

# **PROFILE ON OF PARQUET PANELS OF WOOD**

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<b>I. SUMMARY</b>	

This profile envisages the establishment of a plant for the production of parquet panels of wood with a capacity of 300 tonnes per annum. Parquet panels of wood are pieces of wood used for flooring ceilings and other decoration purposes with different geometrical patterns composed of individual wood slates held in places by mechanical fastening or an adhesive.

Basic raw material required is well seasoned log of wood that can be obtained locally.

The present demand for the proposed product is estimated at 192 tonnes per annum. The demand is expected to reach at 415 tonnes by the year 2017 .

The total investment requirement is estimated at Birr 8.71 million, out of which Birr 447.50 thousand is required for plant and machinery. The plant will create employment opportunities for 24 persons.

The project is financially viable with an internal rate of return (IRR) of 15.36 % and a net present value (NPV) of Birr 2.21 million, discounted at 8.5%.

The project has forward linkage effects with construction sector. 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**

Parquet panels of wood are pieces of wood used for flooring, ceilings and other decorations purposes with different geometrical patterns composed of individual wood slates held in places by mechanical fastening or an adhesive. Their demand is met through imports.

## **III. MARKET STUDY AND PLANT CAPACITY**

## A. MARKET STUDY

### 1. Past Supply and Present Demand

A wide variety of materials are used in modern floors. Parquet panels of wood are one of the decorative floor coverings. Wood floor covering is still extensively used in residences, especially as parquets (short, hard pieces of wood assembled in geometric patterns). Wood tiles and fabricated parquets can easily be installed on existing floors.

The demand for parquet panels of wood is met both from domestic production and imports. However, there is no official statistics on how much quantity is produced locally. As a result, the import data obtained from the Customs Authority is utilized to estimate the unsatisfied demand (see Table 3.1).

**Table 3.1**  
**IMPORT OF PARQUET PANELS OF WOOD ( TONNES)**

<b>Year</b>	<b>Imported Quantity</b>
2000	5.5
2001	27.9
2002	6.0
2003	23.4
2004	28.5
2005	201.5
2006	154.8

*Source:- Customs Authority.*

Table 3.1 reveals that imported quantity of parquet panels of wood has been generally increasing in the past seven years although there is some fluctuation from year to year. The yearly average level of import during the period 2000- 2002 was about 13 tonnes and

increased to about 26 tonnes during the period 2003 - 2004. A substantial increase of import is registered during the recent two years, i.e., 2005 - 2006. During this period the annual average has reached to a level of about 178 tonnes. This huge increase is believed to be a result of the boom in the building construction sector. Assuming the construction sector to continue as in the past few years, the current unsatisfied demand is estimated at 192 tonnes.

## 2. Projected Demand

The demand for parquet panels of wood is directly related with the construction of modern buildings. The construction sector in the past few years has been growing at a rate 8.5%. Assuming an 8% growth rate to be achieved in the future, the projected unsatisfied demand for parquet panels of wood is shown in Table 3.2.

**Table 3.2**  
**PROJECTED UNSATISFIED DEMAND (TONNES)**

<b>Year</b>	<b>Projected Demand</b>
2008	207
2009	224
2010	242
2011	261
2012	282
2013	305
2014	329
2015	355
2016	384
2017	415

Demand for parquets panels of wood will increase from 207 tonnes in the year 2008 to 282 tonnes and 415 tonnes by the year 2010 and 2017, respectively.

### **3. Pricing and Distribution**

Taking the current CIF price of imported parquets and allowing 30% for various charges, the recommend factory-gate price is Birr 9,750 per tonne. Distribution of parquet panels of wood be handled through direct delivery to major building construction companies.

## **B. PLANT CAPACITY AND PRODUCTION PROGRAMME**

### **1. Plant Capacity**

The market study for parquet panels presented above indicates that demand of the product in 2009 will be 224 tonnes. This figure will grow to 453 tonnes in 2018. Accordingly, the envisaged parquet panel plant will have annual production capacity of 300 tonnes. The parquet panel plant will produce average –sized grooved parquet (360 x 60x 22mm) with tongued and grooved blocks (for left –hand and right –hand use), skirting board and fitting pieces. The plant will operate single shift of 8 hours a day and 300 days a year.

### **2. Production Programme**

Production will start at lower level of plant capacity. Thus, during the first year the plant will operate at 75% of capacity, and then will raise its production to 85% and 100% in the 2<sup>nd</sup> and 3<sup>rd</sup> year, respectively. Table 3.3 shows production programme.

**Table 3.3**  
**PRODUCTION PROGRAM**

<b>Year</b>	<b>1<sup>st</sup></b>	<b>2<sup>nd</sup></b>	<b>3<sup>rd</sup> and above</b>
Capacity utilization (%)	75	85	100
Production (tonnes)	225	255	300

#### **IV. MATERIALS AND INPUTS**

##### **A. RAW AND AUXILIARY MATERIALS**

The major raw material is wood of oak or other tree. This wood can be sourced from natural forests found in different regions of the country such as Sheka zone of SNNPRS.

Auxiliary materials consist of machine oil, soldering brass, abrasive disks and other additional materials which are all locally available. Annual requirements of raw and auxiliary materials with related costs are shown in Table 4.1 below.

**Table 4.1**

**RAW AND AUXILIARY MATERIALS REQUIREMENT AND COST**

<b>Sr. No.</b>	<b>Description</b>	<b>Qty</b>	<b>Cost ('000 Birr)</b>
	<b><u>A. Raw Material</u></b>		
1	Wood (oak, etc)	300	646.5
	<b>Sub-total</b>		<b>646.5</b>
	<b><u>B. Auxiliary Materials</u></b>		
1	Machine oil (litres)	2,250	247.5
2	Soldering brass	Req	9
3	Abrasive disks	Req	15
4	Other additional materials		7.5
	<b>Sub-total</b>		<b>279</b>
	<b>Total</b>		<b>925.5</b>

## **B. UTILITIES**

Electricity and water are utilities required for parquet panel plant. A total of 48,000 kWh electrical energy is required for one year production. Water is also required by the plant for drinking and other general purposes. Annual water requirement is estimated to be 500 m<sup>3</sup>. The annual requirements of these utilities with their cost are indicated in Table 4.2.

**Table 4.2**  
**UTILITIES REQUIREMENT AND COST**

<b>Description</b>	<b>Qty.</b>	<b>Cost '000 Birr)</b>
Electricity, kWh	48,000	22.73
Water, m <sup>3</sup>	500	1.62
<b>Total</b>		<b>24.35</b>

## **V. TECHNOLOGY AND ENGINEERING**

### **A. TECHNOLOGY**



## **1. Production Process**

The manufacturing process consists of four stages, namely:-

- a) Raw material preparation and sorting
- b) Machining stage
- c) The surface treatment stage
- d) The sorting stage

The raw material, usually oak wood, is first prepared and made ready for machining. Sorting is done in order to discriminate those timber parts that do not suit the preparation of parquet panels.

In the machining stage, the basic materials are prepared and machined to become finished products. In the production department, basic wood work machinery of good type will be installed, suitable for carrying out all the necessary operations.

The machined wood parts pass to the surface treatment stage where they are impregnated.

In the sorting section, the pieces are checked and sorted according to quality. They are then wrapped 940 pieces (equivalent to 1 m<sup>2</sup>) in the packing section. The packages are taken from there to the final storage area. The production process does not have any adverse impact on environment since the only waste to be generated is wood file (segatura) and this is also used for energy source in households.

## **2. Source of Technology**

Machinery and equipment supplier address for parquet panels production is given below.

Mehtap As

TURKEY

Tel: 00903523212910

Fax: 00903523 212915

<http://www.beypan.com.tr>

## **B. ENGINEERING**

### **1. Machinery and Equipment**

Production of parquet for panels requires conventional wood working machines. The details of wood working machines and required tools are indicated in Table 5.1 below.

**Table 5.1**

**MACHINERY AND EQUIPMENT REQUIREMENT AND COST**

Sr.	Description	Qty.	Cost ('000 Birr)
-----	-------------	------	------------------

No.					
			LC	FC	TC
1	Planing and thickening machine	3	-	105	105
2	Circular saw	2	-	33	33
3	Band saw	2	-	49	49
4	Wood lathe	3	-	72	72
5	Belt sander (stationary)	2	-	23	23
6	Belt sander (portable)	2		12	12
7	Drilling machine (fixed type)	2		15	15
8	Band saw blade welder	2		42	42
9	Work benches	5	4	-	4
10	Planing knife and tool grinder	2	-	2.5	2.5
11	Various types of tools for wood shop: folding rule, steel tape rule, marking gauge, try square, divider, different types of hand saw and saw frames.	As req	-	10	10
12	Other inputs like wood varnish, sand paper, etc	As req	-	5	5
	FOB price		4	375	378
	Freight, insurance bank, materials handling	-	75	-	75
	<b>CIF Landed Cost</b>	-	<b>79</b>	<b>368.5</b>	<b>447.5</b>

## **2. Land, Building and Civil Works**

The total area requirement of the Project is 2,000 sq mt, from this space 1,200 sq mt can be used for construction of buildings to house the machinery(750m<sup>2</sup>), the store for raw and finished material(350m<sup>2</sup>) and office(100m<sup>2</sup>). The building cost at 2,300 /sq mt is estimated at Birr 2,760,000.

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 below 5000 m<sup>2</sup> 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 m<sup>2</sup> 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 /m<sup>2</sup> in Akakai-Kalti and Birr 341/ m<sup>2</sup> in Lebu and recently the city's Investment Agency has proposed a lease price of Birr 346 per m<sup>2</sup> 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 this profile, which is a manufacturing project a land lease rate of Birr 346 per m<sup>2</sup> 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 criteria 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**

<b>Scored Point</b>	<b>Grace Period</b>	<b>Payment Completion Period</b>	<b>Down Payment</b>
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 m<sup>2</sup>, is estimated at Birr 41.52 million of which 10% or Birr 4,152,000 will be paid in advance. The remaining Birr 37.37 million will be paid in equal installments with in 28 years, i.e., Birr 1,334,571 annually.

## **VI. MANPOWER & TRAINING REQUIREMENT**

### **A. MANPOWER REQUIREMENT**

The envisaged plant requires 24 work forces. The details of manpower for parquet flooring plant with related monthly salaries and annual wages is shown in Table 6.1.

**Table 6.1**  
**MANPOWER REQUIREMENT AND LABOUR COST (BIRR)**

<b>Sr. No.</b>	<b>Job Title</b>	<b>Req. No.</b>	<b>Monthly Salary</b>	<b>Annual Expenditure</b>
	<b><u>A. Administration</u></b>			
1	Plant manager	1	3,000	36,000
2	Secretary	1	900	10,800
3	Accountant	1	1,200	14,400
4	Clerk	1	500	6,000
5	Cashier	1	600	7,200
6	Time keeper	1	500	6,000
7	General services	4	1,400	16,800
8	Sales man	1	1,200	14,400
9	Store man	1	700	8,400
	<b>Sub total</b>	<b>12</b>	<b>-</b>	<b>120,000</b>
	<b><u>B. Production</u></b>			
1	Production foreman	2	1,800	21,600
2	Skilled workers	3	1,800	21,600
3	Semiskilled workers	5	2,250	27,000
5	Technician	2	1,200	14,400
	<b>Sub total</b>	<b>12</b>	<b>-</b>	<b>84,600</b>
	Workers' benefit (25% BS)	-	-	51,150
	<b>Total</b>	<b>24</b>	<b>-</b>	<b>255,750</b>

## B. TRAINING REQUIREMENT

Training of production workers and production foreman will be carried out for a period of two weeks. Total training expenditure will be Birr 15,000.

## VII. FINANCIAL ANALYSIS

The financial analysis of the parquet panels 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
Work in progress	2 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 8.71 million, of which 4% is 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)**

<b>Sr. No.</b>	<b>Cost Items</b>	<b>Local Cost</b>	<b>Foreign Cost</b>	<b>Total Cost</b>
1	Land lease value	4,152.00	-	4,152.00
2	Building and Civil Work	2,760.00	-	2,760.00
3	Plant Machinery and Equipment	79.0	368.50	447.50
4	Office Furniture and Equipment	100.00	-	100.00
5	Vehicle	450.00	-	450.00
6	Pre-production Expenditure*	639.13	-	639.13
7	Working Capital	167.82	-	167.82
	<b>Total Investment cost</b>	<b>8,347.95</b>	<b>368.50</b>	<b>8,716.45</b>

\* *N.B Pre-production expenditure includes interest during construction ( 524.13 thousand, training ( Birr 15 thousand) 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 1.95 million (see Table 7.2). The raw material cost accounts for 47.28 per cent of the production cost. The other major components of the production cost are cost of finance, depreciation and direct labour which account for 19.94 %, 15.98% and 6.92% respectively. The remaining 9.88 % is the share of repair and maintenance, utility cost and other administration cost.

**Table 7.2****ANNUAL PRODUCTION COST AT FULL CAPACITY ('000 BIRR)**

<b>Items</b>	<b>Cost</b>	<b>%</b>
Raw Material and Inputs	925.50	47.28
Utilities	24.36	1.24
Maintenance and repair	22.38	1.14
Labour direct	135.45	6.92
Labour overheads	56.44	2.88
Administration Costs	90.30	4.61
Land lease cost	-	-
<b>Total Operating Costs</b>	<b>1,254.43</b>	<b>64.09</b>
Depreciation	312.75	15.98
Cost of Finance	390.23	19.94
<b>Total Production Cost</b>	<b>1,957.41</b>	<b>100</b>

**C. FINANCIAL EVALUATION****1. Profitability**

Based on the projected profit and loss statement, the project will generate a profit through out its operation life. Annual net profit after tax will grow from Birr 419.89 thousand to Birr 1.03 million during the life of the project. Moreover, at the end of the project life the accumulated cash flow amounts to Birr 10.45 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.

$$\text{BE} = \frac{\text{Fixed Cost}}{\text{Sales} - \text{Variable Cost}} = 29 \%$$

### **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 6 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 15.36 % 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 2.21 million which is acceptable.

## **D. ECONOMIC BENEFITS**

The project can create employment for 24 persons. In addition to supply of the domestic needs, the project will generate Birr 2.62 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 forward linkage effect with construction sector.