High-Speed Pouching Saves Time and Energy

IEC-61131-3 programming approach drives the design of the latest generation of vertical form-fill-seal machines.

BY AL PRESHER, CONTRIBUTING EDITOR

A combination servo, pneumatic and linear motion solution is helping Winpak's W-18 vertical form-fill-seal (VFFS) packaging machine reach even higher output while saving energy, time and materials.

Winpak Lane has been producing this servo-driven pouch machine since 2002, and has put more than 150 machines into the field. The servo-driven unit has a solid reputation in the food and packaging industry for high throughput and reliable sealing across a wide range of food products from applesauce to yogurt. But with a recent redesign, Winpak has created a new W-18 series with simpler and more user-friendly operation, and faster and more precise control.

"With the machine redesign, we took a major step and moved into a more user-friendly programming environment using IEC-61131-3," says Mark Griffin, director of sales and marketing for Winpak.

Griffin says the move to the new programming approach has provided increased operating efficiency through its ability to implement complex cam profiles that were problematic in the past, and that needed to run at lower-than-maximum machine speed."

The W-18 is designed to form, fill, seal and date code up to 1,500 packages per minute with accurate and repeatable weight control. Servo drives and motors are used on the pump, pull wheel, rotor and seal bars with a date coder as an optional fifth axis.

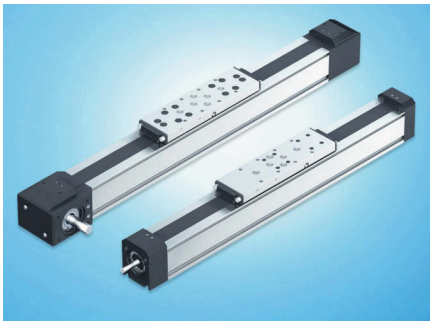
On the redesign, Winpak worked with Bosch Rexroth and automation distributor Applied International Motion (AIM) to specify and implement electric drive and control, pneumatics and linear motion components.

Based on the machine's design parameters, AIM recommended the SERCOS-based IndraMotion MLC controller, which has built-in motion, logic and Flex Profile capabilities. With Flex Profile for the seal axis, cycle times can be optimized for velocity, acceleration, position or time to avoid rebuilding cams each time a parameter changes.

All four axes are synchronized to a master virtual axis, which makes coordinated and repeatable filling and high-speed registration possible. Precise timing on the pump and rotor system

SOURCE: WINPAK LANE

The W-18 pouching machine from Winpak is designed as a four-axis, servo-driven vertical form-fill-seal that can package up to 1,500 packages per minute with accurate and repeatable weight control.



SOURCE: BOSCH REXROTH CORP.

The MKR linear module provides exceptional moment load capacity and smooth, low-friction travel at speeds up to five msec.

provides the W-18 with a superior level of weight control for a machine in its class.

The IndraMotion MLC also features automatic temperature control with tuning and monitoring of 32 separate heat cartridges to help ensure a strong seal every time. The controller stops the machine if a seal bar is out of temperature range, which saves on materials waste due to incomplete sealing.

Product changeovers reportedly occur quickly using the IndraControl VEP model PC-based HMI running a standard Windows platform. Recipes are saved in the controller, enabling a one-touch return to baseline machine parameters. Each axis uses an IndraDrive digital servo drive along with an IP67 washdown-rated synchronous IndraDyn servo motor. The servo drives offer distributed intelligence to close all the loops in the drive. In addition, the motor on the rotor axis has an FDA-approved stainless-steel coating to resist caustic cleaning chemicals.

Besides the servo system, the W-18 features a belt-driven MKR linear module that allows two inkjet heads for the optional date coder to print date codes across 18-inch material widths at once, doubling the speed of the current one-inkjet model. The linear module provides moment load capacity and low-friction travel at speeds up to five m/s.

Pneumatics also play an important role in the new design. The pouch-cutting knife function uses an ICS (ISO Clean Stainless) all-stainless steel cylinder, specifically designed to avoid bacteria buildup. The cylinder has Viton seals to withstand the operating environment. A modular HF03-LG pneumatic valve manifold with Profibus interface is used to open the pull wheels and relax the packaging material film web between each machine cycle. The new machine saves up to 18 cubic feet of air per minute as compared with previous mechanical and pneumatic control machines.

Other key features of the W-18 system include a precision servo drive system which can accurately fill a wide variety of products. An "atmospheric control" option provides a hot-fill solution and also gas-injection in headspace for modified atmosphere packaging

(MAP). The machine can handle film web widths of up to 20 inch (508 mm) and particulates up to ½ inch (12 mm).

Idle mode operation allows the machine to be stopped and started with no loss of product or packaging materials. It also accurately fills products as thin as soy sauce and as thick as peanut butter, which makes it applicable for packaging food, dairy, cosmetic, industrial and pharmaceutical products.

The W-18 produces a high integrity sealed pouch by combining two separate rolls of packaging film. Packages of varying widths may be produced with the use of appropriate change parts. A

SOURCE: BOSCH REXROTH CORP.

Product changeovers occur in a matter of seconds using an IndraControl VEP model PC-based HMI running on a standard Windows platform.

12-across pattern is the most common size for packages with fill weights from 2 to 15g. A six-across pattern is typical for 1 to 3 oz. (3 to 90g) packages such as salad dressing.

Other standard options include front and back registration systems, edge control systems, splice detector, product tanks with level control, specialized

"WITH THE MACHINE REDESIGN, WE TOOK A MAJOR STEP AND MOVED INTO A MORE USER-FRIENDLY PROGRAMMING ENVIRONMENT USING IEC-61131-3."

Mark Griffin, Winpak

low viscosity fillers, complete CIP valve and piping packages, access platforms, and a variety of date coding systems including embossing, thermal transfer and traversing ink jet.

For more information:

- *Winpak Lane: http://dn.hotims.com/27757-501*
- *Bosch Rexroth Corp.: www.boschrexroth-us.com*
- *Applied International Motion: www.aimotion.com*