

Rail Elastic Clip

PRODUCT CODE	: 359817009
QUALITY AND STANDARDS	: As per R.D.S.O. Standards
MONTH AND YEAR OF PREPARATION	: September, 2002.
PREPARED BY	: Branch Small Industries Service Institute Industrial Estate, Varanasi-221106 Telephone (0542) - 2370621

INTRODUCTION

Indian Railways is one of the biggest enterprise in this country. The product namely elastic rail clips are being used with concrete sleeper to fix rails tightly from both sides. The clips are made up of spring steel by forging process.

Forged items are manufactured by hot forging process either by open die or closed die. The product takes shape upon hammering the metal after heating it to forging temperature. The properties of forged items are considered to be better than other metal forming process due to most uniform microstructure.

MARKET POTENTIAL

Elastic rail clips are consumable items because the clips loose or sometimes come out of their jaws due to vibration. Hence Indian Railways and sometimes Middle-east countries are continuous source of market. In case there is slack demand, the capacity of industry can be utilized for other forged items used in automobile industries, machinery manufacturing industries etc. Hence

there is wide scope for manufacturing of forged items.

BASIS AND PRESUMPTIONS

This project profile is prepared on the basis of following presumptions:

1. It is assumed that the unit will be viable at 75% efficiency on single shift basis considering 6 working days per week.
2. The rate of interest is taken at 14% for both fixed and working capital.
3. The cost of machinery and equipment is approximate which is ruling locally at the time of preparation of the profile. When a tailor-cut project is prepared the necessary changes are to be made.
4. The rates quoted in respect of salary and wages are the minimum and may vary as per demand.
5. As Elastic Rail Clips will be sold as product, the cost of material and dies will be charged to the individual components.

IMPLEMENTATION SCHEDULE

Project implementation will take a period of 9 months from the date of approval of scheme. Following is the schedule to attain commercial production:

Nature of Activities	Period (in Months)
1. Scheme preparation and approval	0-2
2. SSI registration	2-3
3. Sanction of loan	3-5
4. Clearance from Pollution Control Board and other relevant agencies	3-4
5. Placement of order for delivery of the machinery and equipment	4-6
6. Installation and procurement of machinery and equipments	6-7
7. Power connection, Telephone connection and other formalities	7-8
8. The trial runs	8-9
9. Commencement of production	9th month onwards.

TECHNICAL ASPECTS

Process of Manufacture

The schedule of production process is as follows:

Shearing → Heating to forging temperature → Forming → Hardening → Tempering → Inspection → Packing.

The raw material which is spring steel bar has to be sheared as per length required. The sheared rods are heated to the forging temperature at 950°C to 1000°C. Over heating should be avoided to check decarburisation. The appropriately heated bar is transferred to power press for forging. Three sets of dies and fixtures are kept as per drawing before hammering. The forged clips are transferred to quenching tank. Dimensional accuracy and quench

hardness of clips are checked before sending the job for tempering. All the clips are tempered at about 350°C for achieving appropriate toughness in the spring. The products are then checked thoroughly as per R.D.S.O. specification and design.

Quality Control and Standards

The raw material is spring steel EN-45 grade. The necessary testing like chemical, mechanical and micro-structure testing is to be done as per IS -3195 specification. Elastic rail clips are the products of Railway made as per R.D.S.O. drawing number T-1892. Hence the design testing like deflection test and other dimensional test is to be performed as per requirements of the above railway specification.

Production Capacity

Estimated production per year: 600 MT
Value : Rs. 2,58,00,000

Motive Power

Total power requirement is about 40 H.P.

Pollution Control

Pollution may be caused through noise of hammer and oil fired furnace used for tempering furnace. Smoke hard will be kept for discharging the fuel gas. In order to avoid/ reduce noise pollution special hammer should be purchased. In the meantime the design of factory shed should be such that it can be minimized.

Energy Conservation

Considerable energy can be saved by preheating the inlet air used in baring of Diesel/ LDO in oil fired furnaces.

FINANCIAL ASPECTS

A. Fixed capital

(i) Land and Building

Rented	(per month Rs.)
Covered area 3000 Sq.ft. @ Rs.2 per Sq.ft.	6000
Uncovered area 2000 Sq.ft. @ Rs.2 per Sq.ft.	4000
Total	10,000

(ii) Machinery and Equipments

(a) Production unit

Description	Qty.	Amount(In Rs.)
Shearing machine of 1" capacity	1	85,000
Power press	1	2,00,000
Blanking machine of 100 MT Capacity	1	1,50,000
Oil fired heat treatment furnace of capacity 650 kg/hour	2	3,25,000
Oil fired furnace for tempering	1	2,50,000
Storage tank for LDO and quenching oil	LS	80,000
Pedestal Grinder 12" wheel size	2	70,000
Total		11,60,000

(b) Testing Equipments

Rockwell cum Brittle Hardness testing equipment	1	35,000
Deflection testing machine	1	50,000
Universal testing machine	1	4,50,000
Chemical Testing equipment	LS	50,000
Total		5,85,000

(c) Diesel Generating Set of 30 K.V.A.

		1,25,000
Total (a+b+c)		18,70,000

(d) Cost of Electrification and installation @10% of

		1,87,000
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(e) Cost of dies tools and fixture etc.

	LS	1,75,000
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(f) Office equipment and furnitures

	LS	50,000
Total (d+e+f)		22,82,000

(iii) Pre-operative Expenses (Rs.)

like legal establishment LS Travelling, startup consultancy, telephone and electricity connection tariff etc.	1,00,000
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Total (ii+iii) 23,82,000

B. Working Capital (per month)

(i) Personnel

Designation	No.	Salary Amount (Rs.)	(Rs.)
<i>(a) Administration</i>			
Manager-cum-metallurgist	1	3,500	3,500
Sales Executive	1	3,000	3,000
Lab Assistant	1	2,500	2,500
Accountant/Clerk	1	2,500	2,500
Peon and Watchmen	2	1,800	3,600
<i>(b) Workshop</i>			
Skilled workers	6	2,000	12,000
Semi skilled workers	8	1,500	12,000
Maintenance Staff	1	1,500	1,500
Total	21	40,600	
<i>Add: Perquisites @ 15%</i>			6,090
Total			46,690

(ii) Raw Materials

Particulars	Qty.	Rate/ MT (In Rs.)	Amount (In Rs.)
20-22mm round of EN-45steel	60	30,000	18,00,000
Total			18,00,000

(iii) Utilities (Rs.)

(a) Power 6000 Unit @ Rs 3.0 per unit		18,000
(b) Light Diesel oil 10,000 lts @ 18 per unit		1,80,000
(c) Quenching oil-205 lts		14,000
(d) Fuel (Diesel)-2,000 lts @ Rs.16 per Ltrs.		32,000
Total		2,44,000

(iv) Other Contingent Expenses (per month)(In Rs.)

(a) Rent	10,000
(b) Transport expenses	2,500
(c) Stationery, Postage, Telephone and, Fax etc.	1,500
(d) Insurance and Tax	1,000
(e) Repair, Maintenance and Replacement	2,500
(f) Consumable stores	1,000
(g) Advertisement and publicity	1,500
Total	20,000

Total Recurring Expenditure (per month)
(i+ii+iii+iv)= **Rs.21, 10,690**

C. Total Capital Investment

(i) Fixed Capital	Rs. 23,82,000
(ii) Working Capital (for 3 months)	Rs. 63,32,070
Total	Rs. 87, 14,070

MACHINERY UTILISATION

75% Machinery utilization is considered for achieving the projected capacity of finished products.

FINANCIAL ANALYSIS

(1) Cost of Production (per year)	(Rs.)
Total Recurring Cost	2,53,28,280
Depreciation on Machinery and Equipment @ 10%	1,29,500
Depreciation on Furnace @ 20%	1,15,000
Depreciation on Moulds and fixture @ 25%	43,7500
Depreciation on office @ 20% equipment's	10,000
Interest on total Capital @ 14% investment	12,19,970
Total	2,68,46,500

(2) Turnover (per year)

Item	Quantity M.T.	Rate/ Ton (In Rs.)	Amount (In Rs.)
Elastic Rail clip.	600	43,000,	2,58,00,000
Scrap	120	30,000	36,00,000
Total			2,94,00,000

(3) Net Profit (per year) (Before Income Tax)

Turnover – Cost of Production
= Rs.294,00,000 – 268,46,500 = **Rs. 25,53,500**

(4) Net Profit Ratio

$$= \frac{\text{Net Profit} \times 100}{\text{Turnover}}$$

$$= \frac{25,53,500 \times 100}{2,94,00,000}$$

$$= \mathbf{8.7\%}$$

(5) Rate of Return

$$= \frac{\text{Net Profit} \times 100}{\text{Total Capital Investment}}$$

$$= \frac{25,53,500 \times 100}{87,14,040}$$

$$= \mathbf{29.3\%}$$

(6) Break-even Point (% Total Production)

Fixed Cost	(Rs.)
Depreciation on machine and equipment including machinery, furnace, mould and fixture and office equipment	2,98,250
Rent	1,20,000
Interest on total capital investment	12,19,970
Insurance	12,000
40% of Salary and Wages	2,24,112
40% of Other Contingent Expenses	43,200
Total	19,17,532

B.E.P.

$$= \text{Fixed Cost}/\text{Fixed Cost} + \text{Profit} \times 100,$$

$$= 19,17,532/19,17,532 + 25,53,500, \times 100,$$

$$= \mathbf{43\%}$$

Addresses of Machinery and Equipment Suppliers

1. M/s. Batliboi and Company Pvt. Ltd.
Foxbes. St. Fort, Mumbai.
2. M/s. Nandy and Company
125. Belilious Road,
Howrah -1.

3. M/s. Atlas Eng.Works
19, Ripen St.
Kolkata - 16.
4. M/s. Wesman Eng. Company Pvt.
Ltd.
7, Ganesh Chandra Avenue,
Kolkata - 13.
5. M/s. Wester Works Eng. Ltd.
S-D Valcan Insurance Bldg.,
Mumbai - 20.
6. M/s. Inspection Instruments
Corpn.
7, Sheriff Dovji Zakaria Bldg.,
Mumbai - 3.