

G.M. BUSHES



1. INTRODUCTION:

Bush is a plain bearing surface made of a comparatively softer metal that is inserted into a housing to provide a bearing surface for rotary part in variety of applications. Since most rotating parts like shafts are made of steel, bushes or plain bearing is made of alloys viz brass and bronze which have excellent wear properties. Gunmetal is an alloy that is known for its robustness, heat resistance and anti-corrosive property.

2. PRODUCT & ITS APPLICATION:

Gunmetal is an alloy of copper, tin and zinc also known as bronze, which casts and machines well and is resistant to corrosion from steam and salt water and therefore it, is used to make steam and hydraulic castings, valves, gears, statues, and various small objects.

There are several types of bush bearings viz brass, bronze, self-lubricated oil, graphite etc. lubricant impregnated bearings and bi-metal and Babbitt bearings.

Bronze, Gun metal bushing, Phosphor Bronze, Aluminum Bronze, etc. are widely used in Submersible Thrust Bush and Earth Moving Bushing are manufactured using quality metal and alloys such as brass, bronze and gunmetal. To ensure quality, special compositions are chosen for bush bearings that can be either procured from local foundries or the unit can have its own foundry.

3. DESIRED QUALIFICATIONS FOR PROMOTER:

The promoter with mechanical engineering with copper alloy casting and machining experience shall have better knowledge to manage the project well.

4. INDUSTRY OUTLOOK/TREND

Bushes for bearings in machinery of wide range are essential and supply chain has been essentially domain of small medium sector units. At present, there are more than 100 manufacturers specializing in gun metal, brass, bronze etc. metal bushes. The brass bronze and other metal product clusters are mainly located in UP, Punjab, Haryana, Pune, Bombay, Coimbatore, Hyderabad, Rajkot, Rajkot and Surendranagar.

The gunmetal, brass and bronze bushes and other component castings market of world is valued at Rs 630 Billion in 2016 and is projected to reach Rs 700 Billion by 2022, at a CAGR of 2.8% between 2017 and 2022. Gun metal is a special compositions of Bronze Market, used by Industrial machinery and equipments, Marine engines and equipments, Infrastructure & Construction machinery, Automotive and stationary engines, Electrical & Electronics equipments, Aerospace & Defense, etc.

Trend of new technology products to replace the brass and bronze has emerged viz graphite and PTFE lined bearings but the ease of production and compatibility of brass and bronze is not replaceable except in special applications.

5. MARKET POTENTIAL AND MARKETING ISSUES. IF ANY:

Bushes are extensively used for all types of machines and appliances that have rotating shafts. Starting from automobiles, tractors, earth-movers, trailers, compressors and submersible pumps to even the home appliances and industrial machines of all types need bushes. Various designs are popular viz grooved, flanged bush housing etc. sizes and shapes.

Bronze bearings & bushings, bronze casting & bushing, industrial bushing, brass bush, aluminum bronze bush, bearing bushing, submersible bronze bushes, submersible thrust bushes, earth moving bushings, etc. are wearable parts requiring frequent replacement requirements; therefore there is huge demand potential for these products. The entrepreneur can start with trade channels and tap OEM consumers for supply of select the product range.

The entrepreneur can specialize and focus on specific product range / end user segment that have good market demand in the region in which it is located.

6. RAW MATERIAL REQUIREMENTS:

Main raw materials are scrap or ingots of copper, brass, tin, zinc, etc. The unit is recommended with a pit furnace to cast its own castings. Other materials are in rods and bars of the readily available brass and bronze of desired compositions. The machine shop scrap will be used in furnace to produce own castings.

7. MANUFACTURING PROCESS:

Bushes are produced by machining from the rods and castings. The process involves cutting from rods to desired size and then machining on lathe. Grooves and other machining can also be done on lathe and milling machine.

For self-lubricating bush production bushes may be coated with FEP, PFA, PTFE (Teflon) and other metals like tin that provide better wear properties. The coating process can be done by simple ingenious spray attachments and torch processes on lathe. These coatings are sintered in small oven to get desired uniformity.

8. MANPOWER REQUIREMENT:

The unit shall require highly skilled service persons. The unit can start from 4 employees initially and increase to 10 or more depending on business volume.

Sr. No.	Type of Employees	Monthly Salary	No of Employees				
			Year 1	Year 2	Year 3	Year 4	Year 5
1	Skilled Operators	18000	2	2	3	4	5
2	Semi-Skilled/ Helpers	7000	2	2	3	3	3
3	Supervisor/ Manager	20000	0	0	0	0	0
4	Accounts/ Marketing	15000	0	0	1	1	1
5	Other Staff	6000	0	0	1	1	1
	TOTAL		4	4	8	9	10

9. IMPLEMENTATION SCHEDULE:

The unit can be implemented within 4 months from the serious initiation of project work.

Sr. No.	Activities	Time Required in Months
1	Acquisition of Premises	1
2	Construction (if Applicable)	-
3	Procurement and Installation of Plant and Machinery	1
4	Arrangement of Finance	1
5	Manpower Recruitment and start up	1
	Total Time Required (Some Activities run concurrently)	2

10. COST OF PROJECT:

The unit will require total project cost of Rs 14.38 lakhs as shown below:

Sr. No.	Particulars	In Lakhs
1	Land	0.00
2	Building	0.00
3	Plant and Machinery	5.19
4	Fixtures and Electrical Installation	0.70
5	Other Assets/ Preliminary and Preoperative Expenses	0.30
6	Margin for working Capital	8.19
	TOTAL PROJECT COST	14.38

11. MEANS OF FINANCE:

The project will require promoter to invest about Rs 9.74 lakhs and seek bank loans of Rs 4.64 lakhs based on 70% loan on fixed assets.

Sr. No.	Particulars	In Lakhs
1	Promoters Contribution	9.74
2	Loan Finance	4.64
	TOTAL :	14.38

12. WORKING CAPITAL REQUIREMENTS:

Working capital requirements are calculated as below:

Sr. No.	Particulars	Gross Amount	Margin %	Margin Amount	Bank Finance
1	Inventories	5.13	40	2.05	3.08
2	receivables	6.38	50	3.19	3.19
3	Overheads	0.90	100	0.90	0.00
4	Creditors	5.13	40	2.05	3.08
	TOTAL	17.53		8.19	9.34

13. LIST OF MACHINERY REQUIRED:

All the machines and equipment are available from local manufacturers. The entrepreneur needs to ensure proper selection of product mix and proper type of machines and tooling to have modern and flexible designs. It may be worthwhile to look at reconditioned imported machines, dies and tooling. Some of the machinery suppliers are listed here below:

Sr. No.	Particulars	UOM	Quantity	Rate	Total Value
	Main Machines/ Equipment				
1	Pit Furnace complete with burners, blowers	Nos.	1	250000	250000
2	Band saw machine	Nos.	1	60000	60000
3	Lathes	Nos.	2	60000	120000
4	Torches, coating etc. attachments	Nos.	2	12000	24000
5	Curing oven	Nos.	1	25000	25000
	subtotal :				479000
	Tools and Ancillaries				
1	Bench and Belt Grinders	LS	1	25000	25000
2	Gauges and Tools		1	15000	15000
	subtotal :				40000
	Fixtures and Elect Installation				
	Storage racks	LS	1	5000	5000
	Other Furniture	LS	1	10000	10000
	Telephones/ Computer	LS	1	25000	25000
	Electrical Installation	LS	1	30000	30000
	subtotal :				70000
	Other Assets/ Preliminary and Preoperative Expenses	LS	1	30000	30000
	TOTAL PLANT MACHINERY COST				619000

1. Balaji Engineers
No. 122, Vishala Industrial Estate, Near Odhav Ring Road Chokdi Near Kathwada G. I. D. C., Odhav, Odhav Industrial Estate, Ahmedabad -382415, Gujarat, India
2. Eddy Melt
C 70, M. I. D. C., Hingna Industrial Estate, Nagpur - 440025
Maharashtra, India
3. Electrotherm India Ltd.,
Survey No. 72, Village Palodia, Taluka Kalol Via Thaltej
Ahmedabad- 382115, Gujarat, India
4. Micro Engineering Works;
No. 6/140, Gandhi Nagar, Nallampalayam Road Nanjai Gounden, Pudur, G. N. Mills
Post, Coimbatore - 641029, Tamil Nadu, India
5. Gautam Industries
Plot No. 267, Near Upvan Lake, Upvan
Thane - 400606
Maharashtra, India

14. PROFITABILITY CALCULATIONS:

Sr. No.	Particulars	UOM	Year Wise estimates				
			Year 1	Year 2	Year 3	Year 4	Year 5
	Sales	Rs Lakhs	76.50	102.00	127.50	153.00	178.50
	Raw Materials & Other Direct Inputs	Rs Lakhs	61.53	82.04	102.54	123.05	143.56
	Gross Margin	Rs Lakhs	14.97	19.96	24.96	29.95	34.94
	Overheads Except Interest	Rs Lakhs	10.15	10.15	10.15	10.15	10.15
	Interest	Rs Lakhs	0.65	0.65	0.65	0.65	0.65
	Depreciation	Rs Lakhs	0.74	0.74	0.74	0.74	0.74
	Net Profit Before Tax	Rs Lakhs	3.43	8.42	13.41	18.40	23.39

The basis of profitability calculation:

The Unit will have capacity of 60 MT of Gun metal bushes and other casting/ machined products per year of assorted types/ designs. The sales prices Gun metal bushes and other products of various types range from Rs 250 to 500 per Kg or more depending on type, shape complexity, metal composition, and volumes. The raw material cost brass bronze scrap is ranges from 250 to 350 per Kg depending on grades. The material requirements are considered with wastage/ scrap/burnouts etc. of 4 % of finished products as most of generated scrap is reused. The unusable scrap is sold at @ Rs 80 to 150 per Kg. and the income of same is added. Energy Costs are considered at Rs 7 per Kwh and fuel cost is considered at Rs. 65 per liter. The depreciation of plant is taken at 10 % and Interest costs are taken at 14 -15 % depending on type of industry.

15. BREAK EVEN ANALYSIS

The project is can reach breakeven capacity at 23.13 % of the installed capacity as depicted here below:

Sr. No.	Particulars	UOM	Value
1	Sales at Full Capacity	Rs Lakhs	255.00
2	Variable Costs	Rs Lakhs	205.09
3	Fixed Cost incl. Interest	Rs Lakhs	11.54
4	Break Even Capacity	% of Inst Capacity	23.13

16. STATUTORY/ GOVERNMENT APPROVALS

The unit will require state industry unit registration with District Industry center. No other procedures are involved. For export, IEC Code and local authority clearances. The industry registration and approval for factory plan, safeties etc. are required as per factory inspectorate and labor laws. Other registration are as per Labor laws are ESI, PF etc. Before starting the unit will also need GST registration for procurement of materials as also for sale of goods. As

such there is no pollution control registration requirement, however the unit will have to ensure safe environment through installation of chimney etc. as per rules. Solid waste disposal shall have to meet the required norms. Entrepreneur may contact State Pollution Control Board where ever it is applicable.

17. BACKWARD AND FORWARD INTEGRATION

The machines and equipment offer scope for diversification in to producing other consumer and industrial parts/ components and parts for heavy machinery of construction, earth moving, mining marine applications etc. The units can the spare capacities of furnace and machining capabilities. As such there is not much scope for organic backward or forward integration.

18. TRAINING CENTERS/COURSES

There are no specific training centers for production technology. However foundry technology can be obtained by joining as apprentice in foundry units. The Prototype Development Centers can provide some assistance and for foundry technology, casting, machining, dies and Tools development, courses run by centers of excellence viz Indo German Tool Room at Ahmedabad, Rajkot, Chennai, etc. shall be helpful.

The most important scope of learning is in new product design and development by study of the new product designs, product range, features and specifications of leading Brands / competitors across the world by scanning the Internet and downloading data from websites of Viz. North American, Europe, China etc. markets.

Udyamimitra portal (link: www.udyamimitra.in) can also be accessed for hand-holding services viz. application filling / project report preparation, EDP, financial Training, mentoring etc.

Entrepreneurship program helps to run business successfully is also available from Institutes like Entrepreneurship Development Institute of India (EDII) and its affiliates all over India.

Disclaimer:

Only few machine manufacturers are mentioned in the profile, although many machine manufacturers are available in the market. The addresses given for machinery manufacturers have been taken from reliable sources, to the best of knowledge and contacts. However, no responsibility is admitted, in case any inadvertent error or incorrectness is noticed therein. Further the same have been given by way of information only and do not carry any recommendation.