



Biorenewable Insights: Thermoplastic Starch

Thermoplastic Starch is one in a series of reports published as part of NexantECA's 2020 Biorenewable Insights program.

Overview

Thermoplastic starch (TPS) offers an attractive alternative packaging material or plastic filler for increasing sustainability in traditional polymer applications. Not only is the material biodegradable, the technology for production of it is highly mature and widespread and costs are low compared to other polymers. Despite its poorer mechanical properties, TPS blending has proven to be a useful method of lowering the cost of the polymers for applications while maintaining desirable characteristics such as biodegradability and bio-based content. These strengths have allowed TPS to emerge as a major component of commercial biopolymers despite potential changes to suitability for certain applications that come with blending. Businesses continue to navigate the tradeoff between mechanical properties and cost.

This report covers key strategic questions within the thermoplastic starch sector such as:

- What is the cost of production of TPS, and how does it differ between regions and feedstocks?
- What TPS/biopolymer blends are most competitive with conventional plastics?
- What are the major players and what products are they offering?
- What is current global production capacity of TPS, and how likely are announced ventures to come to fruition in the near future?

Technologies

This report covers generic thermoplastic starch production technology from the perspective of the parent starch manufacturer beginning with agricultural starch sources. Major producers and technology holders are analyzed in the context of these production methods and the blends they produce from TPS.

Process Economics

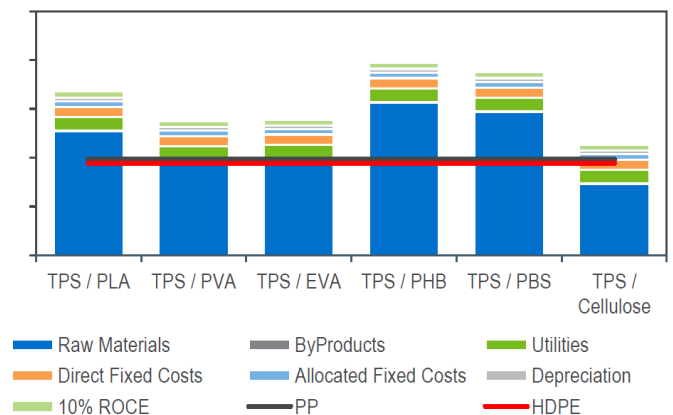
This report covers economics of generic thermoplastic starch manufacturing in four location scenarios (US, Western Europe, Brazil, and China) with regional pricing and variations on preferred agricultural feedstock on a Q4 2020 basis.

Due to the commercial importance of TPS blends, the report also covers the cost of potential blends of TPS vis-à-vis major conventional polymer alternatives.

Commercial Impact

This report places TPS production in the context of global polyolefins and global bioplastics markets. Global capacity levels are covered by producer and future capacity additions are analyzed with comparisons to the costs of conventional polymer products.

Comparative Production Economics for Various Blends of Thermoplastic Starch with Biopolymers Vis-à-vis Conventional HDPE and PP, United States





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- Chemistry
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- Process economics – comparative costs of production estimates for different technologies across various geographic regions
- Capacity tables of plants and analysis of announced capacities
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Technology and Costs comprises the Technoeconomics – Energy & Chemicals (TECH) program (formerly known as PERP), the Biorenewable Insights program (BI), the Sector Technology Analysis, and the new Cost Curve Analysis. These programs provide comparative economics of different process routes and technologies in various geographic regions.

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