Non-Ferrous Castings

PRODUCT CODE	:	331159007
QUALITY AND STANDARDS	:	As per Customers Specifications
MONTH AND YEAR OF PREPARATION	:	November, 2002
PREPARED BY	:	Small Industries Service Institute Advisor Chowmuhani, Krishnanagar Road, Agartala - 799 001.

Introduction

The castings of metals and alloys of copper, zinc, tin, aluminium, lead etc. come under the group of non-ferrous castings. Some of the prominent alloy castings are Brass, Bronze, Aluminium Bronze, Gun Metal etc. These castings are used for various purposes like bearing, bushes, automobile parts, textile parts, corrosion resistance parts, marine parts, impellers, clamps and connectors, over-head conductors etc. Some of the main products manufactured are:

i) Gun metal valves
ii) Gun metal bushes
iii) Water meter body
iv) Aluminium clamps and connectors
v) Impellers
vi) Bell metal castings
vii) Leaded Brass Bearings
viii) Water tight and pressure tight castings

Market Potential

Non-ferrous castings are fast consuming items and the area of application for these items are vast. Due to certain inherent advantages of mechanical and chemical properties, the use of non-ferrous castings is increasing day by day. The consumption of these items is by Automobile Industries, machine manufacturing Industries, Textile Industries, Electrical Industries and so on. The consumption of Gun metal bushes alone is very large which are required in original equipments as well as for replacement market.

Basis and Presumptions

1. Working days per year are 300 days with 8 hours per shift.
2. Profile prepared on the basis of 60% capacity utilization of the melting furnace.
3. Average interest rate is 14% on total investment.
4. Cost of machinery and equipments is as currently prevailing.

5. Labour wages are based on the market wages prevalent in the local market.
6. Installed capacity is 1200 kg per day.
7. 2% metal loss has been considered for calculation which may vary from foundry to foundry.
8. 60% yield with 10% average rejections has been considered for calculation.

IMPLEMENTATION SCHEDULE

Sl.No. Activity	Period in Months
1. Project report preparation	0–2
2. Obtaining provisional registration	2–3
3. Procurement of machinery	3–9
4. Building and shed hiring	4–5
5. Installation of machinery	9–10
6. Procurement of raw materials	10–11
7. Recruitment of labour	10–11
8. Trial production	11–12
9. Commercial production	12 onwards

TECHNICAL ASPECTS

Process of Manufacture

The process is based on sand casting method. The moulds are prepared for particular items. The metal is melt in a 150 kg induction furnace. The molten metal is poured in the moulds and after cooling the product, it is machined and packed.

Quality Control and Standards

The products are made as per customers specifications for mechanical and Chemical properties, the standard is to be followed as per IS specifications.

For producing sound and defect-less castings, proper melting, moulding and pouring techniques should be followed. The unit can at least set up their own captive testing laboratory for chemical, mechanical and metallurgical testings.

Production Capacity (per annum)

At 60% efficiency:

Qty. : 216 MT

Value : Rs. 270 lakh

Motive Power

70 HP

Pollution Control

Foundry being a pollution intensive Industry, needs to obtain no objection certificate from the Pollution Control Board. Every care should be taken to minimise the gaseous as well as solid pollution.

Energy Conservation

Foundry Industries particularly where Induction furnace is used require huge energy in the form of electricity. Optimum use of electricity leads to reduced production cost. To minimise electricity by using right equipment or motor is possible. Energy audit will certainly help to decide the right equipment or motor for specific application without hampering the production process.

FINANCIAL ANALYSIS

A. Fixed Capital

(i) Land and Building	
Covered area of 300 sq.mt. (Rented) @ Rs.25 per sq.mt.	Rs. 7,500

(ii) Machinery and Equipments

Sl. No.	Description	Qty.	Amount (Rs.Lakh)
1.	75 kw/150 kg induction furnace complete with control panel, hydraulic tilting arrangement, water cooled and standard set of bus bar with crucible	1	15
2.	Power operated moulding machine complete with electric motor and accessories	1	1.50
3.	Core oven/heating chamber	1	0.25
4.	General purpose lathe with 2 HP motor and starter	1	0.50
5.	Bench drilling machine of 25 mm capacity with 1HP motor with starter	1	0.30
6.	Non ferrous metal cutting machine	1	0.25
7.	Double ended bench grinding m/c with 2 HP motor	1	0.20
8.	Moulding boxes and ladles	LS	1.00
9.	Weighing machine up to 500 kgs	1	0.20
10.	Fettling equipments, patterns and tools	LS	0.25
11.	Pneumatic hand grinder	1	0.20
12.	Welding machine 400 amp air cooled complete with welding set	1	0.25
13.	15 HP Air compressor complete with air tank and other accessories	1	2.00
14.	Carbon and sulphur testing apparatus with furnace and glass fittings etc.	1	0.25
15.	Muffle furnace for chemical lab	1	0.20
16.	Laboratory glass apparatus	LS	0.20
17.	Immersion type pyrometer 0 - 1800°C	1	0.40
18.	Metallurgical microscope	1	0.40
19.	Micro specimen polishing machine	1	0.25
20.	Hardness tester hydraulically operated	1	0.60
21.	Micrometer/verniers etc.	LS	0.50
22.	Office furniture and fixture	LS	0.80
23.	Electrification and installation of machinery		2.38
	Total		**27.88**

(iii)	Preliminary and pre–operative expenses like legal expenses, cost of project report preparation, establishment cost, travelling, start up expenses, consultancy fees, estimation fees, interest during construction, trial run expenses	1	
	Total		**28.88**

B. Working Capital (per month)

(i) Personnel

Sl. No.	Designation	No.	Salary (In Rs.)	Amount (In Rs.)
1.	Manager	1	6,000	6,000
2.	Supervisor	1	4,000	4,000
3.	Sales Executive	1	5,000	5,000
4.	Chemist	1	3,000	3,000
5.	Typist–cum–Clerk	1	2,500	2,500
6.	Accountant	1	3,000	3,000
7.	Storekeeper	1	2,500	2,500
8.	Peon/Watchman	4	1,500	6,000
9.	Furnace operator	1	4,000	4,000
10.	Skilled Workers	3	3,500	10,500
11.	Semi-skilled Workers	4	2,500	10,000
12.	Unskilled Workers	5	2,000	10,000
13.	Maintenance fitter	1	3,000	3,000
	Total salary and wages			69,500
	Additional perquisites @ 15% of salaries and wages			10,425
	Total			**79,925**
	Say			**80,000**

(ii) Raw Material

Sl. No.	Particulars	Qty. Tons	Rate	Amount (Rs. Lakh)
1.	Copper, Zinc, Tin, Aluminium	18 MT	85,000 average MT	15.30
2.	Fluxes	LS	LS	0.50
3.	Sand	LS	LS	0.20
	Total			**16.00**

(iii) Utilities		(Rs.)
(a) Power @ Rs. 1.75 per kwh	9,000 kwh	15,750
b) Water		2,000
	Total	**17,750**
	Say	**18,000**

(iv) Other Contingent Expenses

Sl. No.	Description	Value (Rs.)
1.	Rent	7,500
2.	Stationery, postage, telephone	2,000
3.	Packaging	3,500
4.	Repair and maintenance	10,000
5.	Consumable store, lubricants, degasses, oils etc.	25,000
6.	Transportation	50,000
7.	Misc. expenses	10,000
8.	Selling expenses	2,000
	Total	**1,10,000**

(v) Total Recurring Expenditure (per month)
= Rs. 18.08 lakh

(vi) Working Capital (for 3 months)
= Rs. 54.24 lakh

C. Total Capital Investment

1.	Fixed Capital	Rs. 28.88 lakh
2.	Working Capital (for 3 months)	Rs. 54.24 lakh
	Total	**Rs. 83.12 lakh**

FINANCIAL ANALYSIS

(1) Cost of Production (per year)		(Rs.)
1.	Total recurring cost	216.96
2.	Depreciation on machinery and equipment @ 10%	1.11
3.	Depreciation on furnace @ 15%	2.25
4.	Depreciation on moulds fixture and furniture @ 25%	0.45
5.	Interest on total investment @ 14%	11.64
	Total	**232.41**

(2) Turnover (per year)	(Rs. Lakh)
Cast components of Non-Ferrous metal 190MT @1.25 Lakh/MT	237.50
Return from sales runner risers and rejection etc. 20 MT @ 0.90 Lakh/MT	18
Total	**255.50**

(3) Net Profit (per year) Rs. 255.50 – 232.41
= **Rs. 23.09 Lakh**

(4) Net Profit Ratio

$$= \frac{\text{Net profit per year} \times 100}{\text{Turn over per year}}$$

$$= \frac{23.09 \times 100}{255.50}$$

= 9.04%

(5) Rate of Return on Investment

$$= \frac{\text{Net profit per year} \times 100}{\text{Total Investment}}$$

$$= \frac{23.09 \times 100}{83.12}$$

= 27.78%

(6) Break-even Point

(i) Fixed Cost		(Rs.)
1.	Rent	0.90
2.	Depreciation	3.81
3.	Interest on total investment	11.64
4.	40% of salaries and wages	3.84
5.	40% of contingent expenses excluding rent	4.92
	Total	**25.11**

(ii) Net Profit (per year) **Rs. 23.09 lakh**

B.E.P.

$$= \frac{\text{Fixed cost} \times 100}{\text{Fixed cost + profit}}$$

$$= \frac{25.11 \times 100}{25.11 + 23.09}$$

= 52.9%

Addresses of Raw Material Suppliers

Available in Local Markets.

Addresses of Plant and Machinery Suppliers

1. M/s. Inductothern (India) Pvt. Ltd.
   Ahmedabad - 380 058
2. M/s. The Wesman Engineering Company Ltd.
   8, May Fair Road,
   Kolkata - 700 019.
3. M/s. Chennai Metro Pvt. Ltd.
   SP 100 A,
   Ambattur Industrial Estate,
   Chennai - 600 058.
4. M/s. Fine Testing Machines Sales and Service
   359, Lake Town,
   Block - A, Kolkata - 700 085