WASTE TYRE RECYCLING PLANT & MACHINERY

CONTACT

(Since 2007)

310-Sanskar Complex, 150 ft Ring Road,
Opp.KKV Hall, Rajkot-360005, Gujarat, India

Mobile: +91 90337 05439
+91 95746 59360
+91 95746 59470

Phone: 0281- 2575966
0281- 3051207

Fax: 0281- 2577974

Email: oceantradelink@ymail.com
Website: www.oceantradelink.net

OFFICE TIME: 10:00 am to 8:00 pm
WASTE TYRE RECYCLING PLANT (JQ 010):
PLANT FEATURES:

- It is the most cost effective wastage tyre recycling technology in the world.
- 100% wastage tyre recycling (No churn left after the process).
- No use of chemical ingredients (Environment Friendly).
- No case of soil, water or air pollution.
- 100% pollution free process.
- Generate economically valuable products out of waste tyres.
- Generated products have good market value and demand.
- Raw material (wastage tyre) is cheap and easily available.
- Each recycled ton of tyres preserves 10 tons of carbon dioxide (CO₂) that is a major greenhouse gas.
- The process can be applied to all rubber based materials.
- The system creates an alternate source of energy to reduce the burden on petroleum products and natural gases.
- The system gives an opportunity to the government and local administrations to deal with the wastage tyre problems.
- The Pyrolysis process has duration of 4 to 12 hours, based on quantity and size of tyre (car tyre, truck tyre, etc.).
- During the process different vacuum values are applied in pre-determined temperatures and in different phases.
- Different gases are obtained and the condensed gas is stored as a fuel oil in the tanks.
TECHNICAL DETAILS:

- This is a batch process system. The wastage tyres are fed into the reactor vessel and heated under controlled conditions of temperature and pressure.
- The process will bring about molecular restructuring of the rubber under the pyrolysis process; as a result furnace oil in gaseous form is produced along with other gases.
- These vaporized gases are passed through heat exchanges, where in the furnace oil is condensed into liquid form.
- During the process, carbon black and steel are also generated.
- The heat exchanger uses coolant water as a condensing medium and this water is re-circulated through the process.
- The system can be operated on 24/365 basis.

PYROLYSIS PROCESS:

Pyrolysis is the decomposition of organic compounds under oxygen free (anaerobic) atmosphere that produces gas, oil, carbon black and steel. Efficient industrial Pyrolysis is a process to treat the rubber and industrial plastic wastage as well.

As a result of pyrolysis of wastage tyres, following things are obtained:

1) Fuel Oil (40 to 45%)
2) Carbon Black (30 to 35%)
3) Steel Wire (10 to 15%)
4) Gas (10 to 12%)

[1] FUEL OIL (40% to 45%)

The main oil product produced by our recycling application is the fuel oil that is widely used for industrial and commercial purposes. The oil has 40% to 45% of the amount of recycled scrap tyres, which will be carried with licensed tanker trucks.
[2] CARBON BLACK (30% to 35%)

Carbon Black is the main product recycled by Pyrolysis technology. The amount of recycled carbon black is 30% to 35% (depending on the type of tyres) of the total amount of scrap tyres recycled in the system. Carbon black is used as raw material or main ingredient in many industries and the chemical structure of carbon black strengthens, lengthens the endurance, and improves the coloring features of the materials.

Carbon black produced by Pyrolysis process (CBp) is more economical compared to carbon black produced primarily from petroleum and is more price-efficient to be used as an ingredient in the industries listed;

- Electric cable jacketing
- Conveyor band
- Carrier Bands
- Hose and doormat
- Black nylon bag
- Rubber additive
- Automotive spare parts
- Heat isolation
- Black colorant in rubber materials
- Plastic pipes
- Industrial rubber products
- Fire fighting

[3] STEEL WIRE (10% to 15%)

Tyres contain steel wires and the amount range of 10% to 15% of the total tyre wastage. All of the steel present in the tyre can be detached after the Pyrolysis recycling process is completed. Valuable steel wires are pressed and sold to steel and scrap dealers.

[4] GAS (10% to 12%)

Non-Condensable gases arise during the pyrolysis process. The amount of gas generated in the system is 12% to 15% of the total amount of recycled tyres and considering the 10 ton scrap tyre/day recycling capacity, the facility generates 1200 to 1500 m$^3$/day gas, which has an enormous energy potential when evaluated. There are some advantages, which are as following:

- It has higher calorific value as compared to natural gas.
- It can be replaced where natural gas and propane are stored.
- The high energy gas may be utilized as a source of energy for the Pyrolysis process.
OPERATIONAL COST & RETURN ON INVESTMENT:

The analysis is based on the conjecture of 10 tons/day capacity unit operating for 300 days a year;

Raw material waste Tyre : 6 ton/6000 kg per day x 300 days = 18,00,000 kg/year.

**Total output:**
- Carbon black (35%) - 6,30,000 kg - (Rs. 6 per kg in India)
- Furnace oil (40%) - 7,20,000 kg - (Rs. 30 per kg in India)
- Steel (12%) - 2,16,000 kg - (Rs. 12 per kg in India)
- Gas (13%) - 2,34,000 kg - (price not considered)

Analysis of Expenditure & Income (yearly):

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Product</th>
<th>Output (%)</th>
<th>Output (kg/ltr)</th>
<th>Price per (kg/ltr)</th>
<th>Income (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Carbon black</td>
<td>35%</td>
<td>6,30,000</td>
<td>6</td>
<td>37,80,000</td>
</tr>
<tr>
<td>2.</td>
<td>Furnace</td>
<td>40%</td>
<td>7,20,000</td>
<td>30</td>
<td>2,59,50,000</td>
</tr>
<tr>
<td>3.</td>
<td>Steel</td>
<td>12%</td>
<td>2,16,000</td>
<td>12</td>
<td>25,92,000</td>
</tr>
<tr>
<td>4.</td>
<td>Gas</td>
<td>13%</td>
<td>2,34,000</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Total Income (A)</strong></td>
<td></td>
<td></td>
<td><strong>3,23,22,000</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Particular</th>
<th>Quantity</th>
<th>Price (Rs.)</th>
<th>Total Cost (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Waste tires</td>
<td>18,00,000kg</td>
<td>8</td>
<td>1,44,00,000</td>
</tr>
<tr>
<td>2.</td>
<td>Salary &amp; Wages</td>
<td>6 x 12 months</td>
<td>7,000</td>
<td>5,04,000</td>
</tr>
<tr>
<td>3.</td>
<td>Fuel (for initial Use)</td>
<td>18000</td>
<td>80</td>
<td>14,40,000</td>
</tr>
<tr>
<td>4.</td>
<td>Electricity + water</td>
<td>----</td>
<td>----</td>
<td>9,00,000</td>
</tr>
<tr>
<td>5.</td>
<td>Mics. Expense (bag packing, repairing etc.)</td>
<td>----</td>
<td>----</td>
<td>18,00,000</td>
</tr>
<tr>
<td><strong>Total Cost (B)</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>1,90,44,000</strong></td>
</tr>
<tr>
<td><strong>Profit (A – B)</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>1,32,78,000</strong></td>
</tr>
</tbody>
</table>
Equipment Technical Parameter:

Project (dimension: D2200mm x L6600 mm) (D =diameter L=length)

1) Material ........................................ Plastic rubber (tires), life garbage
2) Structure ...................................................... Horizontal type revolves
3) Oil yield (tire as raw materials) ........................................ 40 to 45%
4) Carbon black .......................................................... 30 to 35%
5) Steel wire ............................................................... 10 to 15%
6) Gas ........................................................................... 12 to 15%
7) Work pressure ......................................................... Normal Pressure
8) Cooling Method ............................................................. Water
9) Cooling water Consumption(T/h ) ........................................ cyclic
10) Type of installation ...................................................... With foundation
11) Fuel material ......Coal, Wood, Fuel gas, Fuel oil, charcoal, LPG
12) Capacity ................................................................. 10 tons per day

Project Planning & Implementation

(For the capacity of 10 ton/day):

1) Land Requirement : 1500 sq. meters
2) Construction Shade : 600 sq. meters
3) Water Required : 3000 liter
4) Power Requirement : 10 hp
5) Man Power Planning : Manager(2), Technical(1) & Worker(4)

Terms & Condition:

Delivery Time : 45 days from confirmation of order
Payment : 30% with order, 60% before shipment & remaining 10% after delivery
Installation Period : 15 days
Warranty Period : 1 Year