

19. PROFILE ON LAMINATED LEATHER BELT

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I. SUMMARY

This profile envisages the establishment of a plant for the production of laminated leather beltings with a capacity of 2,000 kg per annum. Laminated leather belting is strong and durable belting known as leather nylon sandwiched industrial belting, which is used for transmission of power in industries.

The major raw materials required are chrome tanned leather (hide), polyamide nylon, polyamide fabric, polymer resin cement and adhesive cement. Polyamide nylon, polymer resin cement and adhesive cement have to be imported while the other raw materials are locally available.

The present demand for the proposed product is estimated at 2.8 tonnes per annum. The demand is expected to reach at 7.4 tonnes by the year 2018.

The total investment requirement is estimated at about Birr 7.19 million, out of which Birr 3.5 million is required for plant and machinery. The plant will create employment opportunities for 27 persons.

The project is financially viable with an internal rate of return (IRR) of 19.35 % and a net present value (NPV) of Birr 4.02 million, discounted at 8.5%.

The project has backward and forward linkage effect with the manufacturing industries. The establishment of such factory will have a foreign exchange saving effect to the Country by substituting the current imports.

II. PRODUCT DESCRIPTION AND APPLICATION

Transmission of power in various industries is carried out by using conventional belting materials, which comprise mainly rubber, and canvas materials, which are not durable

and sturdy, and therefore collapse at frequent intervals. Leather nylon sandwiched industrial belting is, hence, a much better product introduced after long years of research.

This belt has proved its versatility and hard wears qualities and is rapidly replacing conventional type rubber and canvas belting. Most machinery in the textile, jute, cement, sugar, paper and various other heavy and medium industries use this belting for efficient transmission of mechanical power.

Nylon sandwiched leather belting is composed of two leather pieces having a nylon film sandwiched in between. The leather gives very high coefficient of friction where as the Nylon bonded with the leather enables the belt to take very high tensile strength.

The major features and advantages of this belting material comprise the following:

- High transmission capacity due to the high co-efficient of friction of the leather material;
- High transmission speed as high as 120,000 ft/ min;
- Suitability for short distance operation with large pulley ;
- Smooth transmission;
- light weight; and
- Reliability and durability.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

Belts which are used in machinery, mechanical appliances or for other technical use are mainly made from rubber, textiles and leather. All types of beltings for industrial use that are supplied to the Country originate through import. Import of rubber, textile and leather based beltings in the past 10 years (1998 – 2006) is given in Table 3.1.

Table 3.1
IMPORT OF BELTINGS IN KGS

Year	Rubber	Textile	Leather	Total
1998	239,627	1,595	1,725	242,947
1999	213,113	40,313	377	253,803
2000	252,305	13,696	422	266,423
2001	248,658	32,428	916	282,002
2002	164,959	588	1,138	166,685
2003	417,082	26,267	1,150	444,499
2004	469,065	3,088	2,228	474,381
2005	390,457	3,402	2,254	396,113
2006	828,359	32,452	2,373	863,184

Source: Customs Authority External Trade Statistics.

As could be seen from Table 3.1, the general trend of import of leather beltings is increasing from year to year. The average quantity imported during the initial three years i.e. 1998-2000 was about 841 kg. This has increased to 1068 kg and 2285 kg during the period 2001-2003 and 2004-2006, respectively. In order to estimate the current demand the imported quantity during year 2006 is taken as a base. Taking annual growth of 10% current (2008), demand is estimated at 2871 kg.

2. Projected Demand

The demand for leather beltings in general will grow with the development of the industrial sector. Hence, taking 2871 kg as the present effective demand and applying an annual growth rate of 10%, the future demand for leather beltings is projected as shown in Table 3.2.

Table 3.2
PROJECTED DEMAND FOR LEATHER BELTINGS

Year	Projected demand (Kg)
2008	2871
2009	3158
2010	3474
2011	3821
2012	4203
2013	4624
2014	5084
2015	5595
2016	6154
2017	6770
2018	7447

As can be seen from Table 3.2, demand would grow from the current 2,871 Kgs to 7,447 Kgs by the year 2018.

3. Pricing and Distribution

The price of laminated leather belting varies with quality, brand and sources. Laminated leather beltings imported from various countries show a wide difference. Data obtained from external trade statistics reveal that the price ranges from Birr 300 to 5000 per Kg. For the purpose of this project, a price of 1,500 per kg is adopted for revenue calculation.

The distribution system proposed for the envisaged plant is to use the existing machinery spare parts merchandizing enterprises. However, proper product promotion and follow up with retailers and users will have an impact to increase the sales volume of the plant.

B. PLANT CAPACITY AND PRODUCTION PROGRAMME

1. Plant Capacity

Bearing limited scale of manufacturing equipment in mind, a plant with an annual capacity of 2,000 kg of flat belts of various sizes is envisaged. Determination of plant capacity is based on 300 working days per annum and a single shift of eight hours each, per day.

2. Production Programme

Table 3.3 below gives the proposed production programme, which hinges on the assumption that progressive capacity build-up, is most appropriate to allow sufficient time for skill development by operators and market penetration.

Table 3.3
PRODUCTION PROGRAMME

Year	1	2	3	4-10
Capacity Utilization [%]	60	70	85	100
Production [kg]	1,200	1,400	1,700	2,000

IV. MATERIALS AND INPUT

A. RAW MATERIALS

The direct raw materials required for the manufacture of laminated leather beltings are chrome tanned leather, nylon film and adhesives. Chrome tanned leather can be acquired from the existing tanneries in the Country while the other raw materials will be imported.

Packaging is the most important auxiliary material needed that is available in the local market.

Table 4.1 below details annual raw material requirements at full production capacity along with associated costs.

Table 4.1
ANNUAL RAW MATERIAL REQUIREMENT & COST

Sr. No.	Description	Unit of Measure	Qty.	Unit Price [Birr]	Cost ('000 Birr)		
					LC	FC	Total
1	Chrome tanned leather (hide)	m ²	838	240	201.12	-	201.12
2	Polyamide Nylon	kg	148	60	3.11	5.77	8.88
3	Polyamide fabric	m ²	400	180	18	54	72
4	Polymer resin cement	kg	123.5	20	0.86	1.61	2.47
5	Adhesive cement	kg	49.5	15	0.26	0.48	0.74
	Grand Total				277.35	7.86	285.21

B. UTILITIES

The major utilities required by the project are electricity and water. Table 4.2 indicates annual requirement at full production capacity.

Table 4.2
UTILITIES REQUIREMENT & COST

Sr. No.	Description	Unit of Measure	Qty	Unit Price [Birr]	Cost ('000 Birr)
1	Electricity	kWh	3,050	0.4736	1.445
2	Water	m ³	500	3.25	1.625
	Grand Total				3.07

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Process Description

Portions of chrome-tanned leather, free from cuts are used for the fabrication of laminated leather beltings.

First, dried splits of chrome tanned leather are cut into straps at right angle in a round-strap cutting machine. A long roll is made by joining leather pieces of equal sizes with suitable adhesive cement applied to the end after splicing. The joint portion is kept under pressure in a cold press to ensure proper bonding.

The ready leather roll is fed into the splitting machine to cut appropriate sizes suitable for uniform sandwiching. The flesh side is buffed and a polymer resin is applied. The final operation is insertion of nylon flesh in between two leather rolls under hot hydraulic press. Both leather and nylon film are kept under heat and pressure for a certain period of time in order to produce a long roll of leather nylon sandwiched belting.

The final roll after lamination is mounted on a winding frame for a few days and thereafter ends of the roll are trimmed by using a circular knife and subsequently buffed on a buffing machine in order to clear unwanted material and gloss if produced during the process of lamination. The process does not have any adverse impact on environment.

2. Sources of Technology

Machines and equipment required to produce laminated leather belt are available in different technological level. For this specific project profile, one German company concerned with planning, supply, erection and start up of machines for leather made products is mentioned.

Müller & Kurth GmbH &co.
P.O.Box 101352
D-63013 Offenbach
Germany
Fax (069) 88 99 04

B. ENGINEERING

1. Machinery and Equipment

Table 5.1 indicates the list of machinery and equipment required. Cost of plant machinery and equipment is estimated at about Birr 3.5 million. Of this, about Birr 2.975 million is required in foreign currency.

Table 5.1

**MACHINERY AND EQUIPMENT REQUIREMENT TO MANUFACTURE
LAMINATED LEATHER BELT WITH ESTIMATED COSTS**

Sr. No.	Description	Qty. No	Cost ('000 Birr)		
			L.C	F.C.	Total
1	Hot hydraulic press; 30 HP	1	75	425	500
2	Circular cutting knife (machine)	1	37.5	212.5	250
3	Upper leather splitting machine: 0.5 HP, 450 mm	1	52.5	297.5	350
4	Cold hydraulic press: 20 HP	1	52.5	297.5	350
5	Strap cutting machine	1	37.5	212.5	250
6	Buffing machine: 3 Hp, 12"	1	30	170	200
7	Belt splitting machine: 0.5 Hp	1	22.5	127.5	150
8	Electric press, sandwiching (for small belts)	1	37.5	212.5	250
9	Hydraulic press (for joining belt ends)	1	45	255	300
10	Adhesive and polyamide resin cement churner	1	60	340	400
11	Ancillary tools and equipment, set	1	75	425	500
	Grand Total		525	2975	3,500

2. Land, Buildings and Civil Works

Total land requirement of the project is estimated at about 800m². Of this, the built-up area accounts for about 400m². Out of the total built up area, 200m² is covered by production facility, 120 m² for store and 80 m² for office building. Cost of building construction is estimated at about Birr 920,000.

According to the Federal Legislation on the Lease Holding of Urban Land (Proclamation No 272/2002) in principle, urban land permit by lease is on auction or negotiation basis, however, the time and condition of applying the proclamation shall be determined by the concerned regional or city government depending on the level of development.

The legislation has also set the maximum on lease period and the payment of lease prices. The lease period ranges from 99 years for education, cultural research health, sport, NGO , religious and residential area to 80 years for industry and 70 years for trade while the lease payment period ranges from 10 years to 60 years based on the towns grade and type of investment.

Moreover, advance payment of lease based on the type of investment ranges from 5% to 10%.The lease price is payable after the grace period annually. For those that pay the entire amount of the lease will receive 0.5% discount from the total lease value and those that pay in installments will be charged interest based on the prevailing interest rate of banks. Moreover, based on the type of investment, two to seven years grace period shall also be provided.

However, the Federal Legislation on the Lease Holding of Urban Land apart from setting the maximum has conferred on regional and city governments the power to issue regulations on the exact terms based on the development level of each region.

In Addis Ababa the City's Land Administration and Development Authority is directly responsible in dealing with matters concerning land. However, regarding the manufacturing sector, industrial zone preparation is one of the strategic intervention measures adopted by the City Administration for the promotion of the sector and all manufacturing projects are assumed to be located in the developed industrial zones.

Regarding land allocation of industrial zones if the land requirement of the project is blow 5000 m² the land lease request is evaluated and decided upon by the Industrial Zone Development and Coordination Committee of the City's Investment Authority.

However, if the land request is above 5,000 m², the request is evaluated by the City's Investment Authority and passed with recommendation to the Land Development and Administration Authority for decision, while the lease price is the same for both cases.

The land lease price in the industrial zones varies from one place to the other. For example, a land was allocated with a lease price of Birr 284 /m² in Akakai-Kalti and Birr 341/ m² in Lebu and recently the city's Investment Agency has proposed a lease price of Birr 346 per m² for all industrial zones.

Accordingly, in order to estimate the land lease cost of the project profiles it is assumed that all manufacturing projects will be located in the industrial zones. Therefore, for the this profile since it is a manufacturing project a land lease rate of Birr 346 per m² is adopted.

On the other hand, some of the investment incentives arranged by the Addis Ababa City Administration on lease payment for industrial projects are granting longer grace period and extending the lease payment period. The criterions are creation of job opportunity, foreign exchange saving, investment capital and land utilization tendency etc. Accordingly, Table 5.2 shows incentives for lease payment.

Table 5.2

INCENTIVES FOR LEASE PAYMENT OF INDUSTRIAL PROJECTS

Scored Point	Grace Period	Payment Completion Period	Down Payment
Above 75%	5 Years	30 Years	10%
From 50 - 75%	5 Years	28 Years	10%
From 25 - 49%	4 Years	25 Years	10%

For the purpose of this project profile the average i.e. five years grace period, 28 years payment completion period and 10% down payment is used. The period of lease for industry is 60 years.

Accordingly, the total lease cost, for a period of 60 years with cost of Birr 346 per m², is estimated at Birr 16.60 million of which 10% or Birr 1,660,800 will be paid in advance. The remaining Birr 14.94 million will be paid in equal installments with in 28 years i.e. Birr 533,829 annually.

VI. MANPOWER AND TRAINING REQUIREMENT

A. MANPOWER REQUIREMENT

Table 6.1 below, shows the list of manpower required along with annual labour cost. Total manpower needed, including skilled and unskilled labour is 27 persons.

Table 6.1
MANPOWER REQUIREMENT & LABOUR COST (BIRR)

Sr. No.	Position	Req. No.	Monthly Salary	Annual Salary
1	General Manager	1	3000	36,000
2	Production & Technical Manager	1	2,500	30,000
3	Commercial Manager	1	2,500	30,000
4	Administration & Financial Manager	1	2,500	30,000
5	Skilled Worker / Operator	6	3,600	43,200
6	Production Supervisor	1	1,000	12,000
7	Mechanic	1	600	7,200
8	Electrician	1	600	7,200
9	Accountant	1	1500	18,000
10	Sales Person	1	1500	18,000
11	Purchaser	1	1500	18,000
12	Secretary	1	900	10,800
13	Clerk	1	500	6,000
14	Store keeper	1	600	7,200
15	Unskilled worker	4	1,400	16,800
16	Guard	2	700	8,400
17	Sub Total	27		298,800
18	Employee Benefit: 25% of Basic Salary	-		74,700
19	Grand Total	27		373,500

B. TRAINING REQUIREMENT

It is proposed that an on-site training shall be organized for the production & technical manager, production workers, and maintenance crew. The training should focus on the operation of machinery, production process and product quality control. The session can be organized during commissioning and performance testing of the plant as part of the package for know-how to be transferred by the technology supplier. Cost of training of such nature is estimated at about Birr 50,000.

VII. FINANCIAL ANALYSIS

The financial analysis of the laminated leather belting 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	8.5%
Discount cash flow	8.5%
Accounts receivable	30 days
Raw material local	30 days
Raw material foreign	90 days
Work in progress	1 days
Finished products	30 days
Cash in hand	5 days
Accounts payable	30 days
Repair and maintenance	5% of machinery cost

A. TOTAL INITIAL INVESTMENT COST

The total investment cost of the project including working capital is estimated at Birr 7.19 million, of which 41 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 ('000 Birr)

Sr. No.	Cost Items	Local Cost	Foreign Cost	Total Cost
1	Land lease value	1,660.80	-	1,660.80
2	Building and Civil Work	920.00	-	920.00
3	Plant Machinery and Equipment	525.00	2,975.00	3,500.00
4	Office Furniture and Equipment	100.00	-	100.00
5	Vehicle	450.00	-	450.00
6	Pre-production Expenditure*	505.99	-	505.99
7	Working Capital	54.13	-	54.13
	Total Investment cost	4,215.92	2,975.00	7,190.92

* *N.B Pre-production expenditure includes interest during construction (Birr 355.99 thousand), training (Birr 50,000) and Birr 100 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 1.67 million (see Table 7.2). The raw material cost accounts for 17.04 per cent of the production cost. The other major components of the production cost are depreciation , financial cost and direct labour which account for 31.43 %, 18.58% and 10.71 %

respectively. The remaining 20.85 % is the share of repair and maintenance, labour overhead, financial cost and other administration cost.

Table 7.2

ANNUAL PRODUCTION COST AT FULL CAPACITY ('000 BIRR)

Items	Cost	%
Raw Material and Inputs	285.21	17.04
Utilities	3.07	0.18
Maintenance and repair	175.00	10.46
Labour direct	179.28	10.71
Labour overheads	74.70	4.46
Administration Costs	119.52	7.14
Land lease cost	-	-
Total Operating Costs	836.78	50.00
Depreciation	526.00	31.43
Cost of Finance	310.94	18.58
Total Production Cost	1,673.72	100

C. FINANCIAL EVALUATION

1. Profitability

Based on the projected profit and loss statement, the project will generate a profit throughout its operation life. Annual net profit after tax will grow from Birr 341.43 thousand to Birr 739.17 thousand during the life of the project. Moreover, at the end of the project life the accumulated cash flow amounts to Birr 9.18 million.

2. Ratios

In financial analysis financial ratios and efficiency ratios are used as an index or yardstick for evaluating the financial position of a firm. It is also an indicator for the strength and

weakness of the firm or a project. Using the year-end balance sheet figures and other relevant data, the most important ratios such as return on sales which is computed by dividing net income by revenue, return on assets (operating income divided by assets), return on equity (net profit divided by equity) and return on total investment (net profit plus interest divided by total investment) has been carried out over the period of the project life and all the results are found to be satisfactory.

3. Break-even Analysis

The break-even analysis establishes a relationship between operation costs and revenues. It indicates the level at which costs and revenue are in equilibrium. To this end, 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.

$$\text{BE} = \frac{\text{Fixed Cost}}{\text{Sales} - \text{Variable Cost}} = 32 \%$$

4. Payback Period

The pay back period, also called pay – off period is defined as the period required to recover the original investment outlay through the accumulated net cash flows earned by the project. Accordingly, based on the projected cash flow it is estimated that the project's initial investment will be fully recovered within 5 years.

5. Internal Rate of Return

The internal rate of return (IRR) is the annualized effective compounded return rate that can be earned on the invested capital, i.e., the yield on the investment. Put another way, the internal rate of return for an investment is the discount rate that makes the net present value of the investment's income stream total to zero. It is an indicator of the efficiency or

quality of an investment. A project is a good investment proposition if its IRR is greater than the rate of return that could be earned by alternate investments or putting the money in a bank account. Accordingly, the IRR of this project is computed to be 19.35 % indicating the viability of the project.

6. Net Present Value

Net present value (NPV) is defined as the total present (discounted) value of a time series of cash flows. NPV aggregates cash flows that occur during different periods of time during the life of a project into a common measuring unit i.e. present value. It is a standard method for using the time value of money to appraise long-term projects. NPV is an indicator of how much value an investment or project adds to the capital invested. In principle a project is accepted if the NPV is non-negative.

Accordingly, the net present value of the project at 8.5% discount rate is found to be Birr 4.02 million which is acceptable.

D. ECONOMIC BENEFITS

The project can create employment for 27 persons. In addition to supply of the domestic needs, the project will generate Birr 2.14 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. The project has backward and forward linkage effects with the manufacturing sector.