



## Methodologies and Thermal Packaging for Recycling of Plastics

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### DESCRIPTION

Plastic recycling has been described as a process of recovering scrap or waste plastics and reprocessing the material into useful products, sometimes they are completely different from their original state. By Classifying their final product of any given recovery process which has been further differentiated to alternative plastic recycling methodologies.

It has become a common place, and has only one problem with increasing in the multifunctionality parts that become more complex, for recycling, and separation it is a most complex issue. Therefore, it is always a tradeoff between the complexity of the product (and therefore process integration and associated energy and cost savings) and the need to provide a cradle to grave sustainable and environmentally sound solution. However, the products are been designed with in the mind from off-set it can still be produced and achieved. It is also necessary to consider environmental legislation which drives to the related search for practical and sustainable disposal solutions.

The plastics are petroleum-based synthetic materials which is the main constituents of carbon and hydrogen. Most of the plastics that are recycled come from thermoplastic family, which represents about 90% of all plastics sold. The thermoplastics are readily recycled as they melt when heated to high temperatures. The entire spectrum of packaging plastics comes from the thermoplastic family. These "Common thermoplastics include polyolefins (polyethylene, polypropylene), styrenes (polystyrene, acrylonitrile butadiene styrene), vinyls (polyvinyl chloride, polyvinylidene chloride), and thermoplastic polyester (polyethylene terephthalate)." The other groups of plastics that comprise the remaining 10% are known as thermosets. These thermosets are insoluble and infusible, and cannot be re-softened or melted by heat. They include phenolics, epoxies, urea-formaldehyde resins and crosslinked polyesters.

One of the main problems in the recycling is of post-consumer plastics which are high cost of transportation and collection. Most of the empty plastic packages and containers occupy large volume and small towns may not be able to collect enough

tonnage to sustain their recyclability as part of an economically viable program. The plastics industry, from American Plastics Council (APC), has sponsored research aimed for driving down the cost of collecting, processing, sorting and reclaiming plastics. Despite the costs, the recycling continues to be highly valued by the American public and communities continue to offer collection services for recyclables.

Since most of the energy is required to produce the plastic products which undergoes into the production of feedstock materials, not for manufacturing process, as the plastic wastes in retain of their original energy content. The plastics industry which gives annually recycles are approximately about 4 billion pounds of post-consumer and pre-consumer scrap plastics. They do not include recycling of several billion pounds of process scrap (regrind) that is incorporated with straight back into the manufacturing process." Of these 4 billion pounds of plastics that are recycled, 1.4 billion pounds are pre-consumer scrap plastic and 2.6 billion pounds are post-consumer plastics.

About 1000 European, 400 North American, and a handful of Japanese recyclers had fought for survive. The procurement mechanism, of raw material quality, and reprocessing technology were not sufficiently advanced to make quality recycled plastics for acceptance in the market place. They record low prices of virgin resin and worldwide re-structuring of economics also contributed to the loss of many recyclers.

### CONCLUSION

By further technological innovations that are needed for devising methods and developing materials for easy collection and transportation of plastics waste are sorting and classifying into single plastics or individual groups of plastics that are based upon their application, compatibility, and processing; resisting thermal degradation and rejuvenating damaged macromolecular chains; restoring properties by compatibilization and impact for modification; developing new methods for processing at minimum expense of energy and time; and developing cost-effective processes for depolymerization.

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