



Cynertia uses multiple Omron technologies in automated bottling line for CBD industry

Case Study

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Overview

The CBD industry in the United States and Canada is growing at a rapid rate, and many companies currently competing for market share need to be equipped for the increasingly high levels of demand that they will soon face. The variation in packaging requirements from region to region also poses a major challenge for these companies, and interest in automated packaging and bottling machinery is rising.

Cannabidiol or CBD, has become popular in recent years as a wellness and mood enhancing substance. This case study discusses the design of a compact CBD concentrates bottling line that addresses the needs of smaller, more space-constrained players in the industry.

This solution provides the following benefits:

- Helps companies address growing demand through automation
- Ensures proper packaging and labeling according to varying standards
- Saves space thanks to the use of relatively compact components

The Omron logo is displayed in a bold, blue, sans-serif font.

Background

Cynertia Factory Automation, Inc., a provider of industrial automation and electrical solutions based in the Canadian city of Saskatoon, designs bottling lines specifically for customers in the CBD industry. This industry requires specialized lines in order to meet legal regulations on content, packaging and labelling. In recent years, CBD has become a widespread presence on store shelves due to its increasing popularity as a wellness and mood enhancing substance. It often comes in its concentrate form, which represents about 36% of its sales.

Major challenges in this growing industry include strict packaging and labeling requirements as well as rapidly increasing demand faced by companies with minimal existing automation. Due to the industry's dramatic expansion, many companies have not had time to invest in automation technology. Labor-related challenges have also made it more difficult for these companies to keep up with demand, and automation is starting to become more attractive for this reason.

The Health Canada department of the Government of Canada has established a comprehensive guide to packaging and labeling requirements (the most significant of which mandates child-resistant packaging) that is the same throughout all provinces, whereas in the United States, each state makes its own regulations. Some uniform requirements exist for CBD-related labeling in the U.S. market, such as a symbol that clearly indicate a product's cannabis content, but most vary from state to state. Bottles are the preferred packaging format for CBD products because they can be lidded with child-resistant caps. In addition, they often have a secondary covering, such as a paperboard box.

Challenges facing CBD market players

Growing interest in CBD as a wellness product presents major opportunities as well as significant challenges for new companies in the industry. With an abundance of manual processes and a tendency toward smaller spaces, these companies stand to benefit from specialized automation technology.

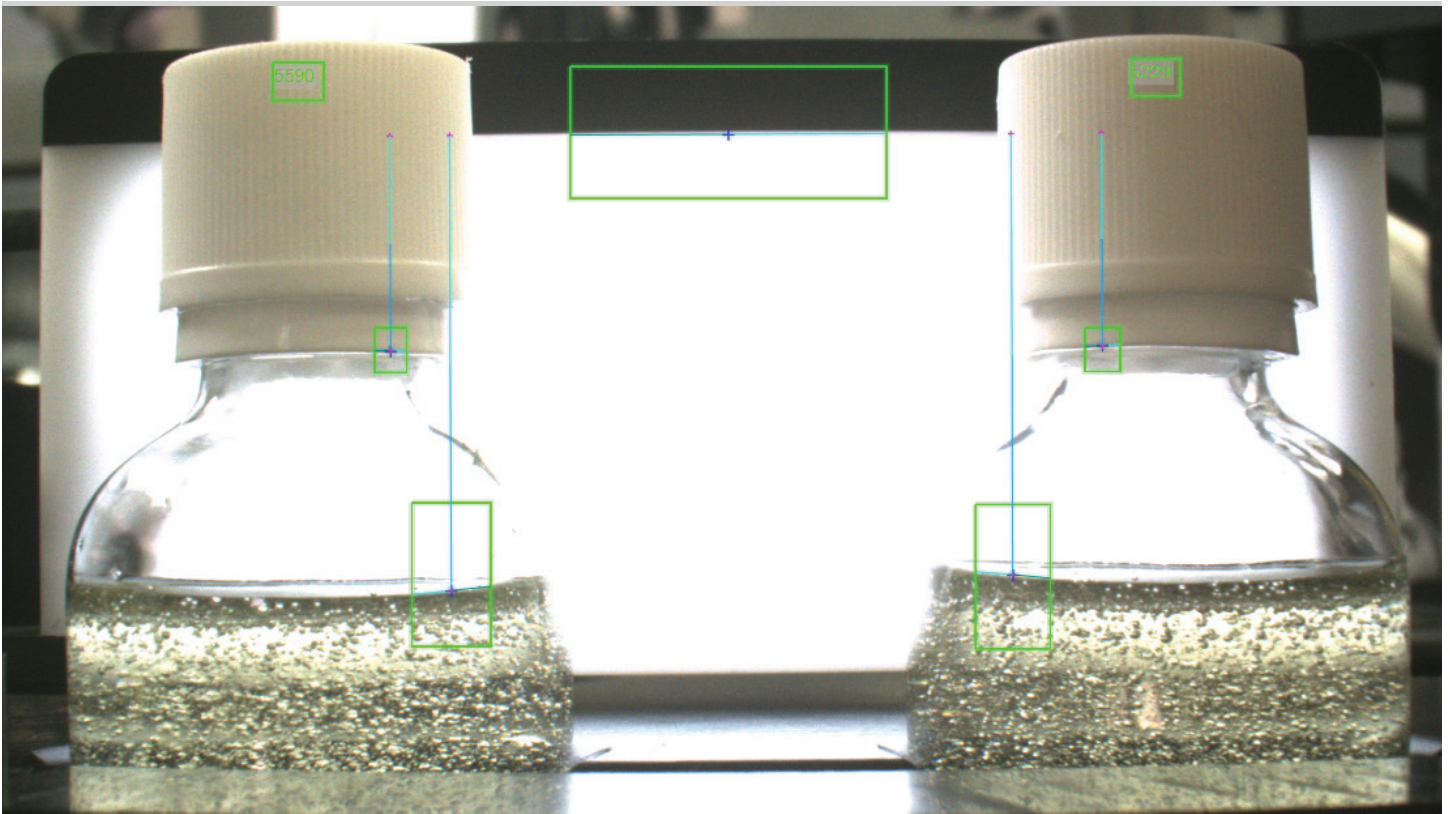
CBD companies' challenges fall into four main categories:

- Growing demand
 - Low automation
 - Packaging requirements
 - Labelling requirements
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Challenge

Cynertia sought to develop an automated line that could bottle up to QTY 6000, which refers to the number of 50-ml bottles of oil processed per hour. The line needed to clean, fill, cap, and label the bottles while ensuring consistent quality, and the bottle filling area needed to meet the requirements for ISO 5 cleanroom classification. (ISO 5 means that there must be fewer than 100 particles per square foot within a cleanroom.) Due to packaging regulations, traceability was an important consideration in designing the machinery.

One of the main challenges was to develop a line that could fit in a compact area. Many companies in the CBD industry are relatively new and have limited floor space, so Cynertia designed its bottling line with this need in mind. Omron was an attractive choice for several of the line's components because many of its technologies are fairly compact. In addition, Cynertia already had familiarity with Omron and was impressed by its wide-ranging product selection and quick delivery.



Omron's AutoVISION product inspection software checks the CBD fill level and ensures the integrity of the cap installation. The software includes thirteen vision tools that optimize common detection characteristics.

Solution

Omron's F430 Series smart cameras play a crucial role in the new production line. One camera detects whether a bottle's fill level is within a certain tolerance and whether the cap has been positioned properly, while another camera verifies that the bottle's label is correctly placed and defect-free. The second camera also scans the barcode on the label for traceability purposes. The F430's pass/fail function transfers data to a third-party programmable logic controller (PLC) using EtherNet/IP communications. The F430 is ideal for this particular project given its small form factor and user-friendly software that easily accomplishes all required quality control checks.

Another contributing factor is the AutoVISION programming interface, which allows users to implement machine vision solutions within minutes instead of investing hours of engineer time. AutoVISION simplifies common machine vision applications with its intuitive navigation that gives instant automated feedback and guides the user through basic steps of setting up the image, editing the inspections, and running the application. If monitoring is required, the additional Web Monitor feature lets users remote connect to the cameras via a web browser and customize the layout as appropriate for the machine operators.

Cynertia also used an Omron E3Z Series transparent object photo-eye sensor to count bottles as they move through the line and determine whether a bottle is present in certain areas of the machine. This helps the system decide when it's advisable to move to the next step, as the line could run into major complications without this information. The E3Z works well for detecting transparent objects and makes PLC integration easy.

On the safety side, Cynertia used Omron F3SG-RE Series light curtains to detect and shut down the machine when an operator's hands enter the glove-port area of the bottle filling and capping section. The F3SG-RE is a reliable and economical solution for hand and arm detection on the machine. To support the requirements for ISO 5 cleanroom, several Omron D40P Series non-contact safety switches detect when the doors to the bottle filling and capping section are opened and prompt the machine to shut down. If any doors have been opened, a half-hour wait period is automatically implemented after the doors are shut to allow the filter unit to bring the area back to the necessary particle concentration levels.

Technology spotlight: F430 industrial Ethernet smart cameras

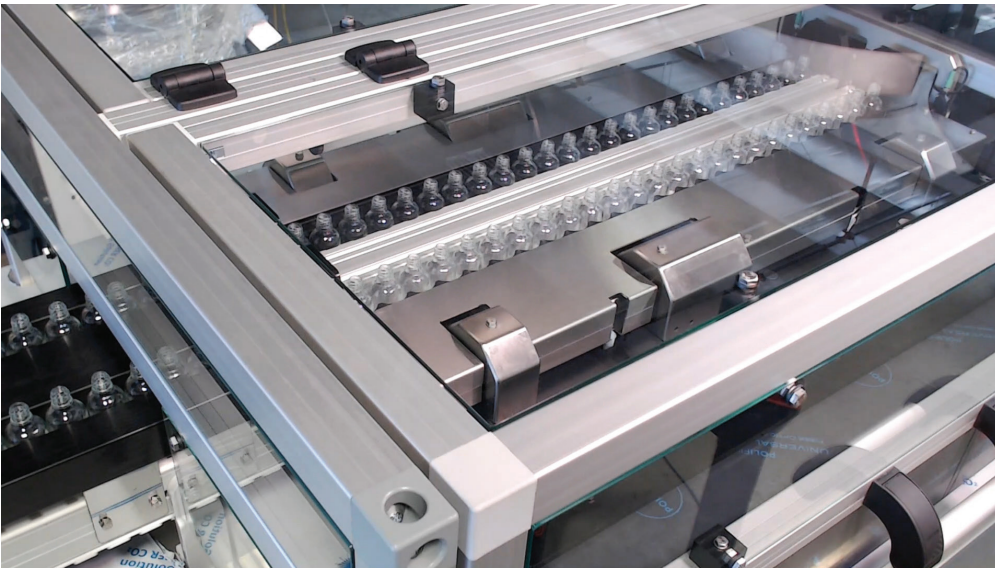
As CBD manufacturers are unable to release any products that fail to meet regional packaging and labeling requirements, it's essential for companies to have robust traceability systems in place to minimize the potential for errors.

Omron's MicroHAWK F430 smart cameras are an excellent option for traceability and inspection thanks to their compact form factor and user-friendly AutoVISION software. With powerful decoding algorithms and optional liquid lens autofocus, the F430 makes it easy to track works-in-progress and ensure correct labeling.

Results

Thanks to Omron's technologies, Cynertia was able to meet its goal of producing 6000 bottles per hour while maintaining consistent quality with regards to fill level, capping and labeling. The high-throughput machine makes bottling much more efficient and helps smaller companies in the CBD industry get their product to market more quickly. The equipment fits easily into small spaces, making it ideal for manufacturers that have minimal space available for automation technology.

In addition, the machine is flexible enough to adapt easily to other types of products, including hand sanitizer or energy drink bottling. Cynertia is highly satisfied with the flexibility and space-saving capabilities offered by Omron's barcode readers, safety components and other technologies.



To support the requirements for ISO 5 cleanroom, several Omron D40P Series non-contact safety switches detect when filling and capping section doors have been opened.

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