

A Single Distillery Filling Line saves \$864K Annually with Minitab Real-Time SPC

Products

Minitab Real-Time SPC

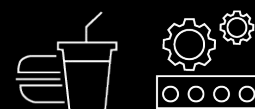
Personas

Quality Engineer
Process Engineer



Verticals

Food and Beverage
Manufacturing



CHALLENGE

Our customer is a global manufacturer of alcoholic and non-alcoholic beverages. Their filling operations manage a wide range of products — from lower-end non-alcoholic mixers to premium spirits.

The company had key areas of concern that it wanted to address: no maximum allowable variance (MAV) violations and maintaining an overfill of less than 1.0%.

TOOLS

The company assessed statistical process control (SPC) solutions to improve performance. Minitab Real-Time SPC was selected for a proof of concept on one filling line at their Toronto, Canada operation. The trial was designed for a limited number of products, but included quality, safety and packaging concerns using the check sheet data collection feature included in Minitab Real-Time SPC.

RESULTS

The company's deciding factors were the overall system "ease of use", electronic check sheet capabilities, and real-time notification of events. At the same time, insights into their content control also weighed heavily on system approval. Key points noted during the proof review:

- Operators appreciated having a "portable" system with standardized data collection that was also easy to use.
- Real-time notifications have prevented several potential issues. For example: an operator noted mismatched divider trays prior to packaging eliminating the need for a product hold and repackaging.
- SIP/CIP and verification data were available to management within a few clicks.
- The company was able to analyze data almost immediately and generate reports as needed. Net content presented an amazing cost reduction opportunity through the improved analysis of content overfill and underfill.

After implementation of the proof of concept, 200 subgroups of 5 samples were monitored for net content. The following results were obtained from production of their 750 ml single malt, with the UpperMAV and LowerMAV of 765-735:

Tackling Material Waste on Construction Sites

| | |
|-----------------------------------|-----------------|
| Label Stated Content (LSC) | 750ml |
| Mean | 755.63ml |
| Standard Deviation | 1.98ml |
| Range | 749.76 ~ 761.36 |
| Overfill / Underfill | +0.75% |
| Outside of MAV | 0 |

The company was satisfied with the results as their goals were no MAV violations and maintaining an overfill of less than 1.0%. Some quick analysis then showed that just a 0.50% reduction in overfill would make an incredible difference. Target was reset, equipment adjusted, and another 200 subgroups of 5 samples each were evaluated:

| | |
|--|--|
| Label Stated Content (LSC) | 750ml |
| Mean | 751.91ml |
| Standard Deviation | 2.04ml |
| Range | 746.05 ~ 759.16 |
| Overfill / Underfill | +0.25% |
| Outside of MAV | 0 |
| Average Daily Filling Volume | 18000Litres (18,000,000ml) |
| Overfill at 0.75% | 135Litres (13,500ml) per day – 3 shifts |
| 135 Liters Overfill to 750ml Bottles | 180 bottles per day at 750ml |
| Product (top shelf) cost per 750ml | \$20.00 (product evaluated, 750ml cost) |
| Product (top shelf) cost per Day / Week | \$3,600 per day / \$18,000 per week |

The company found that reducing the target to 751.87 maintained a greater than 95% probability that product would not be out of MAV. One production line has the potential to save \$18,000 per week with revised targets. With 48 production weeks per year, the company realized \$864,000 savings annually per one line producing the top-shelf 750ml Single Malt.

With successful proof of concept, the company is moving forward with a full site roll out of Minitab Real-Time SPC. The scope will be increased to include the bottle preparation area along with the filling, labelling, packaging, lab, and quality areas.