

**PROJECT PROFILE
ON
COIR PITH BLOCK**

**MONTH & YEAR
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COIR PITH BLOCK

A. INTRODUCTION

Coir is the outside layer of husk that surrounds the shell of the coconut. It consists mainly of fibres, which have traditionally been used to manufacture rope, carpets, doormats, upholstery stuffing, brushes etc. Between these fibres is the corky substance called coir pith or coir dust, which has recently been widely recognised as the superior growing medium in which to grow vegetables, flowers and many other crops. The horticulture industry often calls this substrate coco-peat or coir-peat. Sometimes it is known by similar sounding brand names.

Coir maintains excellent air porosity even when saturated and gives better crops with faster developing roots and more flowers and fruit per plant when used correctly. These results are particularly marked with tomato and rose crops.

B. PRODUCT USES AND SPECIFICATIONS

Coir industry is one of the important traditional cottage industries widely spread over South India.

In the process of extraction of coir fibre from husk, generally about 1/3rd of it is obtained as fibre and 2/3rd of it is obtained as coir pith. Coir pith with a range of interesting properties finds various applications. Coir pith has a high lignin (31%) and cellulose (27 %) content and a carbon-nitrogen (C/N) ratio of 104: 1. (Shekar, 1999). Coir pith also has a very high water holding capacity of 5 to 6 times its weight. It should be noted that coir pith is very stable because of the presence of high percentage of lignin. Hence coir pith left to itself takes decades to decompose. Studies by various institutions have resulted in methods to speed up the process of decomposition (lignin reduction) by fungal/microbial culture. The decomposing or composting of Coir pith is done

near agriculture fields, in heaps generally by the Pleurotus sojarcaju species an edible mushroom, which takes around 35-45 days. Composted Coir pith is used along with organic supplements in crop fields in horticulture and floriculture. It is also used as a rooting and growing medium for certain ornamental flowering plants. Decomposed coir pith is also used as hydroponics systems for growing roses and vegetables under controlled conditions. The coir pith in sterilized condition finds use in mushroom cultivation and floriculture. The coir pith also finds application as an alternative for 'Peat Moss' the extraction of which has been banned in most of the European countries .It also finds application as a mulching material for grape vine.

Coir pith has a calorific value of 3975 k cal/kg, close to 4200 k cal/kg of coal. It can also be used as fuel briquettes with the ash content almost 1/10th of coal. A proper methodology or technology for briquetting coir pith is developed for manufacturing a commercially viable product.

Excellent Water Retention

Coir has better water retention qualities than peat and other growing media. This has obvious advantages in dry climates or at times when plants cannot be watered frequently such as in transit to market.

Quickly Reabsorbs Water From Dry State

Coir peat absorbs moisture immediately, even from a dry state, unlike sphagnum peat which tends to shrink when dry and form a crust. This causes water run-off from the top surface and water loss between the peat and the inside edge of the flower pot. Thus plants growing in coir tend to recover quicker from dry conditions.

Irrigation Efficiency

The ease of re-wetting and the quick drainage characteristics of coir means that coir needs to be irrigated less frequently and for shorter periods. This leads to reduced leaching losses of nutrients and lower water use.

Faster Germination Times And Quicker Seedling Rotations

The inherent qualities of coir and the optimum water/air availability are ideal for quick rooting and propagation. In many cases this leads to more seedling rotations per year and more efficient use of greenhouse equipment.

Environmentally preferable to the alternatives

In its unprocessed state, coir dust is a waste product in its country of origin. Its use therefore, does not involve the destruction of peat bogs and natural wetland wildlife habitat. It is a renewable resource with no hazardous disposal problems (unlike some alternatives such as rock wool). Having carefully researched the question, Horticultural Coir Ltd is quite satisfied that the fossil fuel consumption associated with the transport of coir from Asia are no greater, and most likely significantly less than the fuel costs involved in the production and transport of peat-moss and rock-wool. Coir is transported in a compressed compact state on scheduled vessels.

Degrades Slower Than Many of Its Rivals

The lignin content of around 45% ensures that the excellent water/air ratio is maintained over a longer period of time. Thus, for example, good performance is maintained over the commercial life of a rose plant which may be over 5 years.

Free from soil Diseases

Because Coir originates above ground, it does not contain any soil diseases. In fact several studies have indicated that coir substrate brings increased resistance to *pythium* and other root diseases.

COIR PITH : PHYSICAL PROPERTIES:

- Good water retention
- Increased aeration
- Quick wetability
- A solid potting medium and substratum for plants.

COIR PITH BLOCKS :

- 650 Grams Block
- 5 Kilo Block

CHEMICAL PROPERTIES:

- 100% Organic
- Holds water seven times it's weight.
- Contains natural rooting hormones.
- a pH of 5.2 to 6.8 ideal for plant growth.
- EC not more than 500 (us/cm)

Quality Standards for Cocopeat & cut fibre

Chemical (1 to 1.5 volume extraction methods with water)	PH H ₂ O < 7.0 EC < 0.5 mS/cm	
Physical	Moisture content 75% to 80% Organic Matter content > 90%	
Phytosanitary	Only safe materials free of germinative seeds and disease germs can be used.	

	During intermediary storage, no contamination may occur.	
General	The material may not be contaminated with radio active material	

Some of the specifications of products which are marketed

PRODUCT : COIR PITH BLOCKS (COCO FIBRE DUST)

WEIGHT : 5 Kilograms

SIZE : 30 * 30 * 12 cm

EC(1: 1.5 method) : <0.5

PH: 6.5

<1.0

<1.5

<2.0

<2.5

<5.0

EXPANSION : 17 Liters per Kg

MESH : 5 mm OR 10 mm

GROW BAG SLAB SIZE : 105*13*1.5 cm After Expansion 110*14*8 cm

GROW BAG WEIGHT : 1.150 Kg

BRICKS	WEIGHT	:	0.650	Kg
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BRICKS	SIZE	:	20*10*6	cm
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Blocks of size 30x20x2,5.

EC : below 0,5 mhos/cm

pH : 5,5 to 6,5

moisture: below 18%

compression ratio : 1:5

Item Name	1	2	3	4
Block Specifications:				
Block Dimensions (cm)	30x30x15	30x30x15	30x30x15	30x30x15
Block Weight (Kgs approx)	5	5	5	5
Compression Ratio	5:1	5:1	5:1	5:1
Re-hydrated Yield (litres)	60	60	60	55
Grade Analysis:				
Air Filled Porosity (%)'	20.6	12.8	36.4	65.8
Water Holding Capacity (%)	58.4	67.2	53.1	23
Electrical Conductivity (mS/cm)	<0.7	<0.7	<0.7	<0.9
pH	5.8-6.4	5.8-6.4	5.8-6.4	5.8-6.4

Shipping Specifications:

Blocks 40' FCL (palletised)	5120	5120	5120	5120
MT per 40'	25.6	25.6	25.6	25.6
Blocks per pallet	256	256	256	256
Blocks 20' FCL (Loose loaded)	2000	2000	2000	2000
MT per 20'	10	10	10	10

C. MARKET POTENTIAL

Growing awareness abroad, of late, about the coir pith as an excellent alternative for recycling with farming system has pushed up its demand. Incorporating coir pith improves its structure and physical properties of soil.

The advantage of Coir Pith is that it absorbs water in its range of 400-600 per cent of its weight and releases it to soil very slowly.

Besides application of 10 tonnes of Coir Pith per hectare is an effective ameliorative measure against saline and alkaline reactions of soil.

It is abundantly available as it forms 70 % of the weight of the coconut husk.

The increase in the export of this product has proved that the promotional activities of it overseas have yielded positive results.

It is now extensively used in horticultural and for manufacturing manure.

The Netherlands has become major importer of Coir Pith manure. The other main exporters are Australia, UK, US and New Zealand.

The Export of Coir Pith for the past 6 years:

Year	MT	Rs In Crores
2003-04	29179	19.76
2004-05	40027	28.34
2006-07	67153	54.00
2007-08	83613	63.85
2008-09	96996	64.62
2009-10	131917	123.47

Coir Dust

Coir dust consist of short fibers (2mm or less) and pith (dust), which are left behind after processing of coconut husk. Coir dust accumulates in large numbers outside the mills, which process the husk for extraction of industrially valuable long fibers. It is estimated that there is accumulation of one million ton of coir pith in the coconut growing states in our country. The high lignin and cellulose content in the pith makes it non-biodegradable. When burnt, it smoulders, emitting large quantity of smoke for several days causing air pollution. With the help of Bio-Technology Coir dust coir dust could be converted to useful organic manure which has application in agriculture and horticulture industry.

The product obtained after bio-conversion has excellent properties of being used as growing medium especially in soil- less containers for growing high value horticulture crops. Several companies in the Netherlands have in fact been using coconut coir dust in most of their plant production media since 1980s.

D. TECHNICAL ASPECTS

1. INSTALLED CAPACITY

The installed capacity of the proposed unit is manufacturing of 8MTs of Coir pith blocks per day and 4.32 MTs of Grow bags per day on two shift basis of 8 hours per shift. The annual production capacity will be 2400 MTs of Coir pith blocks and 1296 MTs of grow bags , assuming 300 working days for the year.

2. PLANT AND MACHINERY

The following are the machineries required for the project.

S.No	Items of machinery	Qty-nos	Value Rs.lakhs
1	Rotary Sieving machine	1	2.00
2	Compacting machine	1	8.50
3	Grow bag machine	1	13.00
	Laboratory equipments		0.30
	Electrical installations		1.20
	Vehicles for material handling- JCB and Tipper lorries		25.00
	Total		50.00

3. MANUFACTURING PROCESS

The process of manufacturing coir pith blocks involves the following sequence of operations

The coir pith completely free from seeds, weeds and other foreign particles and brought to the factory. The processed coco peat from coconut fibre factory consists of 10 to 20 percent baby fibres V

The incoming material is checked for EC and Ph values to maintain its purity.

V

The material is passed to sieving machine. The processed coco peat from coconut fibre factory consists of 10 to 20 percent baby fibres.

A specially designed rotary sieving machine with a quarter inch mesh is used for effective removal of baby fibre from coconut pith V

The Raw Material is washed with fresh water to reduce the EC level

Input material EC 3 to ms/cm

Output material EC <0.5 ms/cm V

The sieved material is sent to squeezing machine to remove excess water V

The sieved material is dried to bring down the moisture to 15%.a specially designed drying plat form is used to dry to 15% moisture which is essential for binding during compaction.V

The dried powder is compressed into blocks or grows bags

Block size 30X30X10 cm

Grow slab 120X20X3 cm

TECHNOLOGY

The technology for the manufacturing coconut pith blocks are universally adopted process as mentioned above. An experienced person worked in the similar units manufacturing coconut pith blocks may be able to provide the technology. Alternatively the supplier of equipments such as Essar Engineers and Universal Electro Hydraulicks, Coimbatore are able to provide the technology. In this regard Coir Board and Central Institute of Coir Technology would be of assistance M/s Universal Electro Hydraulicks, Coimbatore had supplied machinery along with manufacturing technology to various units in Tamilnadu and other places and they are one of the forerunner in providing the technology also. The central Institute of Coir Technology (CICT),Peenya Industrial Area,Bangalore-560058 (Phone No:080-28394875) is also providing training to intending entrepreneurs who would like to set up Coir pith block making units.

4. RAW MATERIAL

The raw material requirement for the project is the good quality coir pith at reasonable prices. This can be collected from the de-fibering units. The cost of the coir pith landed cost can be around Rs.700.00 per MT. For calculation purpose the cost per MT is assumed at Rs.500.00 per MT.

5. LAND & BUILDING

Land area required 2 acres cost Rs.20.00 lakhs

Building area required 5000 sq.ft cost Rs.35.00 lakhs

6. UTILITIES

Power:

The total power requirement of the unit will be 36 HP

Water:

Water is required only for human consumption.

Man power:

Manager	1	12000	12000
Supervisor	1	9000	9000
Skilled workers	8	7000	56000
Unskilled	60	5000	300000
Accountant	1	6000	6000
Security	3	5000	15000
			<hr/>
			398000
			<hr/>
		Add Benefits	79600
			477600
			57.31

7. IMPLEMENTATION SCHEDULE

If financing arrangement is made available the project can be implemented with in six month's period.

8. ASSUMPTIONS

Installed capacity	10 MTs of Coir pith Blocks (5kgs Blocks) per day-3000 MTs per annum on double shift basis-8 hours per shift -300 days per annum 4 MTS of Coir pith Grow bags per day-1200 MTs annum on double shift basis-8 hours per shift -300 days per annum
Capacity utilisation	Year-1-50% Year-2-60% Year-3-70% Year-4 onwards-80%
Selling price	Coir pith Blocks-Rs. 8500 per MT Coir pith grow bags-Rs. 9500 per MT
Raw materials	Rs. 700 per MT
Consumables –packing charges	Rs. 300 per MT
Power charges	Rs. 6.60 lakhs per annum Fuel Rs 9.00 lakhs per annum.
Wages and salaries	Rs. 57.31 lakhs per annum
Other manufacturing expenses-Repairs and maintenance	Rs 1.20 lakhs per annum
Depreciation	Written down value method
Selling general and administrative expenses	Rs 6.00 lakhs per annum(Rs. 50000 per month) with 5 % increase annually

Interest on Term loan	14% per annum
Interest on working capital	14 % per annum
Income tax	34 % on taxable income

LIST OF MACHINERY SUPPLIERS

1. Universal Electro Hydraulicks
378, Varatharaj Lay-out No.1,
P.N. Palayam Road, Ganapathy Post,
Coimbatore – 641006.

2.Essar Engineers
519/1A, Athipalayam Road,
Chinnavedampatti (Post)
Coimbatore - 641 006,

3.Sukumar Welding Works
Velliangiripudur
Arachalur-638 101
Erode District.

4. 24 Sakthi engineering works
9/1 Sakthi Co-op. Industrial Estate
Udumulpet Road
Pollachi.

LIST OF RAW MATERIAL SUPPLIERS

The raw material coconut pith can be collected from local coconut growing centres, coir factories, coconut oil expelling centres.

Rs. lakhs

COST OF PROJECT

Land & site development	20.00
Building	35.00
Plant& machinery	50.00
Process know-how	1.00
Other Miscellaneous Assets	5.00
Preliminary and pre-opExpenses	10.00
Margin for working capital	11.43
TOTAL	<u>132.43</u>

MEANS OF FINANCE

Promoters' capital	53.43
Term Loan	79.00
Total	<u>132.43</u>

COST OF PRODUCTION AND PROFITABILITY STATEMENT

Years	1	2	3
Installed Capacity-MTs			
Coir Pith Blocks	4800	4800	4800
Grower bags	1200	1200	1200
Utilisation	60%	70%	80%
Production -MTs			
Coir Pith Blocks	2880	3360	3840
Grower bags	720	840	960
SALES	300.69	370.21	416.64
COST OF PRODUCTION			
Raw materials	126.00	147.00	168.00

Consumables	54.00	63.00	72.00
Power	3.96	4.62	5.28
Wages & Salaries	57.31	60.18	63.18
Other Mfg. Expenses	1.20	1.26	1.30
Depreciation	11.78	10.22	8.87
	<hr/>	<hr/>	<hr/>
	254.25	286.28	318.63
Add:Opening stock in process	0.00	0.00	0.00
	<hr/>	<hr/>	<hr/>
	254.25	286.28	318.63
Less:Closing stock in process	0.00	0.00	0.00
	<hr/>	<hr/>	<hr/>
Total cost of production	254.25	286.28	318.63
Add:Opening Stock finished goods	0.00	5.18	5.94
	<hr/>	<hr/>	<hr/>
	254.25	291.46	324.57
Less:Closing stock finished goods	5.18	5.94	6.61
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Total cost of Sales	249.07	285.52	317.96
General &Admn. Expenses	6.00	6.30	6.49
Selling Expenses	3.01	3.70	4.17
Interest on Term Loan	11.06	10.32	8.39
Interest on WC	4.34	4.34	4.34
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Total cost including administrative cost	273.48	310.18	341.35
Operative profit	27.21	60.03	75.29
Taxation	9.16	20.21	25.34
Net profit	18.05	39.82	49.95
Add: Depreciation	11.78	10.22	8.87
Total Cash accruals	29.83	50.04	58.82

ASSESSMENT OF WORKING CAPITAL

	Total	Margin %	Amount	Annexure Rs. Lakhs Bank Finance
Raw Materials	1	10.50	25%	2.63 7.88
Consumables	3	13.50	25%	3.38 10.13
Stock in process	0	0.00	25%	0.00 0.00
Finished Goods	0.25	5.18	25%	1.30 3.89
Debtors	0.50	12.53	25%	3.13 9.40
Other Expenses		1.00	100%	1.00
		42.71		11.43 31.28
			Say	31.00

CALCULATION OF BREAK EVEN LEVEL

Year	1	2	3
Capacity utilisation	60%	70%	80%
Sales	300.69	370.21	416.64
Less variable Expenses			
Raw material	126.00	147.00	168.00
Consumables	54.00	63.00	72.00
Power	3.96	4.62	5.28
Interest on Working capital	4.34	4.34	4.34
Selling expenses	3.01	3.70	4.17
Sub total	191.31	222.66	253.79
Less variation in closing stock	5.18	0.76	0.67
Total variable cost	186.13	221.90	253.12

Contribution-C	114.56	148.31	163.52
Fixed costs			
Wages & Salaries	57.31	60.18	63.18
Other Mfg. Expenses	1.20	1.26	1.30
Depreciation	11.78	10.22	8.87
Selling, general & Admn. Expenses	6.00	6.30	6.49
Interest on Term Loan	11.06	10.32	8.39
Total fixed costs-FC	87.35	88.28	88.23
Profit Before Tax	27.22	60.03	75.29
BEP=FC/C*capacity utilisation	46%	42%	43%
Cash BEP=FC-Dep.*capcity utilstn	40%	37%	39%

FINANCIAL RATIOS

PAT/Sales	6%	11%	12%
PAT/ Capital	34%	75%	93%
PBIT/Gross Investment	23%	35%	35%