CASHEW PROCESS PLANT

On Turnkey basis

Sesha Sai, Best Engineering

Mövenpick Ambassador Hotel & Hotel Novotel
Accra, Ghana
16-19 September 2013
INTRODUCTION OF COMPANY

Manufacturer & Exporter of

- Herbal Extraction Plants
- Essential Oil Plants
- Food Processing Plants
- Renewable Energy Systems

On Turnkey Basis from 2005

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Exclusive work Shop for Cashew Machines

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Cashew Nut Processing System

Cashew Nut Process Plant On Turnkey Basis
Cashew Nut Processing System

1) Cashew Cooking System
2) Cashew Shelling System
3) Cashew Drying System
4) Cashew Peeling System
5) Cashew Grading System
6) Cashew Packing System
FLOW DIAGRAM FOR CASHEW NUT PROCESSING PLANT

1. Humidifier
2. Peeling
3. Separator (for separating cashew kernel and testa)
4. Working tables (for manual separating un peeled kernels)
5. Cashew kernel grader
6. Packing

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HYDERABAD  +919440344335

Customer:
Title: FLOW DIAGRAM FOR CASHEW NUT PROCESSING PLANT
Date: 24-06-2011  Rev No: 01

SCALE Drawn by: K.N. SRINIVAS

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Cashew process plant - Schematic layout

SCHEMATIC LAY OUT DRAWING FOR CASHEW PROCESSING PLANT
CAPACITY: 5000 KGS (INPUT RAW CASHEW)

11. ELECTRICAL OVEN 1NO
13. SLANTING CONVEYOR 1NO
15. SEPARATOR 2NOS
17. CONVEYOR TABLES 2NOS
19. GREADER 2NOS

12. HUMIDIFIER 1NO
14. PEELING MACHINES 3NOS
16. SLANTING CONVEYOR 1NO
18. SLANTING CONVEYOR 1NO
20. PACKING MACHINE 1SET

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Over All View OF Cashew nut Process Plant

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Raw Cashew Grading Machine with feeding

- Raw Cashew nuts are fedded in to Grader by Bucket elevator.
- To Grade Big, Average and small raw cashew nuts.
Raw Cashew nuts are fedded in to Cooker by Bucket elevator.

To Cook the raw cashew nuts.
To Cut the Cooked raw cashew nuts.

Shelled raw cashew nuts are carried on the horizontal conveyor.
Working Table with slant Conveyor

- Slant Conveyor is used to feed shelled raw cashew nuts on to the working table.
- Working table is used to scoop the cashew kernels from the shelled raw cashew nuts manually.
Tray Dryer

- To Dry the Kernels

Dryer

Trays
To Maintain Sufficient moisture level of unpeeled cashew kernels to reduce the broken percentage during peeling
PEELING MACHINE WITH FEEDING CONVEYOR

- Unpeeled raw cashew kernels are fed into the peeling machine by slant conveyor.

- To peel the unpeeled Cashew kernels.

COMPRESSOR

PEELING MACHINE

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Separator

- Peeled cashew kernels are feeded in to Separator Directly.

- It separates – Testa, Pieces and whole kernels.

Separator with Peeling machine

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Working Table with slant Conveyor

- Slant Conveyor is used to feed Peeled Kernels on to the working table.

- Working table is used to separate peeled & Unpeeled kernels manually.
Grading Machine with Slant Conveyor

- Slant Conveyor for feeding peeled kernels into the Grading machine
- In Grading Machine will have Six Grades

1) W - 180
2) W - 210
3) W - 240
4) W - 320
5) 2 pieces
6) Splits.

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Vacuum Packing Machine

- Used for Vacuum Packing of the Cashew Kernels with inert gas (Co$_2$ & N$_2$) Purging Facility

- 50 Lbs & 25 Lbs

Packing Machine

Packing Chambers

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WORKING TABLES

- Used for Peeling of Hard Skinned cashew Kernels manually

- Grading of cashew Kernels Manually.
<table>
<thead>
<tr>
<th>SL.</th>
<th>PRODUCT</th>
<th>SPECIFICATIONS</th>
<th>PURPOSE</th>
</tr>
</thead>
</table>
| 1.  | Raw Cashew Grader           | MOC: MS  
Capacity: 500 Kg/Hr, Drive: 3 + 2 H  
With Feeding conveyor  
Power required 5 HP | This machine is used to grade the raw cashew nuts based on its size (3 Sizes – Big Average & Small)  
Raw Cashew nuts are feed in to the grader using conveyor.                                                                                           |
| 2   | Conveyor and Hopper         | MOC: MS, Drive: 2 HP  
For Feeding to Cookers.  
Power required 2 HP | This conveyor is for feeding the raw cashew to the cookers.                                                                                                                                               |
| 3.  | a. STEAM COOKER             | To Cook the shells of 1000 Kg per batch in One Hour in two cookers of each 500kg.                                                                                                                                                  | This equipment is for cooking the raw cashew shells.                                                                                                                                                     |
|     | b. STEAM BOILER :           | Capacity: 200 Kg/Hr  
Pressure: 4 Kg/cm²  
With Diesel Fired Burner, Diesel Storage Tank, expansion tank & Control panel, Feed pump  
Power required 1.5 HP |                                                                                                                                                                                                           |
| 4.  | Conveyor                    | To carry the material after shell cutting.  
Length: 40 Feet  
Drive: 2 Hp  
Power required 2 HP | In our quotation we have quoted 18 machines. These 18 machines are arranged in two parallel lines of each 9 machines, in between this two lines we will arrange this conveyor to carry the shelled raw cashews (please refer the attached layout diagram) |
| 5.  | AUTOMATIC SHELL CUTTING MACHINES | Capacity:35 to 40 kg/hr  
Motor Power - 1.0 HP (Each machine)  
Number of cutters - 4Nos (Each Machine)  
All Parts in MS | This equipment is for cutting/shelling the raw cashew nuts.                                                                                                                                               |
| 6.  | Slant Conveyor              | Conveyor length:6feet  
With Cleats, Cleats made of SS 304, Mounted on MS legs, Drive 0.5 HP.                                                                                                                                             | Shelled raw cashews from the conveyor (Sl.no 4) will be transferred to Vibrator cum oscillator through this conveyor.                                                                                 |
<p>| | | |</p>
<table>
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</thead>
<tbody>
<tr>
<td><strong>7. VIBRATOR CUM OSCILLATOR:</strong></td>
<td>Capacity: 300-500 kg/hr&lt;br&gt;Power: 1 HP Oscillator: 1 HP Vibrator</td>
<td>This system is used after the cashew cutting / shelling. The cooked raw cashew after shelling is separated into empty shells, cashew kernels, uncut and half cut. Oscillator separates the removed cashew kernels easily. Vibrator separates the Uncut, half cut and empty Shells. With this system, lot of manual labor can be eliminated for sorting and makes the process easy and time efficient.</td>
</tr>
<tr>
<td><strong>8. Slant Conveyor</strong></td>
<td>Length: 6 Feet&lt;br&gt;Drive: 0.5 HP&lt;br&gt;MOC: MS&lt;br&gt;Power required: 0.5 HP</td>
<td>The output from the VIBRATOR CUM OSCILLATOR will be transferred to the working table through this conveyor.</td>
</tr>
<tr>
<td><strong>9. Working Table with Conveyor</strong></td>
<td>With Conveyor Length: 16 Feet&lt;br&gt;Drive: 1 HP&lt;br&gt;MOC: SS 304&lt;br&gt;Power required: 1 HP</td>
<td>This Working table is used for sorting and scooping the cashew kernels. i) <strong>Sorting:</strong> Sorting of free cashew kernels, waste/empty shells, half cuts and uncuts will not be 100% efficient in the VIBRATOR CUM OSCILLATOR, so the unsorted items will be sorted manually on this working table, while the unsorted items are passing through the conveyor on the working table. ii) <strong>Scooping of cashew Kernels</strong> All the shelled raw cashew nuts will be conveyed to this table. Generally after shelling most of the times kernels will not be free from the shell, so on this table with conveyor, shelled cashew nuts will be passing through conveyor. 12 people will be seating on this table, 6 each on either side of the table will scoop the kernels manually.</td>
</tr>
<tr>
<td><strong>10. Waste Shell carry Conveyor</strong></td>
<td>To carry Waste Shells Length: 24 Feet&lt;br&gt;Drive: 1 HP&lt;br&gt;MOC: MS&lt;br&gt;Power required: 1 HP</td>
<td>After separating the cashew kernels and the shells. Shells will be carried out using this conveyor.</td>
</tr>
</tbody>
</table>
### Cashew Nut Processing Plant

<table>
<thead>
<tr>
<th>No.</th>
<th>Equipment Type</th>
<th>Description</th>
<th>Power Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td><strong>ELECTRICAL OVEN</strong></td>
<td>To dry the Kernels of 1000 Kgs at 55-60°C in 5 to 6 Hours. So, to dry 1000 kg in two batches, it takes 10-12 Hrs. Over all Body in MS. Trays will be in GI Plain / Perforated. No. of Trays : 192 Each Tray Size: 32 x16 x 1½ Inches. Motor: 1.0 HP - 2 Nos. Heater Power : 32 KW Note: With Extra Set of trolleys and trays</td>
<td>52 HP</td>
</tr>
<tr>
<td>12</td>
<td><strong>Humidifier</strong></td>
<td>Swiveling type humidifier to make the kernels up to 4.0 to 5.0% moisture condition for better peeling of skin. Power required 5 HP</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td><strong>Elevator Cum Silo</strong></td>
<td>To feed the kernels to 3 No's of peeling machines. MOC: SS 304 For contact marts and mounting frame in MS Power required 1 HP</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td><strong>a. CASHEW SKIN PEELING MACHINE</strong></td>
<td>Capacity: 80 Kg/Hr. Motor Power – 4KW Material – Contact parts by Stainless steel Air Compressor – 20 HP (Screw Type) Air Pressure – 7.5 to 8 Kg/Cm2 Power required 20 HP</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td><strong>Separator</strong></td>
<td>Voltage Rating - 415 V (Three Phase) Motor Power - 0.25 HP All Parts in SS To separate wholes, Half’s Splits and Testa Power required 0.5 HP</td>
<td></td>
</tr>
</tbody>
</table>

- **Note:** With Extra Set of trolleys and trays.
| **SLANT CONVEYOR WITH SILO & HOPPER:** | **Conveyor length:** 9 feet  
With Cleats, Cleats made of SS 304,  
Mounted on MS legs, Drive 0.5 HP. | To transfer the peeled cashew kernels to the working table. |
|---|---|---|
| **17. Working Table** | **Length:** 4 x 16 Feet  
**Moc:** SS 304 | The peeling machine efficiency is (90 - 95)% efficiency only.  
So on this table we will sort out the unpeeled kernels manually when the kernels are passing through the conveyor on this table. |
| **18. SLANT CONVEYOR WITH SILO:** | **Conveyor length:** 6 feet  
With Cleats, Cleats made of SS 304,  
Mounted on MS legs, Drive 0.5 HP. | This conveyor is used for feeding the peeled kernels in to the grading machine. |
| **19. Grading Machine** | **Gradation capacity:** 100 kg per hour  
**Power consumption:** Single phase A/C 102 Watts  
**Number of Grading:** SIX (6)  
**Power required:** 2 HP | This equipment is used to grade the cashew kernels based on their sizes. |
| **20. Vacuum Packing** | **T Shaped vertical vacuum packing**  
**Chamber Size:** 650 mm x 8 mm bi- active  
**Pump capacity:** 65 cu. m/hr; 2 HP; 3ph  
**Power required:** 3 HP | For vacuum packing of the cashew kernels. |
| **21. Oil Expeller** | We have not quoted this equipment to you.  
Based on your required capacity we can give the specifications for the same. | This equipment is used for extracting the oil (CSNL) from the waste shell.  
Generally the input: output ratio will be 4:1 (i.e if you process 100 Kg you will get 25 kg output).  
In your case your processing 3000 MTNS/year, i.e 12 ton/day.  
So if you process 12 ton per day, you will get 3 tons of cashew kernel and 9 tons of shell.  
Generally the oil content in the shell will be 25-35%.  
So from 9 tons you will getting 2250 liters to 3150 liters of CSNL oil.  
This oil will be bought by varnishing industries. |
| **22. Hand Cutting machine:** | **Material:** M.S,  
**Cutting table:** S.S  
**Note:** We have not quoted this items. | This for manual cutting of raw cashew.  
This is not preferred for plant of your capacity. |
BIO MASS GASIFIER

- From Cashew Waste Shells we can provide producer gas for 

Thermal Application &
Power Application

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