PROJECT PROFILE

ON

AUTO PISTONS

PART-I

NAME OF THE PRODUCT : **AUTO PISTONS .**

QUALITY & STANDARD : IS: 7793:1975.

PRODUCTION CAPACITY : The production capacity of the unit at 75% capacity utilisation.

Quantity - 60,000 Nos. (Per Annum)

Value - Rs.90,00,000/-

MONTH & YEAR OF PREPARATION : January, 2014.

PREPARED BY :

MSME - Development Institute,
Ministry of Micro, Small & Medium Enterprises,
Government of India
107, Industrial Estate, Kalpi Road,
Kanpur-208012.

Tele. 2295070, 2295071 & 2295073 (EPBAX)
Tele. No. 2295072 (SENET & TRC)
Tele/Fax No.: 0512- 2240143
email: dcdi-kanpur@dcmsme.gov.in
Website: msmedikanpur.gov.in

PROJECT PROFILE

ON

AUTO PISTONS

PART-II

A) INTRODUCTION

Gravity casting in Aluminum alloy is used for casting of Piston. Rapid production of engineering piston is used in automobile industries. The technique has obvious advantage when a component is required in large quantities. However in automotive applications, properties and durability are of primary importance. It is, therefore, essential that the best feature of design should be used and optimum casting techniques with minimum cost should be adopted. Gravity Die Casting products are used in domestic as well as international automobile industries.

B) MARKET POTENTIAL

The technique of gravity die cast aluminum alloy components has the following advantages compared to other methods of castings:

1. High Productivity.
2. Good cast surface finish and appearance.
3. Can be cast within close dimensional tolerance.
4. Do not require further machining
5. Very thin section can be cast with easy.
6. Metal wastage in the casting process is less.

Auto piston is a part of automobile which reciprocates in the engine cylinder to transmit power to the wheels. It is generally made of Aluminium.

Pistons are used in automobile industries and auto vehicles manufacturers are its main customers. The primary market is expected to continue as the leading market with the trend of demand growth in order to cater to the requirement of more and more new auto industries. The demand is expected to expand at an average growth rate of 15% to 20%. The replacement market is also likely to expand.

C) BASIS & PRESUMPTIONS

The project report has been prepared keeping in view the following basis and presumptions while calculating the cost of project and that of production:

1. For capacity utilization, it is considered 60% efficiency and 6 working hours per day are required.
2. Four years are required for achieving full capacity utilization.
3. Labour and wages have been taken as per the present circumstances.
4. Interest rates for fixed and working capital are taken @ 15% per annum.
5. Margin Money from the proprietor is 25% and 75% will be raised from financial institutions.
6. Land Building has been considered on rent.
7. Cost of Machinery and Equipments is based on a particular make.

D) IMPLEMENTATION SCHEDULE:

Sl. No.	Activity	Period
i.	Preparation of project report:	
	a) Calling quotations	1 month
	b) Preparation of Report	2 weeks
ii.	Provisional Registration as SSI unit	1 week
iii.	Clearance from Pollution Control Board	3 months
iv.	Financial Arrangements	3 months
v.	Purchase and Procurement of Machinery & Equipment	1 month
vi.	Installation of Machines and Equipment	1 month
vii.	Electrification etc.	1 month
viii.	Recruitment of Staff	1 month
ix.	Commencement of Production	9 months onwards

E) TECHNICAL ASPECTS:

(i) Process of Manufacture:

Aluminium alloys suitable for gravity die casting for piston is to be chosen for casting of the piston. Aluminium alloys like Hyper, LM are suitable for casting of piston. These alloys have excellent fluidity, good corrosion resistance and good mechanical properties. The cast component should be free from holes, pinholes, shrinkage, coldshut etc.

Ingot shall be reasonably free from slag or dross. Microscopical examination in hypereutectic alloys shall show uniform distribution of primary silicon cuboids in the eutectic matrix. Size of silicon cuboids as measured in the field of 75 mm dia and 100 magnification shall be on an average of 40 to 70 microns and individual silicon cuboid size shall be not more than 100 microns.

(ii) Quality Control and Standards

As per IS 7793: 1975, Aluminium Alloys for I.C. Engine Pistons, basically four grades of the alloys have been specified namely 2285, 4658, 4928-A and 4928–B with various alloying compositions like Cu, Mg, Si, Fe, Mn, Ni, Zinc etc. Hardness has been specified between 90 to 140 HB with tensile strength ranging from 165 to 275 N/mm^2 for various grades.

(iii) Production Capacity:

This scheme has been prepared with estimated production capacity of 12 tonnes per annum on single shift basis assuming minimum weight of piston to be 200 grams. 5000 No. of pistons of different sizes for auto engineering are estimated per month.

(iv) Pollution Control:

This industry does not come under the category of pollutant industry. However, consent of the State Pollution Control Board is required which will remain valid till a unit modifies or changes its process.

(v) Energy Conservation:

There is a little scope for energy conservation in this industry except in the melting process where the furnace should be properly insulated to reduce radiation losses and should be fitted with automatic pyrometer control to maintain the proper temperature in the furnace.

F) FINANCIAL ASPECTS:

A) Fixed Capital:

(i) Land & Building:

Rented Land with covered area 2500 sq. ft. **Rs. 20,000/-**

(ii) Machinery & Equipment:

Sl. No	Particulars of Machines	Qty. (Nos.)	Amount (Rs. Lakh)
1.	Crucible Furnace 200 Kg with motor and accessories	4	4,00,000/-
2.	Lathe Machine 4½ ft size and electricals	4	4,00,000/-
3.	Precision Lathe	2	5,00,000/-
4.	Pillar type Drilling Machine with 1 HP motor	1	50,000/-
5.	Bench Grinder double ended with 1 HP motor	1	30,000/-
6.	Vice, Table, Fixtures, Measuring Instruments, Gauges etc.	LS	70,000/-
7.	Laboratory comprising chemical and physical testing with heat treatment furnace.	LS	1,25,000/-
8.	Generator and other electrical accessories	LS	1,25,000/-
		Total:	**17,00,000/-**
	Office /Lab Furniture/Equipments	LS	50,000/-

(iii) Pre-operative Expenses:

Electrical and mechanical installation @ 10% of Plant and Machinery equipments		1,70,000/-
Total Fixed Capital (i + ii + iii):		**19,20,000/-**

B) Working Capital (Per Month):

(i) Salary & Wages:

Sl. No.	Designation	No.	Rate	Total (Rs.)
1.	Works Manager	1	20,000/-	20,000/-
2.	Sales Executive	2	10,000/-	20,000/-
3.	Supervisor	2	10,000/-	20,000/-
4.	Store Keeper	1	5,000/-	5,000/-
5.	Office Assistant	1	4,000/-	4,000/-
6.	Skilled Workers	4	6,000/-	24,000/-
7.	Semi-Skilled Workers	3	5,000/-	15,000/-
8.	Un-skilled Workers	4	4,000/-	16,000/-
9.	Watchman / Peon	2	3,000/-	6,000/-
10.	Maintenance Fitter	1	10,000/-	10,000/-
			Total:	**1,40,000/-**
	Perquisites @ 15%			20,000/-
			Total:	**1,60,000/-**

(ii) Raw Material:

Sl. No.	Item	Qty.	Rate (Rs.)	Value (Rs.)
1.	Aluminium Alloy	1000 Kg	200/Kg	2,00,000/-
2.	Packing material	LS		10,000/-
			Total:	**2,10,000/-**

(iii) Utilities:

1. Power and Electricity for 2000 unit @ Rs. 5/Unit 10,000/-
2. Fuel charges for 300 Ltrs. @ Rs. 60/ Ltrs. 18,000/-
3. Water charges for 100 KL @ Rs. 10/KL 1,000/-

Total: 29,000/-

(iv) Other Contingent Expenses (P.M.):

1	Rent	20,000/-
2	Office Stationery, Postage and Telephone etc.	1,500/-
3	Publicity & Advertisement	1,500/-
4	Travelling and conveyance	1,000/-
5	Packing charges	3,000/-
6	Legal and other expenses	1,000/-
7	Repair and maintenance	3,000/-
8	Consumable stores	2,000/-
9	Insurance	2,000/-
10	Miscellaneous Expenses	2,000/-
	Total:	**37,000/-**

(v) Working Capital / Total Recurring Expenditure (P.M.):

1.	Salary & Wages	1,60,000/-
2.	Raw Materials	2,10,000/-
3.	Utilities	29,000/-
4.	Other Contingent Expenses	37,000/-
	Total:	**4,36,000/-**

(vi) Total working capital for 3 months 4,36,000 X 3 = Rs. 13,08,000/-

C) TOTAL CAPITAL INVESTMENT:

I.	Fixed Capital	19,20,000/-
II.	Working Capital for 3 months	13,08,000/-
	Total:	**32,28,000/-**
	Say:	**32,30,000/-**

G) FINANCIAL ANALYSIS:

i) Cost of Production (Per annum)

Sl. No.	Particulars	Value(Rs.)
1.	Total Recurring Expenditure /Cost	52,32,000/-
2.	Depreciation on machinery and equipment @ 10%	1,62,500/-
3.	Depreciation on dies, tools and fixtures @ 25%	17,500/-
4.	Depreciation on Office Equipment, Furniture @ 20%	10,000/-
5.	Interest on Total Capital Investment @ 15%	4,85,000/-
	Total: -	**59,07,000/-**

ii) Turnover (Per Annum)

Item	Value (Rs.)
By sales of 60,000 Nos. Auto Pistons of different sizes @ Rs. 150/- per piston (average basis)	**90,00,000/-**

iii) NET PROFIT (Per annum) Before Taxation:

Turn Over	(-)	Cost of Production	=	**Rs. 30,93,000/-**
90,00,000/-	(-)	59,07,000/-		

iv) PROFIT ON SALES (Per Annum):

Profit/annum X 100	30,93,000/- X 100	=	**34.36%**
Turnover/Annum	90,00,000/-		

v) RATE OF RETURN (Per Annum):

Net Profit/annum X 100	30,93,000/- X 100	=	**95.75%**
Total Capital Investment	32,30,000/-		

vi) BREAK EVEN POINT

Fixed Cost:

1.	Depreciation on Furnaces & Machinery & Equipments	Rs.	1,80,000/-
2.	40% of salary & wages	Rs.	6,53,000/-
3.	40% of other contingent expenses (excluding Insurance)	Rs.	1,77,000/-
4.	Insurance	Rs.	24,000/-
5.	Interest on Total Capital Investment @ 15%	Rs.	4,85,000/-
	Total:-	**Rs.**	**15,29,000/-**

B.E.P.

Fixed Cost X 100	15,29,000/- X 100	=	**33.08%**
Fixed Cost + Profit	15,29,000/- + 30,93,000/-		

Names & Address of Machinery & Equipment Suppliers:

1. M/s Engineering and Industrial Foundry Company,
   Ramnagar, Coimbatore-641009.
2. M/s crystal Elmec
   Ichalkaranji Industrial Co-op. Estate Ltd.,
   Common Hall No. 5, Block No. 8/9,
   Ichalkaranji-416115.
3. M/s Instrumentation Controls,
   P.B. 2726, Kalbadevi,
   Mumbai-400 001.
4. M/s Plus-one Machine Fabrik
   St. No. 323, Pl. No. 25-26, Udyambag,
   Belgaum-8.

5. M/s Aluminium Alloy Manufacturing Co.,
   126, V. V. Chandan Street,
   Mumbai-3.

6. M/s Bassein Metals Pvt. Ltd.,
   B-61, Dattani Apts No.4, Parekh Nagar,
   S. V. Road, Kandivalli (W),
   Mumbai-67.

7. M/s Radiant Metals and Alloys Pvt. Ltd.,
   A-6, Girikunj Caves Road, Andheri (E),
   Mumbai-3.

8. M/s Fuel Instruments and Engineers Pvt. Ltd.,
   68-69, Parvati Co-operative Indl. Estate,
   Yaddrav, Tah. Shirol,
   Kolhapur-416145.

9. /s Electril Super Thermal Engineers,
   151, Small Factory Area, Lakadganj,
   Nagpur-440008.

10. M/s Mechachem Industries,
    D-55, M.I.D.C.,
    Nagpur-440 028.

Raw Material:

Raw material can be purchased from local market, as it is available easily. Moreover, it can also be had from Government Depots and Corporations.

*****