A
PROJECT PROFILE
ON
ALLOY STEEL /HEAT RESISTANT STEEL
Casting
(UPDATED)

2010-2011

Prepared by :

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QUALITY STANDARD	**:**	As per BIS & customers Specification
PRODUCTION specialized CAPACITY	**:**	700 MT of Machined steel casting @52000/MT Value Rs.36,40,000/-
MONTHS AND YEAR OF THE PREPRATION	**:**	NOVEMBER, 2010
PREPARED BY	**:**	Metallurgy Division, MSME- development institute, 34, Industrial Estate Nunihai, Agra- 282006

INTRODUCTION:

Specialized carbons steel/ alloy steel/ heat resistant steel casting are widely used in Infrastructure Development Requirements like Indian Railway, cement Industries. Thermal power stations and fertilizer Industries.

These casting requires certain special mechanical properties. As such casting can only be manufactured in the environment with process controls. Such and every process can be monitored and chemical added as and when require by melting in electrically. controlled medium frequency Induction furnace. The project Is focused on value addition in their castings with consistency in mechanical properties, superior microstructure reduced machining allowance and timely supply.

MARKET POTENTIAL:

Indian railways rail coach Factories, cement manufactures ore dressing units, fertilizer units and thermal power plants are constantly in need of specialized steel castings. The customers prefer an SSI product because the cost of SSI products is generally less due to less overhead expenses. With the of engineering industries and industrialization India has become the manufacturing hub for M.M.C. who are setting up their production units in India for re-export to their home country, the demand for such castings has increased dramatically. The requirement of this product is inherent and cannot in any way get diluted.

Moreover the pollution problems and stringent pollution control mechanics introduced by developed countries has resulted in high manufacturing cost making then unviable in developed countries. Hence, there is a good scope of export of such castings from India.

In present scenario India with massive scientific talent, low salary over heads, dry climatic conditions, political in developed countries. There is a excellent scope of export to U.K., Australia and Germany.

PRODUCTION TERGETS (PER ANNUM)

The project envisages a production of 850 MT per annum of good castings (as cast-unmachined) with an installed capacity of 123 MT per annum at 80% efficiency and 5% marching less.

BASIS & PRESUMPTIONS :-

i) single shift of 8 hours/day.
ii) 300 working days in year.
iii) 80% capacity utilization.
iv) Labour wages based on local market conditions and Wages Act.
v) Interest rate for fixed and working capital 13% on an average.
vi) Time period for achieving full capacity utilization 3 years.

IMPLEMENTATION SCHEDULE:

i)	Acquisition of land building	4 months
ii)	Placements of order for machinery	2 months
iii)	Delivery period of machinery	2 months
iv)	Installation of machinery & power connection	2 months

v) Arrangements of tools 2 months
vi) Clearance from state pollution control board 1 months
vii) Arrangements of finance 3 months
viii) Arrangement of man power 2 months

All activities may be initiated simultaneously and the project may come to commercial production within 6 months.

TECHNICAL ASPECTS:

i) **Process Outline**

a. Patten Making
b. Maudling
c. Melting
d. Casting
e. Felting/grinding/Shot blasting
f. Heat treatment
g. Machine
h. Testing
i. Dispatch with final inspection report

Pattern making:

The patterns are made on basis of the drawing/samples provided by the customers. The pattern making activity may be out sourced also.

Maudling:

Maudling sand is prepared sand Muller by adding suitable proportion's of various additives and the moulds are prepared with help of the pattern.

Melting:

The steel scrap is melted in the induction Furnace with addition of predefined mix of Ferro-alloys, at a temperature of 1600^{o} c. molten metal is then taken into ladles and poured into the mould. Once the metal has solidified they are knocked out from the mould boxes. Runners risers are knocked out and castings are cleared by hand grinders and sent for shot blasting/felting.

If required the casting undergoes heat treatment in the electrically controlled Heat treatment furnace. Machining if required is carried out using lathe machine, drill machine, shapers etc.

1. Quality specification:

As per BIS and customers specification

2. Production Capacity (p.a)

(b) Quantity – 700 MT machined items @ rs. 40.000/MT.

(c) Value - Rs. 2, 80,00,000/-

4. **Motive power required:** Transformer of 400 K.W.

5. Pollution control:

Since the castings is to be manufactured by furnace the project of 100% ecofriendly.
However, it is required to get NOC from state pollution control Board. The pollution due to dust etc. can be reduced by providing a fall out area for the dust within the factory premises
Itself. Exhaust fans and chimneys have to be provide at suitable places.

1. Energy Conservation:

1. Efforts to be made to achieve maximum thermal efficiency of the furnace.
2. Energy audit of the unit has to be done on regular interval to take suitable step for energy conservation.
3. Arrangement may be made for preheating of charge.
4. The opening furnace has to be closed while not in use.
5. Preventing maintenance and proper maintenance of machines will act towards energy conservation.
6. Strict process control to be done.

FINACIAL ASPECTS:

Fixed Cost-

1. Land and building 10000 sq. ft. (rented) P.M. Rs. 15,000
2. **Machinery and equipments:**

Sl.No.	Description	Ind/Imp	Qty	Value (Rs.)
1.	500 kg. Medium Furanency Induction furnace with all accessories.	Ind	1	25,00,000
2.	Transformer 400 KW		1	5,00,000

3.	Electrical connection/cable etc.			3,00,000
4.	E.O.T. Crane 5 MT cap. 20 HP motor			2,00,000
5.	Water pump, pipe, line, etc.			2,000,00
6.	Cooling Tower			1,00,000
7.	Compressor 3 HP		1.No.	1,00,000
8.	Arc Welding M/c 300 Amp. 3 phase		1 No	30,000
9.	Sand mixer (100 kg cap.) with 5 HP. Motor		2 Nos.	60,000
10.	Vibrating sand sieving M/c 3 deeks with sieving and 15 HP motor		1 No.	30000
11.	Hand operated pin lift maulding machine fitted with column. Squeezing arm, plunger and pressure plate.		1 No	2,00,000
12.	Drying oven oil fired		1.No.	50,000
13.	Heat Treatment Furnace (2mx1.5 mxx 1.5 m) electrically controlled		1 No.	2,50,000
14.	Bench grinder double ended with 2 HP motor	Ind	1 No	15,000
15.	Flexible shaft grinder		2 No.	20,000
16.	Swing frame grinder with 10 HP motor		1 No.	50,000
17.	Bench Drilling machine 20 mm cap with HP motor.		1 No.	15,000
18.	Preumatic grinder		1 No.	5,000
19.	Patterns			10,000
20.	Ladies of cap 10 kg to 70 kg (self fabricated)		5 Nos.	1,00,000
21.	Maudling boxes		LS	1,00,000

22.	Foundry & moldings tools		LS	20,000
23.	Material Handing equipments		LS	10,000
24.	Felting and cutting Tools		LS	20,000
25.	Lathe machine 12 feet		2 Nos.	60,000
26.	Lathe machine 10 feet		1 No.	25,000
27	Lathe machine feet		1No.	15,000
28.	Weighing machine 200 kg cap.		1 No.	20,000
2.(B)	laboratory and Testing Equipments :			
29.	Chemical analysis equipments		LS	70,000
30.	Sand testing like permeability meter, speedy moisture tester etc.		LS	25,000
31.	Hardness tester (Brinal)		1 No.	15,000
32.	Metallographic metallurgical microscope		1 N0.	30,000
33.	Specimen polishing machine (double disc type)		1 No.	20,000
34.	Lzod/Chapy impact tester		1 N0.	50,000
35.	Immersion pyrometer		1 N0.	25,000
36.	Measuring/Inspection tools		LS	25,000
37.	Pollution Control equipments (Exhaust/chimney etc.)		LS	25,000
38.	Energy conservation equipments			
	Installation &			3,78,000

	electrification @ 10% of machine & equipment			
	Total cost of machinery & equipment			61,58,000
	Cost of tools & Fixtures		LS	30,000
	Cost of office equipments/table/chair		LS	50,000
	Preoperative expenses			30,000

Total fixed capital : 62,68,000

3. Working Capital (per month):

1) Personal:

Sl.	Description	NO.	Salary	Total
A)	**Administrative & supervisor**			
1.	Manager	1.	10000	10,000
2.	Engineer	1.	10000	10,000
3.	Supervisor	1.	5000	5,000
4.	Accountant (part time)	1.	4000	4,000
5.	Clerk cum typist	1.	4000	4,000
B)	**Technical:**			
1.	Foundry Technologist	1.	15000	15,000
2.	Skilled Worker	4.	5000	20,00
3.	Unskilled worker	10.	2500	25,000
4.	Machine operator	4.	3000	12,000
			Total salary	1,05,000
	Perquisites @ 15% of salary			15,000
			Total	1,20,000

Raw material (per month):

Sl.No.	Description	Ind	Qty	Rate	value in Rs.
1.	Scrap		75 MT	Rs. 25000/MT	18, 75,000
2.	Fem.		200kg	Rs.50/kg	10,000
3.	Fest		300kg	Rs. 60/kg	18,000
4.	Other, alloys, Fluxes/refractory		LS		50,000
5.	Sand		25000kg	Rs.2/kg.	50,000
			Total		20,03,000

iii) Utilities (per month)

Electricity (power)	55000KWH @ Rs.500/KWH	2, 75,000
Water	LS	2,000
	Total Rs.	2,77,000

iv) Other contingent Expenses (per month)

1.	Rent	20,000
2.	Postage & stationery	5,000
3.	Telephone	2,000
4.	Consumable Stores	5,000
5.	Repair& maintenance	10,000
6.	Transport Charges	10,000
7.	Advertisement and publicity	3,000
8.	Insurance/Taxes/other/ misc. expenses	20,000
	Total	75,000

Total Recurring Expenditure:

Total recurring expenditure per month-
I+II+III+IV= Rs. 24, 75,000

Total Working capital for 3 months Rs. 74, 25,000

Total capital Investment:

Fixed capital	Rs. 62, 68,000
Working capital for 3 months	Rs, 74, 25,000
	Rs. 1, 36, 93,000

Machinery Utilization:

The capacity utilization is considered to be 80% of the installed capacity.

FINACIAL ANALYSIS:

Cost of production (per month)

1.	Total recurring cost expenditure per year	Rs. 2,97,00,000
2.	depreciation on machinery, furnace, tools & Fixtures & office equipments @ 10%	Rs. 6, 27,000
3.	Interest on total capital investment @ 15%	Rs. 20, 52,950
	Total cost of production per annum:	Rs. 3,23,80,95

ii. Turnover (per annum):

700 MT of machine specialized steel castings @Rs. 52,000/MT Rs. 3, 64, 00,000

iii. Net Profit per annum:

Total sales-total cost of production Rs. 40, 19,000

Net Profit Ratio:

$$\frac{\text{Net profit X100}}{\text{Turnover}} = 11\%$$

Rate of return (on investment):

$$\frac{\text{Net Profit X100}}{\text{Total investment}} = 29\%$$

4,890

Break Even Analysis:

Fixed Cost (per annum)

a)	Total Depreciation on m/c & equipment, tools & fixtures, office equipments etc,	Rs. 6, 27,000
b)	Rent	Rs. 2, 40,000
c)	Interest on total capital investment	Rs .20, 52,950
d)	Insurance etc.	Rs. 2,40,000
e)	40% of other contingent wages	Rs. 5,76,000
f)	40% of other contingent expenses	Rs. 3,60,000
	Total fixed cost	Rs.40,95,950

Break even Point:

$$\frac{\text{Fixed cost X100}}{\text{Fixed cost profit}} = \frac{\text{Rs.40, 95,950X100=}}{\text{81, 14,950}} = 49\%$$

Name & address of machine and equipments supplier:

A. Furnace Suppliers

1. Electrotherm (India) Ltd. Survey No.72, palodia (via – Thaliej), Ahmedabad, Gujrat-382115, India Tele : 079-3734553-57, 3734613-15 Fax: e-mail mkt@inductotherm.com
2. inductotherm (India) P.Ltd. B.P. No. 59, Phase- 1, 47, GL de vatva, Ahmedabad – 392445, Tele 079-37314961, Fax 079-3731266 Email iil@inductothermindia.com Website. www.inductothermindia.com

3. m/s Induction Power HO Bandari House, Plot-815, Sola kalol Road, P.O.santej-382721. Gandhi Nagar, Gujarat Tel 02764-286621-23, Fax 02764-286622.

B. Crane suppliers, foundry Machinery & equipment:

1. M/s Avon Engineers HO Bandari House, 91 Nehru Place, New Delhi-110019
2. M/s SSEC Foundry Equipment (P) Ltd. 839/1-B, Bettathpuram pudur, karanmandai Post Coimbatore-641104, India Tel.04254-272165, 273153, Fax-04254-272495
3. M/s Vadhan Works P.Ltd 43/3, karve Road, Income Tax lane, pune-411004 Tel/fax-91-020-5440086,
4. M/s Washman Engg Co.P Ltd., 340, fantneon Road, Madras-600008. Tel. 44-28263581
   www.wisman.com