

POLYOLS AND USP RESINS FROM PET

Plastic packaging forms a significant portion of household waste, and PET soft drink bottles / mineral water bottles represent a major percentage of the waste. There has been significant growth in recycling efforts of Pet bottles. A rough estimate puts the recycling at 20 % of the consumption. The main method of recycling PET is washing and regrinding to make PET flakes for mixing with virgin PET. Another way of recycling is the chemical method. Higher value added products like Unsaturated Polyester Resins and polyols can be produced by this method.

Proposal:

Abundant availability of raw material and excellent demand for end products make chemical recycling of PET a very attractive investment opportunity.

Product mix

Unsaturated Polyester Resins	5000 tons / yr
Polyols	5000 tons / yr

Market

The main use of unsaturated polyester resins is in manufacture of Fiber Reinforced Plastic (FRP) products.

1. For Hand Lay-Up and Spay-Up
2. For Press Molding
3. For SMC/BMC
4. For Corrugated Sheets
5. For Chemical Resistance Applications
6. For Boats and Yachts
7. For Buttons
8. For Decorative Panels
9. For Synthetic Marbles
10. For Castings
11. For Gel Coats
12. For Putty, Surfacer, Powder coatings
13. Additives

Polyols are used in manufacturing polyurethane resins which are widely used in flexible and rigid foams, durable elastomers and high performance adhesives and sealants, fibers, seals, gaskets, condoms, carpet underlay, and hard plastic parts.

Market for USP resins and Polyols in India is very huge. The only constraint is the high cost. Making these products from PET waste offers cost reduction possibilities.

Manufacturing process:

PET waste is broken down into components in a process termed “glycolysis”. Ethylene / propylene Glycols are used in this process.

The glycolised PET is converted to unsaturated polyester resin by reacting with Malic Anhydride and dissolving in Styrene. The process is similar to manufacture of regular USP resins.

Reacting the glycolised PET with Adipic acid gives the polyester polyol.

Technology:

These technologies have been developed by a number of research institutions. Eventhough the overall process looks simple, there are many fine points where expertise is required. It is also necessary to acquire the application technology (how the resins / polyols are used in making downstream products).

Plant and Machinery:

The plant and machinery is identical to standard resin manufacturing units consisting of SS reactors with condenser assemblies, Nitrogen plant, Hot oil units. The machinery can be got fabricated locally.

Raw materials:

PET waste, Ethylene glycol, malice anhydride, Styrene, Adipic acid etc.

Utilities:

Cooling water, Fuel for hot oil system and power

Project cost

Rs. 25 crores

Turnover and profitability

RS. 80 crores with net profit margin of 10 %.

Suggested location:

Any place where PET waste is available.

Entrepreneur profile:

Existing manufacturers of USP resins are best suited for this project

Apitco's consultancy:

1. Technology tie-up
2. Market study
3. Project planning