



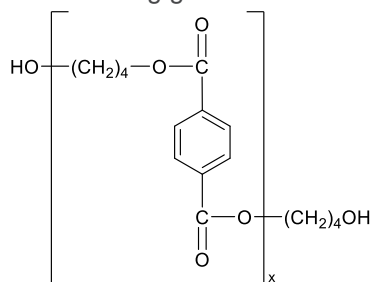
## TECH 2020S3: Polybutylene Terephthalate (PBT)

**Polybutylene Terephthalate (PBT) is one in a series of reports published as part of NexantECA's 2020 Technoeconomics – Energy & Chemicals (TECH) program.**

### Overview

PBT, also known as polytetramethylene terephthalate (PTMT), was originally developed and commercialized in 1970 by Hoechst Celanese. The material was intended to replace thermosetting materials such as diallyl phthalate, alkyd, and phenolic resins, which had been used particularly in automotive electrical systems and interconnections. PBT offers a high continuous use temperature compared to some other thermoplastics, excellent electrical properties, and can easily be flame retarded by further compounding.

Presently, most PBT is made by the direct esterification of purified terephthalic acid (PTA) with 1,4 butanediol (BDO), followed by polycondensation. The final PBT polymer has the following general structure.



PBT production can be carried out via a batch polymerization process as well as a continuous process. Improvements in continuous PBT processes, and increased availability of PTA, have resulted in essentially all recent plants being built as continuous, world-scale production facilities employing the PTA/BDO route to PBT.

### Commercial Technologies and Economics

Commercially available technologies for the leading licensors (Mitsubishi Chemical, Zimmer and Uhde) were profiled using information as provided by these firms.

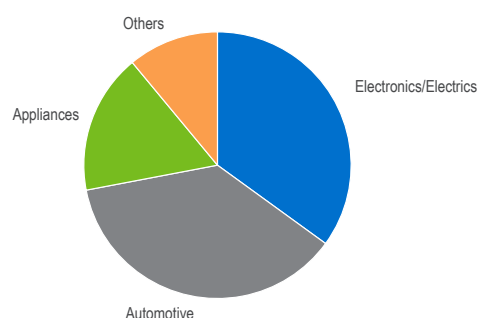
An economic analysis was prepared for world-scale continuous and batch production plants using composite PBT technologies representative of those in actual commercial operation; both routes from DMT and PTA were modelled. The analysis was prepared for plants located in the U. S. Gulf Coast, Western Europe, and Coastal China as follows:

- Continuous PBT from PTA
- Continuous PBT from DMT
- Batch PBT from PTA
- Batch PBT from DMT

### End-Use Applications

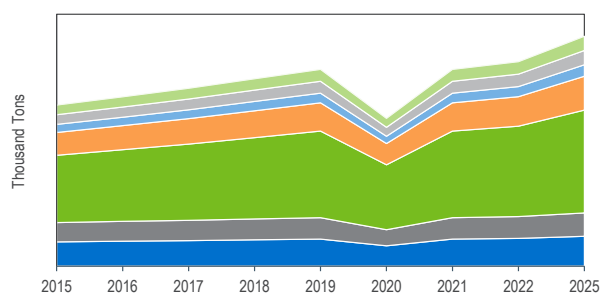
With excellent electrical properties, PBT is often regarded as having the best overall performance profile for electrical/electronic (E/E) applications of all the Engineering Polymers. The global PBT market breakdown by application is illustrated below. Automotive applications are the largest end-use for PBT, followed by electronics/electrics.

Global PBT Demand by Application, 2020, Percent



### Market Analysis

Key end-use markets, applications and market trends were developed for PBT for the regions – North America, Western Europe, China, Other Asia, and Rest of World. Demand and supply/demand balances are provided for 2015-2025.



A list of global producers was provided.

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