

# Aluminium Shots and Notched Bars

PRODUCT CODE	: N.A.
QUALITY AND STANDARDS	: IS 1253:1965
PRODUCTION CAPACITY	: 120 MT/Yr/Shift
MONTH AND YEAR OF PREPARATION	: May, 2002
PREPARED BY	: Small Industries Service Institute Bais Godam Industrial Estate, Jaipur—302006 Phone Nos. : 212098, 213099 Fax : (0141)-210553 E-mail : sisijpr@Raj.nic.in Website : www.sisijaipur.org.

## INTRODUCTION

Aluminium shots and notch bars are used as deoxidiser in steel plants. The deoxidisers are of two types: (i) Aluminium (ii) Ferrosilicon. Aluminium has certain advantages over the Ferrosilicon, as it is cheaper and can be easily made in the form of shots or ingot. Aluminium shots have the comparative advantage i.e. they offer greater surface area in better contact and mixing.

## MARKET POTENTIAL

The demand for product is mainly from steel making plants like Durgapur, Bhilai, Rourkela, Salem and small plants having induction furnaces. The demand per annum as presumed is over 1500 M.T. for Aluminium shots. There are

units manufacturing this product in Orissa and West Bengal. In Rajasthan a unit can be set up to cater to the needs of the State and neighbouring States for small/mini steel plants.

## BASIS AND PRESUMPTIONS

1. The production target has been assessed on the basis of 300 days in a year on single shift basis.
2. The melting losses have been considered as 3.5%.
3. The capacity utilization in the 1<sup>st</sup> year could be around 60 to 70% of the installed capacity.
4. The wages and labour are based on local markets and State Wages Act.
5. The interest rate for working and fixed capital would be 18% per annum.

## IMPLEMENTATION SCHEDULE

The product unit can be set and implemented in a period of one year by performing various activities in a systematic manner and simultaneous application of various common activities.

## TECHNICAL ASPECTS

### Process of Manufacture

The basic steps involved in the manufacture of Aluminium shots and knotted bars are as follows:

- |                   |               |
|-------------------|---------------|
| (i) Melting       | (ii) Casting  |
| (iii) Grading and | (iv) Testing. |

#### *Melting*

Commercial grade Aluminium of 99% purity is suitable for manufacture of shots and notch bars. The scrap should be properly segregated and subjected to magnetic separation to avoid Iron contamination. Melting is carried out in graphite crucibles in pit type furnace. Aluminium scrap and ingots should be preheated to drive out by using oil or moisture before introducing into molten metal. The melting is carried out under protective cover flux to avoid excessive melting bases.

#### *Casting*

Aluminium shots are made by passing molten Aluminium at a correct temperature through a refractory coated vibratory sieve. The metal beneath the sieve is collected in a water tank with an arrangement for continuous circulation of water.

#### *Grading and Testing*

The shots so obtained from the water tank are graded and oversized shots are

sent for remelting. Samples from a representative lot are sent for chemical analysis. The material conforming to the standards is weighed and packed.

### Quality Control and Standards

Aluminium Knotch Bars and Shots used for deoxidation of steel should conform to IS:1253:1965.

### Motive Power

Approximate motive power requirement is about 2 KW.

1. The unit should be selected away from locality.
2. Exhaust pipe should be adjusted to avert the pollution control inside the factory.
3. Tree and plants are kept for clearing the polluted air.

### Energy Conservation

Suitable measures should be taken to minimise power consumption.

## FINANCIAL ASPECTS

### A. Fixed Capital

(i) **Land and Building (Rented)** **Rs. 5,000**  
covered area 50 × 50 sq. ft.

(ii) **Machinery and Equipments**

Sl. No.	Description	Qty.	Amount (In Rs.)
1.	Coke Fired Pit Furnace to accommodate crucible of 40 kg capacity of Aluminium with Blower/ Motor 5 H.P. and accessories	4 Nos.	60,000
2.	Vibratory refractory sieve with driving gear and Motor 2 H.P.	1 No.	20,000
3.	Water Tank with connection for cold water circulation Motor and Pump 1 H.P.	1 No.	5,000

4. Electric Hoist of 1 Ton capacity	1 No.	20,000
5. Platform Type weighing Machine 500 kg capacity.	1 No.	15,000
6. Testing Equipment	L.S.	50,000
7. Exhaust arrangements for Pollution Control	L.S.	10,000
8. Electrical and Mechanical Installation	L.S.	20,000
9. Cost of Moulds, Fixture hand tools, ladle, Ladle holder etc.	L.S.	20,000
10. Office furniture and Equipments	L.S.	20,000
11. Pre-operative expenses	L.S.	10,000
<b>Total</b>		<b>2,50,000</b>

## B. Working Capital (per month)

<b>(i) Administrative/Supervisory/Technical (Rs.)</b>		
1. Manager	1	5000
2. Supervisor/Melter	1	4000
3. Chemist	1	3000
4. Clerk/Typist	1	2000
5. Skilled Worker	1	2000
6. Semi skilled/Unskilled Workers @ Rs.1500 each	4	6000
<b>Total</b>		<b>22,000</b>
<i>Perquisites @ 15%</i>		3,300
<b>Total</b>		<b>25,300</b>

<b>(ii) Raw Materials (per month) (Rs. In lakh)</b>	
Commercial grade pure Aluminium scrap 10 MT @ 70 Kg.	7.0
Fluxes/ Chemicals	0.10
<b>Total</b>	<b>7.10</b>

<b>(iii) Utilities (per month) (Rs.)</b>	
Power	10,000
Fuel Coal 4 Ton @ 8000 Ton	32,000
Water	L.S. 2,000
<b>Total</b>	<b>44,000</b>

## **(iv) Other Contingent Expenses (per month) (Rs.)**

1) Rent	5,000
2) Postage and Stationery	500
3) Repair/Maintenance	500
4) Insurance	1,000
5) Miscellaneous Expenses	2,000
<b>Total</b>	<b>9,000</b>

## **(v) Total Recurring Expenses (per month) (Rs.)**

1) Raw Material	7,10,000
2) Salary and Wages	25,300
3) Utilities	44,000
4) Other Expenses	9,000
<b>Total</b>	<b>7,88,300</b>

## **(iv) Total Working Capital for 3 months**

= Rs. 788300 × 3 = **Rs. 23,64,900**

**Say Rs. 23,65,000**

## C. Total Capital Investment

1. Fixed Capital	Rs. 2,50,000
2. Working Capital for 3 months	Rs. 23,65,000
<b>Total</b>	<b>Rs. 26,15,000</b>

## FINANCIAL ANALYSIS

### **(1) Cost of Production (per year) (Rs.)**

1. Total Recurring Cost	94,60,000
2. Depreciation on Machinery and Equipments 10%	18,000
3. Depreciation on Furnace/ Furniture 25%	15,000
4) Interest on total capital investment 18%	4,70,700
<b>Total</b>	<b>99,63,700</b>

### **(2) Return by Sale (per year) (Rs.)**

Aluminium shots and Note bars 119 M.T.C. @ 90 per kg.	1,07,10,000
Net Profit (Before Income Tax)	7,46,300
Net Profit on Sale	= 7%
Return on Total Investment	= 28%

**(3) Break-even Point**

<b>Fixed Cost</b>	<b>(Rs.)</b>
(i) Depreciation on Machinery and Equipment	18,000
(ii) Depreciation on Furnace and Furniture	15,000
(iii) Rent	60,000
(iv) 40% of Other Contingent Expenses	2,54,400
(v) Interest on Total Investment	4,70,700
(vi) 40% of Salary and Wages	121440
<b>Total</b>	<b>9,39,540</b>

$$\begin{aligned} \text{B.E.P.} &= \frac{\text{F.C.} \times 100}{\text{F.C.} + \text{Profit}} \\ &= \mathbf{55.7\%} \end{aligned}$$

**Addresses of Machinery and Equipment Suppliers**

- (1) M/s. Wesman Engg. Co.  
1/2 llenby Road,  
Kolkata-20
- (2) M/s. Steelage Engineers  
B-30, Industrial Estate,  
Rourkela