing of the tyre. However, modern day processes have adopted to a pre-cure method. This modern method, also referred to as cold cure, has the strip already pressed while it is applied to the casing. The strip is stuck to the casing by a layer of compounded un-cured rubber also known as cushion or bonding gum. The un-cured rubber is vulcanized by applying heat and pressure. As of current, the patterns of retreading in India are 50 per cent pre-cured and 50 per cent conventional. Modern processing technology has enabled the process to run smoothly and seamlessly

3. DESIRED QUALIFICATIONS FOR PROMOTER:

Graduate in any discipline.

4. INDUSTRY LOOK OUT AND TRENDS

The cost effectiveness offered by retreaded tires is one of the primary factors driving market growth, which is further supplemented by the robust growth of the transportation industry. Furthermore, tire retreading is an environmental friendly solution and hence, is being supported by various regulating bodies which encourage the use of retreaded tires. The continuously growing vehicle parc is another major factor which increases replacement requirement for tires. Large fleet owners of commercial vehicles prefer tire remolding to ensure cost effectiveness.

The global tire retreading market is expected to witness increase in investment from tire manufacturers. Fluctuation in raw material prices may act as a restraining factor and cause fluctuations in the market growth. Oil is a key raw material for tire retreading and hence, any fluctuations in oil prices are capable of causing fluctuations in retreading tire market growth. Another issue that the tire retreading market is facing is quality and reliability.

5. MARKET POTENTIAL AND MARKETING ISSUES, IF ANY:

As day by day, more and more vehicles are running on roads, hence more tyres are required for replacement. With further growth of economy, there will be an increase in transport as well as passenger vehicles and hence more tyres will be required. Hence, there is a very wide scope for retread tyres as an original replacement. Retreading of tyres in the commercial vehicle segment is poised for growth. The biggest driver for growth will be the rising use of radial truck and bus tyres. The other drivers will include the rise in multi-axle trucks, road infrastructure and highway connectivity. It is the operational savings that have led to the rise in popularity of tyre retreading in India. In the commercial vehicle segment especially. No section in the commercial vehicle industry is immune to retreading. May it be a 49-tonne tractor-trailer or a 1-tonne mini truck. Retreading of tyres is catching up. A retreaded tyre costs around 30 per cent less than a new tyre. At the other end, a retreaded tyre performs up to 80 per cent of a new tyre under similar operating conditions. It is the value for money a retreaded tyre offers, which has made it a favorite of a transporter.

6. RAW MATERIAL REQUIREMENTS:

Raw Material (per month)

Particular	Qty.	Unit	Price(Rs.)/Unit	Total(In Rs.)
For Retreading 200 LCV Tyre in Procured System				
Precured Tread Rubber	1000	Kg	110	110000
Cushion Compound	100	Ltr	100	10000
Vulcanizing Solution	60	Ltr	90	5400
Envelope	200	Nos	10	2000
Total				127400
For Retreading 300 Passenger Car Tyre in Precured System				
Precured Tread Rubber	900	kg	110	99000
Cushion Compound	105	Ltr	100	10500
Vulcanizing Solution	75	Ltr	90	6750
Envelope	300	Nos	10	3000

Particular	Qty.	Unit	Price(Rs.)/Unit	Total(In Rs.)
Curing Bag	300	Nos	8	2400
Total				121650
For Retreading 250 Nos. Truck Tyre in Precured System				
Precured Tread Rubber	2375	kg	110	261250
Cushion Compound	252	Ltr	100	25200
Vulcanizing Solution	250	Ltr	90	22500
Envelope	250	Nos	10	2500
Curing Bags	250	Nos	8	2000
Total				313450
Total Raw Material				562500

7. MANUFACTURING PROCESS:

The manufacturing of retreading rubber is done in the following stages: I) Compounding: Removing unwanted materials such as nails, rivets etc. Ii) Mixing: Reclaimed rubber and oils; Iii) Extruding: The mixture of rubber so obtained is put into extruder to form rubber sheets. Iv) Retreading: Before retreading tyre is buffed and it is allowed to stick properly. Tyres are buffed properly to remove all undesired rubber and to clean surface. The retreading rubber is now put on its outer surface with an adhesive solution.

The tyre coming from the customers is cleaned dully. Dust and mud are removed. The casing is inspected for cuts, ply section, condition of beads etc., and based on the condition of the casing, the tyre is selected or rejected. Under inflated conditions the selected tyre's crown area is buffed to the required texture and contour. This is for better bonding of procured rubber to the casing. The buffed casing is mounted on the tread building machine. Cushion compound is applied on the buffed tread area over which the procured tread rubber is applied and stickled using rollers. The joint portion of the procured tread rubber is stepped to avoid possible opening during curing of the tyre. The buildup of the tyre is covered by a rubber envelope and placed in the "bonder" and the bonder steam is passed at specific temperature, which cures the cushion compound to complete the bonding of the tread on the casing.

8. MANPOWER REQUIREMENT:

Designation	No.	Salary (Rs.)	Amount (In Rs.)
Manager	1	15000	15000
Supervisor (Technical)	1	10000	10000
Skilled Workers	5	7000	35000
Semi-skilled Workers	6	5000	30000
Un-skilled Workers/ Helper	3	3000	9000
Clerk cum Typist	1	6000	6000
Salesman	1	8000	8000
Office Assistant- cum-peon	1	3000	3000
Watchman	1	3000	3000
Total	20		1E+05

9. IMPLEMENTATION SCHEDULE:

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

Sr. No.	Activity	Time Required (<i>in months</i>)
1	Acquisition of premises	1.00
2	Construction (if applicable)	2.00
3	Procurement & installation of Plant & Machinery	2.00
4	Arrangement of Finance	2.00
5	Recruitment of required manpower	1.00
	Total time required (<i>some activities shall run concurrently</i>)	4.00

10. COST OF PROJECT:

Sr. No.	Particulars	₹ in Lacs
1	Land	18.00
2	Building	20.75
3	Plant & Machinery	13.30
4	Furniture, Electrical Installations	4.13
5	Other Assets including Preliminary / Pre-operative expenses	0.50
6	Working Capital	15.85
	Total	72.53

11. MEANS OF FINANCE:

Bank term loans are assumed @ 75 % of fixed assets. The proposed funding pattern is as under:

Sr. No.	Particulars	₹ in Lacs
1	Promoter's contribution	20.00
2	Bank Finance	52.53
	Total	72.53

12. WORKING CAPITAL CALCULATION

WORKING CAPITAL CALCULATION:	(In Rs.)
Power @ Rs. 5.5 for 3600 units	19800
Fuel for Boiler	30000
Total	49800

Other Contingent Expenses	(In Rs.)
Postage and Stationery	3000
Insurance and Taxes	4000
Telephone	3000
Repair and Maintenance	5000
Publicity and Advertisement	10000
Travelling and Transport	15000
Renewal and Replacement	5000
Other Miscellaneous Expenses	15000
Total	60000
(v) Total Recurring Expenses	(In Rs.)
Staff and Labour	119000
Raw Material	562500
Utilities	49800
Other Contingent Expenses	60000
Total	791300
(vi) Total Working Capital for 2 Months	
Rs. 791300 x 2 =	1582600

13. LIST OF MACHINERY REQUIRED:

A detail of important machinery is given below: It requires only 15 HP power connection.

Particular	Ind. / Imp.	Qty. Nos.	Price(Rs.)	Total (In Rs.)
Buffing machine with dust collector builder tyre truck bonder/three tyre LCV/Passenger bonder with curing rims and Electric hoist	Ind	1	750000	750000
Work bench Envelope/Tyre stand Gantry	Ind.	1	60000	60000
Boiler cap. 300 kg/hrs.	do	1	400000	400000
100 Ibs working pressure Air compressor fitted with 5 H P Motor	do	1	70000	70000

Particular	Ind. / Imp.	Qty. Nos.	Price(Rs.)	Total (In Rs.)
Air conditioner	do	1	50000	50000
Total				1330000
Electrification and Installation at 10% of the above cost				133000
Office Equipments and Furniture.				80000
Cost of Auxiliary items. i.e. pipe erection Electric fittings, Retreading, Tools, Mechanical Hoist with Trolley etc.				200000
Total				1743000
(iii) Pre-operative Expenses				50000
Total Fixed Capital Requirement (i)+(ii)+(iii)				5668000

All the machines and equipment are available from local manufacturers. The entrepreneur needs to ensure proper selection of product mix and proper type of machines and tooling to have modern and flexible designs. It may be worthwhile to look at reconditioned imported machines, dies and tooling. Some of the machinery and dies and tooling suppliers are listed here below:

- Kamdhenu Agro Machinery
Plot No. 6, Near Power House,
Wathoda Road, Wathoda
Nagpur - 440035
Maharashtra, India
- Future Industries Private Limited
Shed No. 15, Ambica Estate,
Corporation Municipal Plot,
Opposite Sadvichar Hospital,
Naroda, Ahmedabad - 382330,
Gujarat, India
- The Global Pharma Equipments

Star Industrial Estate,
D-32, Naik Pada,
Near Hanuman Mandir,
Opposite Dwarka Industrial Estate,
Vasai East, Vasai - 401208,
Maharashtra, India

14. PROFITABILITY CALCULATIONS:

LCV Tyre Retreading Size-700×15-2400 Nos.

Passenger Car Tyre Retreading Size-590×15-3600 Nos.

Truck Tyre Retreading Size 300x20-3000

Value: Rs. 124.8 Lakhs

Sr. No.	Particulars	UOM	Year-1	Year-2	Year-3	Year-4	Year-5
1	Capacity Utilization	%	70%	80%	90%	90%	90%
2	Sales	₹. In Lacs	87.36	99.84	112.32	112.32	112.32
3	Raw Materials & Other direct inputs	₹. In Lacs	66.46	75.96	85.45	85.45	85.45
4	Gross Margin	₹. In Lacs	20.90	23.88	26.87	26.87	26.87
5	Overheads except interest	₹. In Lacs	7.50	8.00	8.80	9.50	11.00
6	Interest @ 10% on 52.53	₹. In Lacs	5.25	5.25	4.50	3.65	2.50
7	Depreciation of 57.53	₹. In Lacs	8.62	7.33	6.23	5.29	4.40
8	Net Profit before tax	₹. In Lacs	-00.47	3.33	7.34	8.43	8.97

The basis of profitability calculation:

The growth of selling capacity will be increased 10% per year. (This is assumed by various analysis and study, it can be increased according to the selling strategy.)

Energy Costs are considered at Rs 7 per Kwh and fuel cost is considered at Rs. 65 per litre. The depreciation of plant is taken at 10-12 % and Interest costs are taken at 14 -15 % depending on type of industry.

15. BREAKEVEN ANALYSIS:

The project shall reach cash break-even at 78.73 % of projected capacity as detailed below:

Sr. No.	Particulars	UOM	Value
1	Sales at full capacity	₹. In Lacs	124.80
2	Variable costs	₹. In Lacs	94.94
3	Fixed costs incl. interest	₹. In Lacs	23.51
4	$BEP = FC/(SR-VC) \times 100 =$	% of capacity	78.73

16. STATUTORY / GOVERNMENT APPROVALS

As per the allocation of business rules under the Constitution, labour is in the concurrent list of subjects. It is dealt with by the MOLE at the Central and Departments of Labour under State Governments in respective States / UTs. The MOLE has enacted workplace safety and health statutes concerning workers in the manufacturing sector, mines, ports and docks and in construction sectors.

Further, other Ministries of the Government of India have also enacted certain statutes relating to safety aspects of substances, equipment, operations etc. Some of the statutes applicable in the manufacturing sector are discussed below:

The Static and Mobile Pressure Vessels (Unfired) Rules, 1981

These (SMPV) Rules are notified under the Explosives Act, 1884. These rules regulate storage, handling and transport of compressed gases. These rules stipulate requirements regarding construction and fitments, periodic testing, location, fire protection, loading and

unloading facilities, transfer operations etc. in respect of pressure vessels whose water capacity exceeds one thousand litres. These rules are enforced by the Chief Controller of Explosives under the Ministry of Industry and Commerce, Govt. of India (PESO).

The Manufacture, Storage and Import of Hazardous Chemicals Rules (MSIHC), 1989

These MSIHC Rules are notified under the Environment (Protection) Act, 1986. These rules are aimed at regulating and handling of certain specified hazardous chemicals. The rules stipulate requirements regarding notification of site, identification of major hazards, taking necessary steps to control major accident, notification of major accident, preparation of safety report and on-site emergency plan; prevention and control of major accident, dissemination of information etc. These rules are notified by the Ministry of Environment and Forests (MOEF) but enforced by the Inspectorates of Factories of respective States / UTs in the manufacturing sector.

The Factories Act, 1948 and State Factories Rules

The Factories Act, 1948 is very comprehensive legislation dealing with the matters of safety, health and welfare of workers in factories. The Act places duties on the occupier to ensure safety, health and welfare of workers at work. Some of the salient provisions of the Act include:

- Guarding of machinery
- Hoists and Lifts; Lifting Machines and Appliances
- Revolving Machinery
- Pressure Plant
- Excessive Weight
- Protection of Eyes
- Precautions against dangerous fumes, gases etc.
- Explosive or inflammable dust, gas etc.
- Precautions in case of fire

- Safety of buildings and machinery
- Permissible limits of exposure of chemical and toxic substances
- Entrepreneur may contact State Pollution Control Board where ever it is applicable.

17. BACKWARD AND FORWARD INTEGRATIONS

Chemical companies often become integrated and undergo other activities outside the chemical industry. Increased competition prompts many companies to reduce supply chain costs by looking outside the chemical sector at suppliers and customers. While most companies within the chemicals sector primarily produce chemicals, some companies also conduct other manufacturing activities. The exact proportion of chemicals sector companies that are integrated with other sector activities is unknown, but many companies actively seek vertical integration. Many manufacturers pursue vertical integration to secure suppliers and customers for their products.

Mergers and acquisitions are a common way for companies to undertake new chemical ventures. By purchasing their chemical suppliers, some manufacturers secure future chemical feedstock for their products or other chemicals that they use in manufacturing. The company making the purchase obtains valuable expertise and equipment. Some mining and petrochemical production is more cost-effective when integrated within a chemical company. Energy and feedstock costs are often a significant expense for chemical companies. Integrating chemical production with activities that secure supplies of chemical feedstock and energy is relatively common as chemical companies grow. Chemical companies are located near mines, oil fields, ammonia factories and water supplies. This reduces transportation costs and increases the reliability of supplies by reducing the distance between feedstock and the factory.

Some companies, such as Sino-Coking Coal and Coke Chemical Industries Incorporated, own their mines. BHP Billiton operates a broad range of mines and is primarily a mining company. It does, however, also produce petrochemical feedstock for the chemical industry and

therefore operates within the chemical industry as well. These companies technically operate within both the chemical and mining industries in their normal business operations.

Integrating a chemical company with other activities provides several direct benefits for the company and is becoming increasingly common. High energy costs necessitate greater control of energy resources and minimal reliance on expensive transportation. Chemical companies experience volatile profitability due to fluctuations in feedstock and energy expenses. Some companies control this volatility through careful supply chain management and by charging supply surcharges. Actively researching and developing alternative feedstock and energy supplies helps the company reduce costs.

Vertical integration supports these activities by eliminating redundant activities at multiple companies and increasing efficiency. By consolidating activity among multiple, similar operations, chemical companies achieve cost savings that contribute to higher profitability. End products are often very profitable, and some chemical companies purchase their former customers to take advantage of the marked-up prices of products further along in the supply chain.

Integration may become more common for many chemical companies as competition strengthens and traditional feedstock becomes more expensive. Market demand for chemical feedstock increases as emerging market economies grow and result in increased consumer spending around the world.

18. TRAINING CENTERS AND COURSES

There is no such training required to start this business but, basic chemical bachelor's degree is plus point for enterpriser. Promoter may train their employees in such specialized institutions to grow up the business. There are few specialised Institutes provide degree certification in chemical Technology, few most famous and authenticate Institutions are as follows:

1. Department of chemical LD college of engineering
No.120, Circular Road, University Area, Navrangpura,
Opposite Gujarat University, Ahmedabad, Gujarat 380015

2. MIT College of chemicalEngineering, Pune
Gate.No.140, Raj Baugh Educational Complex,
Pune Solapur Highway,
Loni Kalbhor, Pune – 412201
Maharashtra, India

Udyamimitraportal (link : www.udyamimitra.in) can also be accessed for handholding services viz. application filling / project report preparation, EDP, financial Training, Skill Development, mentoring etc.

Entrepreneurship program helps to run business successfully is also available from Institutes like Entrepreneurship Development Institute of India (EDII) and its affiliates all over India.

Disclaimer:

Only few machine manufacturers are mentioned in the profile, although many machine manufacturers are available in the market. The addresses given for machinery manufacturers have been taken from reliable sources, to the best of knowledge and contacts. However, no responsibility is admitted, in case any inadvertent error or incorrectness is noticed therein. Further the same have been given by way of information only and do not carry any recommendation.