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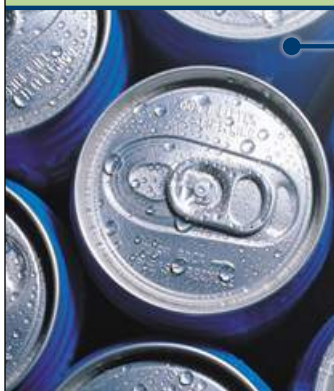
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Phone: 703/243-8555 • Fax: 703/243-8556 • Web: www.pmmi.org

Staff at PMMI Media Group can be contacted at
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Stone scales craft beer beyond micro format

Known for variety, Stone had long required extreme flexibility in its equipment. But as the business scales up, an all-new line had them looking to strike a balance between agility and volume.

By Matt Reynolds, Editorial Director, Packaging + Processing OEM

Since its 1996 debut, San Diego-based Stone Brewing built its reputation on remarkable variety and collaborations with other brewers, including special releases that are nationally distributed. The nearby Escondido, CA, bottling facility had grown over time to accommodate both short and long runs of a multitude of SKUs.

bottling and kegging facility, opened in 2016 in Richmond, VA, represents a departure from its Escondido digs.

Most important, the new facility's beer tanks are much larger than that of the California location, as they are tasked with accommodating the entire U.S. east of Colorado—and often handle overflow for the West Coast. Sited specifically

to move upwards of 700 hundred thousand barrels a year in the future at peak production capacity, the equipment site-wide had to simultaneously match today and tomorrow's volume while retaining flexibility.

Still, the seasonal and high-variety nature of the company had to be baked into the bottling lines as well, so as not to sacrifice flexibility for longer runs. According to Pat Tiernan, COO, the key was balancing the simultaneous needs for flexibility with large volumes to support growth in the future. Landed costs, alongside quality and cost of support, vaulted to the top of the Tiernan's needs checklist.

"We plan to have the Richmond facility producing longer runs of fewer beer varieties, but to still have the flexibility to crank up some big collaborations and brews that are outside of our normal, core beers," Tiernan says. "To do that, we wanted to be with vendors we could trust and we knew would be there when things happen, as they inevitably do at

such a scale. We needed larger scale to support growth, but still do what Stone does from a creative and brand perspective, in the beers we produce."

With two competing necessities on his hands, Tiernan aimed to keep it simple with all new, off-the-shelf equipment.

"For us, customization is undesirable," he adds. "It's better to go standard, in my opinion, if you can get it to work.



A robotic palletizer and stretch wrapper reside at the end of the line.

Given such roots, it would stand to reason that flexibility would be the primary motivating factor in choosing bottling and packaging equipment for a new facility. But while the beers retain their decidedly independent, craft character, the term "micro-brewery" no longer applies after more than 20 years of growth. In terms of volume, Stone now ranks in the top 10 of craft breweries in the U.S. As such, its latest



Stone's labels carry a lot of branding weight, and the pressure-sensitive labels allow for brighter colors and tactile response cues.

That means ease of getting replacement parts, more service availability, and everything that goes with it. That will allow us to crank out that 700 thousand barrels of beer when the facility hits peak brewing capacity in the future."

Flexibility versus throughput

A recent purchase at the existing Escondido facility brings into stark relief the differing approaches at the two bottling plants. The West Coast facility received a major flexibility upgrade in 2016 with a **Krones** (www.krones.com) Varioline packaging line (see page 18, 3 Floyds Brewing, for details on Varioline). Those configuring the Richmond facility, while doing so concurrently with the Escondido upgrade, chose not to go this route, highlighting the differing purposes of the two plants.

"Varioline is going to give you versatility and complex package setups for both secondary and tertiary packaging. This gives you versatility for unique configurations as demanded by the market. Sometimes the market wants a smaller package that fits in a refrigerator or cooler, and Varioline in Escondido allows us to make those changes on the fly," says Mark Madonia, Stone's Richmond Packaging Manager. "The Richmond facility is more for core product production runs and special releases."

In fact, three varieties make up the lion's share of the bottling at Richmond. The most commonly run bottle is four six-pack per case IPA, followed by a four six-pack of Delicious IPA or a 22-oz bottle Arrogant Bastard. Remaining runs

tend to be of special collaborations or seasonal varieties, but these constitute considerably lower volume.

"So we don't need the variation of packaging configurations that they might require in Escondido. Our packer is a unit that allows us to run certain packages with minimal conversion, and then we're not hindered by conversion times," Madonia adds. "The idea is changeover that's simple and straightforward." The packer he selected is a **Hartness 2800** (www.hartness.com).

Stone's Richmond bottling line

A Hartness robotic depalletizer with an integrated DYNAC single-file bottle accumulator opens the bottling line. The standard 12-oz. empty amber bottles, supplied by a nearby **Owens-Illinois** (www.o-i.com) facility in Toano, VA, travel overhead to an **Arrowhead** (www.arrowheadsyste.ms.com) ArrowTower lowerator. After dropping to plant floor level, bottles are fed into a Hartness single-file accumulator and buffer conveyor prior to pressure-sensitive labeling using oriented polypropylene film labels.

"Using pressure-sensitive allows us to feature vibrant colors and unique tactile response cues on the label, yet remain extremely predictable in the manufacturing environment," Tiernan says. "We tend to do a lot of branding on the bottle. For us, it's a great way to let the beer on the shelf tell stories about the beer our fans enjoy."

The labeler is a Krones Autocol 1235, which has requisite labeling checkmat inspection equipment and can operate



A Modulfil HRS rinser/filler/capper, complete with Moduljet rinser and fill-level checkmat, operates at 660 bottles/min.

rinser/filler/crowner, and a Krones Varioclean cleans the filled and capped bottles, which are then dried in a **Sonic Smart Tunnel** (www.sonicairsystems.com) using air-knife technology. The Varioclean unit is sized to provide the clean in place (CIP) for the existing bottle line, but will also accommodate a canning line. In fact, most of the existing line, save for the rinser/filler/crowner, will be used for canning soon, as well as bottling, so most of the equipment will pull double duty.

Meanwhile, a Hartness case conveyor connects a **Wayne Automation**

(www.wayneautomation.com) VCE high-speed case erector with a Wayne BCI 120 basket carrier erector and inserter. At the convergence of the case and bottle conveyors sits the aforementioned Hartness 2800 case packer. Finally, a Wayne

at 660 bottles/min. Bottles are then conveyed into a 600 bottles/min Krones Modulfill HRS rinser/filler/ crowner block, complete with Moduljet rinser and fill-level checkmat. A Hartness DYNAC 7100 accumulator/conveyor exits the

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Location, location, location

One site selection criterion that favored Richmond, VA, was a strong local talent base and similar nearby industries that could support such a large facility. Stone itself has honed and perfected a training program and certification process that they exported to the new site. Potential staffers have to clear a certain proficiency bar—all of them have to be able to maintain the equipment, for instance—and can potentially climb to higher levels and cross train against the line as they grow as employees.

"I like to joke around that before the Varioline, the old packaging line on the West Coast was like the opening credits on Laverne and Shirley," says Tiernan. "We had old VW bug engines as compressors for our chilling equipment. But such equipment is easy to maintain, and when they did break, the skill level required to fix them is not as high as the new tech."

But today's electrician, tasked with maintaining such high-end robotics and equipment, has to be of a newer vintage. Richmond has a strong local talent pool of folks versed in PLCs, ladder logic, and code writing, making it attractive.

"On the West coast, we struggled with this a little as the technology had greatly changed, so we've had

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to ramp up our training programs and the skill levels of the people on the team," he says. "We benefitted by not having to do that in Richmond, because we could seek out the right skillsets."

And this brewery has a history of being a good neighbor and steward of the locations it calls home. In this case, while

the brownfield site moved from blueprint to reality, Stone worked with the City of Richmond to develop training programs preparing technically proficient potential employees for the specifics of brewing and bottling.

"Another thing that really attracted us was the level of outreach, from brewers, from community members and economic development folks, from various levels of government, and from local universities," Tiernan says. "There are three universities in town, and we participate in various forms with all three of them. And they're interested in us, putting together specific programs for craft brewing or other operational and packaging elements. The technical proficiency is here, but specific to brewing and brewery plant operations, the East Coast maybe needing to catch up a bit to the West Coast. We can team with these universities to make that happen."

Fully automated and integrated

As on most Krones equipment, control level software uses Botec HMI interface, and **Siemens** (www.siemens.com) controls and PLCs. The company interfaces the shop floor system with Ignition MES software by **Inductive Automation** (www.inductiveautomation.com). Ignition handshakes with the Microsoft Dynamics AX ERP system, so from material in to beer out, it's all scan in, scan out, and fully automated online.

"It's a pretty dialed-in operation," Tiernan says. "Ignition is a highly flexible, programmable platform that allows us to do everything from data management and business intelligence to shop floor controls."

Even in a simple and low-support/low-overhead version of the software—and without having to pay a bunch of consultants—Ignition software allowed Stone to create its own shop floor systems and integrate them freely.

"Plus, it doesn't lock you in to the more robust versions of the system in the future," he says. "It was a great way to connect a new ERP system



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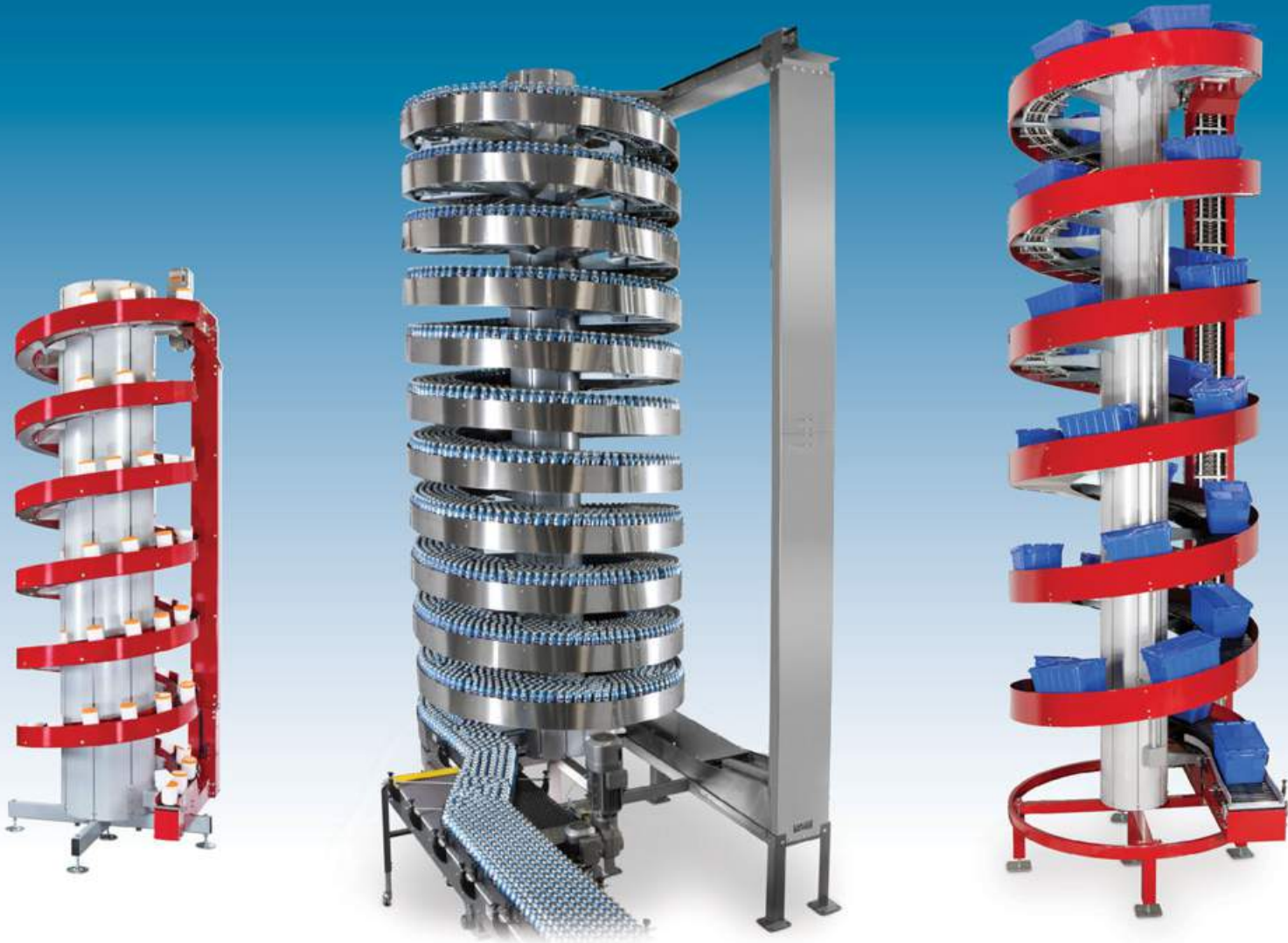
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with some of the existing controls and shop floor work that had already been done in Ignition, and tie it all together.”


Equipped with this MES software, and its own set of KPIs and dashboards, Stone’s next step is to link the Escondido facility, the Richmond facility, and even a Berlin, Germany brewery and bottling plant that was developed in parallel with Richmond. When connected, all operators can see what’s running, and where, at any time. It’s thought that Richmond will handle some West Coast production overflow, making connectivity important. More practically, they can compare planned outcome with actual results, can observe all quality-control parameters, can run charts to improve production or identify problems, and have access to all the main dashboards all through one system.

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“We have two engineers who spend part of their time developing and maintaining that system, so as we add more capability on the floor, it’s very easy to plug in a new PLC or to reset a schema in one part of the operation versus the other, or program in, for example, sequencers on our centrifuge and filtering operation,” Tiernan says. “It’s just very well adapted for our purposes, and it’s flexible enough to run all of our breweries.” ●



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Devils Backbone keeps it local, familiar

This growing East Coast brewery has found value in responsive, local machine builders and vendors who are intimately familiar with their lines of bottling and canning equipment.

By Matt Reynolds, Editorial Director, Packaging + Processing OEM

A regional craft brewery tends to celebrate the area from which it hails. This can be represented in flavors, branding, attitude, or all the above. Devils Backbone, for instance, a Virginia brewery, adopts the outdoorsy posture endemic to its Three Ridges Wilderness Area home, a back-wood, hill-country outdoor playground near Roseland, VA, its founding location.

Founded as a brewpub in 2008, the company's growth and demand eventually convinced management to add a production-based facility, complete with bottling and canning

lines. The 15,000-sq.-ft. facility began humbly in 2012 as a 30-barrel brewhouse. A CFT (www.cft-group.com) filler hinted at the beginnings of automation, but bottles were hand depalletized, and cases were hand erected and hand packed.

But a 2014 jump from a 30- to a 120-barrel brewhouse necessitated a corresponding leap in automation. During this process, Josh West, Director of Operations at Devils Backbone, put a lot of trust in local and regional companies in the East and North East to accomplish this. He wanted

A high-level depalletizer single files and feeds bottles into a lowerator on their way down the line. Many of the equipment suppliers represented in the line are located near the brewery's Richmond, VA, location.





Operators attend to the case erector and drop packer on the Devils Backbone bottling line.

“We’re moving from glue to pressure-sensitive because we’re planning on hitting higher speeds at our new location, and we are anticipating upgrading to a faster bottle filler in coming years, so we need to have equipment that’s ready to handle that speed,” West says. “Plus, we want to move away from cold glue for various reasons. It can be messy, for one. You need to keep glue in inventory, and keep it from freezing in the winter.

to work with people who would be relatively nearby, in the same time zone, and available to help automate and grow.

“We connected with **Wayne Automation** (www.wayneautomation.com) and a couple of other manufacturers that were somewhat nearby. Wayne supplied us with the case erector and a six-pack erector and inserter, and a top sealer for the finished bottled cases,” West says. “That made a tremendous difference. It went from us having to burn the midnight oil just to make boxes to get ready for the next day, to being able to make boxes on the fly, as needed. It’s been remarkable. We would never fathom going back to building them by hand.”

Now, in 2017, the company is growing again, moving all packaging operations into yet another new building. Some equipment will survive the move, and other equipment will be replaced or upgraded in anticipation of even greater line speeds down the road. But having seen the value of regional equipment partners, West will be largely sticking with the familiar suppliers that got Devils Backbone to where it is today.

Bottling line

The bottling line at Devils Backbone begins with a **Sentry** (www.sentryequipment.com) high-level depalletizer that single-files bottles overhead and feeds them into a Sentry lowerator. Sentry, which is in nearby Lynchburg, VA, provided all conveyance and much of the systems integration for the brewery, further illustrating West’s local preference.

At floor level, the bottles are fed into a CFT 20-head monoblock bottle rinser/filler/crowner. CFT manufactures and integrates the monoblock, but the bottle crowner is manufactured by **Arol** (www.arol.com). An accumulator, also designed by Sentry, manages volume and back-ups. Bottles then pass a Videojet ink jet date-coding unit and a **Filtec** (www.filtec.com) low-fill detector unit that then feeds into a **PE. USA** (www.pe-us.com) labeler. This cold glue labeler is a vestige from the original 2012 operation, but West has eyes on a pressure-sensitive labeling application, also from P.E. USA, as it moves packaging operations into the new building in 2017.

Using pressure-sensitive will streamline things for us.”

After labelers, the bottles ascend a gentle incline into a **Standard-Knapp** (www.standard-knapp.com) drop packer, which West selected due to its proximity, reputable name, and parts availability.

“I shopped around, and while they weren’t necessarily the cheapest option, I thought that combination of factors meant they’d be able to provide the best service in the long run. And I have no complaints so far. When we’ve needed service they’ve been easy to get ahold of and quick to get here if we need assistance, which is what I value most.”

In parallel to the drop packer, on the secondary packaging side of the line, a Wayne Automation case erector and basket



Paperboard basket-style carriers are erected and stuffed into cases that then are fed into the drop packer.



Cans exit a twist rinser and proceed to be filled on a 20-head can filler. Lids are then seamed onto cans, and coded with an ink-jet coder.

responsive to the conversations I was having with them, even before I had purchased a piece of equipment. They seemed robust and versatile, parts availability would be easy, and the service and local support has definitely been there for us."

Changeover on the case erectors, when going from 12- to 24-packs or vice versa, takes 20-25 minutes, sometimes faster. Sometimes, operators don't need to shut down the bottle filler during changeovers, as the accumulator can accommodate a backup.

carrier erector builds the cases and carriers. Typically, cases contain four six-pack carriers. But sometimes, cases hold 12 or 24 bottles without any paperboard carrier at all.

"We went with Wayne for the same reasons," says West. "They're close by, out of Pennsylvania, and they were very

After cases are erected, the bottoms are hot melt glued. Basket carriers are inserted if applicable, and cases are conveyed to meet the Standard-Knapp, which releases the bottles into the pack. The case continues to a Wayne top sealer, which folds the tops down and glues the top of the



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box closed. The Wayne top and bottom sealers use **Nordson** (www.nordson.com) adhesive systems. Marsh ink encoders by **Videojet** (www.videojet.com) use ink jet to encode the closed cases.

Palletizing is currently done by hand. Plans for the new facility include requisite space for a palletizer, but that would only be required if and when the company opts for a faster bottle filler.

Canning line

Cans share the same Sentry depalletizer as the bottling line. This is possible, despite the differences in shape, height, and weight, thanks to a pressureless combiner system. This setup single files the depalletized cans or bottles by using several parallel tracks of conveyors to feed contents into a single guard rail at a gentle but intersecting angle. Each track's individual speed is continuously adjusted to carry bottles or cans out of their palletized block position into a single line against the lone guard rail. A more typical two-rail system physically bottlenecks the contents, so the variance in weight and shape between cans and bottles would necessitate two separate two-rail single filers from the depalletizer.

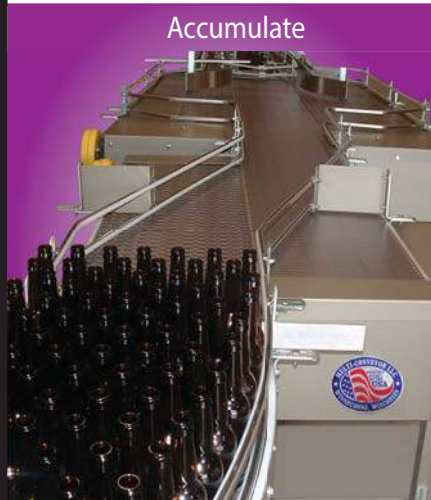
Once in single file, the cans are diverted from the bottle line into a twist rinser from CFT, then into another 20-head CFT can filler, which is set up similarly to the bottle filler. Lids are seamed onto the cans, which are date coded by another Videojet ink-jet encoder.

Uniquely, pre- and post-date coding, the conveyor employs an inverter add-on, or a helical feed screw, made by **Carleton** (www.carletonhelical.com). This flips the sealed cans upside down in a machined housing with a rifling effect, orienting them in such a way that the date is placed at a precise location on the bottom that doesn't interfere with the intricate artwork on the cans.

New in 2016, the brewery now employs a can cartoner with Nordson hot melt glue system. Previously, Devils Backbone had employed ring carriers, which was another source

of hand labor in pulling cans off the line, putting them in trays, and snapping on the ring carrier toppers. The cartoner, a Brewpack 150 from **Switchback Group** (www.switchbackgroup.com) which is leased from **WestRock** (www.westrock.com), represents a shift from six pack toppers to paperboard cartons, both in 6-pack and 12-pack varieties. The glossy

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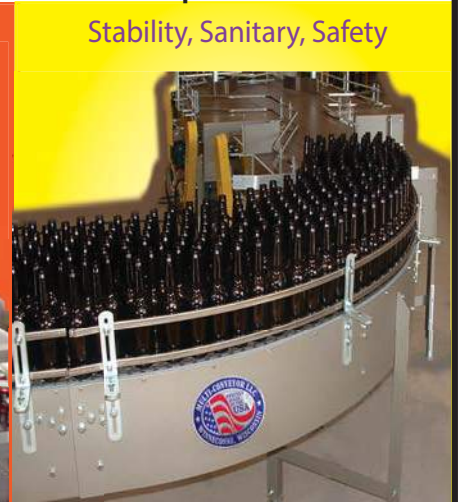
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Cans are packed into cartons on a Brewpack 150.

paperboard material, supplied by **Graphic Packaging** (www.graphicpkg.com), which didn't absorb ink very well, led West to switch date coders, from an ink jet to a laser Videojet.

"This is a fairly new piece of equipment, but the changeover from six- to 12-pack and back is improving," West adds. "We hired a few key staff members who have really owned that machine, learned the ins and outs of it."

Can cartons are hand palletized, and trays are hand formed and packed, but the new 2017 facility will integrate a tray former from **Plemons** (www.weplemons.com), and a Wayne Automation tray packer.

Operation speeds and feeds

Devils Backbone's packaging line operates five days a week with three shifts, or 24-5. The filler can hit roughly 120 bottles/min, but about 80% of that figure is more practical.

"It's a work in progress. Our third shift is still new, still shadowing and learning the ropes. We also have a new maintenance staff so our efficiency has been improving," West says. "Like anything else, we look for constant improvement, and we are getting more dialed in. We haven't quite nailed down our target numbers yet, but we're getting there, and with our new facility in 2017, we'll be getting even faster before long." ●

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Steady growth makes automation essential

Beers brewed by this Munster, IN, brewery just 60 miles from Chicago have won their fair share of accolades over the years. Now management is focused on expansion and automation.

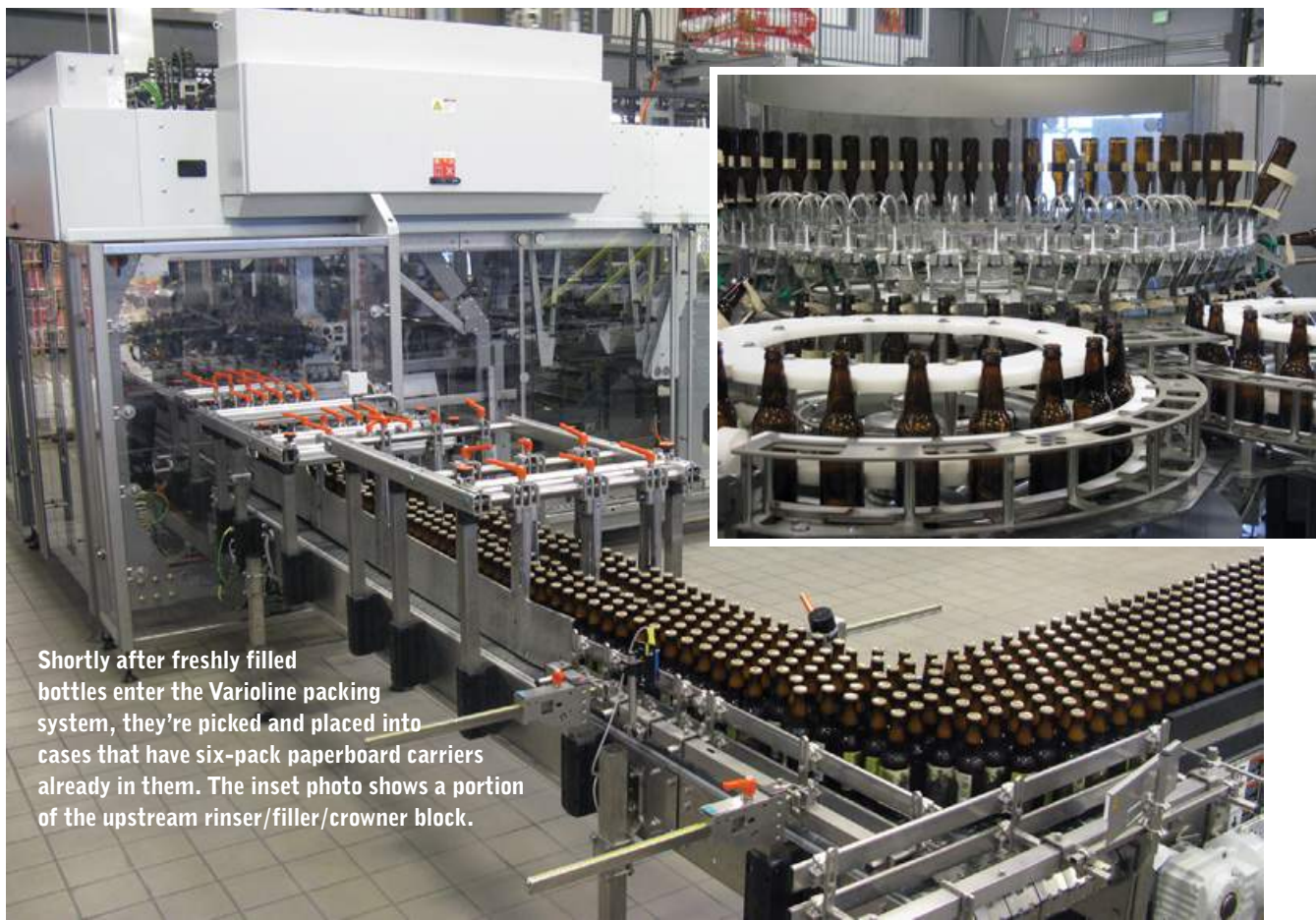
By Pat Reynolds, VP Editor

Launched in 1996 in Hammond, IN, and relocated four years later to its current location in nearby Munster, 3 Floyds Brewing grew steadily in its first decade. Great beer and word of mouth—combined with being located just 60 miles east of metropolitan Chicago and a population in the range of 7 million—fueled this early growth, so that by 2006 the firm was producing around 4,600 hectoliters annually. But right about that time was when the Internet came into its own. When sites like ratebeer.com and beeradvocate.com started singing the praises of 3 Floyds' pale ales, wheat beers, and a Russian imperial ale that can only be bought on the last Saturday of April, sales really took off. In fact, the

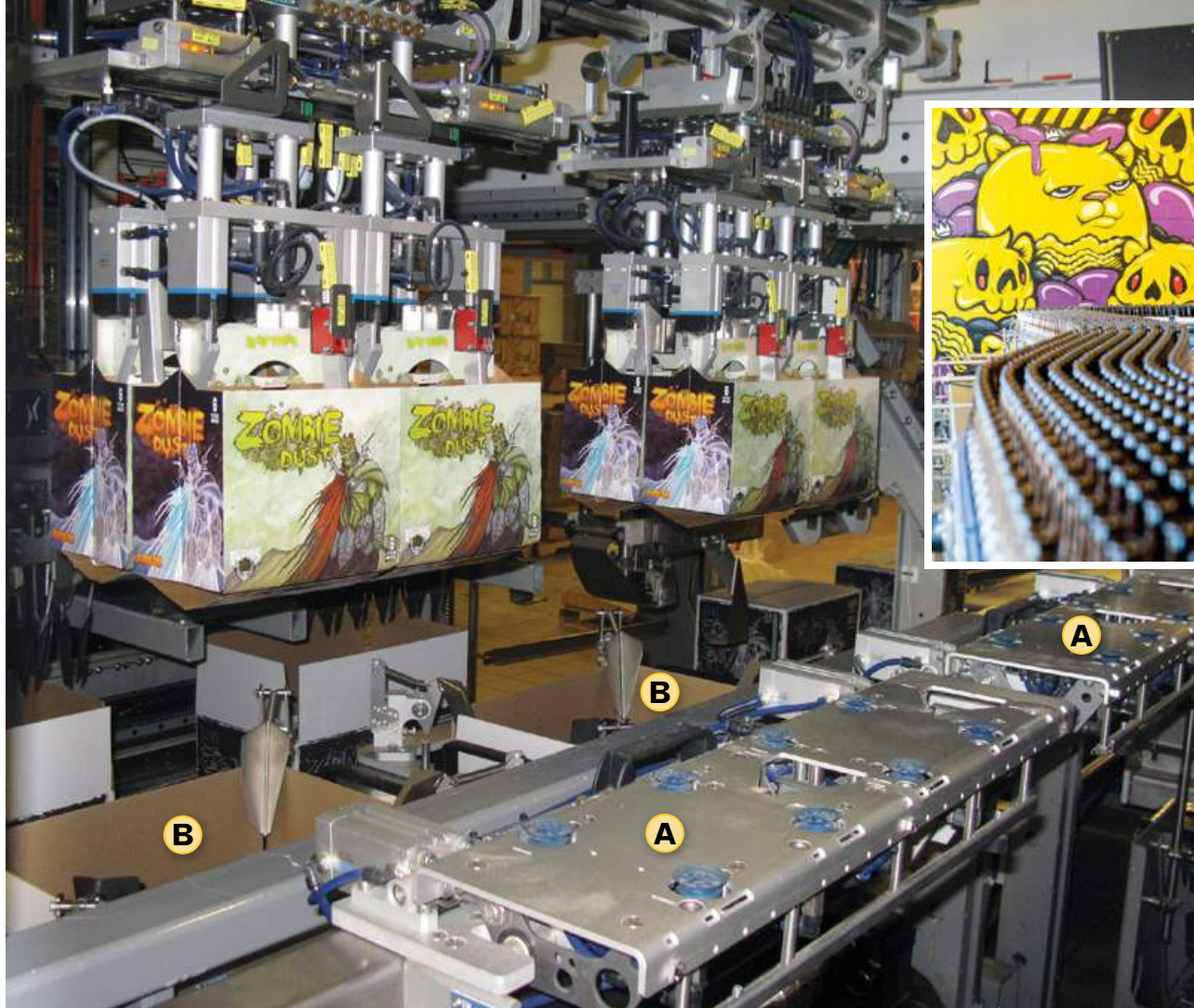
Munster brewery produced something like 60,000 hectoliters of beer in 2016, more than a 10-fold growth over 10 years.

In addition to a couple of seasonal beers here and there, 3 Floyds now produces six beers in 12-oz bottles and nine beers in 22-oz bottles. By 2012 it became pretty clear that the existing bottling line, which couldn't exceed 70 bpm, was no longer able to keep pace with the brewery's growth. So a new packaging hall was added to the existing space and into it went a turnkey line from **Krones** (www.krones.com) that has a rated speed of 250 bpm.

"Theoretically, this line would bottle 290,000 hectoliters a year in a three-shift mode," says Head Brewer Chris



Shortly after freshly filled bottles enter the Varioline packing system, they're picked and placed into cases that have six-pack paperboard carriers already in them. The inset photo shows a portion of the upstream rinsing/filler/crowner block.



Shown here are eight paperboard basket-style carriers as they are being transported from the flat plates on which they are erected (A) to the two corrugated shippers into which they'll be stuffed (B). Inset shows colorful cartoon atmosphere that is part of the 3 Floyds vibe.

Bogges. “So currently it’s overdimensioned. But we thought it important to look ahead a bit so we won’t have to install another line every few years, and in the meantime we’re using the best technology available.”

The turnkey Krones line begins with a Pressant Universal 1N bulk glass sweep-off depalletizer with low-level discharge onto a bulk-glass conveyor. The depalletizer is also equipped with a) vacuum cup pickup tooling that allows it to pick and stack the paperboard tier sheets that separate layers of glass and b) mechanical tooling for picking and stacking empty pallets.

A Krones Glideliner smoothly reduces the mass of bottles to a single-file lane of bottles that are conveyed into the rinser/filler/crowner block. Just ahead of this block the bottles pass a **Domino** (www.domino-printing.com) ink-jet printer that puts a batch number and born-on date on the bottle shoulder.

The monoblock system consists of a 44-head Moduljet rinser using water as the rinsing medium and a Modufill filler with 44 filling valves. “The filler gives us excellent values for oxygen pick-up, in the range of 50 parts per billion, coupled with very consistent fill levels,” says Travis Fasano, Packaging Manager at the Brewery. The short-tube, level-controlled filler

with vent tubes operates with double pre-evacuation and what Krones calls an “interpolated CO₂-flushing feature”— i.e., between the two pre-evacuations there is a CO₂ flush. The filling valves are electro-pneumatically controlled. A monoblocked turret receives bottles from the filler via a starwheel transfer. It sorts and applies the crowns and then releases bottles to a discharge conveyor.

Bottles are inspected for correct fill level by a Krones Checkmat FM-X, and immediately after that they enter a Krones Prontomatic cold glue labeler. Correct label placement is verified by a Checkmat E. Labels are supplied by **Inland** (www.inlandpackaging.com).

End-of-line packaging

At this point it’s time for the end-of-line packaging done on the Krones Varioline. According to Fasano, the conveyor connection between filler and labeler will hold about 1,000 bottles in accumulation. And between the labeler and the Varioline, the accumulation capacity is about 2,000. “So running as we are at about 250 bottles/min, we have about four minutes to address a jam before machines start to stop,” says Fasano.

The Varioline might be the most impressive machine in the plant. (Be sure to see the video referenced on page ?????) The components on a Varioline can vary considerably—which, of course, is how the machine got its name. It all depends on what the application calls for. But essentially each module consists of a steel base frame, a control cabi-

net, gantry robots to perform all the picking and placing, and servo-controlled cleated/flighted conveyors.

According to Kronos' Mark Forsberg, the Varioline is six machines in one: carrier erector, carrier stuffer, case erector, bottle inserter, partition inserter, case sealer. Because so many functions are executed within the frame of one machine, con-

veyor connections from one machine to another are eliminated. Consequently, 75% less floor space is required, says Forsberg. And efficiency, he says, is guaranteed at 97.5%.

Operating at 3 Floyds is a two-module system capable of almost 900 bottles/min when 24-count cases are being packed. Properly equipped, the system could handle 850 bottles/min.

Module 1 is responsible for erecting either four- or six-pack paperboard carriers, stuffing carriers into a corrugated case, and picking and placing bottles into that case. The other module erects corrugated shippers and closes them with hot melt adhesive. Just one operator is required, and the operator's only real responsibility is feeding the magazines with paperboard carriers and corrugated cases. The paperboard carriers are from **Graphic Packaging** (www.graphicpkg.com), while cases come from **International Paper** (www.internationalpaper.com).

"It's so much better than what we used to have, which was largely a manual operation," says Fasano. "Right now we're only doing 12- and 22-oz bottles, but it can handle cans, too." Space for a Kronos can filler was designed into the new line, so as soon as a bigger brewhouse is added, cans will be multipacked on the Varioline, too. They'll be packed in a 12-count wraparound paperboard and then two 12-packs will be placed in a corrugated tray.

Case erecting in Module 2 is done in several steps. First vacuum cups mounted on an overhead gantry robot pick two flat case blanks from twin magazines; as the cases are pulled into a bottom sealing station, they're both opened; once in the bottom-sealing station, the bottom minor flaps are

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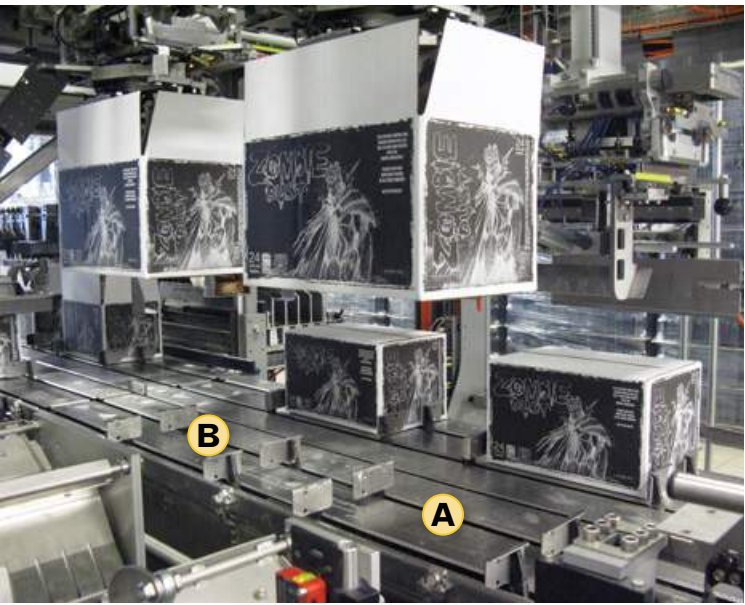
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An overhead gantry robot is about to place two empty cases into positions marked A and B in the cleated/flighted conveyor, which will carry the cases to the left. In the bottom right are two filled and sealed cases moving out of the Varioline in a left to right direction.

hot melt glued by a **Nordson** (www.nordson.com) unit.
A second gantry robot now uses its vacuum cups to grab the two cases by the folded and sealed minor flaps, lift them, and place them into a station where the major flaps are folded and glued. The same gantry robot then lifts the two cases, rotates them 45 degrees, and places them on a flighted conveyor that takes them off at a right angle in a direction we'll call south so that they can have paperboard basket-style carriers inserted into them on nearby Module 1.

WATCH A VIDEO OF THIS PACKAGING LINE AT: pwgo.to/2692

Meanwhile, on Module 1, vacuum cups on a gantry robot pick eight flat paperboard basket-style carriers from a magazine feed. The blanks are carried a short distance to a series of plates riddled with their own vacuum cups. So as the gantry robots retract in an upward motion, the bottom sides of the eight paperboard carriers are held securely by vacuum cups while the tops are held equally secure. As a result, the eight carriers are all popped open. Once they are open, the vacuum cups on the overhead gantry robot release and the plates holding the now erected carriers rotate 45 degrees so that the carrier handles all face upward. At this point, a second gantry robot mechanically picks all eight erected paperboard carriers and stuffs them into the corrugated cases



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that have been erected over on Module 2.

Once cases have their requisite number of paperboard basket-style carriers inside, they are pushed ahead into a flighted conveyor that runs in a direction we'll call north—in other words, the direction opposite that in which they entered. Another gantry robot picks 24 bottles from the continuous-motion infeed conveyor and places them into the carrier-stuffed corrugated cases. The cases are then indexed in a northerly direction to a station where yet another overhead gantry robot comes down with tooling that closes the top flaps, both minor and major, with hot melt adhesive.

First of its kind

The Varioline at 3 Floyds represents the first commercial installation of the Pro Series, which simplifies case handling by replacing a system of reciprocating shuttle carts for movement of cases in favor of a flighted conveyor whose flights are each individually controlled by its own servo motor. In the past, if case size changed, the appropriate reciprocating shuttle cart had to be put in place and the old one removed. Now it's just a matter of going to the touch screen controller and picking from a menu the case size involved. The servo motors automatically move the flights to where they need to be.

Like the servo motors that drive the many overhead gantry



Vacuum cups pick two cases at a time from a magazine feed and erect them so that they can be positioned for folding and gluing of their bottom flaps.

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robots on the Varioline, the servos on the flighted conveyor are from SEW (www.seweurodrive.com) and the drives are from B&R (www.br-automation.com), while the PLC is from **Rockwell** (www.rockwellautomation.com). Another supplier of automation technology playing a big role in the Varioline system is **Festo** (www.festo.com), whose pneumatic valves, actuators, and vacuum technology is represented in abundance.

Another improvement in the Pro Series is that bottle infeed is now a smooth, continuous motion rather than intermittent. A drawback to most intermittent-motion infeeds is that as back pressure builds, bottle handling can be compromised.

What hasn't changed in the Varioline is the feature that made it such a standout machine when it first appeared, namely its versatility. As was mentioned earlier, 3 Floyds will soon be multipacking cans on this machine. And already the machine is being used for the following:

- 12-oz bottles in two six-count paperboard carriers or four six-count paperboard carriers per case
- 12-oz bottles in four-count paperboard carriers that are case packed three carriers or six carriers per case
- 22-oz bottles separated by paperboard dividers in 12-count cases

The Varioline will also handle wraparound cases, though 3 Floyds doesn't produce any currently.

One key to all of this versatility are the quick-change heads that can be easily removed from the end of an overhead gantry robot and mounted on a wheeled rack so that the quick-change head for the next container format can be mounted on the robot. Also helpful is that the magazines that hold paperboard carriers and corrugated cases are modular. To go from a 12- to a 24-bottle case, a forklift is used to lift the entire magazine module out of the Varioline and put the new one in place.

Things should get even more interesting at 3 Floyds once the canning equipment—also from Krones—enters the picture. "We'll have to add some conveyor connections, and we

also plan to automate palletizing," says Boggess.

Also on the drawing board are a new kegging line, an expanded brew house, and a brand new distillery for whiskey and gin. Ambitious? Maybe so. But what else can be expected from a brewery whose motto has always been "It's not normal." ●

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Craft brewing—quick hits

The Craft Brewers Conference doesn't take place until next month. But why not take a peek now at a few of the more intriguing developments unfolding in this always exciting arena?

By Pat Reynolds, VP Editor



Launched in February of 2014 in Martin City, MO, Martin City Brewing began with 22-oz glass bottles filled semiautomatically on a filler/crowner from **Wild Goose Canning** (www.wgcaning.com). Then in June of 2016 the firm installed a can line, once again sourcing it from Wild Goose. Currently just 12-oz cans are in production, though under consideration are 16-oz cans, too.

The application of pressure-sensitive labels is a key element in the brewery's operations, both on cans and on bottles. The labels are typically a biaxially oriented polypropylene (BOPP) printed on a **Mark Andy** (www.markandy.com) hybrid flexo/digital press by label converter **Label Solution Inc.** (www.easylabelling.com). The equipment selected for applying the labels to both cans and bottles is a Model PL-501 from **Pack Leader USA** (www.packleaderusa.com). Integrat-

ed into the labeler is a **Videojet** (www.videojet.com) 6320 Thermal Transfer Overprinter.

For the 22-oz bottles, labels come in two basic varieties. For what might be called "standard" beers—the ones produced in the highest volumes—fully printed labels are being applied. In this case, the Videojet 6320 Thermal Transfer Overprinter applies nothing more than a date code to each label and, in some cases, a QR code that consumers can scan with a smart phone to learn more about the brewery, or food pairings for certain beers, or announcements about new beers in the pipeline, etc.

But it's a different story entirely for what might be called "special" beers, which are the



Martin City uses this pressure-sensitive labeler to apply labels to both cans (top left) and bottles. For small-volume beers, labels have a large blank space that can carry whatever variable information the brewery chooses to print (right) with the thermal-transfer printer mounted on the labeler.



STUDIO ALBUM RELEASED ON A BEER CAN

Beer and music is a perfect pairing—especially when that beer is from a craft brewer known for its experimental varieties, and the music is from a band known for its blend of genres and technology. In 2016, Aeronaut Brewing Co. of Somerville, MA, collaborated with The Lights Out, a music and light project, to develop a line of beer that supports the spirit of the band's new album, titled T.R.I.P. (The Reckonings In Pandimensionality). Also called T.R.I.P., Aeronaut's new Imperial Session IPA, brewed with galaxy hops, is packaged in a can that acts as the vehicle for the release of the new album.

"We're fascinated by the role packaging plays in discovery, both live and on the shelf," says Adam Ritchie, guitarist for The Lights Out. "For an unsigned band making new music, we could release it digitally, but where's the fun in that? We could put CDs and vinyl on a record store shelf, but people aren't discovering new bands that way anymore. If they're going to a record store, most of them are picking up something they already want, by someone they already know. But a lot of the people who used to walk the aisles of a record store looking for new music every weekend are now going to the liquor store at least that often, where they want to discover something new. Most beer purchase decisions happen right there in front of the cold case. The opportunity for someone to discover a band there caught our curiosity."

Raul Gonzalez, an artist who has created all of Aeronaut's beer labels, designed the graphics for T.R.I.P. as well. The artwork was inspired by photos and videos of The Lights Out's live music and light show, which features band members wearing goggles that light up in sync with the music.

Consumers can obtain the new album when they follow instructions printed on the side of the T.R.I.P.



beer can and send a tweet to The Lights Out, using a special hashtag, also printed on the can. From there, they receive a response from the band with a link to a site where they can stream or download the album, learn more about the project, see photos and video, sign up for the band's fan club, and see a list of upcoming shows.

"We'd like everyone to experience the beer and the music together, because we're trying to create a complete sensory experience," explains Ritchie. "Nothing is preventing someone from accessing the information without purchasing the beer. It's an honor system, and one that we are comfortable with, given the nature of this audience. Craft beer fans appreciate small things that are creative and of quality."

The 16-oz cans are sold in a four-pack that costs \$14.50. It is currently available in stores in the Boston area as well as at Aeronaut's brewery.

—Anne Marie Mohan

seasonal or special-occasion beers produced in much smaller volumes. For these beers, the only information pre-printed on the label is the Martin City logo. Beneath this logo is a large blank space, and it's here that all kinds of things can be printed—beer variety, alcohol content, date of bottling, "Just Married!," a description of the ingredients or where they're sourced, and so on (see photo A p. 24). No matter how small a run might be, there is no need to change out the label when the message to be printed needs to change. Just select the message at the control panel of the Videojet 6320 TTO and resume labeling.

On the canning side of things, the equipment from Wild Goose includes a bulk depalletizer in addition to the rinser/filler/seamer, which has a four-head in-line filler and cranks out 12-oz cans at about 42/min. Approximately 75% of the cans filled are of the preprinted variety. But once again, as with the bottles, for short runs of specialty beers, labels have only the Martin City logo at the top and the blank space is printed by the Videojet TTO unit in any way the brewery sees fit. Also on the can line is a Videojet Continuous Ink Jet printer that puts a two-line lot and date code near the bottom of each can.

A custom 'stubby'

Peace Tree Brewing Co., founded in 2009 in Knoxville, IA, has four flagship brews as well as several seasonal and specialty beers produced throughout the year. The firm has gone to market in a stock "stubby" glass bottle for most of its existence. But last year it was decided that a modification was in order, so Peace Tree called on **Berlin Packaging** (www.berlinpackaging.com) for a refresh.

Four things about the bottle in use needed to be addressed:

- Designed originally for products other than beer, it held only 11.82 oz when all the bottles it competed with held a true 12 oz.
- Its neck finish did not allow for easy opening.
- The supply chain behind it was not as efficient as it might be.
- It didn't stand out on shelf.

Berlin responded with a custom 12-oz amber glass bottle designed by its Studio One Eleven innovation team and produced by a manufacturer in China. In addition to fitting smoothly into Peace Tree's existing filling line, it addresses all of the above shortcomings, especially in the way it uses distinctive embossing on the shoulder and near the bottom to set it apart and reinforce brand recognition.

Another important modification was in the positioning of



Distinctive embossing on the shoulder and near the bottom is among the highlights of the custom bottle for Peace Tree Brewing.

the bottle's "transfer bead." This bead is a slight protuberance just under a bottle's neck finish that plays an important role in the glass blowing process because it facilitates the transfer of the bottle from its mold. On the bottle used by Peace Tree in the past, the transfer bead was so close to the neck finish



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that it made bottle opening difficult. Because it's positioned further down the neck on the new bottle, a bottle opener fits better and opening is easier.

Completing the eye-pleasing look are high-gloss pressure-sensitive paper labels from **Grace Label** (www.gracelabel.com).

A new twist on the growler

Craft beer lovers have long relied on refillable "growlers," typically a 64-oz container used for home consumption. Now there's an aluminum can version first introduced by Oskar Blues Brewery of Longmont, CO. Holding 32 oz and made by **Ball Corp.** (www.ball.com), the Crowler™ is filled and seamed on a one-up machine developed by Oskar Blues and **Wisconsin Aluminum Foundry** (www.wafco.com). According to Jason Dan, Crowler Spokesperson



Oskar Blues Brewery developed the 32-oz aluminum Crowler as well as the one-up filler/seamer that is essential to the concept.

at Oskar Blues, these machines, which go for just under \$4,000, can be found in breweries, brew pubs, restaurants, liquor stores, and gas stations. Even supermarkets are getting in on the act, as Cincinnati-based Kroger is testing the concept at a 12-tap growler station in its new store in Midtown, Manhattan.

Oskar Blues claims that key advantages the aluminum has over glass is that it's lighter and more portable, it's shatterproof, it seals tighter, and it won't allow in light. At one liquor store in New York City, which has offered the Crowler for the past two years and sells

between 135 and 200 each month, shelf life on the Crowler is as long as six months. On the Crowler website is this addi-

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tional information on how the filling and seaming takes place.

“Oskar Blues added a CO₂ purge station to purge the cans before filling them, which helps assure there is no beer-degrading oxygen added to the beer. The Crowler is purged and immediately filled. Then the lid is applied and the Crowler is placed onto the seamer pedestal. The pedestal is turned so that the can is raised up and locked under pressure into the seamer. Turn it on and push GO. Turn it off, twist the pedestal to lower the can, and take it with you to enjoy. Once you open the Crowler, drink it up—ensuring the craft beer is consumed in a single serving while the beer is in its prime, just like in the taproom.”

As for graphics, most shops and tap rooms selling Crowlers apply a pressure-sensitive label to the can manually. To see video of Crowlers in production, go here: pwgo.to/2694.

Pumping spent grain

Victory Brewing Co. got its start in 1996 in Downingtown, PA. More recently the firm opened a 212,000 sq ft brewery in Parkesburg, PA, where about 10 brews a day are produced for an annual output of approximately 225,000 barrels.

To keep production moving, a NEMO® progressing cavity pump from **Netzsch** (www.pumps.netzsch.com) is used for spent grain removal. A byproduct of the brewing process, spent grain is typically hot (150 deg F) and abrasive. Significant pressure is needed to pump the spent grain some 250 feet to silos outside the



A progressing cavity pump is used at Victory Brewing to pump spent grain to outdoor silos.

brewery. A great deal of back pressure is put on the pump, so a natural air line is run into the conveying line after the pump to create air gaps. To facilitate in the reduction of the discharge head, air is introduced into the conveying line after the pump to create air gaps that eliminate the phenomenon known as a plugged flow. ●

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Hitachi pwgo.to/2714

Brewery-friendly machines

A number of Barry Wehmiller companies will participate in this year's Craft Brewers Conference. Accraply will exhibit a craft beer labeling system that includes the Graham | Sleeveit SLF labeler. Pneumatic Scale Angelus will show its new CB50 can seamer, which is based on its high-speed seamer designed for large-scale operations and has a rated speed of 50 cans/min. Thiele Technologies will exhibit its automatic cartoners, case packers, case erectors, loaders, and wrappers suitable for brewery products in a variety of case sizes and types.

Barry Wehmiller

pwgo.to/2726



Case packer for microbreweries

Standard-Knapp's Model 939EZ case packer is a low-cost packer designed specifically for microbreweries and wineries.

Standard- Knapp

pwgo.to/2713

Accumulation table for craft brewers

Garvey has designed the Beer-Flo accumulation table specifically for craft brewers; unit is able to create a buffer for product accumulation in a small footprint.

Garvey

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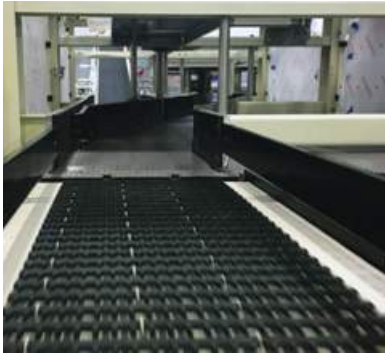


Coding for the craft beer industry

Domino's new Ax-Series of printers features a new generation of ink-drop technology said to offer gains in ink usage, droplet accuracy, and placement at traditional print speeds; the printers' i-Pulse system allows for the printing of high-contrast, durable messages, and multiple lines at fast speeds.

Domino pwgo.to/2712

Go to the link at the end of each item for more info



Conveyors to move full cases of beer

Multi-Conveyor LLC recently provided a series of conveyor systems for the reconfiguration of an existing full-case transportation line at a major brewery in the Midwest.

Multi-Conveyor
pwgo.to/2711



CIJ printers

ID Technology, powered by Pro Mach, offers the latest update to the ciSeries range of continuous ink-jet (CIJ) printers from Citronix, the ci5000 Series, which will be shown at this year's Craft Brewer's Conference and Brew Expo.

ID Technology
pwgo.to/2707

Top-load case packer for wine, beer, and spirits

The Douglas TriVex RLi top loader and sealer offers the wine, beer, and spirits markets versatility with high-speed automation.



Douglas Machine pwgo.to/2708

Craft Brewers Conference
Booth #1559

Your Craft Beer Labels Come Alive

With Exciting New Label Materials

Take a look at all our new types of label media available to make your craft beer brand get noticed including metallics, clear film, estate papers, textured materials and even real wood! Weber can digitally print your labels from a wide range of label stock and adhesive combinations to make your products stand out from the crowd. And we have the labeling and CIJ coding systems to help any size brewery become more efficient.

Want to improve your craft beer packaging?

Weber's Craft Beer Starter Kit has information about labels, ink jet coding and labeling systems that can help your brand grow.



www.weberpackaging.com/craft-beer-labels.html



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Cartoning, Tray Forming, Casepacking FOR CRAFT BREWERS

Spartan Casepacker



Up to 35
cartons
per minute

Spartan Traypacker



Up to 25
trays
per minute

Our Customers Are Thrilled

“Econocorp provides us with the versatility we need to keep up with growing demand at our brewery. We chose the Spartan for our packaging needs after having great success with the E2000. Both of these machines allow us to package in both a 4 pack and 8 pack recyclable box that really helps us stand out on crowded beer shelves. Flexibility, reliability, and labor savings have made it an easy choice for us to make Econocorp our partner in our growth trajectory.”

*Tim O'Leary, Kettlehouse Brewing Company LLC
Missoula, Montana.*



ECONOCORP INC

72 Pacella Park Drive, Randolph, MA 02368

Fax: +1 (781) 986-1553

Telephone: +1 (781) 986-7500

info@econocorp.com www.econocorp.com



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With over 40 years of experience in shrink labeling, AFM offers a complete line of shrink sleeve labelers, tunnels and shrink sleeve labels. Supplying both the machines and the material, AFM provides a single source that works together seamlessly and maximizes uptime.

Shrink sleeve labels are ideal for craft brewers. Labels can be purchased in small batches and applied by hand for low volume seasonal brews, or purchased in bulk and applied with one of our shrink sleeve applicators for larger volume house brands. Ordering blank cans saves money and valuable floor space, and allows brewers the flexibility to package all of their brands in house.

Single source. Quality products. Proven experience. Your benefits go on and on. When it comes to shrink labeling, rely on AFM and our authorized local distribution network to provide the right solution to your product labeling needs. Contact us today to find out how we can benefit your brewery.



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