

Waterborne Output Optimisation

- 38% reduction in annual batch quantities
- Highest ever monthly output achieved [86,503 gallons]
- Increased capacity for filling machines by 590 units' p/h

The Background

The client is a leading global supplier of liquid and powder coatings, supplying to manufacturers such as Volkswagen, Mercedes, General Motors and BYD. They specialise in waterborne paint products, and their aim within this project was to increase their production output in order to meet higher demand.

P7 were engaged to assist in the optimisation of the production output due to their focus on involving team members in the process, aligning with the P7 principle of "People + Process = Performance" – working closely with two key stakeholders from the company, the Area Manager and Area Process Engineer.



Challenges

Before the project, the Client published a weekly production schedule that often resulted in conflicting requirements, such as:

- Small batch runs required more filling machine change-overs for containers and/or labels;
- More time had to be spent washing filling machines between assorted products because of multiple small batches;
- Production run splits required multiple change-overs for labels;
- Container sizes and types were not optimised, which caused frequent switching back and forth between different containers;
- Frequent switches back and forth between scheduling the same two types of products;
- Multiple small batches of the same product being made each month, instead of making them at once with optimum batch sizes; and
- Plans having inaccurate run rates for filler based on the can size, which led to batches being allotted more time than necessary.

On top of this, minor machine stops and delays were frequent, which meant that production output rarely met demand.

These conflicts lowered production output, resulting in monthly back-orders to customers ranging from \$250k to \$1MM. The persistent back-orders jeopardised the area's monthly production goals. Exacerbating the problem further was an order pattern by one customer, who would place large orders at the month end that consume large quantities of finished goods above forecasted amounts, requiring "drop-ins" of critical production orders.

Analysis of planning data and production history found:

- 10 product codes historically produced an average 103 batches per year that can be targeted for batch size optimisation.
- The planned filling machine run rates were found to be underestimated by 30-60% for 3.5L, 1L, and 0.5L containers.
- KPI tracking data indicated that time allotted to machine change-over was excessive, relevant to the production plan of batches loaded and filled.



Solutions

In order to overcome these challenges, P7 helped design and implement a solution to consolidate batch sizes for all work centres within inventory carrying limits, and to adjust the planned run rates to more realistic values for 3.5L, 1L and 0.5L containers.

Analysis was conducted on product codes and corresponding mixing tanks in order to adjust batches to appropriate sizes based on historical demand. Planning data for run rates was also updated in OMP and forecasting modules.

In order to drive continuous improvements from KPI tracking data, 3C Practical Problem Solving was used. Leadership Standard Work [LSW] was also developed with the Area Manager in order to ensure appropriate efforts are being applied to performance tracking, problem solving, and escalated issues. P7 also introduced a Scrum Board Project Management Tool to help teams visualise project steps and milestones, and drive efforts towards completion.

Additional work was completed to support the increase in uptime. This included repairs and upgrades to the filling machines, refurbishments to the labelling machine, and change-over analysis on the packing machine.

Impact on Performance

As a result of support from P7, the client has achieved:



38% reduction in annual batch quantities

Increased capacity for filling machines by 590 units' p/h



Batch size optimisation; reducing both wash time and change-over time - resulting in **increased filling machine uptime**

Revised KPI tracking metric - meaning captured performance and causes of abnormalities



Record output of 86,503 gallons achieved, due to increased filler uptime