



Samsung TOTAL Petrochemicals Co.

Control solution increases polypropylene production, product consistency

Samsung TOTAL Petrochemicals Co., a 2004 joint venture of Samsung General Chemicals Co. and TOTAL SA, provides high quality petrochemical products and unique services to its customers. Samsung TOTAL operates a large petrochemical complex consisting of 14 separate plants in Daesan, part of Korea's Chungnam Province. The company manufactures a wide range of products from olefins to polyolefins, base petrochemicals, byproduct fuels, solvents and other downstream petrochemicals used in everyday life.

To secure its stance as a leader in the world petrochemical industry, Samsung TOTAL works closely with its customers, focusing on an integrated complement of human expertise and innovative technology to create and provide top quality products and services.

The Challenge

Samsung TOTAL's Daesan facility is located 400 kilometers from China's Shandong region. As China's demand for polypropylene increases, this location is a strategic advantage for the company. To better meet Chinese and worldwide polypropylene demand, and to handle the rising cost of raw materials, Samsung TOTAL needed a technology solution to better control and optimize its production process. Samsung TOTAL saw the need to deploy a model predictive control (MPC) solution on its polypropylene production.

and a wide range of products. The right MPC solution, Samsung TOTAL officials noted, would better control its reactor and extruder, which can be plant bottlenecks. In addition, Samsung TOTAL sought the ability to transition quickly from one grade to the next, given the large product portfolio, thus eliminating transition waste and increasing total prime production.

Pavilion applied its ValueFirst[®] customer engagement methodology to Samsung TOTAL's process, performing an in-depth benefits analysis and outlining a strategy to achieve the plant's key goals and objectives. Based on Pavilion's assessment, Samsung TOTAL would realize a payback within 12 months based on the following benefits:

- > Improved production
- > Enhanced product consistency
- > Decreased raw material (catalyst, co-monomer) consumption

To meet their business challenge and realize significant value, Samsung TOTAL selected Pavilion Technologies to deliver the polymer control solution. With model predictive control applications operating at more polyolefin facilities than any other provider, Pavilion Technologies is the de facto standard in the industry. Deployed on every major process technology and on all major catalyst types, Pavilion MPC solutions have an unrivaled track record of superior performance.

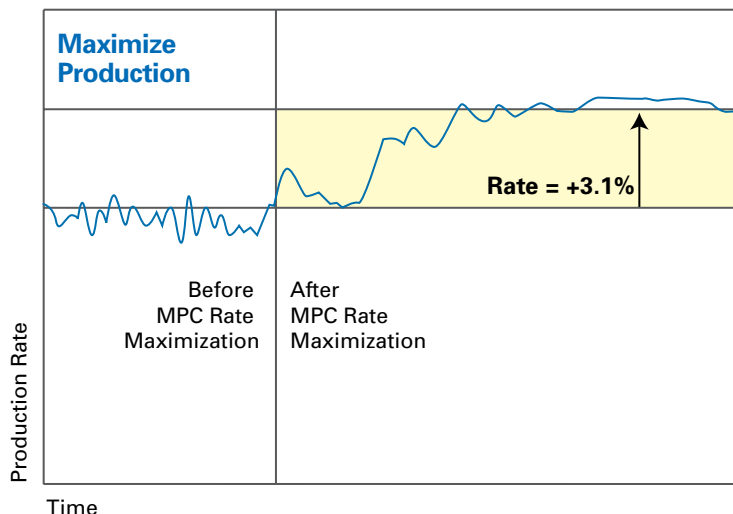
Key Benefits

- > ROI of 140 percent
- > Production increase of 3.1 percent due to the elimination of bottlenecks in the polypropylene A-Train
- > Production rate increase of 5.7 percent at the extruder
- > Product consistency and process improvements of 27 percent
- > Enhanced predictive measurement accuracy with an average MFR accuracy rate of 95 percent

A-Train Polypropylene Line Gets On Track

In order to control and optimize its 150 KMT A-Train polypropylene line, Samsung TOTAL sought a company that understood Mitsui's Hypol I process technology. This process uses high-performance catalysts, two-phase polymerization – the conversion of a raw material –

Figure 1
Increased Production Rate with MPC by 3.1%





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“No other company has a greater depth of experience or a proven track record of delivering benefits from advanced process control solutions in polyolefins than Pavilion. We were able to capitalize on Pavilion’s experience and technology to enhance our production rates and our product. This technology will help us to meet growing demand for polypropylene in the Chinese market.”

Sang Seop Na, Ph.D.

Polymer Production Technology
Team Manager
Samsung TOTAL

Pavilion engineers deployed the company’s polymer solution, which is based on the Pavilion8® software platform. Leveraging a powerful modeling engine at its core, this MPC platform has a modern service-oriented architecture that enables customers to control, analyze, monitor, visualize, warehouse and integrate their production and environmental process performance to enhance plant profitability.

Results: Expectations Exceeded

With Pavilion’s polymer control solution, Samsung TOTAL has achieved its project goals: maximizing the production rate, increasing product consistency and enhancing its melt flow rate (MFR) predictive measurement accuracy, all while maintaining a proper margin of safety.

In just nine months, Samsung TOTAL realized a significant payback, with an ROI greater than 140 percent. Specifically the site has realized the following benefits:

- > Production increase of 3.1 percent due to the elimination of bottlenecks in the polypropylene A-Train
- > Production rate increase of 5.7 percent at the extruder
- > Product consistency and process improvements of 27 percent
- > Enhanced predictive measurement accuracy with an average MFR accuracy rate of 95 percent

As a result of the success of this first project, Samsung TOTAL elected to deploy Pavilion Technologies polymer control solution on the polypropylene B-Train to realize similar results and to meet their strategic goal of increasing market share in the region.

Product Quality Improvement

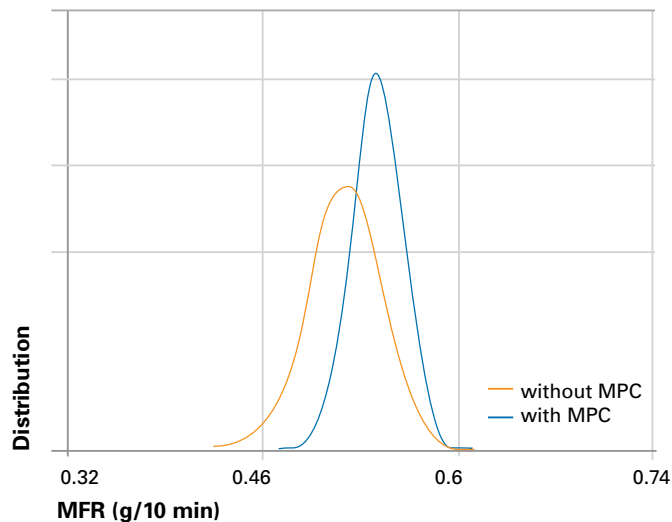


Figure 2

Pavilion’s Solution Reduced Melt Flow Variability and Increased Product Consistency by 27%
(Figure shows results of campaign BB110)

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