

**PRODUCT** : **PRESSURE DIE CASTINGS**  
**(Al. Alloy upto 1 Kg.)**

**QUALITY STANDARD** : **IS 11804 :1986**

**PRODUCTION CAPACITY** : **Qty. - 77.29 M.T./annum**  
**Value – Rs. 185.49 Lakhs**

**MONTH & YEAR OF PREPARATION** : **JANUARY 2011**

**PREPARED BY** : **MSME-DI, AHMEDABAD**

## **INTRODUCTION:**

Due to several advantages like high productivity, better surface finish and appearance, to have very little machining, close dimensional tolerance, very thin section can be cast without any casting defects, sound castings & metal wastage is less etc., pressure die castings has gain popularity and application where appearance, soundness, thin section, close dimensional tolerance, high production etc. are associates. Out of variety of metal and alloys are pressure die cast, aluminum and its alloy has major share in production and application.

## **MARKET POTENTIALITY:**

Al. Alloy pressure die castings are finding applications in major three types of market viz. (1) Primary market (2) Replacement market and (3) Substitution market. The automobiles component and fittings, telephone industry, electrical appliances, electronic components and builder hardware & fittings etc. are the major market for Al. Pressure Die Castings.

The requirement of defense, aeronautic and space is also there, where mechanical properties and durability are of prime importance, therefore it is essential that the best features of design should be employed and optimum casting technique with minimum cost be adopted.

The primary market is expected to continue as the leading market, with demand growth in requirement as the field like, builder hardware, automobile components, electrical appliances, electronic components, telephone industry are growing to meet the demand of more and more urbanization and change of life style.

The technological developments are opening up the new field of application of the Pressure Die cast components.

**BASIS AND PRESUMPTION:**

- (1) The production target is well within the working of 8 hr/day and 300 days/annum.
- (2) For calculating production capacity, raw material and further calculation, the 6 hr. working of pressure die casting m/c. and 1.06 kg. shot wt. are considered, considering time required for the change of die, knockout of casting, coating of die, if any, maintenance etc.
- (3) 5% metal loss has been considered to workout raw material requirement, which may vary.
- (4) The wages/salary, rates, cost of m/c. /plant etc. considered for calculation purpose are based on the information available and are supplemented with estimation where such details were not available and it may vary with time, place, capacity, etc.
- (5) 15% interest rate has been considered on total capital investment and it may vary.
- (6) A lump sum cost of moulding die is considered in this profile for calculation purpose, but it will be in interest of the unit that it may ask for the die cost from the customer to minimize the investment, etc.
- (7) The cost of land & building are estimated one and it may vary with place, time and type of construction, etc.

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### **IMPLEMENTATION SCHEDULE:**

Approx. time required for diff. activities

- |   |            |
|---|------------|
| (1) Project Report preparation & approval             | - 2 months |
| (2) Selection of site                                 | - 1 month  |
| (3) Registration of unit                              | - 2 weeks  |
| (4) Financial assistance                              | - 3 months |
| (5) Machinery procurement, erection and commissioning | - 2 "      |
| (6) Staff/labour recruitment                          | - 1 month  |
| (7) Trial-run   | - 1 week   |

Number of activity can be initiated simultaneously; hence entire project can be implemented with the span of eight months.

### **TECHNICAL ASPECTS:**

#### Manufacturing process:

The aluminum alloys metal melted in furnace, followed by degassing and modification. The degassed and modified liquid metal for single shot is loaded into cylindrical chamber through a pouring apparatus; a piston then forced the metal into the die. The solidified casting is taken out and inspected.

### **QUALITY STANDARD:**

IS: 11804:1986 Code of practice for mfg. of Al. Alloy Pressure Die Castings.

### **PRODUCTION CAPACITY:**

Estimated production capacity is 77.29 M.T./annum on single shift basis.

### **MOTIVE POWER REQUIREMENTS:**

Electric connection of 40 H.P.

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**FINANCIAL ASPECTS:**1. Fixed CapitalLand & Building

(A) Land 100 Sq. meter @ Rs. 400/- per Sq. meter	Rs. 40,000/-
(B) Covered area 60 Sq. meter including work shed & office @ Rs. 2800/- Sq. meter	Rs. 1,68,000/-
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	Rs. 2,08,000/-

2. Machinery & Equipment:

<u>Sr. No.</u>	<u>Description</u>	<u>Qty.</u>	<u>Indigenous/ Imported</u>	<u>Price (Rs.)</u>
1.	Cold chamber, horizontal pressure die casting machine 80T. capacity 55 mm dia. plunger, complete with control panel & other accessories etc.	1	Ind.	22,88,000/-
2.	Electric resistance melting furnace, 150 Kg. capacity complete with panel & other accessories, etc.	1	-do-	2,60,000/-
3.	Mould die & fixtures etc.	L.S.	-do-	3,00,000/-
4.	Measuring tools, jigs, fixtures, gauges, etc.	L.S.	-do-	95,000/-
5.	Physical testing laboratory consist of universal testing machines, hardness tester etc. alongwith its accessories	1 set	-do-	4,75,000/-
6.	Chemical testing laboratory consist of hot plate, chamber, muffle furnace, glass wares etc.	1 set L.S.	-do-	1,70,000/-
7.	Metallographic lab. consist of metallurgical microscope x 1000, disc polishing m/c. specimen cutting hacksaw, specimen sand grinder m/c. etc.	1 set	-do-	1,10,000/-

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8. Center lathe 900mm heavy duty with 3 H.P. motor and accessories	1	-do-	65,000/-
9. Shaping m/c. 24" stroke with 3 H.P. motor & accessories	1	-do-	55,000/-
10. Pillar drilling m/c. 1" cap. complete with 1 H.P. motor & accessories	1	-do-	36,000/-
11. Double ended Bench grinder with 1 H.P. motor	1	-do-	12,000/-
12. Trimming Ball press	3	-do-	60,000/-
Electrification & installation @ 10%			3,92,600/-
Pre-operative expenses	L.S.		50,000/-
Office furniture & equipments	L.S.		1,00,000/-
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			44,68,600/-

Say Rs. 44,69,000/-

Fixed Capital:

(i) Land & Building	2,08,000/-
(ii) Plant & Machinery	44,69,000/-
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	46,77,000/-

Working Capital (P.M.)(i) Personnel:

<u>Sr. No.</u>	<u>Designation</u>	<u>No.</u>	<u>Salary</u>	<u>Total (Rs.)</u>
1.	Manager/Metallurgist	1	15,000/-	15,000/-
2.	Supervisor	1	8,000/-	8,000/-
3.	Chemist	1	7,000/-	7,000/-
4.	Skilled Worker	3	6,000/-	18,000/-
5.	Unskilled Worker	5	4,000/-	20,000/-
6.	Accountant	1	7,000/-	7,000/-
7.	Clerk	2	5,000/-	10,000/-
8.	Watchman/Peon	2	4,000/-	8,000/-
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				93,000/-
	(+) Perquisites @ 15%			13,950/-

Total	:	----- 1,06,950/- ...7
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(ii) Raw Material (P.M.)

(1) Al. Alloy 6.78 M.T. @ Rs. 1,45,000/M.T.	9,83,100/-
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(iii) Utility (P.M.)

Electric Power approx. 4500 Kwh @ Rs. 5.50/Kwh	24,750/-
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Water            L.S.	2,000/-
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26750/-

(iv) Contingent Expenses (P.M.)

Rs.

(1) Consumable stores            L.S.	7,000/-
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(2) Repairs & maintenance       L.S.	7,000/-
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(3) Postage & Stationery           L.S.	2,000/-
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(4) Telephones                      L.S.	2,000/-
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(5) Insurance                        L.S.	2,000/-
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(6) Transportation                 L.S.	5,000/-
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(7) Sales expenses                 L.S.	10,000/-
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(8) Misc. expenses                 L.S.	5,000/-
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Total	:	----- 40,000/-
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(v) Total Recurring Expenditure (P.M.)

i + ii + iii + iv = Rs. 11,56,800/-

Say = Rs. 11,57,000/-

(vi) Total working capital required on 3 months basis:

v x 3 = 34,71,000/-

Total Capital Investment

(i) Fixed Capital	- 46,77,000/
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(ii) Working Capital	- 34,71,000/-
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81,48,000/-

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Machinery Utilization:

No. of shots in an hour will decide the production of the castings. Therefore, due care should be taken to produce as maximum as shots to achieve higher production. To achieve and maintain quality standard, the optimum use of laboratory will be advisable.

**FINANCIAL ANALYSIS:**

(i) Cost of Production (P.A.)

Total recurring expenditure	Rs. 1,38,84,000/-
Depreciation on furnace @ 25%	Rs. 65000/-
Depreciation of testing/lab. equipment @ 20%	Rs. 151000/-
Depreciation on measuring tools, jig/fixtures @ 20%	Rs. 19000/-
Depreciation on mould die fixture @ 25%	Rs. 75000/-
Depreciation on machinery @ 10%	Rs. 251600/-
Depreciation on office furniture/equipment @20%	Rs. 20000/-
Interest on Capital Investment @ 15%	Rs. 12,22,200/-
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	Rs.1,56,87,800/-
Say :	Rs.1,56,88,000/-

(ii) Turnover (P.A.)

By sale of 77.29 M.T. Al. Alloy Die Castings @ Rs. 240/- per kg.	Rs.1,85,49,600/-
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(iii) Net Profit (P.A.)

Turnover - cost of production	Rs. 28,61,600/-
Say :	Rs. 28,62,000/-

(iv) Net Profit Ratio:

$$\frac{\text{Net Profit} \times 100}{\text{Turnover}} = \frac{28,62,000 \times 100}{18549600} = 15.42\%$$



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(v) Rate of Return:

$$\frac{\text{Net Profit} \times 100}{\text{Total Capital Investment}} = \frac{28,62,000 \times 100}{81,48,000} = 35.12\%$$

(vi) Break Even Analysis:(A) Fixed Cost

(a) Total depreciation	Rs. 5,81,600/-
(b) Insurance	Rs. 24,000/-
(c) Interest on Capital Investment	Rs. 12,22,200/-
(d) 40% of salary & wages	Rs. 5,13,360/-
(e) 40% of contingent expenses (excluding insurance)	Rs. 1,82,400/-
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	Rs. 25,23,560/-

$$\text{B.E.P.} = \frac{\text{F.C.} \times 100}{\text{F.C.} + \text{Profit}} = \frac{25,23,560 \times 100}{25,23,560 + 28,62,000} = 46.85\%$$

Name and address of machinery suppliers:

- 1) M/s. H.M.T. Ltd.  
Machine Tool Marketing Division  
Karaka Building No. 1, Ashram Road  
Ahmedabad 380 009.
- 2) M/s. NSIC Technical Service Center  
P.O. Balitikuri, Howrah 711 402.
- 3) M/s. Pioneer Furnaces Pvt. Ltd.  
146-148, G.I.D.C.  
Vithal Udyognagar 388 121.
- 4) M/s. Fine Spavy Associates & Engineers Pvt. Ltd.  
C-45/2, M.I.D.C. Area  
Miraj 416 410.

Raw Materials:

Can be purchased from local market.

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