

# Aluminium Fabrications

PRODUCT CODE	:	335908004
QUALITY AND STANDARDS	:	As Per IS 1948:1961 and IS1949:1961
PRODUCTION CAPACITY	:	Qty. : (a) Stair Case Hand Rails 9,000 sq. ft. Value : Rs. 11,25,000 Qty. : (b) Doors 12,000 sq. ft. Value : Rs. 12,00,000 Qty. : (c) Windows 13,000 sq. ft. Value : Rs. 11,70,000
MONTH AND YEAR OF PREPARATION	:	March, 2003
PREPARED BY	:	Small Industries Service Institute New Colony, Rayagada - 765004, (Orissa)

## INTRODUCTION

Aluminium fabricated items like doors, windows, staircase hand rails and supports, railings for verandas, corridors etc. have become the generally accepted feature in most modern buildings. The use of aluminium in business and office complexes, buildings, theatres as well as decorative purposes is very common. Similarly in residential buildings also aluminium doors, windows, railings, grill-works etc. are used extensively. Textile shops and other trading shops built in lighter materials too are going in for shelves made of aluminium for stocking purposes.

The advantages of aluminium such as light weight, strength, corrosion

resistance, durability, easy in fabrication, attractive appearance and easy maintenance make it a popular material for use in modern buildings. Aluminium required for use in buildings is available from large scale manufacturers such as Indal, Balco, Jindal etc. as extruded sections in various shapes and sizes for specific uses. These sections are also available through their local dealers. The usual length of these sections is 12 feet/4 meters. Fabricators anodise these to desired colours and fabricate the items as per the customers' requirements. These items have good appearance and finish and the maintenance expenses are almost nil while steel and wooden items require regular painting and polishing periodically.

## MARKET POTENTIAL

The development and construction activities being inter-linked, there is good scope for aluminium fabrication units for meeting the growing demand of new buildings for offices, business and shopping complexes, theatres etc. Aluminium fabricated and anodised items like doors, windows, railings, staircases, shelves, ladders etc. are being increasingly used in the modern constructions on consideration of durability and appearance. If the present trend is any guide, theatres, restaurants, hotels, shopping complexes, office premises and other luxurious buildings will fast replace wooden materials with aluminium fabricated items. The consumption of these items is already on the increase.

## BASIS AND PRESUMPTIONS

1. The production of the unit is worked out on the basis of single shift of 8 hours a day for 300 working days a year. The unit is expected to work at 70% efficiency in the first year.
2. The unit is expected to achieve 80% production capacity in the second year onwards.
3. Wages for labour etc. have been taken as per the rate prevailing at the time of preparation of the project profile.
4. Interest rate is calculated @ 16% on Capital Investment.
5. Entrepreneur has to raise 25% of the capital investment as margin money.
6. Considering the product and usage, the project can last for

more than 10 years. The repayment of term loans will be made in 5 years after one year moratorium.

7. The unit is proposed to function in own building.
8. Cost of machinery and equipment has been taken as per the rates quoted by machinery manufacturers/suppliers.

## IMPLEMENTATION SCHEDULE

Sl.No.	Name of Activity	Period
1.	Preparation of project report:	
	(a) Calling Quotations	5 weeks
	(b) Scheme Preparation	2 weeks
2.	Provisional Registration as SSI	1 week
3.	Financial arrangement from financial institutions and others	12 weeks
4.	Purchase and procurement of machinery and equipment	8 weeks
5.	Erection and electrification	3 weeks
6.	Recruitment of personnel	4 weeks

Some activities shown above can be undertaken simultaneously in order to minimise the period of completion of the project.

## TECHNICAL ASPECTS

### Process of Manufacture

Manufacturing process involves anodising the aluminium extruded sections first and then fabrication. Anodising process involves buffing, pickling in acid solution, then cleaning in water, neutralising in acid and keeping the extruded sections in anodising tank for specified time. After anodising, the sections are to be fabricated as per the design and sizes of the customer by cutting, drilling, bending, welding,

screwing, riveting, assembling with glasses and beading, wherever necessary. Handles locks etc. are also fitted as per requirements.

#### Production Capacity (per annum)

Items	Quantity	Value (In Rs.)
Stair Case Hand Rails	9,000 sq. ft	11,25,000
Doors	12,000 sq. ft	12,00,000
Windows	13,000 sq. ft	11,70,000

#### Quality Control and Standards

IS 1948:1961 specifies requirements regarding materials, fabrication and dimensions of aluminium doors, windows and ventilators manufactured from extruded aluminium alloy sections of standard sizes and designs completed with fittings ready for fixing with buildings. This standard does not cover the requirements for industrial doors, windows and ventilators.

IS 1949:1961 deals with aluminium windows suitable for use in industrial buildings.

Aluminium doors, windows, stair case hand rails etc. are made as per the customers' specifications and requirements. Workmanship and high finish are main criteria for these kind of products. Care should be taken in joining and assembling to get better appearance and finish.

#### Pollution Control

The anodising process using acid solution may leave residual solution which has to be disposed off periodically. The local Pollution Control Board may be consulted for appropriate method of disposal of these solutions.

#### Energy Conservation

Energy consumption of this unit is on the low side since the lower powered motors are used in the production activity. The workers of the unit should be made aware of the need to conserve energy by switching off the energy sources when not required.

### FINANCIAL ASPECTS

#### A. Fixed Capital

(i) Land And Building	Amount (In Rs.)
(i) Land 500 sq. mtr. @ Rs. 150 per sq. mtr including registration	75,000
(ii) Cost of land development, fencing, approach road, inside roads, land scaping, drainage etc. @ Rs. 150 per sq. mtr.	75,000
(iii) Total built-up area 350 sq. mtrs. as follows:	
- Administrative building 75 sq. mtrs. construction cost @ Rs. 2,500 per sq. mtr.	1,87,500
- Factory shed 200 sq. mtrs. construction cost @ Rs. 1,500 per sq. mtr.	3,00,000
- Stores, staff canteen etc. 75 sq. mtrs. @ Rs. 2,000 per sq. mtr.	1,50,000
Total	7,87,500

#### (ii) Machinery and Equipments

Sl. No.	Description	Qty.	Amount (In Rs.)
1.	Heavy duty cut off machine with 2 HP motor, starter etc.	1	25,000
2.	TIG Welding M/c. with all accessories	1	1,10,000
3.	Anodising plant complete with rectifier 500 Amps 30 volts, complete with necessary tanks of 14 ft. length and initial chemical	1	3,00,000

Sl. No.	Description	Qty.	Amount (In Rs.)
4.	Buffing machine with 2 HP motors	2	12,000
5.	Drilling machine 12 mm cap. with 0.5 HP motor	1	9,000
6.	Double ended bench grinder 200 mm with 0.75 H.P. motor	1	3,000
7.	Hand Tools	-	10,000
8.	Portable Electric Drill	2	5,000
9.	Office furniture and equipments	-	15,000
10.	Erection and installation charges	-	15,000
	<b>Total</b>		<b>5,04,000</b>
(iii)	Pre-operative expenses	-	15,000
	<b>Total Fixed Capital (i+ii+iii)</b>		<b>5,19,000</b>
	<b>Total</b>		<b>13,06,500</b>

## B. Working Capital (per month)

### (i) Personnel

Sl. No.	Designation	Nos.	Salary (Rs.)	Amount (In Rs.)
1.	Manager	1	4,500	4,500
2.	Supervisor	1	3,000	3,000
3.	Skilled Worker	3	2,100	6,300
4.	Semi-skilled Worker	6	1,500	9,000
5.	Helper	4	900	3,600
6.	Accountant/Clerk	1	2,400	2,400
7.	Field Workman	3	1,500	4,500
8.	Peon/Watchman	1	1,500	1,500
	<b>Total</b>			<b>34,800</b>
	<i>Employees benefits @ 15%</i>			<b>5,220</b>
	<b>Total</b>			<b>40,020</b>
	<b>or Say</b>			<b>40,000</b>

### (ii) Raw Materials

Sl. No.	Description	Qty.	Amount (In Rs.)
Aluminium extruded sections such as follows:			
1.	Book type hand rails 4" size	480 ft.	12,000
2.	1" square pipe	3000 ft.	24,000
3.	Flats 2" width × 1/8" thick	480 ft.	2,900
4.	4½ × ½" section	324 ft.	8,100
5.	2½ × 1½" section	1200 ft.	24,000

Sl. No.	Description	Qty.	Amount (In Rs.)
6.	2" × 1" section	1200 ft.	18,000
7.	Aluminium wire 2 mm for welding	2000 ft.	4,000
8.	Handle section for doors	60 ft.	1,200
9.	Clips	4200 ft.	14,000
10.	Glass sheet 3 mm/4.5 mm thick	1920 ft.	28,800
11.	Chemicals for anodising	LS	5,000
12.	Misc. items such as hinges, screw, rubber beading, tower bolts, locks, wooden plug etc.	LS	15,000
	<b>Total</b>		<b>1,57,000</b>

(iii) Utilities	Amount (In Rs.)
Electricity - 2,000 units @ Rs. 4.50 unit	9,000
Water L.S.	1,000
<b>Total</b>	<b>10,000</b>

(iv) Other Contingent Expenses	Amount (In Rs.)
1. Postage, stationery and other office services	5,000
2. Consumable stores, tools, repair and maintenance	10,000
3. Transport and conveyance	5,000
4. Advertisement and sales promotion	5,000
5. Insurance	1,000
6. Miscellaneous	4,000
<b>Total</b>	<b>30,000</b>

(v) Total Recurring Expenditure (per month)(In Rs.)	
(i) Personnel	40,000
(ii) Raw material	1,57,000
(iii) Utilities	10,000
(iv) Other Contingent Expenses	30,000
<b>Total</b>	<b>2,37,000</b>

Working capital is considered for an average working Capital cycle of 1½ months

$$\begin{aligned} \text{Hence, Working Capital} &= \text{Rs. } 2,37,000 \times 1\frac{1}{2} \\ &= \text{Rs. } 3,55,500 \end{aligned}$$

## C. Total Capital Investment

1. Fixed Capital	(In Rs.)
(i) Land and Building	7,87,500
(ii) Machinery and Equipments	5,19,000
2. Working Capital (for 1½ months)	3,55,500
<b>Total</b>	<b>16,62,000</b>

## FINANCIAL ANALYSIS

### (1) Cost of Production (per year) Amount (In Rs.)

Total recurring expenditure	28,44,000
Depreciation on Building @ 5%	39,375
Depreciation on Machinery and Equipment @ 10%	47,400
Depreciation on office equipment @ 25%	3,750
Interest on total capital investment @ 16%	2,65,920
<b>Total</b>	<b>32,00,445</b>
or Say	32,00,500

### (2) Turnover (per year) (Rs.)

(a) Stair-case hand rails 9000 ft. @ Rs. 125 per ft.	11,25,000
(b) Doors - 12,000 sq. ft. @ Rs. 100 per sq. ft.	12,00,000
(c) Windows 13,000 sq. ft. @ Rs. 90 per sq. ft.	11,70,000
(d) Sale of Scrap	60,000
<b>Total</b>	<b>35,55,000</b>

### (3) Net Profit (per year) (Before Income Tax)

$$\begin{aligned} \text{Net Profit} &= \text{Total Sales} - \text{Cost of Production} \\ &= \text{Rs. } 35,55,000 - \text{Rs. } 32,00,500 \\ &= \text{Rs. } 3,54,500 \end{aligned}$$

### (4) Net Profit Ratio = $\frac{\text{Net Profit per year} \times 100}{\text{Turnover per year}}$

$$\begin{aligned} &= \frac{3,54,500 \times 100}{35,55,000} \\ &= 9.97\% \end{aligned}$$

### (5) Rate of Return = $\frac{\text{Net Profit per Year} \times 100}{\text{Total Investment}}$

$$\begin{aligned} &= \frac{3,54,500 \times 100}{16,62,000} \\ &= 21.33\% \end{aligned}$$

### (6) Break-even Point

Fixed Cost (per year)	Amount (In Rs.)
Depreciation on building, machinery and office equipment	90,525
Interest on total capital investment	2,65,920

Fixed Cost (per year)	Amount (In Rs.)
40% Salary and Wages	1,92,000
40% other contingent expenses	1,39,200
Insurance	12,000
<b>Total</b>	<b>6,99,645</b>
or Say	7,00,000

$$\begin{aligned} \text{B.E.P.} &= \frac{\text{Fixed Cost} \times 100}{\text{Fixed Cost} + \text{Profit}} \\ &= \frac{7,00,000 \times 100}{7,00,000 + 3,54,500} \\ &= 66.38\% \end{aligned}$$

### Addresses of Machinery and Equipment Suppliers

1. M/s. Engineering Tools and Equipments  
Post Box No. 1972,  
64, S.B. Singh Road,  
Mumbai - 400023.
2. M/s. C M F Engineering  
3-A, Continental Plaza,  
705, Annasalai,  
Chennai - 600006.
3. M/s. India Machine Tools Company  
Pulikwal Buildings  
Post Box No. 1781,  
M.G. Road, Eranakulam,  
Cochin - 670002.
4. M/s. Hind Rectifier Ltd.  
Lake Road, Bhandup,  
Mumbai - 400078.
5. M/s. Archem Industries  
1/IC, Abdul Halim Lane,  
Kolkata - 700016.

### Addresses of Raw Material Suppliers

1. M/s. Hindustan Aluminium Corporation Ltd.  
Industry House,  
159, Church Gate Reclamation,  
Mumbai - 400020.

2. M/s. Jindal Aluminium Company Limited  
Tumkur Road, 7th Mile Stone,  
Bangalore.
3. M/s. Aluminium Corporation of India Ltd.  
7 - Council Street,  
Kolkata - 700001.
4. M/s. Premier Metals and Engg. Company  
T. D. Road,  
Ernakulam - 682018.
5. M/s. Borukha Aluminium Limited  
K. R. S. Road, Matagally,  
Mysore - 570016.