



eXtended Transport System increases flexibility in food packaging

## Pizza case packer with XTS replaces three machines and conventional product transport technology

Amid rapid change in the food and beverage industries accelerated by the COVID-19 pandemic, consumer packaged goods (CPG) manufacturers, contract packagers and their suppliers have to dramatically increase their agility to meet an exponential surge in demand. This prompted U.S. OEM Brenton to equip their side load case packer machine with the XTS. Now, the linear transport system enhances flexibility in product infeed and makes changeovers faster. In addition, the machine offers a significantly reduced footprint after the redesign.





Left: XTS is at the core of the M2000 packaging machine from Brenton, pictured above: A series of buckets holds pizzas as XTS takes them around a 180-degree corner to grip and stabilize stacks.

Above: Using XTS, Brenton developed a pitch-less machine that handles completely random infeed timing of all frozen pizza shapes, orientations and SKUs.

Brenton manufactures integrated end-of-line packaging systems for the food, beverage and pharmaceutical industries, specializing in case packing, cartoning, robotic palletizing and material handling. Today part of the expansive ProMach, Inc., group of brands, the company has been in existence for over 30 years.

A major U.S. contract packager enlisted Brenton to take on a challenging case packing application for frozen pizzas. This fast-paced facility required machinery that could handle random timing infeeds as well as 26 different frozen pizza SKUs that were either boxed or simply shrink wrapped in plastic. "This application presented a challenge as we had to eliminate change-out flights for different sized products. Switching from 10-inch to 15-inch pizzas required time-consuming mechanical adjustments," Mike Grinager, Vice President of Technology for Brenton, explained. "We also had to deliver a high throughput of 15 cases per minute without product damage. This is complicated by the fact that pizzas are stacked as many as 15 high in variable orientations while they speed down the packaging line."

### Intelligent transport technology handles product variance

Brenton eventually decided that these demands necessitated a mechatronic linear transport system for the company's popular M2000 intermittent motion, side load case packer machine. "This decision led Brenton to the eXtended Transport System (XTS) from Beckhoff, which we found could adapt to these product changes on the fly," Grinager said. "Using XTS, we developed a pitch-less M2000 machine that expertly handles a completely random infeed timing of all pizza shapes, orientations and product variants, including display-ready and bulk packaging."

The upgraded M2000 machine now features 5.5 meters of XTS track with 12 movers to control the product infeed. A true mechatronic solution, XTS offers linear motor characteristics combined with constantly cycling movers on a path available in open or closed versions and the most diverse geometries. As one of many remarkable features, the movers are able to create clamping forces in motion: Two synchronized movers working in tandem grip the pizza stacks





XTS greatly reduces jams and downtime as it moves perfectly stacked pizzas into cartons, according to the packaging specialists at Brenton.

contained in buckets with a predefined force and stabilize them for fast and secure transport to case packaging steps. "That's the beauty of this machine – it takes a stack of 15 shrink-wrapped circular pizzas and can quickly adapt to an infeed of pizzas already in square packaging – all with minimal changeover time," Mike Grinager said. XTS also effortlessly compensates for different infeed timing in the feed because the movers can take up any distance and buffer product in front of the load station to give other production processes extra time if needed. "XTS greatly reduces jams and downtime as it moves perfectly stacked pizzas into cartons," Mike Grinager said. "None of this was possible with other systems we evaluated." Brenton's first XTS application had to handle a heavy payload for this application type considering the weight of the tall stacks of pizzas. Therefore, Brenton integrated a GFX guidance system from HepcoMotion specially adapted to the XTS, which can accommodate higher payloads.

The XTS controller is a Beckhoff C6930 control cabinet Industrial PC. The machine controller connects to a CP2915 15-inch Control Panel display with

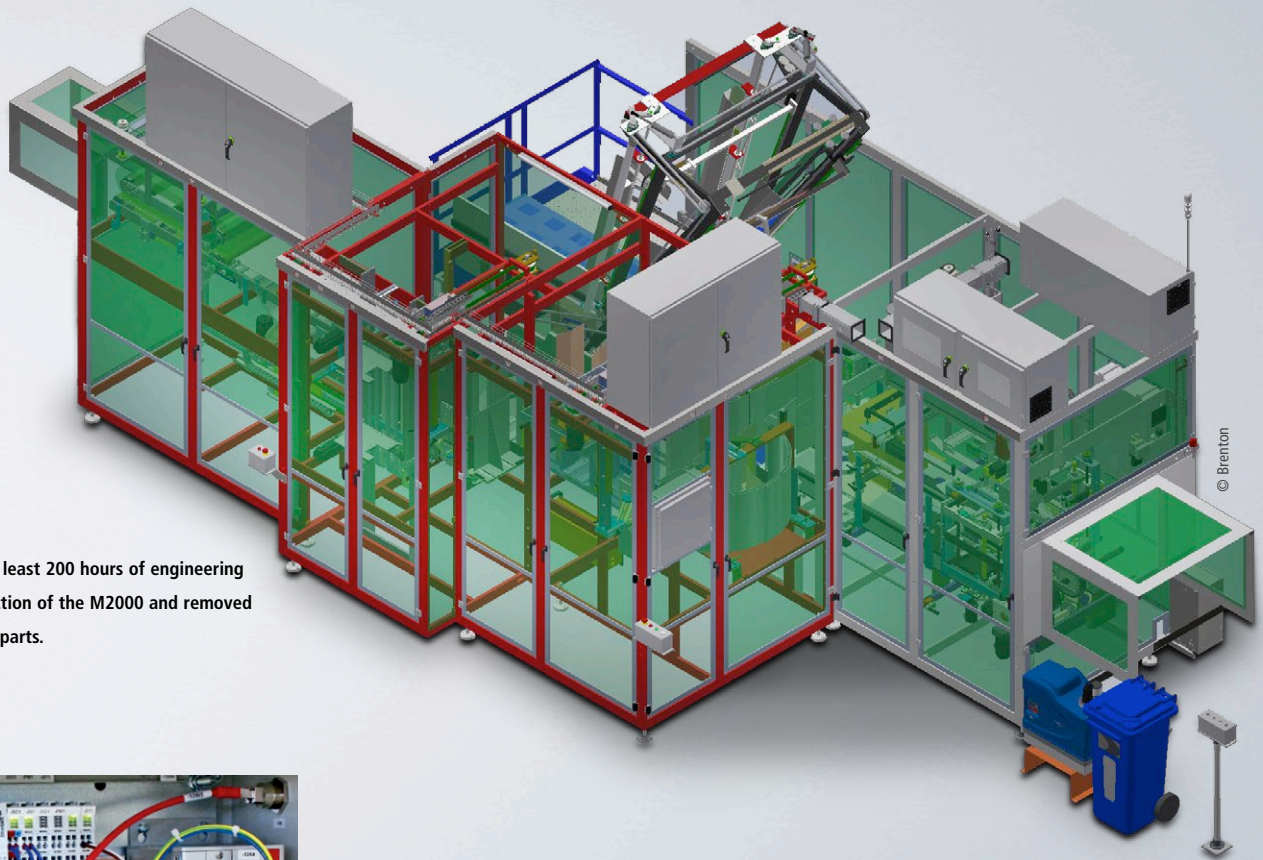
multi-touch capability. Despite the highly dynamic motion control involved, the XTS only utilizes about 15% of the IPC's computing power, leaving ample reserves for other automation functionality.

Later iterations of the Brenton M2000 also include high-speed EtherCAT I/O systems with a variety of EL series terminals, including 8-channel high-density (HD) variants. "Interoperability between the EtherCAT I/O system from Beckhoff and other fieldbuses is very helpful because it simplifies integration," Mike Grinager said. "Establishing connectivity with EtherNet/IP devices was also easy for the Brenton Engineering team," added Patrick Triemert, Application Engineer at Beckhoff USA. "However, with its extremely high-speed and synchronization, EtherCAT is the perfect bus for mechatronic applications like XTS."

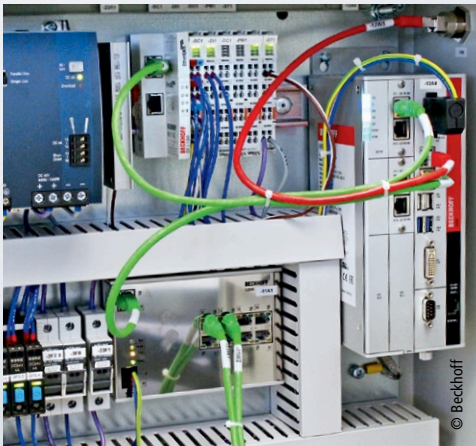
#### **Substantially increased machine throughput**

Brenton has experienced impressive throughput from the XTS-equipped M2000 machine. The M2000 is now able to carton as many as 41 different SKUs and





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A powerful C6930 control cabinet Industrial PC is used to control the XTS and other machine functions in conjunction with the ultra-fast EtherCAT communication system and the corresponding EtherCAT I/O Terminals.

up to 27 cases per minute, which equals 140 frozen pizzas per minute. The machine can also implement up to 26 different pack patterns, including more complex, display ready and commercial patterns at a throughput of 12.5 cases a minute. "One XTS-equipped M2000 machine can actually do the work of three conventional case packing machines," Mike Grinager said.

After eliminating many of the change-out steps, Brenton reduced the typical downtime required for remaining infeed changeovers from around 30 minutes down to just five minutes with XTS. Brenton saved at least 200 hours of engineering time for the infeed section of the M2000 and dramatically reduced complexity by being able to remove about 100 parts from the infeed, such as chains, flights, pushers and rotation mechanisms.

Since then, Brenton has already received a third order from the contract packaging company and there are quotes from other customers for additional machines with XTS. In addition to supporting well-established packaging

markets for Brenton, XTS is opening up many new project types for the OEM, particularly in pharmaceutical applications where they see even more potential to expand market share. "XTS supports many new machine designs for projects that we might have passed on previously," Grinager said. "We now have in our reach new concepts that are faster, more flexible and can reduce machine footprint by as much as 50%. Following our initial XTS successes, Brenton is also researching XTS Hygienic for washdown applications in food manufacturing and the XPlanar flying motion system for the most challenging material handling requirements in the industry."

More information:

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