SPECIAL REPORT

Waterloo Brewing's director of capital engineering Luigi Fantin standing in front of the pilot brewhouse installed inside the company's on-site Taphouse restaurant, complete with fermenting, aging and bright beer tanks, to offer guests a selection of unique hyper small-batch brews.

THE BEST THEY CAN

A new canning line enables leading craft beer producer to keep expanding its product portfolio and market share

By Andrew Snook

Waterloo Brewing has come a long way since its inception into the brewing industry in 1984, when it became Ontario's first craft-brewing company under the **Brick Brewing** banner.

Over the past 38 years, the Kitchener, Ont.-based company has gone from being a small local brewery to growing into Ontario's largest privately-owned brewery.

Including the co-packing side of the business, Waterloo Brewing produces 241 different SKUs (stock-keeping units) and employs approximately 275 people.

"Waterloo Brewing started with eight employees and produced 35,000 cases in its first year," recalls director of capital engineering Luigi Fantin.

"We're now producing over 11 million cases of products annually," he says. "We have our craft-brewing sector along with a thriving co-manufacturing business."

Some of the compny's best-known brands in its own portfolio include:

- The flagship ***Waterloo*** beer brand featuring *Waterloo Amber*, *Waterloo Craft Lager*, *Waterloo Dark*, *Waterloo IPA*, *Waterloo Radlers*, and a variety of limited-time Signature Series brews;
- The popular ***Laker*** brand of beers, featuring *Laker Lager*, *Laker Ice*, *Laker Light* and *Laker Red* labels;
- The ***LandShark*** *Lager* and ***LandShark*** *Seltzer* beverages, as well as the ***Seagram*** brand coolers and ciders.

While the *Laker* brand of beers only retails in Ontario, all of the company's other branded products have national distribution.

For its part, Waterloo Brewing's co-manufacturing business produces a variety of canned beverages, including beer, seltzers, ciders, tomato-based beverages, and even a line of energy drinks for a growing list of brand customers.

The past several years has been a time of aggressive expansion in improving and growing Waterloo Brewing's 177,000-square-foot facility housing offices, retail space, a restaurant/taphouse, and manufacturing and warehousing space.

"We've really done a lot, especially the past seven years," Fantin says. "We've spent around $85 million.

"We keep adding more tanks and more processes [and] we added an on-site retail store, which we complemented with a restaurant and patio to feature our craft beers," Fantin says.

The most recent investment the company made in its operations was a new canning line in 2021—adding a second canning line to the facility.

"That (canning) is the big package format that's growing year over year," Fantin says, noting the two canning lines are packaging increasingly varied varieties of beer, cider and RTD (ready-to-drink) mixed beverages, along with non-alcoholic drinks and tomato-based products.

"We're quite flexible," Fantin asserts. "Along with a multitude of package arrangements, we equipped both of our can fillers with liquid nitrogen droppers to allow us to can non-carbonated, or 'still' products, like tomato-based drinks or teas."

As Fantin relates, Waterloo Brewing's new canning line was designed to keep up with the growing market for canned beverages well into the future.

The overall speed of the canning line is dictated by the filler, which currently operates at 775 cans per minute. That said, the line can be pushed to fill up to 850 cans per minute, Fantin says.

"We designed the line so that if we ever changed that filler, it could go up to 1,000 cans per minute," he adds.

The new canning line starts with pallets of empty cans which are swept layer by layer onto a conveyor system with a **Barry-Wehmiller *400G2*** automatic empty can depalletizer.

The depalletizer sweeps empty cans onto the conveyor system where they are single-filed and sent through an ionized

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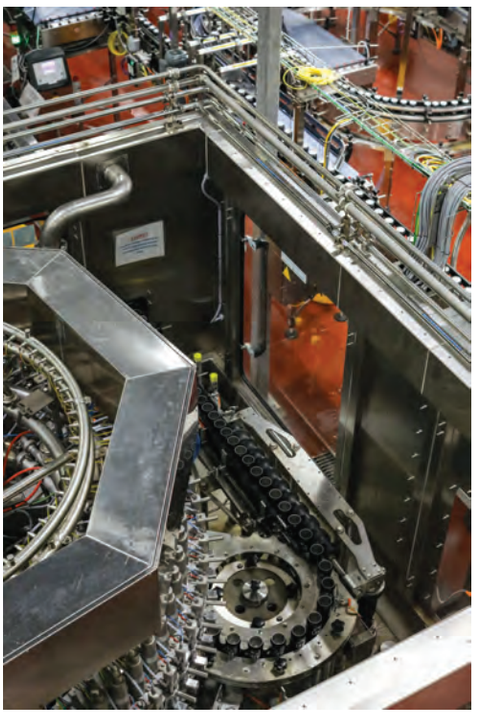

(clockwise)
A multi-sided view of the cans of Lake Ice brand beer going in and out of the CFT Group's MasternAn RS 72 model filler and the eight-head CFT 3000/8N model seamer.

(from left) Luigi Fantin joins reliability specialist Hannah Fiander and production supervisor Meaghan Gray in front of the SK500T ERGON tray-packer/wrapper manufacured by the SMI Group.

air rinser prior to entering the can filler.

The empty cans are filled with a 72-valve **CFT Group**'s ***MasterCan RS 72*** filler, and the lids are applied with the CFT eight-head seamer (CFT Group 3000/8N). Once filled, the cans are sent through the CFT Group ***PR TUNNEL 4x22 RC-UP*** tunnel pasteurizer.

This is the second can pasteurizer Waterloo Brewing has purchased from CFT. The decision was easy, as Fantin was impressed by the ease of installation and commissioning of the first pasteurizer they installed.

"It just went in, and it ran," Fantin recalls. "This was the easiest machine start-up I've ever done.

"It hit the operating specification on the first run," he extols. "We put in the theoretical settings and punched in the temperatures, and started it up."

Says Fantin: "It hit right where it was supposed to, and it just kept going.

"To verify the performance, we sent in a can with a monitoring probe so we can measure the pasteurization performance and were just floored that it matched."

Moreover, Fantin readily adds that all CFT machines feature excellent fill controls and are easy to work on.

"Our team is also very familiar with the machine and the company," Fantin points out. "We have the same valves on all our can filling machines.

"Once you're familiar with them, it makes a world of difference."

After being filled, and pausterized if required, the cans are either placed inside corrugated trays—in "loose" arrangement for individual can





(clockwise)
A close-up of the high-speed film wrap application inside the SK500T tray-packer/wrapper capable of wrapping up to 50 trays per minute, with loaded trays then transferred inside the APR 3105L ERGON low-level palletizer (bottom) for layer forming and stacking onto pallets.

sales or in four- or six-pack cartons—or packaged into beer cartons holding 12, 15, 18 or 24 cans each.

For the latter, the plant employs **WestRock Company**'s high-speed ***DuoDozen 1250M*** model end-load cartoner capable of packing up to 1,200 cans per minute in four different case configurations for both standard and sleek cans.

For tray-packing, the line is equipped with an **SMI *SK500T ERGON*** tray-packer/wrapper that can process up to 50 trays per minute.

"It quite a flexible machine that can package both standard cans and sleek cans in loose format, 12 and 24 cans per unit, and a variety of cartons, including four-pack and six-packs," Fantin notes.

Once the cans are packed inside boxes or trays, they are transferred to the SMI ***APR 3105L ERGON*** low-level palletizer, where the cases are stacked onto a pallet in pre-programmed layer patterns.

"The SMI palletizer is capable of palletizing up to 50 units per minute for 24-packs and 70 units per minute for 12 packs," Fantin notes.

"We use three different pallets," Fantin points out, "and this palletizer is able to fulfill our customer needs with varying layer-building patterns and the number of cases per tier."

Once palletized, the loaded skids move on to the ***WCA-SMART*** automatic turntable stretchwrapper, manufactured by **Wulftec International**, capable of stretchwrapping up to 70 loads of product per hour.

"On our second can line, we had SMI supply most of the full-can conveyors and all of the full-case conveyors," Fantin says. "The empty can conveyors were supplied locally by Lagrotta Packaging Group in Cambridge and the infeed laner to the end-loader (1250M) was supplied by Descon Conveyors Solutions in Newmarket."

Stefano Bertocchi, managing director for **SMI Group** in Canada, happily concurs.

"We have a good relationship with Luigi due to our previous installation with another machine," Bertocchi states. "We're able to supply Waterloo consistently even with their aggressive time-frames.

"We've never been late to deliver a machine or an installation. For this reason, he gave us the opportunity to quote the new line."

On Waterloo Brewing's first canning line, SMI Group's model ***LSK 25 T*** shrinkwrapper met the company's needs by being able to tray and wrap loose 355-m*l* and 473-*ml* standard cans and 355-*ml* sleek cans; 2x3 hi-cone cans; and cartons of 2x2 and 2x3 cans.

The *LSK 25 T* wraps all of these products in film, on a pad with film or in a tray with film, with the flexibility of using clear or registered (printed) film to meet the brewer's varying packaging needs.

The conveyors supplied by SMI Group are

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designed to be flexible and efficient thanks to innovative technical features and stainless-steel construction and components.

The corrugated trays for packaging the cans are shipped in by **Moore Packaging** of Barrie, Ont., which has been supplying Waterloo Brewing for many years.

"They've introduced so many different brands over the last number of years that forced us to focus on our setups and changeovers and trying to be as efficient as possible with the number of different prints and graphic changes they have – both with their own brands and licensed brands they're co-packing and manufacturing," says Moore Packaging director of sales Jeff Abbott.

Despite the current supply chain struggles across the globe for a wide variety of products and raw materials, Abbott says his company has been able to meet all the packaging needs of Waterloo Brewing.

"We have strong paper contracts in place for our raw materials, which has allowed us to supply our good partners like Waterloo Brewing with uninterrupted service," Abbott explains.

"We value the long-term partnership and the trust they have in us," he adds. "It makes for a tremendous partnership.

"We've continued to support their growth and that's the essence of our business," Abbott states. "It's based on relationships that both companies enjoy."

Not surprisingly, the commissioning of Waterloo Brewing's second canning line had to overcome some challenges due to the ongoing *COVID-19* coronavirus pandemic.

"Having to deal with COVID, we knew it would be tough," Fantin says. "For example, we had a technician that went home for Easter [in Italy], because he had been here a month.

"When he tried to come back, they refused to let him come back in," he sighs. "We lost that technician and had to bring in a totally different technician from the U.S."

The company also had issues procuring parts for the new canning line.

"As with any new equipment, there's always going to be some supply issues where you know you're going to need something," Fantin says.

"Trying to get the parts was tough; we had shipments being lost … two shipments falling off the face of the Earth … it was definitely challen-

(clockwise)
A fully stretchwrapped palletized load of Laker Ice brand beer cans rolls out of the Wulftec model WCA-SMART automatic turntable stretchwrapper and is quickly picked up by forklift to be transferred to the plant's shipping area or storage.

ging."

As Fantin relates, Waterloo Brewing combines simple, traditional brewing principles with its state-of-the-art **Krones Steinecker** brewhouse to make many different types of beers and beverages.

"We have the ability to use many different types of adjuncts in the brewhouse, or 100-percent malt," he explains. "Our efficient wet mill prepares the grain for brewing before transferring it into the mash mixer, where the starch is converted to fermentable sugars."

This wet mash is then moved to the lauter tun to be clarified into clear wort. The wort is then boiled in the kettle, where it also gets dosed with hops. The hop material is then efficiently separated from the wort using a whirlpool motion, leaving the clarified wort to be cooled through the wort cooler.

"This cold wort is then oxygenated, dosed with yeast, and sent to a fermenter," Fantin explains.

"Our fermenters are vertical cylindrical conical tanks with efficient glycol cooling control. During fermentation, the sugars in the wort are metabolized by the yeast to make alcohol and CO_2."

Upon reaching the end of fermentation (sugar reduction, alcohol creation, diacetyl reduction), the beer is cooled down and the yeast that has settled into the cone of the fermenter can be removed.

To prepare beer for packaging, the remaining yeast is removed using a centrifuge. The beer is then filtered through a leaf filter, using diatomaceous earth as a filter media, and silica gel powder for colloidal stability.

"The beer filter removes all the powder, along with suspended yeast from the beer," Fantin says. "The final product alcohol is attained post-filtration— either by adding de-aerated carbonated water or not diluting at all—depending on the beer.

"At this stage this beer is now called 'bright beer': it's cold, carbonated, and ready to be packaged."

For cider brewing, the juice is pasteurized upon receipt and all the required nutrients are added. The juice is then fermented in upgraded fermenters which have a specialized recirculation systems installed, referred to as ***Ecoferms***.

These *Ecoferms* can continuously circulate the cider liquid inside the vessel—creating more efficient and consistent fermentation.

The ciders are then are centrifuged and blended with supplemental ingredients before being packaged.

Fantin explains: "Our blended RTD beverages are prepared using equipment that runs separately from the brewing equipment.

"We receive bulk high-proof alcohol of many different types. The alcohol can be diluted with water from different sources within the brewery to begin the blending process.

"We manage many different flavors, colors, sweeteners, and other ingredients to create beverages as per the specific recipes," Fantin relates.

"The blended liquid is cooled and carbonated as the final preparation for packaging. We have specialized equipment that allows us to blend unique beverages, such as non-alcoholic products and tomato-based products," Fantin continues.

"We have a homogenizer for processing tomato-based products and a de-alcoholization unit that uses vacuum pumps to pull alcohol out of beer and other liquids to create a low-alcohol or no-alcohol beverage.

"Our tomato-based liquid system includes the ability to add dry spices and liquids like Worcestershire sauce,' Fantin notes.

"As for our de-alcoholization system, we have the ability to do both macro- and micro-dosing for flavor and body enhancing."

The company also has a kegging unit that is capable of cleaning and filling kegs of various sizes.

In operation, an empty keg is loaded upside-down onto the infeed conveyor where it is first emptied of any residual liquid.

It is pre-rinsed with water before it is cleaned with caustic, sanitized with acid, sterilized with steam and, ultimately, purged with CO_2 before being filled with beer or cider.

"All of this is done while the keg is upside-down and engaged with valves at various stages along the conveyor," Fantin says.

"Several kegs run through the stages of the machine in a single-file line. To finish, the keg is turned upside-right before being placed on the outfeed conveyor for palletization."

As Fantin points out, the highly competitive nature of the beverage market requires constant innovation to stay ahead of the pack.

"We work together to maintain a pace of innovation that's never been seen before," he says. "It's definitely a tough landscape.

"I think the reason we continue to grow is we have lots of flexibility," Fantin reasons. "We have the craft-brewer roots in our Waterloo portfolio, and then when it comes to all the rest, we can pivot and adapt quite quickly.

"We have a team of dedicated, passionate professionals working behind the scenes," he concludes, "who are committed to creating consistent high-quality products with a mandate to be best-in-class for brewing, blending and packaging capabilities."

SUPPLIERS
SMI Group
Moore Packaging
Descon Integrated Conveyor Solutions