Case Study / Unilever Bertolli Olive Oil

Industry: Food Production



Changeover reduced to 36 minutes from 9 hours, a massive 93% improvement

Challenge

Due to increasing demand, the Unilever Bertolli factory had run out of capacity on its three plastic bottle olive oil lines. Line 4 had a capacity utilisation of 96%. They decided to try and improve the efficiency of the lines by reducing the changeover times, which for Line 4 were in excess of 9 hours. An additional target was set to rollout any improvements on Line 4 into two similar olive oil lines.

Solution

Using SMED to analyse the changeover process six improvement projects were identified:

- **Casepacker - Bottle Spacers**
- **Casepacker - Quick Adjustment**
- **Lane Divider - Height Regulation**
- **Buffer Table - Lane Guides**
- **Filling Machine - Height Adjustment**
- **Depalletizer - Kaizen**

The plan was to remove more than 40 changeover tasks, with a tentative target of reducing the overall changeover time from 9 to 3 hours in the first 6 months.

Results

Overall Line 4 changeover time was reduced from 542 to 36 minutes, a massive 93% improvement.

A decrease in the capacity utilisation of 7% to 89%, resulted in the OEE increasing by 6% to a record 87%.

Two similar olive oil lines utilising similar machines and technology have also benefited from the same changeover savings being replicated and trained.

The Client

The Client

Unilever is one of the top manufacturer's of packaged consumer goods world wide, operating in Asia, Africa, North America, the Middle East, Western Europe, and Latin America. The company's products cover two categories, food and home and personal care, with known brands such as Bertolli, Dove, Vaseline, Surf, Slim Fast and Lipton. Unilever is part of the Unilever Group owned by the Netherlands-based Unilever N.V. and UK-based Unilever PLC.

Photo 1- Tuscany, Italy

The Bertolli factory located in Italy, is a brand of Unilever and was founded in 1865, in Lucca, Tuscany. It was always known for its olive oil but has now widened its range to Pasta Sauce and Ready meals. The site has six Olive Oil Lines, three of which fill into plastic bottles of differing quantities.

The Challenge

As the success of the Bertolli brand has increased, so has the utilisation demand on its production lines. The company faced a choice of either installing another line, or trying to make the lines more efficient. One of the three plastic bottle lines had changeover times in excess of 9 hours, as well as having the largest capacity utilisation (96%). This line, Line 4, also has the most SKU's at 140. All three lines are using the same technology and automation, with slightly better changeover times. It was decided to try and replicate any benefits gained on Line 4 across the other two lines.

The Approach

Working with KCTS, an achievable target was initially set to reduce the changeover time to a sustainable 3 hours within 6 months to justify the expense of a SMED analysis. KCTS used multiple high definition video cameras to provide simultaneous views of the changeover on Line 4, making it much easier to identify all the process steps and adjustments.

After the first analysis, it was decided to initially concentrate on the Case Packer machine, which had the greatest changeover step time at 6 hours, split into two blocks. The initial changeover at 3 hours, and an additional 3 hours of many minor adjustments required during start-up, before the line changeover was considered complete.

Once the initial changeover reduction was achieved and trained across all the shifts, further detailed plans were to be implemented to progressively reduce the overall changeover time.

Photo 2 - Bertolli Olive Oil

CHANGEOVER REDUCTION

KCTS

Improvements - Line Divider Height Regulation

Before:
37 minutes of difficult manual adjustments.

Photo 3 - Difficult manual adjustments

After:
Push button and complete in 2 minutes

Photo 4 - Procedure now just pushing a button

The Implementation

It was decided that whichever shift was on day's were to be assigned the responsibility of carrying out the SMED activities, then as the shifts rotated, everyone on the line had the opportunity to contribute to the analysis and improvements.

The initial SMED analysis had identified all the process steps required to complete the changeover and the key activities to be improved. A plan was put in place to solve the following time consuming issues:

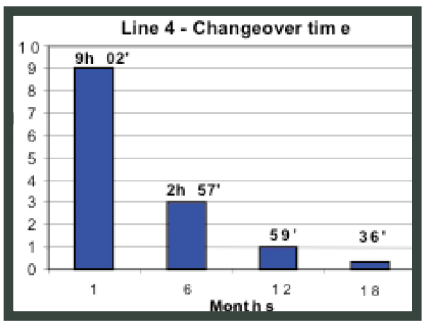
1. Casepacker - Bottle Spacers
2. Casepacker - Quick Adjustment
3. Lane Divider - Height Regulation
4. Buffer Table - Lane Guides
5. Filling Machine - Height Adjustment
6. Depalletizer - Kaizen

Over an 18 month period, each of the above issues were solved, removing a total of 47 changeover tasks, trained out across all shifts and then replicated on the other two lines. Prior to each training event, the new changeover procedure was documented, forming the basis of the training material.

Results

Over the 18 month project period, Line 4 changeovers dropped from 542 to 36 minutes giving a 93% time saving.

This time saving translated into a drop in the capacity utilisation of 7% to a more manageable 89%, allowing time initially for more planned maintenance activities to be carried out, followed by an increase in production volume. The eventual increase in OEE was 6% to 87%.

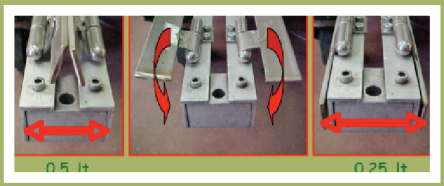


Lane Bottle Size adjustment Improvment

One of the improvments accomplised from the Changeover reduction exercise was the line width adjustment.

Before:
Two different size bottles (0.5 litre and 0.25 litre) were made on one line. The bottle size changeover used to involve a lengthy time consuming process of changing the width of the line to accomodate size bottle, using a sample bottle as a guide for the new width.

After:
The lanes of the line now have hinged plates that can be rised or lowered into position depending on the size of bottle being produced. Guides are no longer manually set using a sample bottle reducing the changeover and startup time.



For more information contact
KCTS Limited
+44 (0)151 608 9036
info@kcts.co.uk
Visit us at: www.kcts.co.uk

CHANGEOVER REDUCTION

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