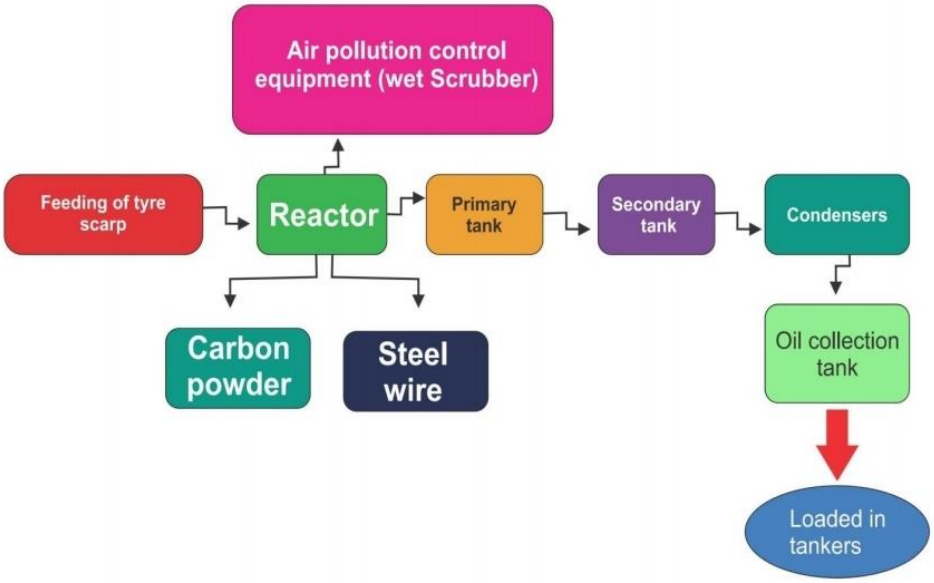
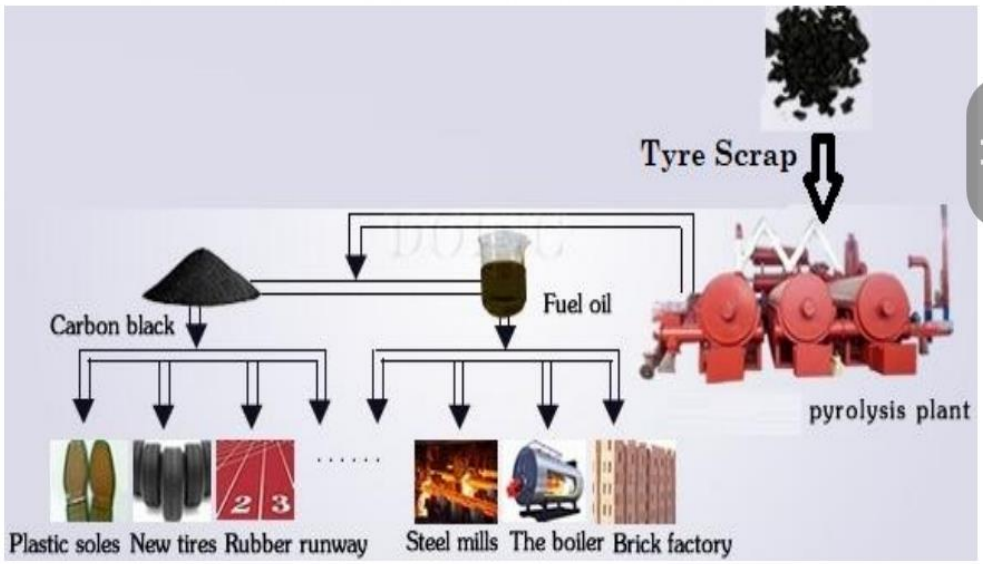
THE PYROLYSIS METHOD:

The Pyrolysis method for recycling used Tires is to ascertain Pyro - Oil and its bi-products in the form of Carbon Black and Scrap Steel, it is a 24 hours process where whole or shredded tires are loaded in the reactor and initially heated with Wood, Agricultural Briquettes, Coal, Gas or Pyro-Water under controlled conditions of temperature and pressure, which heats the Tires in a reactor vessel containing an oxygen free atmosphere. In the reactor the rubber is softened after which the rubber polymers continuously break down into smaller molecules. These smaller molecules eventually vaporize and exit from the reactor. These vapors are condensed into oily type liquids, as these gases flow into vapor gas separating tank, then through heat exchangers where conversion of vapors into liquid takes place in the form of Tire-Oil or Pyro-Oil takes place as water is constantly circulated in and out of the Heat Exchangers for cooling as a condensing medium. Some molecules are too small to condense; they remain as Hydro - Carbon Gas a.k.a Pyro – Gas, which is used as fuel in the later stage of the process. The minerals that were part of the Tire i.e. Scrap Steel and Carbon Black, about 40% by weight, are removed as a solid. After this, the reactor is left for cooling for about 10 hours followed by unloading of Carbon Black directly into jute bags followed by Scrap Steel removal with the help of a mobile Hydra crane.

PROCESS FLOW CHART:





REASON WHY OUR PLANT IS "POLLUTION FREE"

1. **Treatment of gas generated due to burning of wood for initial heating.(Smoke Handling System)**

It is also called as smoke scrubber system which is placed at the top of the cover of reactor. In this process the smoke generated during the burning of wood or coal is suck by the blower & that gas is treated with water wherein the carbon, wood & ash particles are settled down in the block due to heavy density as compared to water & due to the smoke's temperature water will evaporate & white smoke which is pure smoke is emitted out of the chimney from the height mention by PCB. This system avoids the air pollution occurred due to the burning of wood.

2. **Treatment of pyro – gas in the process.**

We are reusing about 95% of generated pyro – gas as fuel for the heating of reactor, remaining 5% gas is burnt at 100 feet height along the stack, thus destroying the methane gas. This system destroys the odor and is smoke free. This is one of the norms which are being suggested by the Pollution Department.

3. **Collection of carbon from the reactor.**

In our process we have developed a mechanized, direct outlet to collect carbon. Carbon is being unloaded directly to carriage bags & thus avoiding the carbon to expose to the atmosphere, therefore avoiding pollution due to carbon.

4. **Pyro – water Burning system.**

In every process approx. 400 liters of pyro – water is produced along with pyro – oil, it contains a certain percentage of oil and carbon in it, due to which it has a very high calorific value. This can be used in the initial firing purpose hence eliminating the use of briquettes up to 90%. Therefore making it a very eco-friendly equipment.

2. CARBON BLACK (38% to 40%)

Carbon Black is the second product of Pyrolysis process. The amount of recycled carbon black is 38% to 40% (depending on the type of Tires) of the total amount of scrap Tires 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 in the industries listed:

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

Potential Buyers - Manufacturers of the above mentioned industries.

PYROLYSIS PRODUCTS DETAILS:

1. PYROLYSIS OIL (38 % to 45%)

The main product of Pyrolysis plant is Tire oil (Pyro-Oil). This is used in many industries as fuel. It is a replacement for furnace oil and LDO. There are 2 Tires of oil we get from the process, one is normal Tire oil and other is heavy oil. Heavy oil is about 2 % to 4% of the total produce. The final percentage is about 38 % to 45 % depending on the quality of Tires. At present there is a great demand of fuel oil in the market, as every industry requires fuel for various purposes.

Applications of Pyro - Oil:

- Hot mix plants.
- Forging units.
- Steel Industries.
- Rolling Mill Industries.
- Chemical Industries.
- Die casting units.
- Boilers.
- Furnaces.

Potential Buyers - Manufacturers of the above mentioned industries.

FEATURES OF THE PLANT:

- 100% waste Tire recycling is achieved (no churn left after the process).
- Raw material for these plants are waste Tires which are abundant in any part of the world.
- Raw material is very cheap when compared to other industries.
- Lower fees for waste management.
- No chemical ingredients are used in process (environment friendly).
- During and after the process; no soil, water or air pollution is observed.
- Creates economically valuable products out of waste (all of the products are industrial raw materials that have a market value).
- The most cost-effective waste Tire recycling technology in the world.
- Raw material (scrapTire) is cheap and easy to provide. These are the by-products of Tire production.
- Each recycled ton of Tire preserves 10 tons of CO_2 that is a major greenhouse gas.
- The process can be applied to all rubber based materials.
- The system creates an alternative source of energy to replace petroleum products and natural gas.
- System gives the opportunity to governments and local administrations to deal with the waste Tire problem to a great extent.
- System prevents the spread of diseases caused by waste Tires.
- It is feasible technology with small amount of investment, high availability of raw materials, short recovery period and with our guidance, is the ideal choice of investing.
- The process of Pyrolysis has duration of 8 hours. 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 fuel-oil in tanks.