

Polycarbonate Update

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Abstract

Polycarbonate is one of the most versatile, high-performance resin due to its unique combination of properties including high impact strength, high heat resistance, and transparency. These properties have allowed polycarbonate to outperform other transparent polymers in various applications. In 2019, the global demand for polycarbonate was 4.4 million tpy with total capacity at 5.6 million tpy. The demand is forecasted to increase by 17% over the next 5 years, going from 4.4 million tpy in 2019 to 5.1 million tpy in 2024. However, capacity is forecasted to far exceed demand growth. The capacity is expected to increase from 5.6 million in 2019 to 8.0 million tpy in 2024, which is equivalent to a 42% increase in capacity. Almost all of the new capacity is expected in China. New polycarbonate plants are being built in China based on the interfacial and melt processes. For the interfacial process, bisphenol A (BPA) is phosgenated in an aqueous solution of sodium bisphenolate with methylene chloride as an organic solvent. For the melt process, BPA reacts with diphenyl carbonate (DPC) in a molten state without the solvent. Historically, interfacial phosgenation, or the conventional interfacial process, has dominated the field. The non-phosgene melt technology is projected to have the fastest growth rate in the future.

With the number of new plants being built, rationalization of plants with relatively high cost of production is a strong possibility. This report will provide a timely update of polycarbonate production technologies and estimated process economics. In this report, we will update the process economics and technology to produce polycarbonate by the following processes:

- Polycarbonate production by an integrated melt process consisting of diphenyl carbonate (DPC) production based on Asahi Kasei technology and polycarbonate (PC) based on EPC technology
- Polycarbonate production by an integrated melt process consisting of diphenyl carbonate (DPC) production based on Versalis/Lummus technology and polycarbonate (PC) based on EPC technology
- Polycarbonate production by a plug flow interfacial process by phosgenation.

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