62. PROFILE ON PRODUCTION OF METALLIC ZIPPERS

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I. SUMMARY

This profile envisages the establishment of a plant for the production of metallic zippers with a capacity of 140 tonnes per annum.

The present demand for the proposed product is estimated at 96.54 tonnes per annum. The demand is expected to reach at 182 tonnes by the year 2020.

The plant will create employment opportunities for 53 persons.

The total investment requirement is estimated at about Birr 9.32 million, out of which Birr 2.12 million is required for plant and machinery.

The project is financially viable with an internal rate of return (IRR) of 24% and a net present value (NPV) of Birr 10.03 million discounted at 8.5%.

II. PRODUCT DESCRIPTION AND APPLICATION

Zippers are used for fastening clothes, bags, etc. A metallic zipper consists of two rows of metal teeth that can be pulled together to close something or pulled apart to open it.

A metallic zipper is highly applicable in garment, footwear, leatherwear, upholstery industries.

Metallic zipper can be closed or open-end type depending on the nature of application. They are also designated according to chain width standards. For the purpose of this profile, the closed end type with a medium chain width of 4.5-5.5mm has been taken as a reference product.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

Metallic zippers are used for manufacturing of garments. Therefore the local demand for the product is influenced largely by the expansion the local garment industry. According to the information from the Ethiopian Investment Agency, investment permits were issued to a total of 161 projects with capital of Birr 990 million in the area of garment and related articles manufacturing, of which 12 are already operational and 15 are under implementation. When the licensed projects become operational the local demand for zippers will increase considerably.

However, since there is no domestic facility for manufacturing metallic zippers, the products are imported from overseas. Import of metallic zippers is given in Table 3.1.

Table 3.1

IMPORT OF METALLIC ZIPPERS (Kg.)

Year	Import
2000	60,390
2001	93,649
2002	75,717
2003	67,491
2004	141,072
2005	126,640
2006	110,879

Source :- *Ethiopian Customs Authority,*

As could be seen from Table 3.1, import data of metallic zippers does not show any trend. Import varies from 60,390 kg during the year 2000 to about 141,072 kg in the year 2004. With such very erratic data a trend analysis could not be worked out to estimate the present demand. Hence, the simple average of the period under consideration is assumed to indicate present demand. Accordingly, the present demand is estimated at 96,548 kg.

2. Demand Projection

The demand for metallic zippers is related with the expansion of the garment and leather goods production. Ethiopia has a good potential to expand the garment and the leather sector due to the availability of the basic raw materials. Moreover, the government has given due attention to these sectors in its industrial policy. Considering these favourable situations, the demand for metallic zippers is estimated to grow by an average rate of 5% per annum (see Table 3.2).

Table 3.2

PROJECTED DEMAND FOR METALLIC ZIPPERS (KG)

Year	Projected Demand
2008	101,376
2009	106,444
2010	111,767
2011	117,355
2012	123,223
2013	129,384
2014	135,853
2015	142,646
2016	149,778
2017	157,267
2018	165,130
2019	173,387
2020	182,056

3. Pricing and Distribution

Based on the average CIF price of the product for the past three years Birr 200.00 per kg is taken for sales revenue projection.

Laces can be directly sold to bulk purchases such as garment industries. In addition whole sole and retail channels have to be used to reach the numerous consumers that require in small quantities.

B. PLANT CAPACITY AND PRODUCTION PROGRAMME

1. Plant Capacity

According to the market study above, the envisaged plant will have a capacity of 140 tones of metallic zippers. The plant will operate single shift of eight hours a day and 300 days per annum.

2. Production Programme

The plant is intended starting production at 70% of installed capacity in the first year. It will then raise its capacity to 85% in the second year, and finally to 100% in year three and thereafter.

IV. MATERIALS AND INPUT

A. RAW AND AUXILIARY MATERIALS

The raw material required by the plant for the manufacture of metallic zipper are aluminium wire, cord, bought out components such as slides, top and bottom attachments, sewing thread and tape.

Annual requirement of raw and auxiliary materials is shown in Table 4.1.

Table 4.1

RAW MATERIALS REQUIREMENT AT FULL CAPACITY OPERATIONS

Sr. No.	Description	Qty. (tones)	Unit cost ('000 Birr)	Total cost ('000 Birr)		
				FC	LC	Total
1	Aluminium wire	87.80	6,570.00	576.846	144.21	721.06
2	Bought-Out components (top & bottom attachments, slide)	L.S	-	-	-	120.00
3	Cotton tape	5,550,000 meters	Birr9.5/100m	527.250	131.81	659.06
4	Zn-alloy GDZn A14-Cul	57.50	?			
5	Cord	2.24	Birr18/Kg	40.32	10.08	50.40
6	Sewing thread	5.23	Birr65/Kg	-	339.95	339.95
	TOTAL			**19,154.40**	**4,793.85**	**23,948.25**

B. UTILITIES

Inputs required by the plant consist of electricity, and water. Electricity is required for supplying power to all production equipment, and also to power sockets, lighting system and other auxiliary equipment of the plant.

For the plant operating single shift of eight hours a day, and 300 days a year, the total annual electrical energy requirement will be 450,600 Kwhs. The annual electricity bill will then be Birr 355,200.-.

Water is required for cleaning, drinking and general purpose. The annual water requirement is estimated at 5,000m^3, and the corresponding expenditure is Birr 50,000.-.

Thus, the total annual cost of utilities is estimated at about Birr 405,200.-.

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Process Description

The manufacturing of metallic zipper is started by forming the chain. After the chain forming operation, is sewn of zip chain to the cloth tape. Such unfinished slide fastener chain is wound on stainless steel. Zip chains surface polishing, rolling and waxing (an integrated process is carried out using one machine) operations are conducted.

After the coils are completed, cutting of zipper tape in to standard sizes will be done, the bottom metal stop is riveted. Then the slider-stops added and the top metal stop is riveted. The sliders are cast in zinc alloy by pressure molding machines, then treated in rotating drums & parts are polished. Finally after all the assembly process is completed inspection will be carried out and pass the product for packing.

2. Source of Technology

The machinery and equipment required can be obtained from the following companies.

BROADDRILL ZIPPER MACHINERY Co. Ltd
NO.49-51,Commercial 2nd Street, Qiaotou Town,
Yongjia country,Wenzhou City, Zhejiang
Tel 0577-67458945
Fax: 0577-67452926
Mobile:013968966329/013968952738
Contact Person: Mr.Liu

B. ENGINEERING

1. Machinery and Equipment

Plant machinery and equipment required for metallic zipper plant is presented in table 5.1. The total investment cost of plant machinery and equipment is estimated at Birr 2,115,450. Out of which Birr 1,567,000 will be required in foreign currency.

Table 5.1

List of Machinery and Equipment for Metallic Zipper Plant

Sr. No.	Description	Qty.
1	Winding Machine	1
2	Zipper Chain Production Machine	1
3	Sewing Machines	3
4	Zipper polishing, rolling & waxing Machine	1
5	Magnetic cutting device	3`
6	Bottom stop attaching Machine	3
7	Top stop attaching Machine	5
8	Open-end bottom stop casting Machine	2
9	Slider pressure casting Machine	3
10	Automatic slider assembly Machine	4
11	Slider enamelling	2
12	Packing device	2

2. Land, Building and Civil Works

The envisaged plant will require a total land area of 1,000m^2 including the production area, warehouse, laboratory & offices. The total land lease value for 80 years at the rate of Birr 0.4967 per m^2 is therefore Birr 39,736. The floor space required for the building of and other facilities will be about 500m^2. The total estimated cost of building and civil works at the rate of Birr 2,000 per m^2 is about Birr 1.00 million.

Therefore, the total cost of land, building and civil works is estimated at Birr 1039,736.

3. Proposed Location

Location of an industrial plant is determined on the basis of the proximity to the market for final products. The majority of the raw materials for the envisaged products have to be imported. Therefore, it would be advisable to locate the plant at Sodo Zuria Wereda in Sodo town.

VI. MANPOWER & TRAINING REQUIREMENT

A. MANPOWER REQUIREMENT

The manpower list and the corresponding monthly and annual salaries are given in Table 6.1 below.

Table 6.1

LIST OF MANPOWER REQUIREMENT AND ANNUAL SALARY

Sr. No.	Description	No.	Salary (Birr)	
			Monthly	Annual
A. ADMINISTRATION				
1	Plant Manager	1	2,000	24,000
2	Head, Finance & Administration Department	1	1,600	19,200
3	Head, Production and Technical Department	1	1,600	19,200
4	Secretary	1	850	10,200
5	Accountant	1	1,000	12,000
6	Salesman	1	800	9,600
7	Clerk	1	600	7,200
8	Cashier	1	650	7,800
9	General Service	3	250	9,000
SUB TOTAL		**11**		**118,200**
B. PRODUCTION				
13	Forman	1	1,200	14,400
14	Machinery Operators	28	650	218,400
15	Assistant Operators	15	450	81,000
15	Mechanics	2	800	19,200
16	Quality controller	1	600	14,400
17	Laborers	4	200	9,600
SUB TOTAL		**51**	**-**	**357,000**
EMPLOYEE'S BENEFIT (25% OF BASIC SALARY)		-	-	118,800
TOTAL		**56**	**-**	**594,000**

B. TRAINING REQUIREMENT

Training for production worker is required. It can be conducted during the erection period and the cost is embodied in the machinery cost as the training will be provided by the supplier

VII. FINANCIAL ANALYSIS

The financial analysis of the metallic zippers project is based on the data presented in the previous chapters and the following assumptions:-

Construction period	1 year
Source of finance	30 % equity
	70 % loan
Tax holidays	3 years
Bank interest	8%
Discount cash flow	8.5%
Accounts receivable	30 days
Raw material local	30days
Raw material, import	90days
Work in progress	2 days
Finished products	30 days
Cash in hand	5 days
Accounts payable	30 days

A. TOTAL INITIAL INVESTMENT COST

The total investment cost of the project including working capital is estimated at Birr 9.32 million, of which 31 per cent will be required in foreign currency.

The major breakdown of the total initial investment cost is shown in Table 7.1.

Table 7.1

INITIAL INVESTMENT COST

Sr. No.	Cost Items	Total Cost ('000 Birr)
1	Land lease value	39.7
2	Building and Civil Work	1,000.0
3	Plant Machinery and Equipment	990.9
4	Office Furniture and Equipment	75.0
5	Vehicle	225.0
6	Pre-production Expenditure*	291.3
7	Working Capital	6,698.4
	Total Investment cost	**9,320.4**
	Foreign Share	31

** N.B Pre-production expenditure includes interest during construction (Birr 141.29 thousand) and Birr 150 thousand costs of registration, licensing and formation of the company including legal fees, commissioning expenses, etc.*

B. PRODUCTION COST

The annual production cost at full operation capacity is estimated at Birr 25.50 million (see Table 7.2). The material and utility cost accounts for 95.49 per cent, while repair and maintenance take 0.41 per cent of the production cost.

Table 7.2

ANNUAL PRODUCTION COST AT FULL CAPACITY ('000 BIRR)

Items	Cost	%
Raw Material and Inputs	23,948.25	93.90
Utilities	405.2	1.59
Maintenance and repair	105.77	0.41
Labour direct	356.4	1.40
Factory overheads	118.80	0.47
Administration Costs	237.6	0.93
Total Operating Costs	25,172.02	98.70
Depreciation	233.58	0.92
Cost of Finance	98.58	0.39
Total Production Cost	**25,504.18**	**100**

C. FINANCIAL EVALUATION

1. Profitability

According to the projected income statement, the project will start generating profit in the first year of operation. Important ratios such as profit to total sales, net profit to equity (Return on equity) and net profit plus interest on total investment (return on total investment) show an increasing trend during the life-time of the project.

The income statement and the other indicators of profitability show that the project is viable.

2. Break-even Analysis

The break-even point of the project including cost of finance when it starts to operate at full capacity (year 3) is estimated by using income statement projection.

$$BE = \frac{\text{Fixed Cost}}{\text{Sales} - \text{Variable Cost}} = 20\ \%$$

3. Pay Back Period

The investment cost and income statement projection are used to project the pay-back period. The project's initial investment will be fully recovered within 5years.

4. Internal Rate of Return and Net Present Value

Based on the cash flow statement, the calculated IRR of the project is 24% and the net present value at 8.5% discount rate is Birr 10.03 million.

D. ECONOMIC BENEFITS

The project can create employment for 56 persons. In addition to supply of the domestic needs, the project will generate Birr 6.2 million in terms of tax revenue. The establishment of such factory will have a foreign exchange saving effect to the country by substituting the current imports.