PHOSPHOR BRONZE BEARING SLEEVES

Product Code (ASICC)	**:**	**72107**
Quality & Standards	**:**	**IS: 7811-1991**
Production Capacity	**:**	**48 MT per year**
Month & Year of Preparation	**:**	**March, 2011**
PREPARED BY Institute,	**:**	**MSME-Development** **(*METALLURGY DIVISION)*** **C.G.O. Complex, Block "C",** **Seminary Hills, Nagpur – 6.**

1. INTRODUCTION OF PRODUCT:

An alloy of Copper with other elements like Tin & Phosphorus are called Phosphor Bronzes. Phosphor Bronzes have high antifriction properties. Addition of phosphorus improves foundry properties, raises hardness, strength elastic properties & specially corrosion resistance & antifriction properties which makes it suitable & ideal for making bearing sleeves where antifriction properties alongwith strength are required.

Generally, Phosphor Bronze contains Tin(Sn) upto 10-12% & Phosphorus upto 0.3 % apart from Copper & other elements.

2. MARKET POTENTIAL:

Phosphor Bronze bearing sleeves have wide applications in engineering, & automobile industry.

3. BASIS AND PRESUMPTIONS:

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

i) Target has been fixed at 48 MT/Annum on the basis of single shift working and on average of 25 working days/month, which comes to 4.0 MT/month.

ii) The production is based on single shift of 6 hours and 300 working days at 61% capacity of melting furnace Further to the above, runners, risers and rejections has been accounted upto 10% of the melt.

iii) The rate of interest on the borrowed capital has been taken as 12.5%/ annum.

iv) Margin money will be the 15% of the total cost of project.

v) Pay back period being 10 years with a moratorium period of 1 ½ years.

vi) 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:

Project implementation will take a period of 8 months from the date of approval of the project. Break-up of activities with time-period for each activity is shown below.

Sl.No.	Nature of activities	Time period in months (Estimated)
1.	Scheme preparation and approval	0-1
2.	SSI provisional registration	1 day
3.	Sanction of loan	2-5
4.	Clearance from Pollution control Board	3-4
5.	Placement of order for delivery of machinery	4-5
6.	Installation of machines	6-7
7.	Power connection	6-7
8.	Trial run	7-8
9.	Commencement of production	9 months

4. TECHNICAL ASPECTS:

a. PRODUCTION DETAILS AND PROCESS OF MANUFACTURING:

The process of casting involves preparation of moulds cavities (cylindrical type) of sand, melting of metal of desired composition, pouring the molten metal into the mould cavity, knocking the mould after solidification & cooling of the castings, fettling and cleaning.

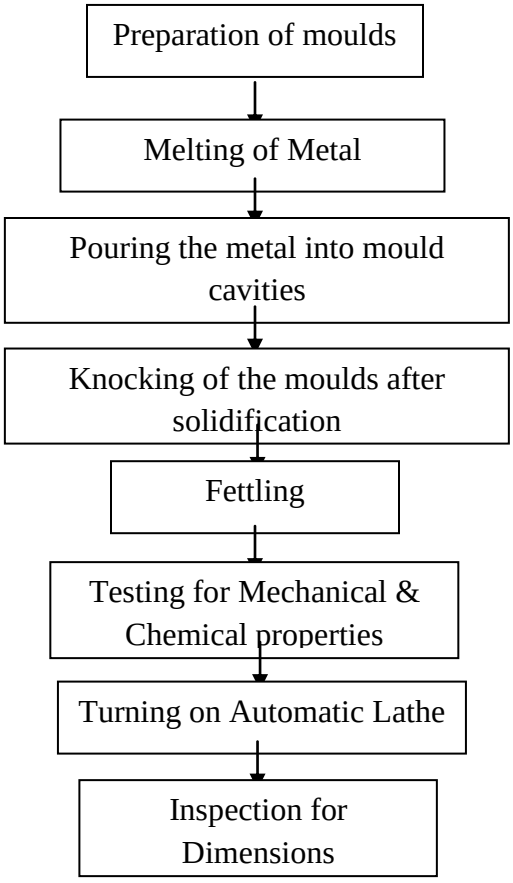
The cast bars are then taken to machine shop for machining of bearing sleeves as per requirement. The size of bearing sleeves may vary from 25mm to 100mm in diameter & 3mm to 12mm in thickness

b. QUALITY CONTROL AND STANDARDS:

In general, quality of the castings is required to meet the customer's specifications or requirements. However, for specific mechanical & chemical properties IS: 7811- 1991 or other standard should be followed.

Tests for mechanical and chemical properties may be carried out at any nearest commercial lab. For producing sound and defect free castings proper melting, molding and pouring system should be followed.

6. PROCESS FLOW CHART:



7. PRODUCTION CAPACITY:

Quantity : 48 M.T. PER ANNUM

Value : Rs. 1,87,20,000/-

8. MOTIVE POWER REQUIREMENTS: 5 HP

9. POLLUTION CONTROL MEASURES:

While heating provision for smoke emitting equipment be made with chimney to pass through flue gases.

10. ENERGY CONSERVATION:

Energy audit is an essential part for energy conservation. The following factors should be taken care of with regard to fuel economy in industrial furnace.

a. Proper heat distribution, complete combustion with minimum excess air.
b. Operating at the desired temperature.
c. Reducing heat losses from openings, Waste heat recovery from fuel gases.
d. Control of chimney draught.

11. FINANCIAL ASPECTS:

(a) Land & Building (3000 Sq.ft.)on Rental basis: Rs.8,000/- PM.

(b) Machinery & Equipment:

Sr.No.	Description	Quantity	Value (Rs.)
	Melting Shop		
i)	Oil fired tilting furnace with graphite crucible, 100 kg capacity with 2 HP motor blower & burner.	1	2,60,000/-
ii)	F/c oil tank with pipe line connection and immersion heater.	1	75,000/-
iii)	Laddles & tongues	L.S.	10,000/-

Moulding Shop

iv) Hand Moulding equipment such as Rammer, Ventor, Trowels etc. L.S. 10,000/-

v) Moulding Boxes L.S. 10,000/-

Machine Shop

vi) Automatic Lathe Machine, 4 ft. 1 1,35,000/-

Fettling Section

vii) Fettling equipment, wire brush etc. L.S. 4,000/-

viii) Bench Grinder 1HP 1 8,000/-

General Equipment

ix) Weighing Machine, 100 Kg. capacity 1 10,000/-

Office Equipment

x) Almirahs, Chairs, File racks etc. L.S.. 70,000/-

TOTAL: **5,92,000/-**

Installation & Electrification Charges @ 10% of above 59,200/-

Pre-operative expenes 25,000/-

TOTAL:

6,76,200/-

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12. WORKING CAPITAL (Per month):

a. STAFF & LABOUR (P.M.):

i)	Melter	1
	8,000/-	
ii)	Moulder	1
	5,000/-	
iii)	Turner	1
	5,000/-	
iv)	Semiskilled Worker	3
	9,000/-	
v)	Unskilled Worker	3
	6,000/-	
vi)	Watchman/Peon	2
	3,000/-	

TOTAL:

36,000/-

Perquisite @ 15%

5,400/-

TOTAL:

41,400/-

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b. RAW MATERIAL (P.M.):

i) Bronze Scrap, @Rs. 300/- per kg 4.25 MT
12,75000/-

ii) Furnace Oil, @Rs.35/- per ltr. 750 ltrs.
26,250/-
iii) Additives & alloying elements L.S.
8,000/-

TOTAL:

13,09,250/-

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c. <u>UTILITIES (P.M.)</u>:

i) Electricity
8,000/-
ii) Water – 15 KL @ Rs. 100/KL
1,500/-

TOTAL:

9,500/-

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d. <u>OTHER CONTINGENT EXPENSES (P.M.)</u>:

i) Rent
8,000/-
ii) Repair & Maintenance
4,000/-
iii) Consumables pertaining to moulding work
3,000/-
iv) Office expenses
2,000/-
v) Insurance
3,000/-
vi) Travelling & conveyance
2,000/-

vii) Miscellaneous
5,000/-

TOTAL:

27,000/-

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13. <u>TOTAL WORKING CAPITAL (P.M.):</u>

i) Staff & Labour
41,400/-
ii) Raw material
13,09,250/-
iii) Utilities per month
9,500/-
iv) Other expenses per month
27,000/-

TOTAL:

13,87,150/-

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14. <u>TOTAL CAPITAL INVESTMENT:</u>

i) Fixed Capital
6,76,200/-
ii) Working capital for 3 months
41,61,450/-

TOTAL:

48,37,650/-

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15. <u>FINANCIAL ANALYSIS</u>:

(a) <u>COST OF PRODUCTION (P.A.):</u>

i)	Total recurring cost	1,66,45,800/-
ii)	Interest on total investment @12.5%	6,04,706/-
iii)	Depreciation on M/cry & equip. @10%	26,200/-
iv)	Depreciation on furnace @20%	52,000/-
v)	Depreciation on office equipment@20%	14,000/-

TOTAL:1,73,42,706/-

(b) TURNOVER PER ANNUM

@ Rs. 390/- per Kg. on good castings x 48,000 Kgs. = **1,87,20,000/-**

(c) <u>NET PROFIT PER YEAR:</u>

Turnover per year – Cost of production per year.

1,87,20,000– 1,73,42,706 = **13,77,294/-**

(D) <u>NET PROFIT RATIO</u>:

$$= \frac{\text{Net Profit per year}}{\text{Turnover per year}} \times 100$$

$$= \frac{13,77,294/-}{1,87,20,000/-} \times 100$$

= 7.36%

(E) <u>RATE OF RETURN</u> :

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

Total investment

13,77,294/-

= ---------- x 100

48,37,650/-

= **28.47%**

(F) <u>Break-even Point</u> :

<u>Fixed cost (FC)</u>

i)	Rent	96,000/-
ii)	Depreciation on machine and equipment@ 10%	34,620/-
iii)	Dep. On furnace @20%	52,000/-
iv)	Dep. On office equipments @20% 14,000/-	
v)	Interest on total investment@12.50%	6,04,706/-
vi)	Insurance	10,000/-
vii)	40% of salary and wages 16,560/-	
viii)	40% of other contingent expenses 10,800/- excluding rent and insurance.	

TOTAL:

8,38,686/-

<u>BREAK-EVEN POINT (BEP)</u>:

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

$$= \frac{8,38,686/-}{8,38,686/- + 13,77,294/-} \times 100 = \mathbf{37.84\ \%}$$

NAMES AND ADDRESSES OF MACHINERY SUPPLIERS

1. M/s. Electroil Super Thermal Engineers,
   151, Small Factory Area, Lakadganj,
   Nagpur – 440008.

2. M/s. Mechachem Industries,
   D-55, M.I.D.C., Nagpur.

3. M/s. ESSKAY Industrial Corporation,
   D/8 A, Ghatkopar Indl. Estate,
   L.B.S.Marg, Ghatkopar,
   Mumbai – 86.

4. M/s. Nagpur Ceramics Pvt. Ltd.,

A-4, M.I.D.C., Nagpur.

5. M/s. Krystal Elmec,
   Ichalkaranji Indl. Co-op. estate Ltd.,
   Common Hall No.5, Block No. 8/9,
   Ichalkaranji – 416115.

6. M/s. Vasant Tara Trading Company,
   899 E, Shahupuri, 5th Lane,
   Kolhapur – 416001.

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