

## Footwear Manufacturer Optimises Production and Shipment using Preactor APS



Grendene is the largest injected footwear manufacturer in the world and have the largest footwear factories in Latin America. They export to 90 countries and their products are seen in almost every show shop window around the world. Their products are aimed at the mass distribution markets for Men, Women and Children. They have more than 20,000 sales points in Brazil and another 20,000 abroad. They have a huge number of styles with short life cycles with more than 500 new releases every year.

The difficulties faced by Grendene to complete the planning of their production were directly related to the large number of variables to take into account when programming their equipment. Considering the seasonality, typical of companies in the footwear industry, and the growing diversity of products offered to customers, increasingly demanding, there is a need for a production model that takes into account all the variables related to production management.

The challenge to optimize the process of injection requires the need to meet a demand that does not follow a predictable behavior. Besides being unstable, this demand is an aggregate combination of hundreds of thousands of sales orders, served by a production capacity that is difficult to measure. This is because it is affected by the availability of intensive and specialized labor, and the use of machines that handle multiple simultaneous operations. The effective handling of this complexity is the determining factor in the financial performance of the factory.



The projection of the amount of matrices is performed based on estimates of the demand distribution over the footwear size at the stage of product development. Considering the costs associated with manufacture, small changes in demand do not justify an increase in the number of matrices. Therefore, it is necessary to find a programming solution for each product / color that equalizes an optimal distribution of the matrices available considering the demand.

Without a production planning system that makes a feasible a full demand management to be met primarily in the portfolio of sales orders, Grendene often faced situations in which there were many products available in stock, and in many situations without a combination of products that would allow a shipment of a complete order, resulting in high costs of storage and delays in billing.

## THE SOLUTION



Occupying a central position in the production flow, the factory of injected footwear determines the course of the process as a whole. With greater complexities involved in their process and high costs associated with equipment and matrices, the Preactor project started with the process of injection. This definition was considered strategic within the development of the solution, considering that the high costs associated with the matrices and the modern equipment could yield a rapid return on the investment.

The process to be optimized includes the distribution of different product lines, with their respective sizes and colors on injection machines capable of processing different product numbers simultaneously. The optimization needed to find a programming solution for each product / color comparing the demand with the availability of matrices of each number over time.

The introductory project involved many areas of the company, especially engineering, PCP, purchasing, IT and sales. The design of the solution was developed jointly between ACCERA consultants, a Preactor partner based in Brazil, and experts of each of these areas. Gradually, the details were being absorbed from simulations in partial prototypes that were designed during the initial stages of specification and development, only then to formalize the final outcome of the application and validate it for use.

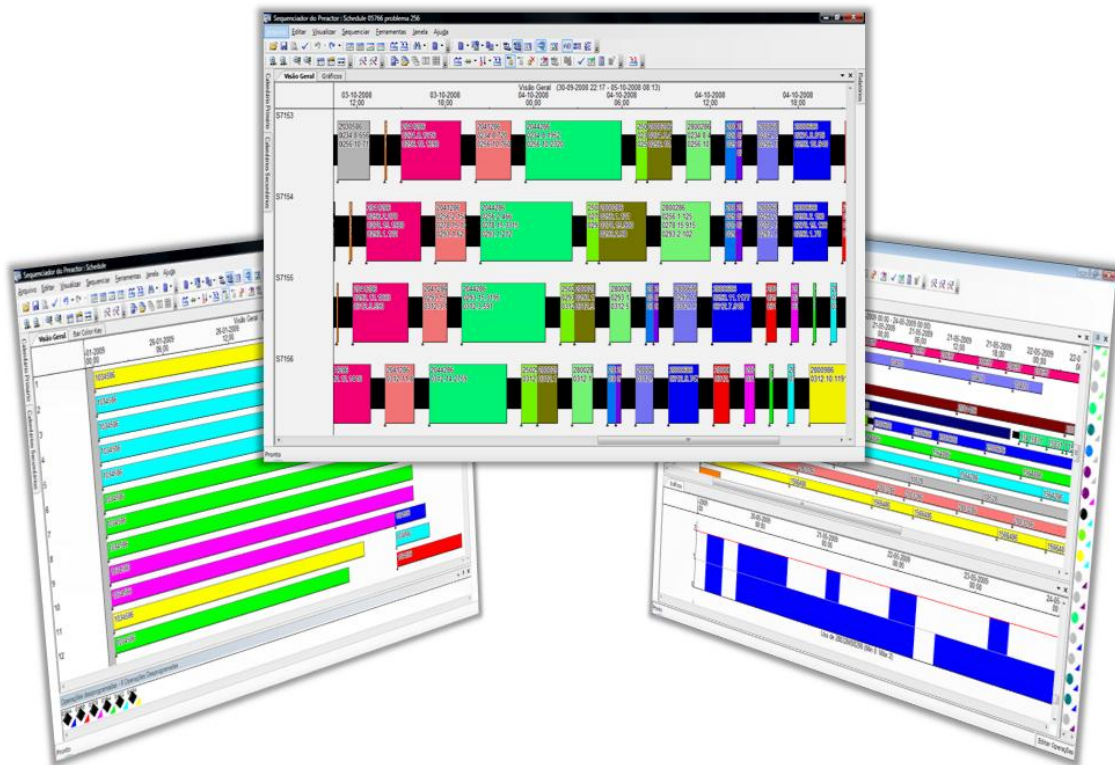
In addition to the complexities involved in production planning, the rule of the injection machine optimization takes into account the products of the same sales order, which should be available for shipment on the same day. For this, special rules were used based on minimum conditions to ensure that all production is loaded with the minimum possible stock, ensuring and advancing billing. Requests of a same product with similar characteristics can be grouped together and allocated in the injector simultaneously, while sales orders with low value, which would not hit minimum value to shipment are set aside until the moment they become part of a group that justify their production from an economic perspective.

The planner can dynamically view and manipulate the production plan through a custom and interactive report. The challenge is to balance the production capacity available in each period with the demand consisting of existing sales orders and sales forecasts.

## RESULTS

Among the major gains obtained with the Preactor solution, we emphasize:

- Anticipation of shipments divided over the month, producing the best combination of mix, reduced inventory of finished product, and improved billing;
- Better utilization of production resources, creating combinations of optimized grades to avoid unnecessary trade offs and to minimize losses for reduced mold;
- Early assessment of productive capacity, carefully analyzing the firm and expected demand in relation to the availability of machinery, molds and operators;
- Automation of PCP processes, reducing people dependency, and significantly reducing the efforts involved in programming;
- Anticipating the problems, simulating scenarios and evaluating the impact of factory decisions;
- Visibility and agility in reprogramming through the plan update from notes, and adjust of programming when unexpected conditions are observed in production.



As next steps, Grendene should expand the solution gradually to cover more of their factories. In parallel, initiate the implementation of a specific solution to the sales department to view the mix of orders in relation to the impacts in the factory and simulate scenarios to direct sales in the best possible combination.