BRAKE DRUMS

1. INTRODUCTION:

Most rotating machines including automobiles require control of motion with the help of brakes. Drum brake is a brake that uses friction caused by a set of shoes or pads that press and grip the rotating cylinder-shaped part called a brake drum. Lifting machines and other heavy earth moving machines also use drum brakes as they are very safe and secure in operation.

It is recommended to take up manufacture of brake drums and other components by entrepreneurs.

2. PRODUCT & ITS APPLICATION:

The term drum brake usually means a brake in which shoes press on the inner surface of the drum. When shoes press on the outside of the drum, it is usually called a clasp brake. Drum brakes are mostly used to achieve compact and light weight construction in automobiles for speed control.

Advantages of drum brakes:

- less expensive to produce
- Lower frequency of maintenance due to better corrosion resistance compared to disks.
- Built-in self-energizing effect requires less input force (such as hydraulic pressure).
- Wheel cylinders are somewhat simpler to recondition compared to calipers.
- Minor weight savings, primarily from much smaller and lighter hydraulic cylinders vs. calipers.

Brake drums are mostly made of cast iron to fit in to wheel rim housing. Drum brake components include the backing plate, brake drum, shoe, wheel cylinder, and various springs and pins.

3. DESIRED QUALIFICATIONS FOR PROMOTER:

The promoter with experience of foundry metal casting and auto component trading with mechanical / metallurgical engineering background will be suitable for the project.

4. INDUSTRY OUTLOOK/TREND

Brake Drum are essential component for automobiles and other large capacity mobile engines viz earth moving machine, material handling machines as well as marine engines. Being part of the auto component industry, the outlook for this product relates with the Indian auto-components industry that has experienced healthy growth over the last two decades.

There are more than 230 manufacturers of brake drums for auto as well as industrial and material handling equipment spread all around India. Most of the manufacturers are clustered around the major auto Hubs like Delhi to Punjab, Chennai – Coimbatore - Bangaluru, Bombay – Pune - Ahmednagar, Ahmedabad - Rajkot regions. Some of these are OEM suppliers and most of them are present in replacement markets. Most of the units are specializing in specific auto model ranges of Motorcycles, scooters, Cars, LCV, HCV, Tractors, earth movers, Forklifts, Traveling cranes, Hoists, etc.

There are no major technology changes except material compositions of metals viz Cast Iron/ Bronze, etc.

5. MARKET POTENTIAL AND MARKETING ISSUES. IF ANY:

All auto vehicles use brake drums fitted with their wheel rims/ axles. The automotive industry in India is one of the largest in the world with an annual production of 23.96 million vehicles in

2015–16. The Indian automotive aftermarket is expected to grow at a CAGR of 10.5 per cent and reach Rs 75,705 crore (US$ 13 billion) by the year 2019-20, according to the Automotive Component Manufacturers Association of India (ACMA).

The auto-component industry of India has expanded by 14.3 per cent because of strong growth in the spares or after-market sales to reach at a level of Rs 2.92 lakh crore (US$ 44.90 billion) in the year 2017. The sales of passenger vehicles, commercial vehicles and two wheeler grew by 9.23 per cent, 4.16 per cent and 6.89 per cent respectively, during the period April-March 2017. This indicates the scope for brake drum demand for new vehicles as also for the aftermarket demand though is reflect small volume.

In view of the strong growth of domestic spares market as well as export market of the components, there is scope for Indian units to grow in coming decades. The Two Wheeler segment, with 81 per cent market share, is the leader of the Indian Automobile market; and it is growing steadily due to a growing middle class and a young population. Moreover, the Indian two wheeler companies are exporting to African and Latin American markets and also emerging as a leading exporter.

In view of this, though there are many competitors, there is very good scope for Brake drums and related auto components for domestic and export potential.

6. RAW MATERIAL REQUIREMENTS:

Brake drums are most made from cast iron. The main raw material is cast iron scrap and pig iron.

7. MANUFACTURING PROCESS:

The brake drum is generally made of a special type of cast iron that is heat-conductive and wear-resistant. It rotates with the wheel and axle. This braking friction generates substantial heat. The main activity involved is to cast the metal of suitable grade and machining to specifications.

8. MANPOWER REQUIREMENT:

The unit shall require highly skilled service persons. The unit can start from 6 employees initially and increase to 18 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
	Variable Labour / Workers :						
1	Skilled Operators	15000	2	2	3	3	3
2	Semi-Skilled/ Helpers	8000	4	6	6	9	12
	Subtotal :		6	8	9	12	15
	Fixed Staff						
1	Supervisor/ Manager	25000	0	0	1	1	1
2	Accounts/ Marketing	15000	0	0	1	1	1
3	Other Staff	7000	0	0	1	1	1
	Subtotal :		0	0	3	3	3
	TOTAL		**6**	**8**	**12**	**15**	**18**

9. IMPLEMENTATION SCHEDULE:

The unit can be implemented within 3 months from the serious initiation of project work.

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

10. COST OF PROJECT:

The unit will require total project cost of Rs 24.26 lakhs as shown below:

Sr. No	Particulars	In Lakhs
1	Land	0.00
2	Building	0.00
3	Plant and Machinery	13.75
4	Fixtures and Electrical Installation	2.10
5	Other Assets/ Preliminary and Preoperative Expenses	1.50
6	Margin for working Capital	6.91
	TOTAL PROJECT COST	**24.26**

11. MEANS OF FINANCE:

The project will require promoter to invest about Rs 11.25 lakhs and seek bank loans of Rs 13.01 lakhs based on 70% loan on fixed assets.

Sr. No	Particulars	In Lakhs
1	Promoters Contribution	11.25
2	Loan Finance	13.01
	TOTAL :	**24.26**

12. WORKING CAPITAL REQUIREMENTS:

Working capital requirements are calculated as below:

Sr No	Particulars	Gross Amount	Margin %	Margin Amount	Bank Finance
1	Inventories	3.87	40	1.55	2.32
2	Receivables	5.06	50	2.53	2.53
3	Overheads	1.28	100	1.28	0.00
4	Creditors	3.87	40	1.55	2.32
	TOTAL	14.08		6.91	7.17

13. LIST OF MACHINERY REQUIRED:

Sr. No	Particulars	UOM	Quantity	Rate	Total Value
	Main Machines/ Equipment				
1	Induction Melting Furnace for cast iron alloys	Nos	1	400000	400000
2	Centrifugal Casting machines	Nos	2	60000	120000
3	Pin Lift Molding Machine		2	60000	120000
4	Sand Mixer, sieves etc.	Nos	1	80000	80000
5	Shot blasting machine		1	80000	80000
6	Lathe Machine		3	100000	300000
7	Drilling Machine		1	65000	65000
8	Bench/ Flexible shaft grinders		2	30000	60000
	subtotal :				1225000
	Tools and Ancillaries				
1	Patterns tools and gauges	LS	1	50000	50000
2	Mold boxes , Misc. tools etc.	LS	1	100000	100000
	subtotal :				150000
	Fixtures and Elect Installation				
	Storage racks and trolleys	LS	1	15000	15000
	Other Furniture	LS	1	20000	20000

	Telephones/ Computer	LS	1	25000	25000
	Electrical Installation	LS	1	150000	150000
	subtotal :				210000
	Other Assets/ Preliminary and Preoperative Expenses	LS	1	150000	150000
	TOTAL PLANT MACHINERY COST				1735000

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 and dies and tooling suppliers are listed here below:

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 NanjaiGounden, Pudur, G. N. Mills Post, Coimbatore - 641029, Tamil Nadu, India

5. Gautam Industries
   Plot No. 267, Near Upvan Lake, Upvan
   Thane - 400606
   Maharashtra, India

Other well known machine manufacturers can be searched from directories/ internet. Some are listed here below:

ACME TOOLINGS, D-67, Phase 1, IDA Jeedimetla, Hyderabad – 500055,
Ace Manufacturing Systems Ltd., Batliboi Ltd. Mumbai, Bharat Fritz Werner Ltd., HMT Machine Tools Ltd., Advani Oerlikon Ltd, Bombay, Lakshmi Machine Works Ltd., Lokesh Machines Ltd., Praga Tools Ltd., Toolcraft Systems Pvt. Ltd.

The above list of machine supplier is illustrative. There are many machinery, dies and tools suppliers and consultants at several industrial clusters all over India where you may find suppliers of services and machinery for a chosen product mix. Other well known machine manufacturers can be searched from directories/ internet.

14. PROFITABILITY CALCULATIONS:

Sr. No	Particulars	UOM	Year Wise estimates				
			Year 1	Year 2	Year 3	Year 4	Year 5
1	Capacity Utilization	%	35	45	60	70	80
2	Sales	Rs Lakhs	60.74	78.09	104.12	121.48	138.83
3	Raw Materials & Other Direct Inputs	Rs Lakhs	46.40	59.66	79.55	92.80	106.06
4	Gross Margin	Rs Lakhs	14.34	18.43	24.58	28.67	32.77
5	Overheads Except Interest	Rs Lakhs	13.59	13.59	13.59	13.59	13.59
6	Interest	Rs Lakhs	1.82	1.82	1.82	1.82	1.82
7	Depreciation	Rs Lakhs	1.74	1.74	1.74	1.74	1.74
8	Net Profit Before Tax	Rs Lakhs	-2.81	1.29	7.43	11.53	15.62

The basis of profitability calculation:

The Unit will have capacity of 300 MT of Brake Drums and allied products per year of assorted types/ designs. The sales prices of Brake of various types range from Rs 35 to Rs 150 per Kg or more depending on type, metal composition, and volumes. The raw material cost of CI

scrap is ranges from 25 to 35 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 15 ~ 18 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 break-even capacity at 41.86 % of the installed capacity as depicted here below:

Sr. No	Particulars	UOM	Value
1	Sales at Full Capacity	Rs Lakhs	173.54
2	Variable Costs	Rs Lakhs	132.58
3	Fixed Cost incl. Interest	Rs Lakhs	17.15
4	Break Even Capacity	% of Inst Capacity	41.86

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, safety 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 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.

17. BACKWARD AND FORWARD INTEGRATION

The machines and equipment offer scope for diversification in to producing other consumer and industrial parts/ components viz cast iron hydraulic / pneumatic cylinders for brakes and

other components, parts for heavy machinery of construction, earth moving, mining structural tubes etc. The unit can add few machines to produce normal sand castings, etc by using 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 training can be obtained by joining as apprentice in foundry units. The Prototype Development Centers can provide some assistance for casting/metallurgy for 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, Skill Development, 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.