PYRO-PLANT

(An Effective Product Based Solution to convert Waste Plastic into Energy)

Prototype 25kg Pyro-Plant

Need of the Hour

Twenty per cent of municipal waste is non-biodegradable plastic, which currently ends up in landfill, thereby creating pollution. With the relentless problem of landfill site locations continuing to present difficulties to councils and waste collection agencies, the single biggest cost of waste management today is transport. Many councils are now forced to pay huge rates per ton simply to move the waste out of the collection areas and into the landfill sites.

Although many methods such as incineration and recycling are there, but they have again some drawbacks and cause pollution. To overcome this problem a new technology has been developed for their better disposal.

The Present Scenario

Various methodologies have been tried and tested to process waste plastics for many years, with recycling becoming the most common methods, reflecting the needs of the time. Plastics that cannot be processed are handled by waste management companies by land filling or incineration in recent years, building or expanding of incinerators has become difficult due to the opposition from governments and community groups with environmental concerns, most notably the level of the emissions.

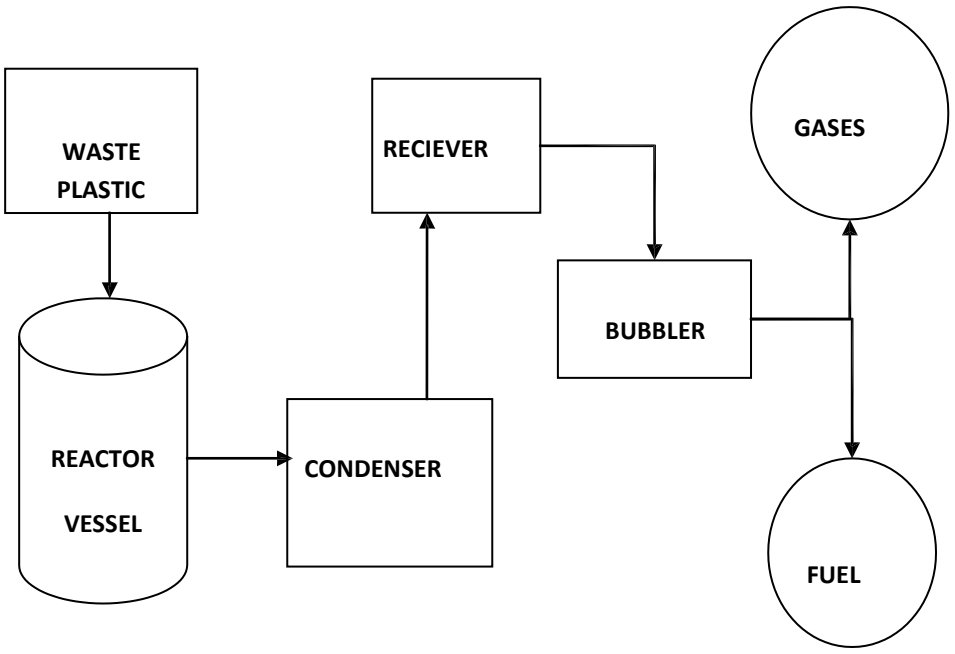
Liquefaction of plastics is the superior method of reuse of the resource. The distillate product is an excellent fuel and makes Pyrolysis is one of the best, economically feasible and environmentally sensitive systems in the world today. Pyrolysis fuels are used as fuel for diesel burners, trucks, agricultural pump sets and generators.

The Process

Pyrolysis is a process whereby, scrap and waste plastics are converted into liquid hydrocarbons that can be used as fuels. The system uses liquefaction, pyrolysis, and breakdown of plastics. The system can handle almost all the plastics that is currently being sent to landfills.

Pyrolysis is the process of thermal disintegration **in the absence of oxygen**. Plastic waste is continuously heated in a cylindrical chamber and the pyrolytic gases condensed in a specially designed chamber to yield hydrocarbon distillate, comprising straight and branched chain aliphatics, cyclic aliphatics and aromatic hydrocarbons. The resulting mixture is essentially equivalent to petroleum distillate.

Process Flow-Diagram



Requirements

- 3 Phase supply
- Chamber with heater - To heat Plastics
- Condenser- To Cool Gas
- Collector – To collect the distillate fuel
- Motor- To give Inlet Water Supply for Cooling the Condenser
- Thermostat – To Control Temperature
- Control Panel – Electrical Circuit.
- Pressure : Atmospheric Pressure
- Temperature: Approx 200 – 450 degree Celsius. (Varies with respect to Input Plastic).

Input

- Polyolefin
- Polystyrene
- Polyethylene(PE) 0.918
- Polypropylene(PP) 0.90
- Polystyrene(PS) 1.04
- ABS resin (ABS) 1.03-1.072
- Plastics recovered from the kerbside collection of recyclables... e.t.c
- HDPE

Not To be Used:-

- PET

Product Yield

1. Pyrolysis system converts these waste plastics into high- grade "Green" distillate fuel. This has proven successful, and is economically viable and a virtually non-polluting, (100%) synthetic fuel which does not require engine modification for maximum efficiency. Pyrolysis process, and with a production efficiency of over 95%, the resultant diesel output, almost equals the waste material input.

2. **Economics**

   One tonne of waste plastic will, on average, produce 930 - 980 litres of diesel fuel, with just 10 - 50 ppm sulphur content
   Simply, Fuel output is
   Every Kilogram of Waste Plastic gives 800 ml of diesel by consuming 1KW of electricity.

3. Most of the gas is liquefied in the condenser but some remain as gas. Hydrocarbon with carbon count of 4 and lower, remain as gas at room temperature. This off gas contains methane, ethane, propane, butane, etc. Although volume of the gas varies, depending upon the types of plastics, it is usually 20%.

4. The carbonaceous char forms in the chamber, during the pyrolysis. The char residue produced, is about 2-5% of the output for the relatively clean polyolefin feed stocks.

Advantages

- Low- Cost Fuel
- Reduction of Waste Plastics
- Ability to handle unsorted, unwashed plastic.
- Energy from Waste.
- Low sulphur Content fuel.
- LPG from Waste (By Product)
- Reduce Pollution caused by Plastic Waste.

Pre-treatment

Chop the Plastics in uniform size.

Maintenance

Coking occurs in the chamber when the pyrolysis of the waste plastics is almost complete. The chamber requires cleaning every second process, and just takes a few minutes.

The plant is used to reduce plastics, Reuse Plastics, and to recycle Plastics. We would like to end this by saying Pyro-Plant has a strategy of:

“REDUCE REUSE RECYCLE”