

C.I. GEAR BOX HOUSING

Product Code(ASICC) : 71108
Quality & Standards : IS: 210 - 2009
Production Capacity : 750 MT per year
Month & Year of : March, 2012
Preparation
Prepared by : MSME DEVELOPMENT INSTITUTE,
(Metallurgy Division)

C.G.O. Complex, Block“C”,

Seminary Hills, Nagpur - 6.

1. Introduction:

The automobile industry comprising four wheelers, motor cycles, scooters, mopeds along with machinery components especially, achieved a fast progress in 1980 with liberalization policy. Small scale units started manufacturing almost every type of machines indigenously in India. Especially for mechanical machines like Lathe, Milling, Gear Hobbing, Shapers Machines etc. Gear Box is an integral & most important component for transmission of speed.

2. Market Potential:

In this era of rapid industrialization, demand for machines has increased many a folds. In Vidarbha there are very few units manufacturing C.I. Gear Box Housing exclusively. With the increase in the number of industries where these items find application, the market for C.I. Gear Box Housing is increasing particularly due to the fact that the number of units having well equipped laboratory and engaged in the manufacture of such castings is very less and demand for such items by machine manufacturers is ever increasing.

On the other hand, raw material is also available in abundance in this region. This gives an ample scope for setting up of unit of Cast Iron Gear Box Housing

3. Basis & Presumptions:

The project profile is drawn on the basis of following presumptions.

1. Target has been fixed at 750 MT/Annum of finished C.I. Gear Box Housings of various sizes on the basis of single shift working and on average of 15 working days/month, which comes to 63MT in a month.
2. The efficiency of the plant has been presumed at 70% for the first year of production with a projection of 75% and 80% utilization of capacity for 2nd & 3rd year of production respectively.
3. The skilled, semi-skilled & unskilled labor will be engaged @ Rs. 3,000/-, Rs. 2,500/- and Rs. 2,200/- respectively for each type of labor.
4. Interest rate for fixed and working capacity being 12% Per Annum.
Margin money will be the 15% of the total cost of project.
5. Pay back period being 9 years with a moratorium period of 1 ½ years.
Costs in respect of machinery and equipment, raw materials are those generally obtained at the time of preparation of project profile and may vary depending upon various factors.

4. Implementation Schedule:

- | | | | |
|----|---|---|------------------|
| 1. | Scheme preparation and approval | - | 3 months |
| 2. | Selection of site | - | 1 month |
| 3. | Sanction of loan | - | 2 months |
| 4. | SSI Provisional registration | - | 1 day |
| 5. | Machinery procurement, erection & commissioning | - | 2 months |
| 6. | Power connection | - | 1 month |
| 7. | Trial run | - | 2 months |
| 9. | Commencement of production | - | 5 months onwards |

5. TECHNICAL ASPECTS:

a. PRODUCTION DETAILS AND PROCESS OF MANUFACTURING:

The various operations in a foundry are pattern making, mould making, sand preparation, core making, melting, knockout, fettling and finishing. The combination of all these operations will produce castings.

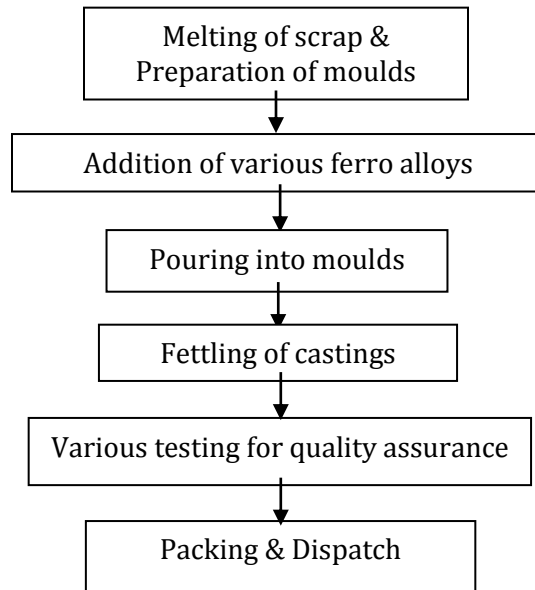
Pig Iron and return scraps are melted in oil fired rotary furnace and the composition of the bath is adjusted by suitably added Ferro alloy, steel scrap, petroleum coke etc. as per the requirement. However, Ferro chrome and inoculants as per requirement are added in the ladle during transfer of molten metal from rotary furnace to ladle. The moulds are made of fluid sand, binding material and additives. Cores made of special sand are dried before the metal is poured in. The castings from fluid sand moulds are taken out and when cold are fettled, inspected, machined and dispatched.

b. Quality Control & Standards:

Graded C.I. castings for automobile components such as Gear Box Housing are produced to serve specific mechanical properties, Chemical composition and micro-structure. Accordingly, a close control of quality at each stage of manufacture is essential. IS: 210-2009 is followed for various specificational requirements for Gear Box Housing.

Quality control methods usually applied are carbon equivalent determination by carbon equivalent meter, hardness determination and determination of alloying elements by chemical methods. The usual grades of cast iron to be produced include G-25, G-30, Gr-35 of IS: 210-2009 (Automotive Grey Iron Castings).

6. PROCESS FLOW graphic representation:



7. PRODUCTION CAPACITY :

QUANTITY : 750 MT/Annum.
VALUE : 2,77,50,000/-

8. MOTIVE POWER REQUIREMENT : 25 HP approximately

9. POLLUTION CONTROL:

Foundry Industry has a share in the present environmental degradation. So it is required to get NOC from Pollution Control Board of the State. The pollution control machinery and equipment costs are too exorbitant for the small foundries.

Foundry Industry, depending on the character of the production, is great source of heat, noxious gases, dust and noise. It also produces a large quantity of wastes such as irreclaimable sands ashes and slag. These all elements have individual contributing effect on the environmental degradation and causes unhealthy and unsafe condition within the foundry.

The important consideration to prevent pollution is the right choice of appropriate techniques to be adopted and correct installation of department, instruments and machinery. These aspects play a significant role in reducing the proportions of pollutant and thereby reduce the magnitude of environmental degradation. There are mainly two methods for control of pollution in a foundry:

1. By exploiting the meteorological and topographical conditions.
2. By using various equipment for cleaning & dispersion of foundry emission.

For a small foundry, the exploitation of natural draughts and climatic conditions are the best and cheapest methods for dispersion of chimney emissions. Use of equipment like gas scrubbers, ventilation fan washers, etc. require considerable capital investment and also in value running expenses. On the other hand, use of high stack and operating the foundry at a time of favorable natural draught through chimney, help to successfully disperse the dust and gases emitted from the foundry at zero or negligible cost.

Proper treatment and handling of the raw material also reduces the emission contents, particularly dust, use of simple measures like removal of dust from the furnace charge, use of oil of proper strength with appropriate air blast will also help to a great extent. Again, use of simple devices like increased chimney height for the furnace, allowing proper space beyond the furnace stack, the pollution of the neighborhood can be reduced by providing a fall out area for the dust, ash etc. within the factory premises itself.

10. ENERGY CONSERVATION:

These days energy conservation efforts are needed to be strengthened Substantially. The potential for conservation however, is must large and all efforts needed to be made the individuals to realize it to the extent possible. The energy audit is an integral part of an energy conservation project and is the key to a systematic approach for decision.

Various factors which affect fuel economy in industrial furnaces are :

- * Complete combustion with minimum excess air.
- * Proper heat distribution.
- * Operating at the desired temperature
- * Reducing heat losses from openings, Minimizing wall losses
- * Waste heat recovery from fuel gases, Control of chimney draught.

The principles of good combustion for the proper selection and maintenance of fuel oil, burner is very important and it has the main role. So standard and good quality burners should be used for better conservation of oil fuel.

So the efficiency of a furnace will depend on how efficient the combustion system is and secondly how best the generated heat is utilized.

11. Financial Aspects

A. Fixed Capital

i) Land & Building, 1000 Sq. Meters (rented) per month

10000

ii) Machinery & Equipments:

S.No.	Description of Machines	Quantity	Price (Rs)
1	Induction Furnace, 500 Kg. cap. With control panel and other accessories etc.	1	2000000
2	Muller, 150 kg. cap., 2 HP Motor	1	30000
3	Vibrating & Sieving Machine	1	15000
4	Annealing Furnace, size-4'x4'x4' with Pyrometer etc.	1	50000
5	Moulding Boxes	L.S.	30000
6	Laddles, Pokers, Wire Net, Buckets etc.	L.S.	10000
7	Hardness Testing Machine, Rockwell	1	50000
8	Chemical & Other Testing Equipments	L.S.	50000
9	Sand Testing Equipments	L.S.	25000
10	Platform Weighing Machine, 500 Kg. cap.	1	8000
11	Welding transformer, 300 Amp. (Oil cooled)	1	15000
12	150 KVA Transformer with standard accessories	1	80000
13	Pedestal Grinder Double Ended 8" wheel	1	10000
14	Flexible Shaft Grinder 150mm, 1HP	1	12000
15	Gas Cutting Set	1	7500
		Total	2392500
16	Electrification & installation @ 10% of above cost		239250
17	Office equipments like furniture, fan, Computer etc.	L.S.	75000
18	Pre-operative expenses		50000
		Total	2756750

12. Working capital (Per month):

A: Staff & Labour:

S.No.	Description	Nos.	Salary	Total
1	Works Manager	1	7000	7000
2	Supervisor(Melet/Molder)	2	6000	12000
3	Accountant/Clerk	1	4000	4000
4	Laboratory Technician	1	3500	3500
5	Skilled Worker	2	3000	6000
6	Semi-Skilled Worker	2	2500	5000
7	Unskilled worker	4	2200	8800
8	Peon	1	2000	2000
9	Watchman	1	2000	2000
			Total	50300
	Add perquisite @15% of salary			7545
			Total	57845

(4)

B. Raw Material (Per month)

S.No.	Particulars	Qty.	Rate(Rs.)	Value
1	C.I. Scrap, MT	66	27000	1782000
2	Petroleum Coke	500	25	12500
3	Ferro-Alloys like FeCr, FeSi, FeMn etc.	L.S.	n.a.	50000
4	Bentonite, Dextrine, Core Oil, Graphite paints etc.	L.S.	n.a.	20000
5	Welding Rods & cutting Gases	L.S.	n.a.	7500
			Total	1872000

C. Utilities (Per month)

1	Electricity	25000
2	Water	5000
	Total	30000

D. Other Contingent Expenses (Per month)

1	Rent	10000
2	Postage & Stationery	3000
3	Telephone	1500
4	Insurance	6000
5	Repairs & maintenance	5000
6	Consumable Stores	2000
7	Misc. Expenses	5000
8	Transport allowances	4000
	Total	36500

13. Total Working Capital (Per month) 1996345

14. Total Capital Investment

i)	Fixed Capital	2756750
ii)	Working Capital	5989035
	Total	8745785

15. Financial Analysis

a. Cost of Production (Per Year)

i)	Total recurring cost	23956140
ii)	Depn. on machinery & equipment @ 10%	23750
iii)	Depn. on furnaces @ 20%	400000
iv)	Depn. On office equipments @ 20%	15000
v)	Interest on Total capital investment @12%	1049494
	Total	25444384

(5)

b. Turnover (Per Annum)

By sale of 750 MTs of C.I. Gear Boxes @ 37000 per MT = **27750000**

c. Net Profit per year

Turnover per year - Cost of production = **2305616**

d. Net Profit Ratio

(Net profit per year/ Turnover per year) X 100 = **8.31 %**

e. Rate of Return

(Net profit per year/ Total investment) X 100 = **26.36 %**

f. Break-even Point

Fixed Cost

i)	Rent	120000
ii)	Depn. on machinery & equipment @ 10%	23750
iii)	Depn. on furnaces @ 20%	400000
iv)	Depn. On office equipments @ 20%	15000
v)	Interest on Total capital investment @12%	1049494
vi)	Insurance	72000
vii)	40% of salary & wages	277656
viii)	40% of other contingent expenses excluding rent & insurance	98400
	Total	2056300

Break- Even Point (B.E.P.)

[Fixed Cost/ (Fixed cost + Profit)] X 100 = **47.14 %**

(6)

NAMES & ADDRESSES OF MACHINERY AND RAW MATERIAL SUPPLIERS :

1. M/s. Hannu Metallurgical,
B-22, Girikunj Industrial Estate, Chakala, Mahakali Caves Road,
Andheri (East), Mumbai – 93 Ph.no. (022)-26875545.
2. M/s. Mahavir Engineering Corpn.,
1, Ambica Estate, B/h. Agarwal I.E.,
off S.V. Road, Jogeshwari West,
Mumbai – 102. Ph.no. (022)-56992785
3. M/s. Divecha Electricals,
Balaji Indl. Complex,
Gala No. ½, Navaghar , Bhayandar (E), Distt. Thane.
4. M/s. Nisha Engrs. & Consultants
Nisha Enclave, Plot No. 95,
Sector 23, Cidco Indl. Area, Turbhe, Distt. Thane. Ph.no. (022)-27684697
5. M/s. Combustion Equipments & Instruments,
Jer Mahal, Dhobi Talaw, 1st Floor, Mumbai – 2. Ph.no. (022)-27690171/27600842.
6. M/s. AIMIL Ltd.,
Malhotra House, Opp. G.P.O.,
Walchand Hirachand Marg, Mumbai – 1. Ph.no. (022)- 22642435
7. M/s. Electroil Super Thermal Engineers,
151, Small Factory Area, Lakadganj, Nagpur – 8. Ph.no. (0712)-2286284
8. M/s. G.R.C.
1, Taratala Road,
Kolkata-700024.
9. M/s. Standard Electricals
282, B.B. Chatterjee Road,
Kolkata-700042. Ph no. (033)- 24422063
10. M/s. Associated Engineers
32, G.C. Avenue,
Kolkata-13. Ph. No. (033)-40066117, 22126477, 24731518
11. M/s. Machine Tools Impex
75, S.C. Avenue,
Kolkata-700013. Ph no. (033)- 22377569, 65481114
12. M/s. Rana Udyog (P) Ltd.
NH-6, Vill.: Sulati, Dhulgarh,
Howrah -711303. Ph.no. (033)- 26617891

NAMES & ADDRESSES OF RAW MATERIAL SUPPLIERS :

SAIL, TISCO or Local Metal Traders or Dealers.

*

(7)