

Omron's Motion and Control Systems Help American Packaging & Plant Equipment Put This One in the Bag

Cambridge, Ontario-based American Packaging & Plant Equipment (APPE) practices a unique business philosophy, which their employees apply in every aspect of their day-to-day activities - keep it simple (KIS). And with over 1 million bags packed on their intermittent and continuous motion machines daily, APPE's customers enjoy the benefits of their business philosophy - the KIS rule. With a passion for vertical form fill seal (VFFS) machines, APPE is continuously involved in developing advanced machines to solve some of the toughest packaging challenges faced by the industry. APPE's latest technological advancement is in the development of an environmentally friendly high-speed VFFS machine. This new machine is the VERTOBAGGER 2.0 and it reduces the waste impact that flexible packaging materials make on a global scale. Unique features of the VERTOBAGGER 2.0 enable companies to use thinner materials and consume less packaging materials by using an ultrasonic sealing mechanism.

Environmental Impact

The VERTOBAGGER 2.0 brings significant environmental benefits to the table by reducing the thickness of the film by a minimum of 10% and by reducing the amount of film used in sealing each bag. Millions of tons of flexible packaging waste can be eliminated from overall global recycling and waste systems. And the unique ultrasonic sealing mechanism will seal through plant-based plastics, which are also referred to as biodegradable packaging materials (BPMs). The VERTOBAGGER 2.0 is the first machine in the world capable of running thin BPMs up to 140 bags per minute.

It is also capable of interchanging between ultrasonic, impulse and standard sealing methods, running flexible packaging films from 140 to 210 bags per minute.

Growing the Core and Beyond

Omron motion systems are used throughout APPE's best-in-class VFFS bagging machines, with six G5 servo motors digitally geared for synchronous motion. "A great example of how Omron's G5 servo motors work seamlessly with our VFFS bagging machines is through the motion of the horizontal jaws," says Al Aman, Owner, APPE. "G5 servo motors control both the X and the Y motion enabling continuous flow processing." And with the number of separate operations on their machines including filling, sealing and cutting, APPE finds them essential to precisely control motion. In fact, APPE has a patent pending on the horizontal jaws due to their unique design and performance.

"Common issues associated with the flexibility of eco-friendly film materials are slippage and friction," states Aman. "The nip roller on our bagging machine compensates for such inefficiencies, minimizing downtime." APPE's patent pending nip rollers are powered by Omron's G5 servos to reliably check alignment, reducing set-up and maintenance time and product scrap.

In addition, APPE uses Omron's E6B2 compact rotary encoder to assist with precise bag length measurement. In conjunction with the rotary encoder, APPE uses Omron's E3ZM photoelectric sensor for print mark registration, allowing for accurately aligned cuts when trimming, with no adjustment required - which also helps save on packaging material waste. Because the sensors are designed with food grade 316L stainless steel housing and are Ecolab certified detergent resistant, they can withstand washdown environments - making them ideal for maintaining clean-in-place (CIP) standards.

For precise control of their machines, APPE uses Omron's 8-axis NJ3 controller



Stronger Seal using 10% Less Film



American Packaging & Plant Equipment in Cambridge, Ontario specializes in intermittent and continuous motion vertical form fill seal (VFFS) bagging machines for the packaging industry - from snack foods to coffee and even fresh produce.

Thanks to the unique motion and control design through their partnership with Omron Automation, the VERTOBAGGER 2.0 continuous motion VFFS bagging machine with ultrasonic sealing sets a new standard in the industry. Overall benefits include an average of 20% improvement in overall productivity, 25% in overall savings, 50% reduction in rework and line losses as well as a 15% reduction in packaging material cost.



with integrated motion. Position is continuously measured via a closed loop system that sends feedback to the NJ3, which accurately and reliably adjusts velocity, acceleration and jerk while allowing operations to remain stable. The NJ3 seamlessly provides advanced motion control with proven machine logic in a single controller with built-in EtherCAT.

EtherCAT is a real-time communication platform with powerful capabilities used in the automation field mainly due to high-speed and determinism of less than 1 ms. Among other advantages, EtherCAT includes a safety protocol and multiple device profiles. Fieldbus standards IEC61158 and IEC61784-2 both include EtherCAT as well as ISO15745-4.

Carbon Footprint

The VERTOBAGGER 2.0 with the ultrasonic sealing mechanism utilizes very little energy to operate at optimum levels. This is primarily because there are no resistive heaters on this machine as ultrasonic sealing technology uses sound waves to generate heat in the packaging material. The machine is built with robust electrical and mechanical components, making it easy to operate at high speeds with minimum energy requirements. Ultrasonic sealing technology assures hermetic seals, even with contaminated surfaces (fluids, solids or fibers between the sealing surfaces). This reduces line re-work and losses by up to 50%.

Flexible Packaging Savings

Not only does the VERTOBAGGER 2.0 bring environmental benefits, such as reducing the carbon footprint, it also saves millions of dollars in packaging material costs. A 10% reduction in material thickness and a 10% reduction in material length, per bag, can result in a savings of 20% on the overall material cost.

Energy Savings

Low energy consumption translates into massive savings when it comes to the cost of operation over the machine's lifespan. For any manufacturing company, conserving energy is an objective. "The way Omron's G5 servos are integrated into our machines allows them

to draw a very low amount of energy compared to traditional VFFS machines," says Aman. "In staying with our business philosophy of 'keep it simple,' we use robust components to do less work. This makes the machines we produce faster, efficient and reliable."

Building Long-term Impact

APPE maintains a policy of partnering with suppliers that not only provide robust and reliable systems but also offer best-in-class service and support. Aman notes that it is important for their machines to be correctly built for the application but that a truly successful integration includes training, maintenance and ongoing support. "Omron offers a wide array of support services such as free technical phone support, local application engineering support and access to local distribution technical experts," says Stanley Wachon, Industry Account Manager, Omron Automation.

And APPE values Omron's extensive network of resources - especially when it comes to the global aspect of support. "Our VFFS bagging machines are shipped all over the world and Omron's global presence makes it very easy for us to access systems off-the-shelf, anywhere in the world," comments Aman.

The bottom line and the key factor, according to Aman - is that they receive unparalleled support from the beginning all the way through to the end.

For more information on the VERTOBAGGER 2.0, please visit www.verticalformfill.com.



Omron Automation is a leading global provider of machine safety and automation solutions, with more than 80 years of service experience in the controls and sensing business. Our customers can rest assured the automation strategy developed will meet the needs of today and include pathways for practical expansion and modification to address the many challenges of the future.

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