Abstract
Process Economics Program Report 128E
POLYPROPYLENE
(September 2011)

Polypropylene is one of the fastest-growing categories of commodity thermoplastic resins in the world. Total polypropylene global production capacity was 59.3 million metric tons per year in 2010. This report is an update and supplement to the series of Process Economics Program reports on technologies and production costs of polypropylene.

Continuing innovations in polypropylene technology have achieved improved process economics. Polypropylene plants with single-line capacities of up to 500–600 thousand metric ton per year can be built, thereby delivering optimum process economics. Monomer efficiency has been improved reducing monomer consumption and emission. Improvements in catalyst and process technology have continued to expand polypropylene product properties to other applications.

This report continues our evaluation of polypropylene processes and catalysts. Polypropylene product and catalyst technology including Ziegler-Natta and metallocene catalysts are reviewed. Gas-phase and bulk processes to produce polypropylene are discussed. Applicable patents related to polypropylene technology are included in the discussion in this report. The industrial status of the polypropylene business including technology licensing, estimated global plant capacity and market data is provided. The process economics for three polypropylene gas-phase processes are presented: (1) the Dow UNIPOL™ polypropylene process, (2) the CB&I Lummus Novolen® polypropylene process, and (3) the LyondellBasell Spherizone™ polypropylene process. The process economics are based on a current world-scale single-line capacity polypropylene plant. This report will be of value to those companies producing polypropylene and to those companies considering entry into the business.
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