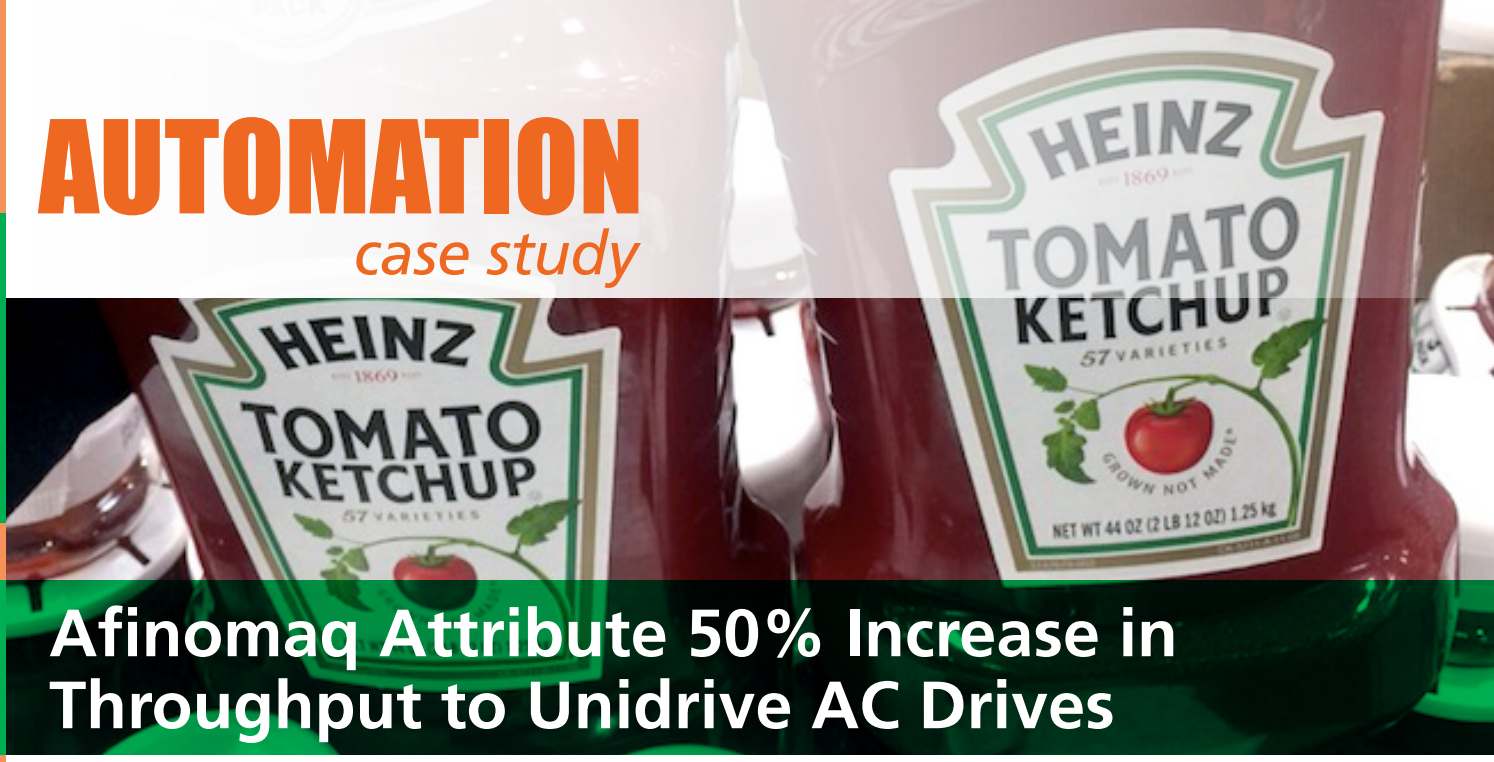
Packaging

AUTOMATION
case study



Afinomaq Attribute 50% Increase in Throughput to Unidrive AC Drives

The upgrade of a ketchup bottle labelling machine, at one of Europe's leading manufacturers of machinery for filling, capping and labelling of bottles, has increased its throughput by 50%, significantly increased its accuracy and eliminated product wastage thanks to servo drives supplied by Control Techniques.

The Challenge

Improve flexibility of the machine with the ability to quickly and easily setup various formats while increasing productivity, accuracy and coordination of processes in highly precise repeatable movements.
The Portuguese company Afinomaq makes a wide variety of machines for the food and beverage industry, including semi and fully automatic labeling machines. The company was experiencing some problems with a machine specifically designed for the labeling of ketchup bottles, with photocell failures because of intensive wash-down procedures and misalignment of labels because of line speed variations.

The Solution

The scheme proposed comprises three sets of Control Techniques Unidrive 1 HP (0.75kW) AC drives in servo mode, twinned with Unimotors to control the three heads of the rotating head labeling machine. Each drive is fitted with an additional Universal Encoder module to monitor the absolute encoder feedback of line speed, as well as a programmable Applications module to provide powerful on-board machine controller. The drives communicate using Control Techniques' high speed drive-to-drive network and are precisely synchronized together as well as being locked to line speed. The weakness of the photocells is eliminated, since the output speed of the labels is monitored in relation to line speed and a 20-position label buffer has been incorporated for label call-off.
The position of the star is monitored by a high accuracy 4096 ppr encoder and this is fed back to the drives via the Universal Encoder module. A sensor detects the input of a bottle into the 'star' - feeding the signal back to the high-speed inputs of the Applications modules to trigger the labeling sequence at the right moment.

Now, with Harker Sumner's Control Techniques servo solution, the machine is totally flexible and can cope with all types of labels needed through a simple configuration of the touchscreen HMI. It is no longer necessary to make any mechanical adjustments on the machine since all of the trim controls, to a fraction of a millimeter, are made on the operator screen.

The Benefits

"The result has been a big increase in machine reliability plus a massive 50% increase in throughput speed," concludes José Marques, "and, as a bonus, bottles are less stressed in the star unit, eliminating breakages!" The Unidrive AC variable speed drive range spans 1 HP (0.75kW) right up to 2,500 HP (1.9 MW). Unidrive is the world's most advanced 'solutions platform' AC drive, configurable into five operating modes - open and closed loop, vector, servo and regenerating modes - connectivity to most industry standard networks and accepting 14 position feedback protocols. With a range of plug-in module options, its on-board PLC can be supplemented, as in this case, with programmable modules.
The Unimotor servo motor six range is available in frame sizes with rated speeds up to 6,000 rpm and rated torques up to 484 lb-in (54.7 Nm). The standard Unimotor range is designed for use with the Control Techniques Unidrive range and is ideally suited to demanding servo environments. A range of feedback options is available: incremental encoder, Sin/Cos single and multi-turn encoders or resolver to suit application requirements.

KEY BENEFITS

- 50% throughput increase
- Significantly improved accuracy & reliability
- Eliminated product waste
- Increased reliability
- Easy programming through hmi

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