PROJECT REPORT

ON

‘PISTON RING’

PURPOSE OF THE DOCUMENT

This particular pre-feasibility is regarding Piston Ring.

The objective of the pre-feasibility report is primarily to facilitate potential entrepreneurs in project identification for investment and in order to serve his objective; the document covers various aspects of the project concept development, start-up, marketing, finance and management.

[We can modify the project capacity and project cost as per your requirement. We can also prepare project report on any subject as per your requirement.]

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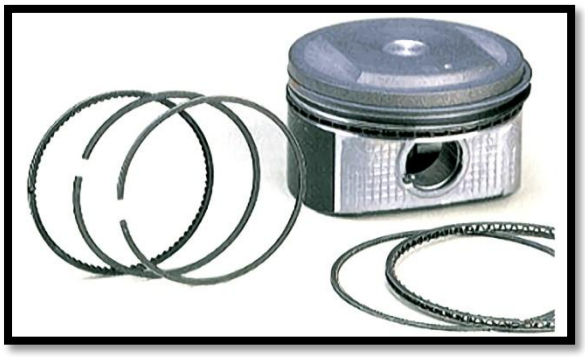
SAMADHAN
Nurturing Dreams - Innovative Solutions

PROJECT PROFILE

ON

‘PISTON RING’



INTRODUCTION.

Piston ring is one of the most important part of the Deisel/Petrol engines.It is an open-ended ring that fits into a groove on the outer diameter of a piston in a reciprocating engine such as an internal combustion engine or steam engine. The principal function of the piston rings is to form a seal between the combustion chamber and the crankcase of the engine. The goal is to prevent combustion gases from passing into the crankcase and oil from passing into the combustion chamber
The three main functions of piston rings in reciprocating engines are:

1. Sealing the combustion/expansion chamber.
2. Supporting heat transfer from the piston to the cylinder wall.
3. Regulating engine oil consumption.

During the compression and power strokes, the compression ring seals the combustion gases and prevents blow-by. Although blow-by is not completely eliminated it is kept to an acceptable limit. During the compression and exhaust strokes the cylinder walls are lubricated with oil by throw off from the connecting rod bearings. Excess oil is wiped off by the piston rings. Not only does the oil ring have the responsibility of wiping the excess oil

off the cylinder walls, but the job is also shared by all of the rings, leaving a fine layer of oil on the wall to provide lubrication for the following ring. As rings wear, the ability to perform these functions is decreased resulting in oil consumption and blow-by. When this happens it is time for a new set of rings.

MARKET POTENTIAL

Piston ring is the one of the most replaceable part of the diesel/petrol engines.It has great demand in the replaceable market as well as in new engines market. For the last few years there is noticeable increase in the automobile industry, which is the vast market for it. Piston rings are not only used in the automobile industry but also used in :

- Railway Engines
- Compressors
- Steam Hammers
- Cars
- Retaining Rings
- Pumps
- Industrial Applications
- Cranes
- Gearboxes

So, by maintaining quality and using proper marketing techniques there is alwayes a great market of this product.

BASIS AND PRESUMPTIONS

- The information supplied is based on a standard type of manufacturing activity utilizing conventional techniques of production and optimum level of performance.
- 65% of the envisaged capacity is taken as efficiency on single working shift. Labour and wages are required as per present circumstances.
- The cost in respect of land & building, machine & equipment, raw material & selling price of finished product etc are those generally obtained at the time of preparation of project profile and may vary depending upon the location, make and for variety of resons.
- The interest on total capital has been assumed @ 10.00% p.a

IMPLEMENTATION SCHEDULE

- Selection of site & Preparation of bankable project report — 3 months
- Filing of EM part-I with GM, DIC — 3 days
- Submission of project report & sanction of finance from financial institution/ Bank — 4 months
- Procurement of Plant, machinery & equipment — 1 month
- Commissioning and erection of Plant & machinery and trial run — 3 months
- Purchase of raw material & recruitment of labour & staff — 1 month
- Start of commercial production — Immediately as soon as above activities completed Immediately after the Enterprises has gone into regular production

TECHNICAL ASPECTS

MATERIAL

The materials used to make Piston Rings are one of the most critical factors in its performance.

Listed below is some of today's common material used in manufacturing of piston rings and metallic seals:

- Cast iron
- Cast iron alloyed for piston rings
- Modular cast iron alloyed for piston rings
- Bronze
- Aluminum Bronze
- Phosphor Bronze
- Steel
- Stainless Steels for use in high temperature

MANUFACTURING PROCESS

Piston rings are generally made up of cast iron. The blanks of cast rings of required size and desired properties are procured from the local foundries. After that blanks are cleaned and get ground. Then the blanks are undergone through various processes like facing,

rough diameter, rough bore, finish diameter & finish bore. The rings are generally machined to the required shape by means of turning, a process in which the ring blank, already axially ground, is copy turned on the inside and outside diameters. After a segment equivalent to the free gap is cut from the ring it assumes the free shape that will give it the required radial pressure distribution when fitted into the cylinder..

Piston Ring Coatings

After the completion of machining process the following surface treatments for piston rings are principally designed to provide corrosion protection for storage, enhance appearance and improve running.

- Bronze Coating
- Ceramic Chrome Plating
- Chrome Plating
- Copper Plating
- Molybdenum
- Phosphate Coating
- Plasma Sprayed Coating
- Tin Coating

PRODUCTION CAPACITY

Approximately 45,000 set of different sizes per year.

QUALITY CONTROL

The procured blanks castings should be checked very carefully as per given requirement (size, grade etc). This is the very first step in quality control.The product should be monitored after completion of each stage so that chance of rejection at the end is eliminated. Piston rings should be manufactured as per IS : 5791-1971 & IS: 8422 for IC engines.The entire operation of surface treatment/ coating should be closely controlled. For the inspection process proper callibarated gauges should be used.

POLLUTION CONTROL

As this unit doesnot comes under heavy polluted industry, although the minimum height of shed may be maintained with exhaust fans for removing decongestion, fumes, dust, etc. and to provide proper ventilation.No Objection Certificate from pollution control board should be taken.

POWER CONSUMPTION

Power consumption, which is approx. 30H.P

LABOUR REQUIREMENT:

4-5 Manpower is required for Piston Ring manufacturing includes:

2 Skilled Labour
2 Unskilled Labour

BANK LOAN

Rate of Interest is assumed to be at 10.00%

DEPRECIATION

Depreciation has been calculated as per the provisions of Income Tax Act, 1961

APPROVALS & REGISTRATION REQUIREMENT:

Basic registration required in this project:

- GST Registration
- Udyam Registration
- NOC from State Pollution Control Board

FINANCIAL ASPECTS

PROJECT AT A GLANCE

Product and By Product	:	**Piston ring**	
Name of the project / business activity proposed :		**Piston ring**	
Cost of Project	:	Rs.22 Lacs	
Means of Finance			
Term Loan		Rs.14.95 Lacs	
KVIC Margin Money	-	As per Project Eligibility	
Own Capital		Rs.2.2 Lacs	
Working Capital		Rs.4.85 Lacs	
Debt Service Coverage Ratio	:	3.04	
Pay Back Period	:	5	Years
Project Implementation Period	:	6	Months
Break Even Point	:	32%	
Employment	:	6	Persons
Power Requirement	:	20.00	HP
Major Raw materials	:	**Piston Ring Casting**	
Estimated Annual Sales Turnover	:	42.97	Lacs
(At full capacity utilisation)			

COST OF PROJECT (Rs. In Lacs)

Particulars	Amount
Land	Rented/Owned
Shed (400Sq Mts)/300 Sq Mts	4.00
Plant & Machinery	10.95
Furniture & Fixtures	1.00
Pre-operative Expenses	0.66
Working Capital Requirement	5.39
Total	**22.00**

MEANS OF FINANCE

Particulars	Amount
Own Contribution @10%	2.20
Term Loan	14.95
Workign Capital Finance	4.85
Total	**22.00**

Beneficiary's Margin Monery (% of Project Cost)

Special	**General**
5%	10%

PLANT & MACHINERY

	PARTICULARS	**QTY.**	**AMOUNT IN RS.**
1	Lathe machine,1800 mm bed with 3 H.Pmotor	2	4,50,000.00
3	Lathe machine,900 mm bed with 2 H.P motor	1	3,50,000.00
4	Face grinder with special attachment, 4 H.Pmotor	1	85,000.00
5	Bench drill machine.12mm capacity	1	25,000.00
6	Bench grinder,250mm wheel dia,1H.P motor	1	25,000.00
7	Gauges,tools & other equipments	L.S	60,000.00
8	Installation and electrification		1,00,000.00
	Total		10,95,000.00

COMPUTATION OF MANUFACTURING OF PISTON RING

Manufacturing Capacity per day	150.00	Piston Ring
No. of Working Hour	8	
No of Working Days per month	25	
No. of Working Day per annum	300	
Total Production per Annum	45,000.00	
Year	Capacity Utilisation	
IST YEAR	65%	29,250
IIND YEAR	70%	31,500
IIIRD YEAR	75%	33,750
IVTH YEAR	80%	36,000
VTH YEAR	85%	38,250

COMPUTATION OF RAW MATERIAL

Item Name	Quantity of	Unit Rate of	Total Cost
	Raw Material KG		Per Annum (100%)
Piston Ring casting	15,600.00	60.00	9,36,000.00
Total			9,36,000.00
Annual Consumption cost	(In Lacs)		9.36

Raw Material Consumed	Capacity	Amount (Rs.)
	Utilisation	
IST YEAR	65%	6.08
IIND YEAR	70%	6.55
IIIRD YEAR	75%	7.02
IVTH YEAR	80%	7.49
VTH YEAR	85%	7.96

COMPUTATION OF CLOSING STOCK & WORKING CAPITAL

PARTICULARS	IST YEAR	IIND YEAR	IIIRD YEAR	IVTH YEAR	VTH YEAR
Finished Goods					
(30 Days requirement)	2.46	2.70	2.94	3.20	3.46
Raw Material					
(30Days requirement)	0.61	0.33	0.35	0.37	0.40
Closing Stock	**3.07**	**3.02**	**3.29**	**3.57**	**3.86**

COMPUTATION OF WORKING CAPITAL REQUIREMENT

Particulars			Total
			Amount
Stock in Hand			3.07
Sundry Debtors			2.76
Total			5.83
Less:Sundry Creditors			0.44
Working Capital Requirement			**5.39**
Less:Margin			0.54
Working Capital Finance			**4.85**

PROJECTED PROFITABILITY STATEMENT

PARTICULARS	IST YEAR	IIND YEAR	IIIRD YEAR	IVTH YEAR	VTH YEAR
A) SALES					
Gross Sale	27.64	33.46	36.54	39.71	42.97
By sale of scap	0.61	0.66	0.70	0.75	0.80
Total (A)	**27.64**	**33.46**	**36.54**	**39.71**	**42.97**
B) COST OF SALES					
Raw Material Consumed	6.08	6.55	7.02	7.49	7.96
Elecricity Expenses	1.86	2.01	2.15	2.29	2.43
Repair & Maintenance	-	0.33	0.37	0.40	0.43
Labour & Wages	3.43	3.78	4.15	4.57	5.02
Depreciation	2.09	1.85	1.60	1.38	1.19
Consumables and Other Expenses	1.38	1.67	1.83	1.99	2.15
Cost of Production	14.85	16.19	17.11	18.11	19.18
Add: Opening Stock /WIP	-	2.46	2.70	2.94	3.20
Less: Closing Stock /WIP	2.46	2.70	2.94	3.20	3.46
Cost of Sales (B)	12.40	15.95	16.86	17.85	18.92
C) GROSS PROFIT (A-B)	15.25	17.51	19.68	21.86	24.05
	55%	**52%**	**54%**	**55%**	**56%**
D) Bank Interest (Term Loan)	1.12	1.35	0.98	0.61	0.24
Bank Interest (C.C. Limit)	0.49	0.49	0.49	0.49	0.49
E) Salary to Staff	4.95	5.45	5.99	6.59	7.25
F) Selling & Adm Expenses Exp.	1.38	1.67	1.83	1.99	2.15
TOTAL (D+E)	**7.94**	**8.96**	**9.28**	**9.67**	**10.12**
H) NET PROFIT	7.31	8.55	10.40	12.19	13.92
I) Taxation			0.33	0.89	1.43
J) PROFIT (After Tax)	7.31	8.55	10.06	11.30	12.50

PROJECTED BALANCE SHEET

PARTICULARS	IST YEAR	IIND YEAR	IIIRD YEAR	IVTH YEAR	VTH YEAR
SOURCES OF FUND					
Capital Account	2.20	4.51	7.06	10.12	13.43
Retained Profit	7.31	8.55	10.06	11.30	12.50
Less withdrawal	5.00	6.00	7.00	8.00	9.00
	4.51	7.06	10.12	13.43	16.92
Term Loan	14.95	11.21	7.47	3.74	0.77
Cash Credit	4.85	4.85	4.85	4.85	4.85
Sundry Creditors	0.43	0.46	0.49	0.52	0.56
Provisions & Other Liab	0.36	0.40	0.44	0.48	0.53
TOTAL :	**25.10**	**23.98**	**23.38**	**23.02**	**23.63**
APPLICATION OF FUND					
Fixed Assets (Gross)	15.95	15.95	15.95	15.95	15.95
Gross Dep.	2.09	3.94	5.54	6.92	8.11
Net Fixed Assets	13.86	12.01	10.41	9.03	7.84
Current Assets					
Sundry Debtors	2.76	3.35	3.65	3.97	4.30
Stock in Hand	3.07	3.02	3.29	3.57	3.86
Cash and Bank	3.41	2.61	3.02	2.44	2.63
Deposits & Advances	2.00	3.00	3.00	4.00	5.00
TOTAL :	**25.10**	**23.98**	**23.38**	**23.02**	**23.63**

DISCLAIMER

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