



*A PROJECT PROFILE
ON*

DIESEL ENGINE CYLINDER BLOCK

2010 - 2011

Prepared by : Mechanical Division

MSME-DEVELOPMENT INSTITUTE

(GOVT. OF INDIA, MINISTRY OF MICRO, SMALL & MEDIUM ENTERPRISES)

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AGRA – 282002 (UP)

**A PROJECT PROFILE
ON**

DIESEL ENGINE CYLINDER BLOCK

QUALITY STANDARD : As per buyer's requirement

PRODUCTION CAPACITY : QUANTITY : 15,000
VALUE : Rs. 1,10,25,000/-

MONTH & YEAR OF PREPARATION : March, 2011

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INTRODUCTION

Diesel Engine Cylinder Block accommodates the cylinder liner, where the combustion takes place and which also serves as a bearing and guide for the piston reciprocating in it. Around the cylinders liner, there are passages for the circulation of cooling water. Diesel Engine Cylinder Block also carries lubricating oil to various components through drilled passages. The material used for Diesel Engine Cylinder Block is grey cast iron containing carbon as flakes of graphite which makes it more wear and corrosion resistant apart from its better machine ability.

MARKET POTENTIAL

Demand of Diesel Engine Cylinder Block is closely linked with the production of diesel engines and population of diesel engines. Diesel Engine Cylinder Block are required either as original equipment or as replacement parts. The rate of replacement demand mainly depends upon the operational conditions and load pressures on various diesels engines. The scope of this unit as ancillary unit to diesel engines manufacturing unit is very good.

BASIS AND PRESUMPTION

The basis and presumptions for the project will be as under:

1. The production of the unit has been worked out on the basis of single shift of 08 hours a day and 300 working days in a year.
2. It has been presumed that the capacity utilization of the unit will be 70% in the first year followed by 75% in the next year and 80% in the subsequent years.
3. The quoted salaries and wages have been taken as per the prevailing rate in state at the time of preparation of the project profile
4. The interest rate has been considered as 14% on capital investment on an average weather financed by any bank or financial institutions.
5. The margin money has been raised 25% of the capital investment.
6. The unit has been proposed to function in rented building. The rental value for accommodation of workshop, office and other covered / uncovered area is taken @ Rs. 40/- per sq. mtr.
7. The payback period has been taken as 5 years after loan disbursement.
8. The quoted cost of machinery, equipments and raw materials has been taken as per the rates prevailing in the market at the time of preparation of the project profile and likely to vary from place to place and supplier to supplier. When a tailor made project profile is prepared, necessary changes are to be made.

IMPLEMENTATION SCHEDULE

The detail of activities with duration for implementation schedule of project will be as under:

- | | |
|---|-----------|
| 1. Procurement of technical know how / transfer of technology | - 15 days |
| 2. Market survey, tie-ups and obtaining quotations | - 15 days |
| 3. Selection of site | - 07 days |
| 4. Preparation of project report | - 07 days |
| 5. Registration and financing | - 70 days |
| 6. Procurement of machines | - 45 days |
| 7. Recruitment of staff and training | - 30 days |
| 8. Addition / alteration in rental premises | - 30 days |
| 9. Procurement of raw material / bought out components | - 15 days |

- | | |
|---|-----------|
| 10. Erection, electrification and commissioning of machines | - 30 days |
| 11. Trail production | - 30 days |
| 12. Commercial Production | - 15 days |

In order to efficient and successful implementation of the project in the shortest period the slack period is curtailed to maximum possible extent and as far as possible simultaneous activities are carried out. According to critical path method, the approximate time required to commence production may be considered as about 08 to 09 months

TECHNICAL ASPECT

Manufacturing Process

The casting of Diesel Engine Cylinder Block purchased from market is cleaned first and then machining of top face, top bore & bottom bore is done to finalize the required sizes on one machine. Taking the top face as reference bottom face is machined, keeping in view the required height of Diesel Engine Cylinder Block. Other side faces like window face & flange face are machined one by one. Finally drilling & tapping operations are carried out.

Alternate Technology

No alternative technology is suggestive in small scale sector for this project. The use of proper tools and fixtures will not only increase rate of production but will also ensure quality of product.

Production Targets

The unit will have the capacity to produce 15,000 Diesel Engine Cylinder Block of various sizes/capacity per annum.

Quality Control and Standards

The Diesel Engine Cylinder Block purchased from market should be checked properly first, then it should be checked at every stage of operations to maintain the better quality. There are customer's specifications which may also be strictly followed.

Utilities

- | | |
|-------------------|----------------------|
| Power requirement | - 15HP |
| Water requirement | - 250 KLt. per month |

Energy Conservation

The revolving / reciprocating parts of plant and machinery should be properly lubricated every time to avoid extra energy consumption. Layout of the unit should be in such manner to avoid back tracking of material. All electric switches may be kept off, when not required. Fluorescent tube with electronic chokes / Compact Fluorescent Tube (CFT) for general lighting may be used for energy saving. As far as possible, motor of correct inductive load should be used with improved power factor. Power factor may be improved by using the capacitors of appropriate rating.

Pollution Control

The unit does not come under the category of polluting industries. Although, the minimum height of shed may be maintained with exhaust fans for removing decongestion, fumes, dust, etc. and to provide proper ventilation.

FINANCIAL ASPECTS

1. Land and Building

On rent 200 Sq. Mtr. Covered area
@ Rs. 50/- Sq. Mtr.

10,000.00

2. Machinery and Equipment

<u>S.No.</u>	<u>Description</u>	<u>HP/KW</u>	<u>Ind/Imp.</u>	<u>Qty.</u>	<u>Value (Rs)</u>
i.	Lathe Machine medium duty center to center 1000 mm center height 230 mm	02 HP	Ind.	03	1,80,000.00
ii.	Lathe Machine medium duty 6' bed complete	02 HP	Ind.	01	80,000.00
iii.	Drilling machine Cap.25 mm Dia., pillar type.	02 HP	Ind.	01	16,000.00
iv.	Automatic Tapping Machine complete	02 HP	Ind.	01	25,000.00
v.	Double ended grinder wheel 250 mm dia.	02 HP	Ind.	01	6,000.00
- Electrification and installation charges					20,000.00
- Testing and measuring equipments					15,000.00
					<u>3,42,000.00</u>
- Other tools and fixtures					20,000.00
- Office equipments					25,000.00

3,87,000.00

3. Pre-Operative Expenses

(Project cost, non-refundable deposits etc.)

20,000.00

4. Fixed Capital

- i. Land and Building
- ii. Machinery and Equipments
- iii. Pre-Operative Expenses

Rented
3,87,000.00
20,000.00
4,07,000.00

5. Staff and Labour (per month)

<u>S.No.</u>	<u>Description</u>	<u>No.</u>	<u>Salary@</u>	<u>Value (Rs)</u>
i.	Supervisor / Foreman	01	6,000/-	6,000.00
ii.	Clerk cum cashier	01	5,000/-	5,000.00
iii.	Skilled workers	03	4,500/-	13,500.00
iv.	Semi-skilled workers	02	3,500/-	7,000.00
v.	Helpers	02	3,000/-	6,000.00
vi.	Peon / Watchman	02	3,000/-	6,000.00
				43,500.00
- Perquisites @ 15% of salary				6,500.00
				<u>50,000.00</u>

6. Raw Material (per month)

Grey cast iron Grade 20
17 MT @ Rs. 42000/-

7,14,000.00

7. Utilities

- i. Electricity (L.S.)
- ii. Water (L.S.)

15,000.00
1,000.00
16,000.00

8. Other Contingent Expenses (per month)

- i. Rent

10,000.00

ii.	Postage and Stationary	500.00
iii.	Advertisement	1,000.00
iv.	Repair and Maintenance	2,000.00
v.	Telephone	1,500.00
vi.	Transportation	4,000.00
vii.	Consumables	2,000.00
viii.	Insurance	5,000.00
ix.	Misc. Expenses	1,000.00
		<u>27,000.00</u>

9. Working Capital (per month)

i.	Staff and Labour	50,000.00
ii.	Raw Material	7,14,000.00
iii.	Utilities	16,000.00
iv.	Other Contingent Expenses	27,000.00
		<u>8,07,000.00</u>

10. Total Capital Investment

i.	Fixed Capital	4,07,000.00
ii.	Working Capital for 3 months	24,21,000.00
		<u>28,28,000.00</u>

MACHINERY UTILIZATION

It is expected that during first year machine utilization will be 70% and during second year 75% and 80% in subsequent years. The suggested Plant & Machinery are sufficient to achieve the target, if utilized as per the assumptions made.

FINANCIAL ANALYSIS

1. Cost of Production (per annum)

i.	Total Recurring Cost per annum	96,84,000.00
ii.	Depreciation on Machinery & Equipments @ 10%	34,000.00
iii.	Depreciation on Tools, Fixtures etc. @ 25%	5,000.00

iv	Depreciation on Office Equipments @ 20%	5,000.00
iv.	Interest on Total Capital Investment @ 16%	4,52,500.00
		<u>1,01,80,500.00</u>
2.	Turn Over (per annum)	
-	By sales of 15,000 Diesel Engine Cylinder Block of various Sizes/capacity @ Rs. 725/- per unit	1,08,75,000.00
-	By sales of scrape (L.S.)	1,50,000.00
		<u>1,10,25,000.00</u>

3. Net Profit (per annum before Income Tax)

$$\begin{aligned}
 &= \text{Turn Over (per annum)} - \text{Cost Of Production (per annum)} \\
 &= 1,10,25,000 - 1,01,80,500 \\
 &= \underline{\underline{8,44,500}}
 \end{aligned}$$

4. Net Profit Ratio

$$\frac{\text{Net profit} \times 100}{\text{Turn over}}$$

$$\frac{8,44,500 \times 100}{1,10,25,000} = 7.65 \%$$

4. Rate of Return

$$\frac{\text{Net profit} \times 100}{\text{Total investment}}$$

$$\frac{8,44,500 \times 100}{28,28,000} = 29.86 \%$$

BREAK EVEN ANALYSIS

1. Fixed Cost (per annum)

i.	Total Depreciation	44,000.00
ii.	Rent	1,20,000.00
iii.	Interest on Total Capital Investment	4,52,500.00
iv.	Insurance	60,000.00
v.	40% of Staff and Labour	2,40,000.00
vi	40% of Other Contingent Expenses	58,000.00

(Excluding rent & insurance)

9,74,500.00

2. Break Even Point

$$\frac{\text{Fixed Cost} \times 100}{\text{Fixed cost} + \text{profit}}$$

$$\frac{9,74,500 \times 100}{9,74,500 + 8,44,500} = 53.57 \%$$

LIST OF MACHINERY AND RAW MATERIAL SUPPLIERS

1. M/s, Sant Machine Tools,
G.T. Road, Near Dholewal Chowk, Ludhiana..
2. M/s, Kalsi Machine Tools,
Gill Road, Ludhiana.
3. M/s, Leading Engineering Corpn.,
Anand Prabhat Industrial Estate, New Delhi.
4. M/s, Ess Kay Engineering Corpn. ,
21/6 A, Freeganj Chowk, Agra
5. M/s, Jeet Machine Tools Corpn. ,
G. B. Road, Delhi
6. M/s, Batliboi and Co.,
Parliament Street, New Delhi.
7. M/s, Associated Engg. Projects,
Opp. Modi Bagh, Delhi Road, Modinagar, Distt. Gaziabad.

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