

# **SSV Sanitary Drum Motors**

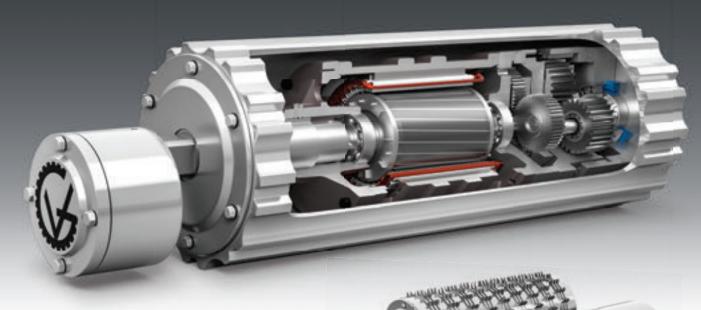
Reduce Washdown Time and Water Usage by 50%





# **SSV Sanitary Drum Motors**

Reduce Washdown Time and Water Usage by 50%



The SSV Series Drum Motor with belt profile machined directly onto the 316-stainless steel drum, drives modular, metal, and monolithic conveyor belts without the use of sprockets. The sprocketless SSV Drum Motor eliminates food by-product build up areas, and areas for bacterial harborage, increasing hygiene, as well as reducing washdown time and water usage by 50%.

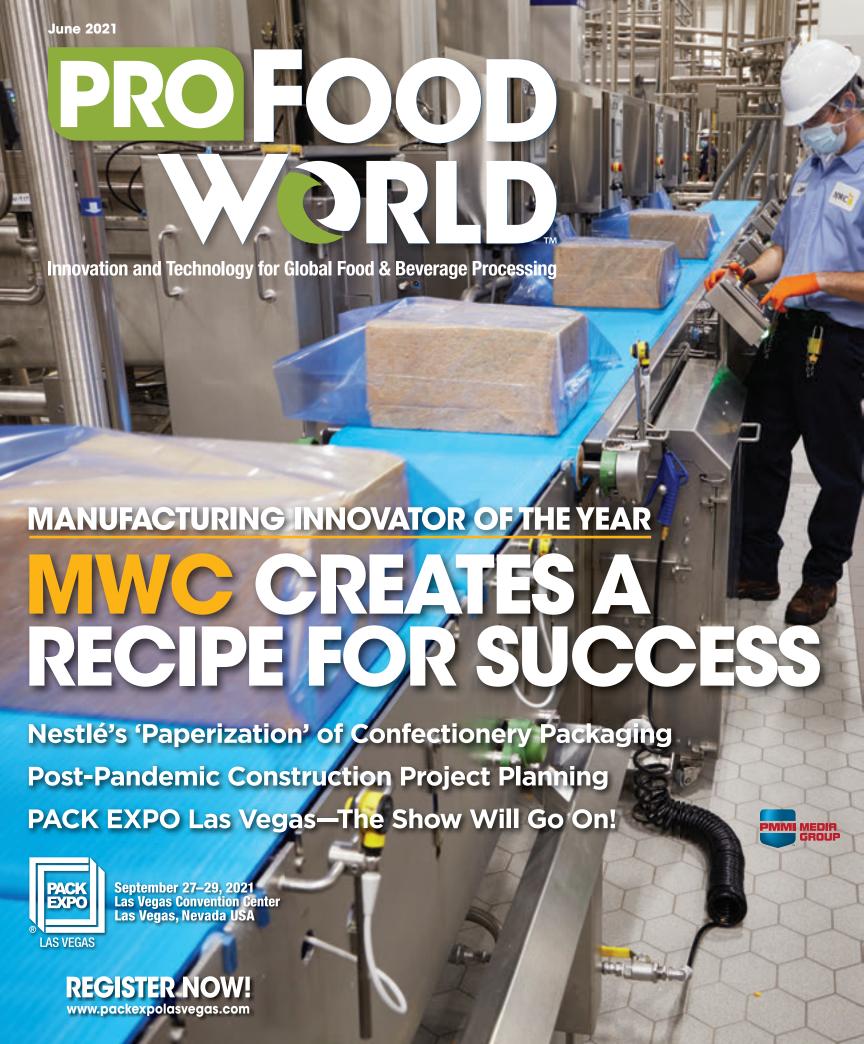


- **ELIMINATE BACTERIAL HARBORAGE AREAS**
- **▶ ELIMINATE PRODUCT BUILD-UP AREAS**









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Powder Processing Equipment and Systems



# CONTENTS





#### DEPARTMENTS

- **6 From the Editor**In good times and bad,
  partnership spells success.
- 9 In the News The latest on PACK EXPO Las Vegas
- **12 OpX Intel**Coronavirus's impact, learnings, and the value of discipline.
- 19 Packaging Technology

  Nestlé achieves 'paperization'
  of confectionery packaging.
- 79 Plant Floor New Products New machinery and tech for production facilities
- **87 Case Study: Dairy Farmers of America**Connected devices enable
  continuity in milk production.
- 90 Case Study: Special Dog Company

Inline seal inspection maintains quality of retort pouches.

95 Tech Perspective MES provides vision needed in competitive distillery sector.



#### ON THE COVER

#### **MWC Creates a Cheese and Whey Recipe for Success**

Intellectual property, proven equipment and technology, operational readiness, a seasoned workforce, and the perfect partnerships provide a winning combination to launch MWC's greenfield dairy facility.

#### FEATURES

#### 55 Bridging the Gap for Whey Permeate

Proliant Dairy Ingredients receives whey permeate from MWC's concentrate process via a pipe bridge, where it is dried on the world's largest permeate dryer of its kind. The collaboration provides environmental savings and maximum return for both facilities.

**61 Tech Today: Pushing Change to Keep Workers Safe, Plants Running**The COVID-19 pandemic prompted food and beverage manufacturers to implement several new safety measures along with cutting-edge technologies geared toward maintaining production in a booming market.

#### REFRIGERATION AND FREEZING SOLUTIONS

- 71 Case Study: Canneberges Bécancour CO<sub>2</sub> refrigeration helps cranberry processor overcome logistics challenges.
- **73** New Products

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# In Good Times and Bad, Partnership Spells Success

The importance of partnership and teamwork has accelerated over the past decade and also shown its necessity to overcome the food industry's challenges.



n my recent conversations about new plant technology with industry suppliers and food manufacturing leaders, phrases like "the best partnerships ever" and "we couldn't have done it without our partners" keep popping up.

Close cooperation between food and beverage processors and their suppliers and engineering consultants has always been a crucial component of manufacturing excellence. In fact, PMMI founded the Alliance for Innovation and Operational Excellence (AIOE) back in 2011.

Over the past decade, the importance of partnership has accelerated. Today, the OpX Leadership Network, formerly known as AIOE, provides a forum where the brightest meet to identify and solve common operational challenges and apply best practices and innovative solutions to real-world manufacturing challenges via open dialogues between consumer packaged goods companies and OEMs.

In the last 10 years, OpX groups, made up of a community of manufacturing, engineering, and operations professionals, have released free work documents and guidelines to help enterprises function at top performance levels. The topics include workforce engagement, total cost of ownership, overall equipment effectiveness, hygienic equipment design, virtual factory acceptance tests, and more. For the past year and a half, *ProFood World* has shared many examples of successful partnerships through its series of articles called OpX Intel.

This issue of *ProFood World* details the partnership between MWC and its engineering and construction firm, as well as MWC's partnership with an adjacent Proliant Dairy Ingredients facility where by-products are repurposed, and sustainability savings benefit both plants.

During the pandemic, processors leaned on their partners more than ever and overcame challenges together. What was learned and implemented during that time will only strengthen the industry's response to the next challenge. Q

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#### RIBBON/PADDLE/PLOW **BLENDERS HANDLE POWDERS TO PASTES**

MUNSON® Ribbon, Paddle and Plow Blenders force agitators through stationary materials, imparting shear needed to reduce agglomerates and blend pastes and slurries. Choose from basic, low cost industrial units to stateof-the-art designs of



304/316 stainless and exotic alloys with heating/ cooling jackets, liquid spray additions, high-speed choppers/intensifiers, and finishes to USDA Dairy and other standards. Extreme vessel rigidity allows tight agitator-to-vessel wall tolerances, resulting in a minimum "heel" of residual following discharge. Heavy- and extra-heavy-duty batch and continuous models in capacities from 1 to 1,150 cu ft (.03 to 32 m<sup>3</sup>).

#### **VEE-CONE BLENDERS SANITIZE ULTRA-FAST, THOROUGHLY**

MUNSON® Vee-Cone Blenders feature smooth internal surfaces free of baffles, shafts and bearings, allowing unobstructed material flow, plus complete discharge through a gate valve for rapid cleaning or sanitizing of the easyaccess interior. Uniform blends are typically



achieved in 5 to 15 minutes with equal efficiency at fill volumes from 100% to 25% of capacity. Ideal for dry and granular materials, these blenders provide a tumbling action that is gentler than machines that force agitators through stationary material. Options include spray bars for liquid additions, Clean-In-Place (CIP) systems, abrasionresistant steel construction, ASME-coded jackets and weigh batching accessories.

#### **FLUIDIZED BED MIXERS BLEND ULTRA-FAST, GENTLY**

Unlike Ribbon and Paddle Blenders with a single agitator shaft, MUNSON® Fluidized Bed Mixers feature two shafts with paddles that counter-rotate at higher speeds to fluidize material. achieving homogeneous blends in 10 seconds to



2 minutes. Low shear forces minimize friction with little or no degradation and insignificant heat generation of <0.6°F (1°C). Drop-bottom gates provide rapid discharge with no segregation and minimal residual. Ideal for short cycles and gentle handling of low- to medium-density powders and fragile flakes  $\leq 50 \text{ lbs/ft}^3 (\leq 800 \text{ kg/m}^3)$  with or without liquid additions. Capacities from 0.21 to 283 cu ft (6 L to 8 m<sup>3</sup>).

#### **ROTARY LUMP BREAKERS** REDUCE AGGLOMERATES. FRIABLE MATERIALS

Remove lumps and agglomerates from bulk foods, pharmaceuticals and chemicals, or break down glass and other friable materials. Dual rotors with three-point, singlepiece breaking heads rotate with minimum clearance inside a curved, perforated



bedscreen. On-size material exits through bedscreen apertures from 1/32 to 2-1/2 in. (0.8 to 63.5 mm) in diameter. The low profile design fits tight spaces between upstream and downstream process equipment, while side-removal bedscreens allow fast, in-place sanitizing. Square or rectangular inlets range from 15 to 48 in. (38 to 122 cm) in widthclassifying screen apertures from 1/32 to 2-1/2 in. (0.8 to 63.5 mm) in diameter.

#### **PIN MILLS REDUCE FRIABLE SOLIDS IN CONTROLLED SIZE RANGES**

Also known as Centrifugal Impact Mills, these MUNSON® machines deliver coarse to fine grinding of friable powders, flakes and granules into controlled particle sizes at high rates per HP/kW. High-speed rotation of the inner disc creates centrifugal force that



accelerates bulk material entering the central inlet of the opposing stationary disc. As material travels from the center to the periphery of the discs at high speed, it passes through a path of five intermeshing rows of rotating and stationary pins, with the desired tight particle size distribution obtained by controlling the rotor speed.

# WORLD'S FASTEST BLENDING <u>AND</u> CLEAN UP

#### No other bulk solids mixer delivers this unique combination of benefits:

- 100% Uniform blending and/or liquid additions to 1 ppm in 2-1/2 minutes
- Total discharge with no segregation
- Ultra-gentle tumbling action (versus blades forced through batch)
- Ultra-low energy usage
- Equal efficiency from 100% to 5% of capacity
- Unlike other rotary mixers:
- No internal shaft or seals contacting material
- Every internal surface accessible



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# IN THE

## The Show Will Go On!

ITH LAS VEGAS fully reopening on June 1 and once again hosting successful conventions, exhibitors continue to book space across four halls for the return of PACK EXPO Las Vegas and Healthcare Packaging EXPO 2021 (Sept. 27-29, Las Vegas Convention Center), the only comprehensive packaging and processing event in the world this year.

"We continuously monitor the industry, and exhibitors and attendees alike are eager to return to conducting business and experiencing new machinery, materials, technologies and solutions in-person," says Jim Pittas, president and CEO of show producer, PMMI, The Association for Packaging and Processing Technologies.

PACK EXPO Las Vegas offers countless opportunities for ideas from 40-plus vertical markets to crosspollinate. Healthcare Packaging EXPO provides the broadest range of equipment and technology solutions for the life sciences industry.

Free educational sessions located throughout the exhibit halls will

provide chances to grow, learn and accomplish professional goals with suppliers showcasing breakthrough studies at the Innovation Stages. The Forum, an interactive stage encouraging open discussions with industry experts, the Reusable Packaging Stage, hosted by the Reusable Packaging Association, and the new PACK to the Future Stage are also must-visit show floor destinations to learn about the latest trends and discuss the future of the industry.

The Cold Pressure Council Annual Conference (Sept. 28-29) will also take place in conjunction with PACK EXPO Las Vegas and Healthcare Packaging EXPO, offering education on the latest in High Pressure Processing (HPP) technologies. All registrants of the CPC conference receive complimentary registration to PACK EXPO Las Vegas and Healthcare Packaging EXPO.

PACK EXPO Las Vegas 2021 will also feature the return of the Processing Zone with solutions from food processing/systems, food safety, engineering, design and construction

president, trade shows, as she provides an

Convention Center on all the latest positive developments for PACK EXPO Las Vegas and Healthcare Packaging EXPO. (pmmi.org/podcasts)

update directly from the Las Vegas

technologies, best practices and case

# **New CEO at Danone**

Effective Sept. 15, Danone announced the appointment of Antoine de Saint-Affrique as CEO. He was previously appointed CEO of Barry Callebaut in October 2015. From September 2011 to September 2015, he served as president of Unilever Foods.

#### **Hershev Buving Lilv's Confectionery Brand**



The Hershey Company will acquire Lily's, the betterfor-you confectionery brand. Lily's low-sugar products include dark and milk chocolate style bars, baking chips, peanut butter

cups, and other confection products that fit Hershey's multi-pronged better-for-you snacking strategy.

#### **B&G Foods Selects New President and CEO**

**B&G Foods appointed** Kenneth C. "Casev" Keller as president and CEO. He will also serve on the company's board of directors. Most recently, Keller served as president and CEO of JDE Peet's NV, a \$7 billion global coffee and tea company.

#### **Utz Brands Set to Acquire Festida Foods**



Utz Brands' subsidiaries have entered into a definitive agreement with Great Lakes

Festida Holdings and related entities to acquire assets, including real estate located in Grand Rapids, Mich., related to the operation of Festida Foods, a manufacturer of tortilla chips, corn chips, and pellet snacks, and the largest manufacturer of tortilla chips for Utz's On the Border tortilla chip brand. The total purchase price is \$41 million.





September 27–29, 2021 Las Vegas Convention Center Las Vegas, Nevada USA services and more. Attendees can once again start their search for front-of-the-line processing solutions while continuing to solve their packaging challenges all under one convenient roof. A processing-specific Innovation Stage will also feature sessions targeting the processing sector.

Additional pavilions contain targeted solutions. The Package Printing Pavilion will shine a spotlight on digital printing and converting technologies and labeling,

coding and marking solutions. The Containers and Materials Pavilion showcases the innovative packages and solutions that are proven to capture the eyes of consumers, including the Showcase of Packaging Innovations, the best and brightest ideas in product packaging that have advanced the industry in the past year. The Confectionary Pavilion will house industry-specific solutions for candy and snack food connoisseurs while serving as the home of the Candy Bar Lounge for networking and industry expert advice with Lounge sponsors from the National Confectioners Association.

The PACK to the Future interactive experience debuts at PACK EXPO Las Vegas and Healthcare

Packaging EXPO, showcasing the industry's past, present and future. PACK to the Future will display carefully curated items and machinery from some of the world's largest consumer packaged goods and packaging companies. Industry experts, futurists, and business and financial leaders will speak daily on where the industry has been, where it is now and what the future holds for packaging and processing.

Networking opportunities abound at PACK EXPO Las Vegas and Healthcare Packaging EXPO, including a Packaging & Processing Women's Leadership Network breakfast with a keynote presentation and an Emerging Leaders Network event for young packaging and processing professionals on the rise.

With its PACK Ready health and safety program, PACK EXPO Las Vegas and Healthcare Packaging EXPO are prepared to welcome the industry back safely, employing thorough and up-to-date protocols for a safe and successful in-person event. Learn more at packexpolasvegas.com/packready.

Registration, which includes access to both PACK EXPO Las Vegas and Healthcare Packaging EXPO, is \$30 until Sept. 3, after which the price increases to \$130. For more information and to register online, visit packexpolasvegas.com and hcpelasvegas.com. •





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#### **OPX INTEL: PANDEMIC INSIGHTS**

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BERNARD CUBIZOLLES SENIOR GLOBAL MARKETING MANAGER - DIGITAL PLANT, GE DIGITAL

STEPHEN M. PERRY FOUNDER AND COACH, FSO INSTITUTE

# Coronavirus's Impact, Learnings, and the Value of Discipline

Prior to the pandemic, manufacturers spent most of their time optimizing assets and processes. When the crisis struck, the industry was forced to reinvent day-to-day activities. Refocusing on people is the key to being prepared for future uncertain times.

> URING THE PAST YEAR, the global coronavirus pandemic put pressure on daily manufacturing operations like never before. As these pressures emerged and mounted, members of FSO Institute's Manufacturing Health Roundtable representing nearly 30 consumer packaged goods companies (CPGs)—dealt with them in real time and collaborated to identify six of the most significant COVID-19 trends as shown on the opposite page. As these six COVID trends show, when disrup

tions of this magnitude occur and uncertainty rules the day, it is easy to lose sight of standard work, process discipline, and the value of predictable dayto-day operations in manufacturing. Maintaining focus and business as usual becomes increasingly difficult. And while most agree that we won't be returning to normal as we have known it, they also agree that there will be a continual need for discipline and repeatability in manufacturing in the new normal world as well.

#### CASE IN POINT

#### Finding certainty in uncertain times

To learn more about how the CPG community is dealing with the turbulence inflicted by the global pandemic, FSO Institute spoke with Amber Brovak of Church & Dwight and Bernard Cubizolles of GE Digital about some of the lessons learned during the past year of uncertainty.







**BERNARD CUBIZOLLES** 

FSO Institute: Amber, as senior manager of global safety operations at Church & Dwight, how has your area been impacted by the global pandemic during the past year?

Amber Brovak: Since most of my experiences with the impact of the global pandemic occurred during my time with my previous employer (Nestlé), my comments are based on that experience.

It is appropriate that "safety first" is listed as the No. 1 trend, as there was a 100% commitment to employee health and safety at Nestlé during this pandemic. In fact, we considered employee health and safety as the gateway to production—without

it, there would be a risk of no production. As our leadership team broke into smaller teams leading the COVID process, we immediately began putting safety protocols into place—from social distancing and physical separations to hand sanitizing and PPE (personal protection equipment). That really opened employees' eyes and showed our focus on and caring about their safety and well-being. We had a small group that spent a large part of each day proactively handling PPE and chemical procurement, including thermometers for each plant. It was difficult, time-consuming, and exhausting, but we had to do it. Initially, the primary focus was at site level, and corporate developed formal procedures quickly

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#### **Sharon Nowak**

Global Business Development Manager Food & Pharmaceutical Industries

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#### **6 Significant COVID Trends for CPGs**



**SAFETY FIRST**—Highest priority on employee health and safety. Heavy focus on:

PPE, such as masks, face shields, hand sanitizers,

Safety on both operator space and common space

Carefully controlling access from outside visitors

and putting safety protocols in place (including

and other supplies for employees

Frequent cleaning and disinfecting

in facilities

third-party audits)

Testing, quarantining, and contact tracing



**CONSTANT COMMUNICATION**—First and foremost, creating a calm, reassuring environment that separates fact from fiction and misinformation. Characterized by:

- Daily communications that help manage expectations
- Leaning heavily on virtual and visual communications
- Developing "feedback from the floor" programs
- Sensitivity to language issues
- Social media communications tools like WhatsApp, Alert. com, YouTube, etc., that employ push notifications
- Rethinking processes for recruiting, onboarding, and training



**DAY-TO-DAY OPERATIONS**—Addressing operational challenges to optimize continued productivity. Primary focus on:



**TECHNOLOGY APPLICATIONS**—Leveraging technology in new and innovative ways. Exemplified by:

- Social distancing 6 ft apart
- Shielding between workers where 6-ft protocol won't work
- Following strict PPE requirements and guidance
- Extended shift coverings due to worker absences
- New ways for virtual project delivery like FATs and vertical start-up
- Addressing on-floor communications with masks, especially where ear plugs are required



- Heavy use of virtual conferencing platforms
- Reliance on wearable technologies where possible
- Use of virtual project delivery platforms
- Engaging younger, digital native employees in new technology uses
- Addressing wireless connectivity challenges
- Increasing use of augmented reality (AR) and virtual reality (VR)
- Exploring technologies for using cellphones as walkie-talkies
- Employing personal scanning technologies like thermal imaging tablets



**SUPPLY CHAIN DISRUPTIONS—Addressing** intermittent supply chain disruptions. Common shortages seen in:



**REOPENING DYNAMICS**—When and how to reopen, especially for non-direct manufacturing jobs. Focus is on:

- Aluminum cans
- Ingredients and other raw materials
- Building supply materials
- Specialty contractor availability, such as HVAC, plumbing, and electrical
- Service tech availability and accessibility

- Rethinking use and configuration of central office and support areas
- Dealing with widening gap between office workers working from home and plant-level workers in the plants
- Installing air purifiers and HEPA filtration systems
- Following ASHRAE guidelines for filtration and disinfecting
- Longer delays in reopening following holidays to offset travel restrictions for employees
- Creating "return to work" teams
- Employing a "readiness grid" to assess all plants' ability to return to work
- Continued focus on family safety
- Monitoring case "spikes" and remaining agile

GRAPHIC COURTESY OF FSO INSTITUTE

and established processes at site level. It was a great partnership!

While communication is always important, with all the uncertainty and misinformation surrounding the pandemic, the need for daily communication grew exponentially. We knew that creating a calm, reassuring environment was critical to our success. Fortunately, we had site-level emergency systems in place for other emergency situations that we were able to use to communicate with all employees. Eventually, we were able to formalize these protocols and communicate (via website) to all employees. Small teams led the way and used visual messaging and push notifications to communicate across the site. Like most companies experiencing a shift to virtual interaction, we leveraged Microsoft Teams and Zoom for communicating with employees both remotely and on-site.

To address day-to-day operations issues, we had small teams that spent hours developing protocols to ensure a safe working environment, with social distancing, PPE, and physical guards/shields that focused on all employee areas (break rooms, restrooms, control rooms, conference rooms, etc.). When we encountered our first potentially positive case, we proactively shut down for two days to ensure the right steps and procedures were in place for our employees to stay safe while working. We immediately held leadership meetings to discuss all the required next steps and communication. We communicated to employees in a way that showed them we took their health and safety seriously, and we would not put their health and safety at risk. Leadership also scheduled regular walks around the site to talk with employees and hear and address their concerns. To ensure we had constant backup in the event of an exposure to our leadership, we split our salaried employees into two groups on alternating days, to cover business continuity.

When it comes to supply chain impacts, like everyone else, we experienced huge interruptions, so we could not produce products fast enough. But perhaps more significant than supply chain interruptions was the tremendous increase in consumer demand that resulted from more people staying at home, stocking up on things, and relying more on e-commerce.

**FSO Institute:** What about lessons learned with an eye toward applying these lessons for improved operational performance going forward?

**Brovak:** I think the greatest lesson we learned was just how agile, resilient, and innovative leadership at site level could be when under pressure. When leadership was challenged, they pulled through. With CDC guidance, they made procedures and aligned their efforts in the direction of keeping all employees healthy and safe. Corporate played a huge role as well. To help communicate, we had daily calls with corporate and ensured that all sites helped reinforce the right steps to take and delivered the most up-todate information and updates on each site.

Another thing we learned was how you see a different side of employees when things like COVID happen. We saw people speaking up more and getting more interested in solving the problems we faced. If we discovered that employees were uncom-

## How OpX Leadership Network Guidance Documents Can Help

Guidance documents from PMMI's OpX Leadership Network can help add certainty to manufacturing's future through their focus on discipline, standard work, process improvement, and a stepwise approach to some of the most significant operational challenges both in and beyond the COVID-19 era. Doug Herald, vice president of operational strategy and continuous improvement at the AmeriQual Group, says his company had several factory acceptance tests (FATs) occur at the beginning of the pandemic.

"The new FATs for virtual use had not yet been published," says Herald. "Our participation in the FSO Manufacturing Health Roundtable [MHRT] monthly industry calls provided opportunities to discuss current hot topics, including doing FATs virtually. Through those MHRT



discussions with my peers, combined with my team reviewing the existing FAT guidelines, we were able to organize our game plan and execute it."

Herald says he is thankful that the OpX Leadership Network published the vFAT addendum midsummer. "We reviewed those guidelines and have already used them as a basis to once again improve how we

conduct FATs on a virtual basis," he says.



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fortable with the procedures we put in place, we acted on that to address concerns. Again, communication with employees was the key. You've heard that saying that "prosperity conceals genius while adversity reveals it." Well, we saw employees stepping up in a time of uncertainty and crisis. We hope to build on that experience.

We also learned that when it comes to our day-today operating systems and processes, the majority of the time, the systems remained in place, and they worked. Meetings were held virtually or with social distancing, physical separation, and masks. We relied heavily on virtual technology, especially for those not at the sites who continued to work remotely. The one item that was impacted the most was new projects or initiatives. They were essentially stopped for a couple of weeks or months, as most of our resources were directed at COVID-related issues, and visitors were not allowed on-site.

I think a final, big lesson we learned was just how significant looking at things differently became to all of us. We were all used to certain routines and the standard ways of doing things. Many disruptions we experienced forced us to look at things differently some bad, some good. For example, we discovered that all meetings did not have to occur face to face; they could be done virtually faster and more efficiently in many cases. The health and safety of employees took on a whole new, heightened posture, with many workers taking greater interest in it. We were forced to look anew at how we recruited, onboarded, and trained employees. We hired nurses and nursing students to assist with many of our COVID protocols. We discovered a better work/life balance for many employees due to some of the changes made during COVID, as schools were closed, and employees had to fill the childcare gap. We were very fortunate to have had most of the technology to do all these things. What we clearly learned was that business as usual

#### **ABOUT THE OPX INTEL SERIES OF ARTICLES**

PMMI's OpX Leadership Network produces more than 20 manufacturing processimprovement documents for CPGs and OEMs.



The FSO Institute has facilitated the adoption and implementation of these documents, especially for food and beverage manufacturers. This series of articles shows how CPGs are using OpX and FSO documents to improve their overall manufacturing health, as well as collaboration with OEMs and other suppliers. Learn more at www.opxleadershipnetwork.org and www.fsoinstitute.com.

was not the same as before, but we were adaptive, resilient, and innovative in the face of disruption. And that's a good thing!

FSO Institute: Bernard, as a software solutions provider to the CPG industry, what are some of the lessons learned based on interactions with your customers, specifically those regarding agility, standard work, discipline, and a focus on people?

Bernard Cubizolles: The global pandemic was a disruption for most of our customers, facing a broken supply chain and having to adapt to new consumer buying behavior impacting their strategic investment plans.

Many have reported a significant loss of productivity due to the implementation of the new pandemic safety procedures, forcing them to rethink their manufacturing processes overall. They realized that they had spent most of their time optimizing their assets and processes, often ignoring their people. The COVID situation has forced them to reinvent their day-to-day jobs. Refocusing on people is key to being prepared for the future in uncertain times.

Our customers assessed their "digital maturity level" and quickly understood that the usage of digital tools to boost resilience and enable growth was the right thing to do. We have seen an increasing demand for remote control and monitoring tools since day one of the crisis, as mobility is becoming the norm. This applies to many profiles: frontline workers, managers, quality personnel. However, the requirements have changed. Users want more information at their fingertips, not just a copy of their local HMI. Having the right information accessible from anywhere on any device has tremendous value.

The digitization of work procedures is the investment that has demonstrated the greatest impact. The key benefit is to enforce discipline in the execution of processes. Digital work process management drives consistency and repeatability in task execution, and also increases the conformance to procedures and standards. Using digital tools reduces the number of errors and allows users to respond faster to unexpected events or situations in a secured way and mitigate risk.

Customers now require the ability to make quick changes to their application without calling for help from an external resource or a data scientist. Rapid application development tools like no-code apps are the solution to empower engineers and become "leaner."

For all these customers, agility is not an empty word. Resilience and adaptability will allow them to come out stronger in the long term. Q











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SENIOR EDITOR, PACKAGING WORLD

# Nestlé Achieves 'Paperization' of Confectionery Packaging

Transitioning from plastic to paper for 419 SKUs of its Smarties brand chocolate candies required extensive R&D in new materials, new package designs, equipment compatibility, and recycling potential for Nestlé.

WO YEARS IN THE MAKING—from concept to launch-Nestlé's introduction in June 2020 of its Smarties chocolate candies in fully recyclable paper packaging represents a world first for a global confectionery brand, the Swiss-based company says. The project, which saw packaging for 419 SKUs of the popular sugar-coated chocolate candy moved from plastic to paper, involved greater complexity than even Nestlé anticipated when it first embarked on the journey.

Challenges included developing a paper substrate that could provide the same functionality as plastic, while still being 100% recyclable and able to run at high speeds on the company's existing packaging equipment. Nestlé also had to reimagine many of its iconic packaging designs—which could not be reproduced with paper—with new structures capable of conveying the same customer experience.

The project used as its starting point the work done on a fully recyclable paper wrapper developed at Nestlé's R&D Centre for Confectionery in York, U.K., in collaboration with the Institute of Packaging Sciences in Lausanne, Switzerland, for Nestlé's new YES! fruit and nut bar. The YES! bar packaging was the first such structure able to run at 300 packs/min on a cold-seal flow-wrap machine.

To adapt the paper packaging material for Smarties, Nestlé called on 50 R&D staff, along with its staff of 180 packaging experts worldwide.

The first Smarties pack to be launched in the new paper packaging was for its popular sharing block, an 18-square chocolate bar filled with mini Smarties. According to Nestlé, 3.5 million Smarties blocks are sold each year. Given the scope of the plastic-to-paper project, the conversion of all SKUs to paper will eliminate more than 400 metric tons of plastic packaging and 38 million plastic lids and plastic stickers worldwide, based on 2019 annual volumes, the company reports.

#### **Global sustainability commitments**

In 2018, Nestlé announced its commitment to make 100% of its packaging recyclable or reusable by 2025



PHOTO COURTESY OF NESTLÉ

in line with the Ellen MacArthur Foundation's New Plastics Economy (NPEC), a global initiative that seeks to address plastic waste and pollution at its source. Currently, 87% of the company's packaging is already recyclable or reusable, notes Rob Cameron, global head of public affairs for Nestlé SA.

In 2020, Nestlé announced another goal—to reduce its use of virgin plastic by one-third by 2025. "That sounds relatively straightforward," Cameron says, "but there is a huge challenge for us in this, which is the availability of food-grade recycled plastic that we can use as feedstock for our packaging."

It was this 2018 global announcement that inspired the confectionery group to pursue new packaging for Smarties to advance the company's sustainability goals, according to Alexander von Maillot, senior vice president and global head of the confectionary and ice cream strategic business unit at Nestlé. Making that switch was easier said than done, however. "We are producing roughly 280 million packs per year. And at that time, 250 million of them were using plastic. Thus, we had to change 90% of our portfolio," he explains. That means transitioning 419 SKUs-about 400 different formats, shapes, and different types of packaging-to paper.

"When we actually looked into the data, we found that plastic was used everywhere, albeit in

Among the new formats are a hexagonal paper tube for the **Smarties Giant** Tube, a multipack of paper tubes held together with a label, a paper bag for small cartons of mini Smarties, and a stand-up pouch.

small ways sometimes, such as a sticker or an Easter egg fitment, the pouches, the bags, the windows in cartons," adds Bruce Funnell, packaging lead from Nestlé's Product Technology Center in York. "Each one had to be tackled in a way to ensure that each of the problems could be solved."

#### Paper provides greatest circularity

As desirable as paper is from a recycling standpoint, however, it does lack much of the functionality of plastic, Funnell acknowledges. It's not as strong as plastic, it tears easily, it's stiffer, and it lacks the oxygen and moisture barriers provided by plastic. It's also a very open and porous structure, which poses a problem for printing graphics onto the packaging.

Typically, Funnell explains, plastic packaging for a confectionery product such as Smarties comprises multiple layers, including an inner layer, a barrier layer (typically aluminum), a print layer, and a final surface layer for protection, between each of which is an adhesive layer. To move Smarties from this multilayer structure to a paper material required developing a cellulose structure and a proprietary, water-based coating that together could provide the needed functionality and recyclability.

"By doing that, we created a material that can be easily separated and recycled, so we can recover the fiber, and we can reuse it," Funnell explains. "And we can also recover the waste elements, which we can use either for further recycling, or we can use it for incineration for energy. So we can recover the vast majority of the material."

The final, proprietary paper structure was developed by the York R&D center in conjunction with Nestlé's packaging engineers and scientists, its factories, its suppliers, and recyclers "to ensure not only that it could be used, but also that it could be recycled at end of life," Funnell says.

#### Sustainable sourcing of fiber

When designing new, more sustainable packaging, Funnell says Nestlé considers a package's full supply chain—from raw materials through to end of life—to ensure the new material doesn't solve one problem while creating another. For its fiber-based packaging, Nestlé works directly with its suppliers to ensure that all paper, pulp, and board comes from sustainable sources.

Packaging for the new Smarties packs uses fiber from proprietary suppliers that is 100% traceable back to country of harvest. In addition, a minimum of













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90% of the fiber volume is responsibly sourced within Nestlé's definition, which reinforces the company's specific commitments on deforestation and forest stewardship, rural development, and water stewardship.

Funnell notes that paper has the added advantage of being available at the scale needed for a company such as Nestlé. "The trees we need for tomorrow are planted today, and the trees we need for today were planted yesterday, so there is enough paper for us to make the change sustainably," he says. "And the fact that we recycle the material over and over again several times means that we keep the material in the loop. Whereas, if you consider plastic that is not recycled, probably the best case is that it will be incinerated for energy recovery and the worst is that it will be littered."

#### **Equipment investments required**

One fundamental challenge was engineering the material to run on Nestlé's equipment. Just as plastic has been optimized for packaging, so too has the packaging equipment been optimized to run plastic. "To enable paper to fulfill its role, we really needed to bring some clever innovation to make that work, to run effectively and efficiency on our automatic lines," Funnell says.

Nestlé's largest Smarties production plant is in Hamburg, Germany, where 20,000 tons of the candy are produced each year. To accommodate the new paper packaging, Nestlé invested \$10 million Swiss Francs (more than \$11 million), much of which was used to install a new line for the hexagonal Smarties Giant Tube.

Some of the investment was also used to modify existing equipment for the paper bags, such as the vertical form/fill/seal machines used for the bags of mini Smarties, according to Arturo Galván, factory manager for the Hamburg chocolate plant. "Although we just changed the plastic material to paper, we had to guarantee that the parameters, including the temperature for sealing, matched perfectly, because if we take a very high temperature, we can burn the paper," he says. "And if the temperature is too low, we cannot guarantee that we're sealing the pouch properly."

#### The beginning of the 'paperization journey'

Since the introduction in mid-2020 of the Smarties Sharing Block in paper packaging, initially in the U.K.'s Asda supermarkets, Nestlé has been rolling out various formats in the new paper packaging globally. Before the project, 10% of

Smarties products were in paper packaging; today, the entire brand portfolio is packed in 100% recyclable paper.

Nestlé is at the beginning of its "paperization journey," von Maillot says. After tackling the YES! bars and Smarties portfolio, Nestlé introduced a 100% recyclable paper pouch for its Nesquik All Natural cocoa powder in Europe. Now, the company is targeting ice cream packaging. Q

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ICHIGAN'S STATE MOTTO DECLARES, "If you seek a pleasant peninsula, look about you."

When a greenfield facility is planned, two of the many key topics researched are the close supply of raw goods and the availability of a qualified workforce. In St. Johns, Mich., MWC found a perfect home for its new cheese and whey processing facility, which ProFood World has named as a 2021 Manufacturing Innovation Award winner.

Located about 15 miles north of Lansing, in the heart of America's automotive manufacturing industry, MWC found not only a talented local labor pool, but also the abundant supply of milk required for its new processing facility.

The 375,000-sq-ft dairy facility receives 8 million lb

of raw milk per day and, from that, produces about 850,000 lb of cheese in 40- and 640-lb blocks per day. MWC also produces whey protein concentrate and isolates at a rate of about 3,000 lb per hr, which are packaged in 20-kg and bulk bags.

Started up in October 2020, MWC's building now spans over 9 acres and processes about 25% of the milk produced in Michigan.

Complete Filtration Resources (CFR) provided a turnkey process solution to receive and process the raw milk, and then coordinated MWC's building and utility needs with Shambaugh & Son. The plant includes some of the newest technology and equipment from some of today's largest equipment manufacturers, including Tetra Pak, GEA, and SPX Flow's APV division.

The plant includes 16 Tetra Pak vats capable of making 10,000 Ib of cheese in every batch.

РНОТО ВУ THOMAS KIRBY

#### Harvesting the Data Cream of the Crop

**AARON HAND** | EXECUTIVE EDITOR

WITH THE SHEER SIZE OF ITS OPERATIONS, and an on-site server system large enough to store three or four months of data, MWC is up to its eyeballs in data. This could be overwhelming, so it's important to know how to turn that data into information, notes George Chappell, vice president of dairy operations for Glanbia Nutritionals. But in much the same way it has added other bells and whistles into its operations, MWC is building out analytical capabilities in layers, bit by bit.

According to Chappell's "effective-before-efficient" principle, when all the equipment is running, MWC gathers data on its servers that create a baseline of information. "Once we have that, then we layer on our management information systems that will generate reports," he says. "These are automated reports that come to specific leaders in the facility that allow them to start making decisions based on the information, not just the data."

Now that MWC has come to the end of its commissioning phase, it's beginning to layer on more reporting to drive further efficiencies, Chappell adds. The supervisory control and data acquisition (SCADA) system provides automation control for the facility and is also used for information and reporting. "It gives you a lot of ways to layer on additional capabilities—whether it's around reporting systems, whether it is linking into other software, where you can pull and send data to business systems and start to link them together," he says.

MWC uses an Ignition SCADA system from Inductive Automation, configured and integrated by Tamaki Control, which specializes in industrial automation. "We proved it out at Southwest Cheese, and so we just dropped it in here and it's a really useful system," says David North, senior site director for MWC.

"It gives you an opportunity to just layer on things like track and trace, OEE [overall equipment effectiveness], and automated report generation," Chappell says. "It has a lot of additional add-ons that are easily pulled forward once you get the plant started up."

Ignition's playback capabilities particularly attracted MWC to the SCADA system, according to North. "Literally, we can turn

back time. Something happens during the night and we come the next day and we can't work out what it was, we can go into replay and we can see every action that was taken during that period of time," he explains. "It is the single most delightful thing to have when you're trying to fault-find where something went wrong or

The system's ability to compress data also initially attracted MWC (and SWC before it) to Ignition, Chappell says, enabling them to reduce server space by about 80%. "It saved us close to a quarter of a million dollars at our other facility, just in those reductions," he says. "It was compelling just from that front, but the more that we use the Ignition system and understand its capabilities and its flexibility, that's just that much more incentive to continue moving forward with it."

#### **Predicting failures**

MWC uses the data from the SCADA system to better manage maintenance on an ongoing basis, based on how many operations are being made every minute, every day, etc., North says. An alarm system also alerts operators and maintenance personnel about any potential situations.

"Anything that the system is picking up that seems abnormal will send an alarm and a flag back to whoever needs to see it," Chappell says. "If you see a valve fault X amount of times, it triggers a signal for people who are our maintenance or operators to go and have a look, see what's going on with valve X. In a plant of this size, where we literally have thousands of valves that can fail, it's impossible for an operator to see those without some type of automation intervention."

The SCADA system enables managers to log in from home to monitor operations. MWC also uses the system to allow its vendors to support the plant remotely. "They can come in through a protected firewall system that we provide them in short intervals that will allow them to come in, access the system, do what they need to do, and then it shuts them back off again," Chappell explains.

"MWC was formed based on the success of Southwest Cheese," states George Chappell, vice president of dairy operations for Glanbia Nutritionals. "We have the same kind of partnership with MWC as we do with Southwest Cheese, which is a joint-venture [JV] model, based on Glanbia Nutritionals operating the sales and marketing portion of the JV." Dairy Farmers of America (DFA) and Select Milk supply all the milk, while Glanbia handles operations and product distribution. MWC was formed in 2018 by these same partners that have been operating Southwest Cheese in New Mexico since 2008.

"The main draw for almost all of our facilities is milk

supply," states Chappell. "It's a natural fit based on the previous JV. Glanbia continues to look for an opportunity to grow and maintain its strong foothold as a No. 1 supplier of cheese and whey products in the U.S."

#### **Product quality and consistency**

In designing the MWC plant, Glanbia relied on decades of knowledge gained from its other facilities, including Southwest Cheese. "We applied those to the process, the build, and how we operate this facility," states Chappell.

The St. Johns facility added new automation and updated maintenance procedures, while incorpo-





The Ignition SCADA system provides alarms for MWC operators, and also provides layers of data capabilities for track and trace, OEE, and more.

"It allows us to receive support, and we have done in the past support from Australia, Europe, anywhere in the world."

It's important that, while layering on capabilities, it's done cautiously, Chappell adds. "I would say we're heavy into Ignition, and we're moving forward with it but moving cautiously to make sure that we do it correctly," he says.

MWC has a fully fenced site with swipe card access, but the security doesn't stop there. "With the amount of automation that we have and the technology that we have, it's important we protect the site from a cybersecurity standpoint as well," Chappell says. "That's an ever-increasing threat that we have to be aware of and that we continue to build the securities around."

rating learnings from the company's other facilities, explains David North, MWC's senior site director. "We've taken all those ideas and all the latest enhancements that the vendors bring, and we incorporated them within this plant."

Chappell also says that customer feedback received over the past 15 to 20 years and the knowledge gained from it has also impacted the St. Johns facility design. "When we first started Southwest Cheese, we weren't a 640 [lb block] supplier," he says. "Southwest Cheese was the first facility where we made 640s, so it was a hard learning curve for us in that facility. The beauty about the St. Johns plant



40-lb blocks of cheese move to Mettler Toledo metal detectors before secondary packaging.

is now we've been doing it for over 15 years, and we have a very good process and recipe for success that's been applied here."

This vast experience is allowing MWC to ramp up production and meet customer requirements more quickly. North says the company's success is based on product consistency and the fact that the facility contains proven technologies that produce a proven product. Chappell agrees. "When you walk through the facility, you can find a lot of the same equipment that's in many facilities out there, at least the newer facilities. But how we use the equipment is the intellectual property that's inside our facility."

#### **Lean manufacturing**

While bringing proven process technologies into the plant has helped make it a success, North doesn't discount the workforce factor. "To make it operate well, we have to have really good people, training, and hiring plans in place."

MWC brought in staff from Southwest Cheese, who are currently working alongside St. Johns employees. North says it gives new employees confidence, because the work is different than other jobs they've held, and it ensures employee safety. "We know the equipment is top notch, but how we train the people operating the plant is a key thing for us," he says.

Once employees are trained, MWC employs the Glanbia Performance System (GPS), a Kaizen-type

PHOTO BY THOMAS KIRBY



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model that looks at how things work and then identifies how efficiencies can be made. Chappell's motto is "Effective before efficient," and while the facility is now in the ramp-up stage, it will soon move into the efficiency stage.

GPS is a collection of lean manufacturing tools, says Chappell. "The beauty of it is that we are on the leading edge of that in the food industry, particularly in cheese and whey. We've applied those principles and tools within how we operate our facilities—and not only in how we operate, but also how we build and onboard it."

For example, when MWC was in the start-up phase, it used a principle called early management. "It's how we manage from the process build and then to the ramp up of the final products," says Chappell. It's key to holding the project together, or what Chappell refers to as operational readiness. "That's the transition from the time the plant is built to the time you have commercialized and are sending product to the customer. It's a critical part of the overall process of bringing on a greenfield site that is pretty easy to miss if you're not accustomed to doing it."

#### Preventive maintenance is critical

North says he feels blessed to be working with a staff that comes from an automotive and engineering



culture that can easily move into the autonomous maintenance and early management culture at MWC.

Preventive maintenance (PM) is absolutely critical, North declares. "The beauty is we lifted those PMs from Southwest Cheese, and we brought them here. We just adapted them, because a lot of equipment is very similar, with a few subtleties, so we can just drop those PMs straight into our system here."

At MWC, production managers don't have to worry about equipment failures, because mainte-



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After crumbling 40-lb blocks, a larger capacity line forms and produces a homogenous 640-lb block using seven state-of-the-art vacuum chambers manufactured by Loos Machine & Automation.

nance staff performs duties, such as vibration analysis and thermal imaging. In fact, the plant runs 24/7 every day of the year and shoots for 100% uptime.

Line changeovers are typically performed during the clean-in-place (CIP) process. "That's where we shift from a 40-lb production to a 640, and vice versa, on one of our lines," says North. "It's very simple compared to what some factories might do when they're making multiple SKUs."

The facility currently processes about 300 million lb

of American-style cheddar cheese annually. "We can do a 50/50 split, so about 150 million lb of 640 and 150 lb of 40," explains North. "Or we could do a straight 300 million lb of 40-lb cheese. That gives us flexibility that we don't have in some of our other plants."

The block formers were redesigned to provide a smaller footprint, a hygienic lift system, and the latest auto baggers for 40-lb blocks of cheese. The block formers provide operators with heightened safety features and MWC with a lower total cost of







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40-lb blocks of cheese are boxed and sealed, then conveyed to a palletizer in the adjoining room.



Plant workers travel through pristine corridors that display company values, such as showing respect and winning together.

PHOTO BY THOMAS KIRBY

ownership to operate the lines, according to Tetra Pak.

The plant also includes a 640-lb cheese block forming line from Tetra Pak, which takes crumbled 40-lb blocks from the block formers and produces a homogenous 640-lb block utilizing seven state-ofthe-art vacuum chambers manufactured by Loos Machine & Automation. Each of the customized vacuum chambers incorporates a tight-seal design, allowing max-

imum drawdown pressures and CIP for ease of cleaning, increased production uptime, and the elimination of confined space hazards. There are two separate whey production streams at MWC. Whey permeate, a byproduct of the cheese process, is sent to the adjacent Proliant Dairy Ingredients plant via a pipe bridge. The bridge transports 95,000 lb per hr of permeate liquid to Proliant so it can make permeate powder. (Read about Proliant's facilty on pg. 55.)

MWC's facility has 16 large Tetra Pak horizontal cheese vats capable of making 10,000 lb in each batch. The vats feature the latest seal technology, provide easy maintenance, and reduce the likelihood of leakage. The cheese belt systems incorporate advanced whey and cheese curds separation technology, which will reduce downtime for CIP, thereby increasing production time."



PHOTO BY THOMAS KIRBY

#### **Turnkey process solution provides** sustainable gains

Equipment was planned, modeled, and coordinated with Shambaugh to ensure it could be placed inside the structure and assembled before the building space was complete. Interconnected process piping was coordinated with utilities and cable trays on massive combined pipe racks suspended from the structure into and out to the additional 30,000 sq ft of cheese CIP, culture storage, secondary package, and support spaces dedicated to the cheesemaking process.

MWC hired CFR to provide a turnkey process solution for receiving and processing raw milk, and coordinated building and utility needs with Shambaugh to ensure a cost-effective, timely, safe, and successful start-up, says CFR Co-owner John Park. "A variety of process modeling, fluid modeling, and 3-D

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PHOTO BY THOMAS KIRBY

Tetra Pak separators are placed in the whey processing area.

# 2021 Manufacturing Innovation Awards set for PACK EXPO Las Vegas



September 27-29, 2021 Las Vegas Convention Center Las Vegas, Nevada USA

THE PRESENTATION of ProFood World's fifth annual Manufacturing Innovation Awards is planned for Tuesday, Sept. 28 during PACK EXPO Las Vegas.

The 2021 winners are:

- MWC Highly automated, 375,000-sq-ft greenfield cheese and whey processing facility in St. Johns, Mich., processes 25% of the state's milk supply.
- Kraft Heinz Expansion and modernization project supporting a new cheese formulation for Kraft Macaroni and Cheese at the company's Wausau, Wis., facility.
- CTI Foods Automated, robotic taco packaging line and system integration project at the company's Saginaw, Texas, facility to supply fast-food outlets.

Leaders from all three plants will discuss the outstanding engineering and production aspects of their award-winning projects during a special session at the trade show.

Registration is now open for PACK EXPO Las Vegas. The show will reunite the packaging and processing community, offering new products, technologies, and solutions, while implementing up-to-date protocols for a safe and successful in-person event. For more information, visit www.packexpolasvegas.com.

Look for plant profiles about CTI Foods and Kraft Heinz in future editions of ProFood World.

equipment and piping modeling was used to plan maintenance access, ease of installation, and operational workflow before fabrication started."

Eight flexible receiving bays receive raw milk through automated mix-proof valve clusters. The raw milk is then processed through dual filtration, standardization, and pasteurization lines prior to cheesemaking. "Dedicated energy recovery systems were incorporated into the designs, saving 16,000 PPH of steam and 1,000 tons of refrigeration," states CFR Co-owner Tim Isenberg.

CFR provided a process solution for the whey plant, using process modeling, fluid modeling, 3-D equipment, and piping modeling to plan maintenance access, use of installation, and operational workflow. "Dual production lines were designed throughout the entire whey plant," states Park. Whey storage pasteurization and fractionation were accommodated in the

soace as well. Shambaugh Project Manager Caleb Casper points to the use of 3-D modeling for determining all the drain locations as a crucial part of the project's success. Any drips or leaks can cause floors to deteriorate over time. Shambaugh placed hub drains in the proper places and designed catch trays to prevent water from hitting the floor. During CIP, as the valves pulse, the

liquid goes straight to the hub drain.

A cheese fines recovery system that uses shortbowl decanters minimizes bacterial growth in the clarified whey. Twelve filtration systems with a total surface area of 65,000 sq ft were installed in 43,000 sq ft of the whey processing space, including two CIP rooms. The system was designed to recover about 95%, or about 800,000 gal of water, each day from the whey process and convert it to Category 1 water for use throughout the plant.

Chappell says the best way to manage waste is to never have the waste in the first place. MWC tries to eliminate all the waste it can and maximize the use of all water. "The dairy industry is a unique environment, because 87% of milk is water. We use the water from the milk to clean our equipment before it ever gets discharged down to the wastewater treatment facility," he says. "That allows us to really minimize how much water we need to use. It also decreases the amount of water that gets discharged."

In other areas of sustainability, MWC plans to implement focused improvement teams to look at how it can minimize waste and improve operational efficiency. At the present time, North says the plant's variable-frequency drives (VFDs) are at 80%.

When the whey and cheese processing lines are

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# **MWC's Robot Configurations Provide Flexibility**

AARON HAND | EXECUTIVE EDITOR

AS ROBOTS BECOME INCREASINGLY PREVALENT in the food and beverage industry, especially on the packaging end, you might expect a state-of-the-art facility like MWC to have its fair share. But that complexity isn't needed in a facility producing consistent product types and sizes. Instead, MWC's operations lend themselves more to hard automation-traditional conveyors and case packers, for example—according to Jody Zepnick, CEO of Zepnick Solutions Inc. (ZSI).

ZSI, which works heavily in the dairy industry, provided the automation for MWC's packaging operations—from the equipment used in sealing the cheese blocks in bags all the way through the coolers and palletizers. ZSI integrates systems, develops equipment and robotic cells, and does a fair amount of the custom equipment design and fabrication, Zepnick notes.

#### Where the robots are

At MWC, Fanuc robots are used to place the packaged 40-lb blocks of cheese onto pallets before they go through a stretch wrapper and are taken to the warehouse. Besides being robust and reliable, a big selling point of these robots, Zepnick says, are the controller safety systems, which integrate seamlessly over Ethernet with the Rockwell Automation safety PLC systems.

Another particular design consideration for these palletizing cells is the end-of-arm tooling (EOAT) that ZSI developed more than a decade ago working together with long-time customer Southwest Cheese. "We reviewed some standard equipment, but it wasn't robust enough for the applications we were looking at," Zepnick says. "We found ways to reinforce and simplify the design. Instead of components, we standardized on welded frames."

For the MWC project, ZSI made additional adjustments to better accommodate the Fanuc robots. "Those [original] palletizing units have been in operation for over 12 years," Zepnick notes. "So we've been provided additional feedback on how to make updates to make them even better."

One of the challenging aspects of any EOAT is cable routing. With the tool twisting back and forth for the palletizing motion, ZSI simplified the cable routing through the end of the robot arm. "It's now a much more reliable installation of how it accommodates the turning of the end-of-arm tool," Zepnick says.

Ultimately, the end-of-arm tooling enables the Fanuc robots to reliably and efficiently pick up two 40-lb blocks of cheese at a time, lifting and rotating the packaged cheese onto the pallet.

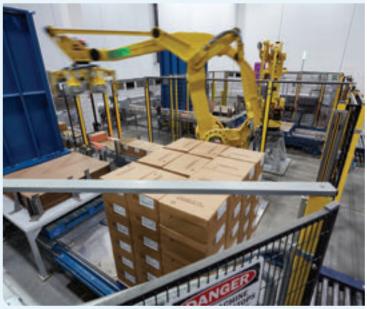
In fact, ZSI has other robotic systems that can handle MWC's massive 640-lb blocks of cheese as well, Zepnick adds. "The robot picks the blocks off the end of the line and stacks them in a format that's much easier for the fork trucks to handle," he explains. "Rather than having to handle each block

individually, they can handle up to four or six blocks—two rows deep and up to three high-and bring them into the cooler."

#### **Simplified automation**

The packaging line that Zepnick put together for MWC begins where bagged blocks of cheese are conveyed on two lines through side-by-side sealers. The two lines are then merged together to go through a metal detector and a leak detector that ZSI developed more than a decade ago. The blocks then continue into a case packer, the cases receive a printed barcode to track them through the system, then up an incline to a rapid cooler. After a 24-hour cooling period, the cases come back down a decline and are weighed, scanned, and labeled. Then they move on to the robotic palletizers.

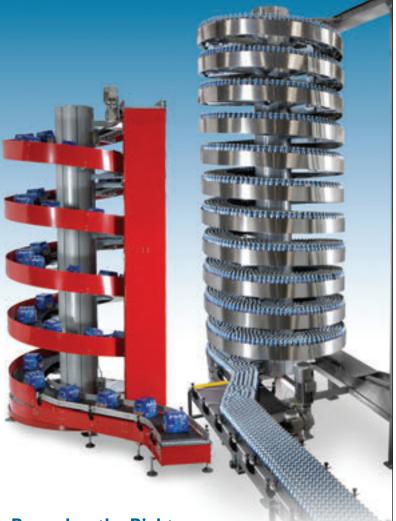
Besides the challenges that COVID-19 presented, MWC's complexity came more from the size and flexibility of the project—allowing backup strategies for one line to run into the other, on to the rapid coolers and palletizing cells. "There's a lot of experience, knowledge and technology that goes into making these systems perform reliably. There are several integrated technologies from mechanical product handling, product accumulation, data collection, product scanning and tracking, and vision inspection," Zepnick says. "Really, the challenge was matching MWC requirements with the most robust configuration of equipment and technology to meet their business needs."



At MWC, Fanuc robots are used to place the packaged 40-lb blocks of cheese onto pallets before they go through a stretch wrapper and are taken to the warehouse.



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running, there is waste heat on the cheese side that can be used on the whey side, says North. "We'll use another set of plates within that pasteurizer where we can transfer heat across. When the whey side is coming down, we can transfer heat back to the cheese side. It makes a really big difference in how much energy we use in the cost per pound of our product."

#### Air handling

The building also needed to satisfy MWC's tight temperature, humidity, and filtration requirements. "The open product processing method provided a unique challenge in dealing with the room's latent load and how to handle air movement to minimize potential fogging," says Shambaugh Senior Mechanical Engineer, Alex Sumajin. In addition to these challenges, the large volume of air required for the space created its own difficulties. Shambaugh's team selected critical process air (CPA) handling systems capable of providing up to 100% outside air at the required temperature infiltration.

According to Sumajin, the units are double wall insulated, and include stainless-steel glycol cooling coils for dehumidification, steam reheat coils to support active dehumidification and temperature control of the space, and gas heating for when tempered outside air is required.

The CPA integral exhausts operate on VFDs that are capable of modulating to maintain air pressure, while also reducing sheet metal return air duct installation. An Allen-Bradley programmable logic controller (PLC) system supports the HVAC system and integrates with process controls for CPA mode of operation selection throughout the process human-machine interface (HMI). "The result is very tight temperature and humidity control, three levels of filtration up to MERV 14 for ultimate food safety and quality, active pressure control to ensure that hygiene zones are maintained, full washdown capability of the CPA equipment and air distribution duct, and integration into process controls, so that operators can manage the HVAC system from plant floor HMIs," states Sumajin.

In addition, utility and chemical piping and cable trays are

#### **MWC suppliers among PACK EXPO** Las Vegas exhibitors

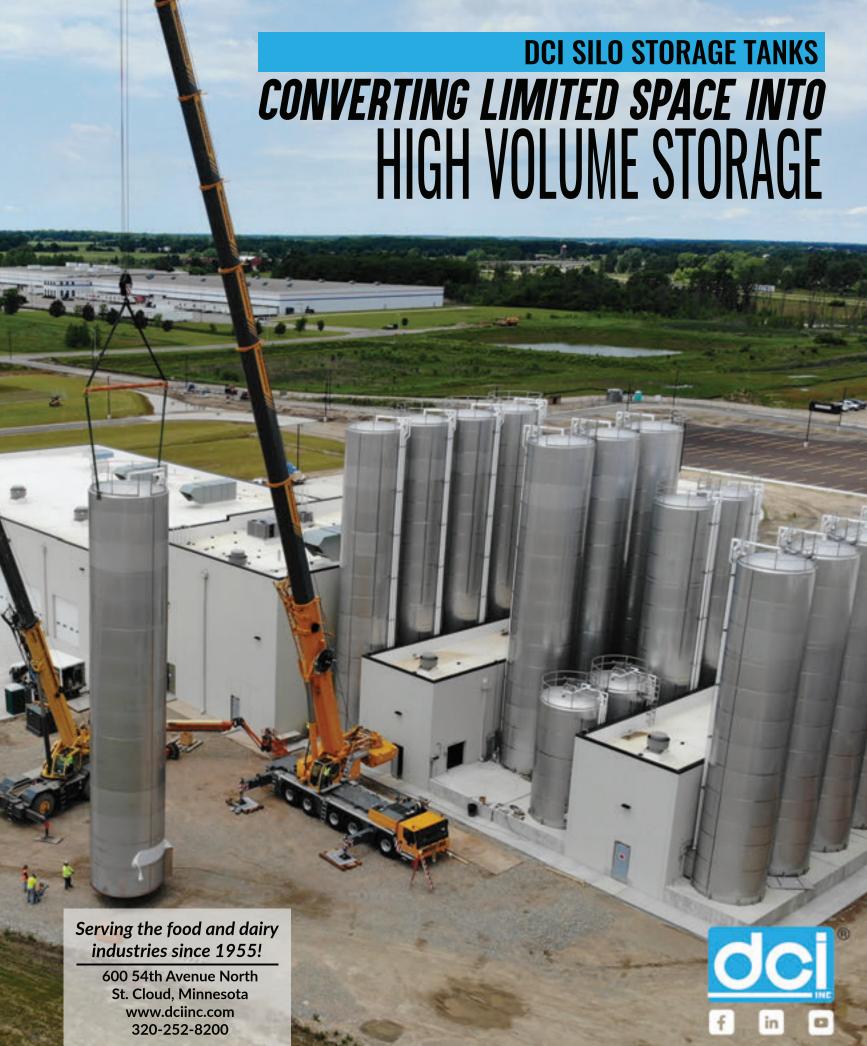


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The following suppliers will be present at PACK EXPO Las Vegas, Sept. 27-29 at the Las Vegas Convention Center.\*

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GEA	Booth 6314
Mettler Toledo	Booth 1814
Rockwell Automation	Booth 4742

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**MWC Senior** Site Director **David North and** Vice President of Dairy Operations for Glanbia **Nutritionals** George Chappell state intellectual property and experience brought from other Glanbia facilities made the St. Johns project a huge success.



PHOTO BY THOMAS KIRBY

accessible for future maintenance and expansion, while ensuring a sanitary, cleanable installation.

One of the many project challenges encountered involved the avoidance of floor-posted supports in the processing areas, says Ritzert. "With point loads from combined process/utility/electrical racks exceeding 7,000 lb, coming up with a clean detail to attach racks to the bottom of the precast roof took some thought, ingenuity, and planning."

Without the use of 3-D modeling, the project would have been challenged to make all the necessary utility and electrical connections, as well as process interconnecting piping details.

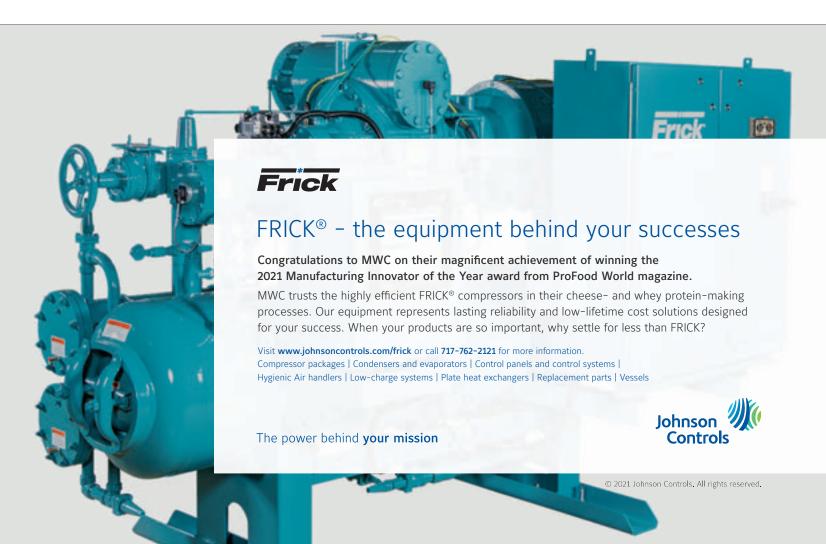
#### **COVID-19** protocols met

While MWC completed most of its factory acceptance testing (FAT) before the pandemic began, all processors had to think of new ways to conduct FATs once the coronavirus was rampant. MWC conducted virtual plant tours with customers. Under normal circumstances, Chappell says customers would visit the site in parallel with the engineering and design phases. Since that couldn't happen during the pandemic, MWC invested in a robot.

"A little robot simply went around with us, and we'd take customers on a virtual tour through the plant using it," Chappell explains. "If they wanted to see something specific, we could take them to those areas and show or demonstrate various things."

Today, with COVID restrictions loosening a bit, MWC still adheres to a strong safety plan with smaller, select groups allowed inside.

Close to 150 workers were hired before the plant's first day of operation. Due to space limitations, training could not be done on-site during the pandemic. To keep staff safe and socially distanced, MWC rented an adjacent building to conduct training and testing. It turned out to be a really good plan in the end, explains North. The unexpected training atmosphere helped create a solid employee culture.

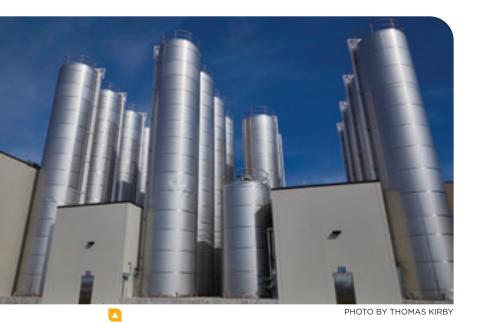




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According to Casper, Shambaugh worked with Glanbia and state and local authorities to ensure all the needed COVID-19 regulations were met. More than a dozen protocol solutions were conceived and brought to fruition in a matter of days. A contact tracing solution was implemented to track personnel

movement and interactions on-site. Sanitation crews wiped down high-touch areas once every hour around the clock. A temperature checkpoint was put in place.

"Because of the protocols that went into place, the communication that took place, the cleaning that took place, we were able to get past the fear," explains Chappell. As a result, MWC was able to meet project milestones. "That in and of itself is a mind-blowing task," he adds.

North points out that Shambaugh & Son managed to make it all the way through the building phase with no COVID-19 infections. "S&S has done an outstanding job managing the whole process for us," he adds. In fact, the project was delivered ahead of schedule in 17 months.

#### Food safety culture

MWC conducts 20- to 30-minute monthly online training on topics, such as foodborne pathogens and hand washing, to bring its workforce up to speed on food safety, as many of the staff have moved from an auto manufacturing culture and must learn the food safety and sanitary needs of the food processing industry. There is also an onboarding process that all employees must attend before they step foot on the plant floor.



"The philosophy is fairly simple," says Chappell. "We build in food quality by design, through the engineering, and what we do. And then, we layer on top of that. That's food safety culture. It's fairly simple when you think about it that way, but it's not simple to execute. But it is simple to think about how we get to a good-quality and food-safe product."

MWC honors its employees for doing a great job by providing recognition in front of peers. Internal trophies are moved to plant areas that are performing at the highest level.

Keeping workers safe is also paramount at MWC. "Safety is one of our non-negotiables, and we unashamedly hold people accountable for doing their jobs safely," Chappell explains.

"Throughout the process, we had engineers and the operational readiness team working together, identifying things like hard-to-reach places and eliminating them," he states. "So, you eliminate some of the risks by design, and then, there are some things that you can't, and that's where layering on the culture occurs."

Ritzert says the clean design of processing spaces sets this facility apart from other plants. "Floors of food plants, specifically hard-to-clean elements of floors, are one of the biggest challenges to product integrity and food safety. Directing waste to drain, sloping floors so high-traffic areas are dry to operator foot-traffic, locating drains to be accessible for cleaning, and avoidance of floor-posted supports were key elements of early planning activities."

Housekeeping is also a core competency at MWC. Having an organized workplace with 5S protocols in place can shape a plant culture. "If you create a behavior, a mindset, a culture around we don't accept leaks, or we don't accept things laying around, it helps support safety, quality, and sustainability," says Chappell. "As a simple example, without the housekeeping, you might accept that you have a hose that's unrolled on the ground. If you look at it on the surface, that's not a big deal, until someone trips over it and falls and has an injury, or it becomes a contaminant."

North concurs. "We've always called it 100% auditready. If we are having auditors on-site, we don't need to prep for it," he states. "We're always ready for it."

When building a greenfield facility, Glanbia typically intends to expand the facility in the future, explains Chappell. "We can layer on efficiencies. When we go into a greenfield site, we make very conscious decisions about what efficiencies we will layer on at the beginning and which ones we will



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bring out at a later date. We already have a list of efficiency projects that we will be bringing on over the coming years," he says. "We're very conscious about what we bring on today vs. what we layer on tomorrow. We have several sustainability projects that we'll be bringing on that will give us better energy efficiency, and all these things can be layered on at a future date."



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Ritzert says he cannot recall a project where every aspect of the team exceeded expectations, including a great owner, a site management team second-to-none, great process vendors, subcontractors and consultants, great local labor force, and a local government committed to the success of the project. "It was only through the actions of each and every one of these people that we were able to deliver this large, complex project and overcome obstacles as well as we did," he says.

Chappell sees a great future for the facility and says the cheese and whey market is economically resilient. "We can go through ebbs and flows of market changes, but people continue to eat cheese, and they continue to buy protein products."

But as consumer buying habits change, Chappell says MWC is able to manage market conditions and can adapt its production to supply its large customer base that sells both branded and private-label products.

"The demand for cheese has historically and steadily grown for the last 30 years at about a 2% to 3% rate," he says. "Effectively, you can bring on a new facility of this size about every five to eight years. If you look at the track record of what we have done as a JV and as Glanbia Nutritionals, we're growing at about the same rate as the market demand would support."

Chappell says he would feel very comfortable if asked to build a similar facility. "We know the blueprint. We know how to make it work all the way through, from designing an idea to full completion and execution." But Chappell says he and North would not have spoken this way 20 years ago. "It's pieces that we've learned and developed over the years. We now have a blueprint that works." Q

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Filtration has utilized its customer first approach to build strong partnerships with the largest food and beverage companies on a global scale. In addition to design and build services they also provide service, automation, programming, spare parts and membranes. Complete Filtrations engineering, process and technical teams are solving some of the most difficult challenges in the industry at the intersection of sustainability and profitability. If you are in the food and beverage, dairy, chemical, vegetable, meat, fish or poultry markets, Complete Filtration can help.

Interested in microbial reduction? How about a complex fractionation of a new product? Need help scaling up your process? With expertise that far exceeds skids and filtration, they are your COMPLETE system and services provider from milk standardization to waste treatment facilities and all your filtration needs in between.



Utilizing sustainability driven designs that are not only good for the environment but also your bottom-line Complete Filtration is your go to partner.



CONTACT

Complete Filtration Resources, Inc. 1900 E 24th Street | Marshfield, WI 54449

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www.gotocompletefiltration.com



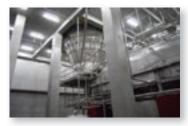
# **Custom Fabricating & Repair**



**Custom Fabricating & Repair** brings a unique proposition to the sanitary marketplace. We are a privately held Wisconsin company that is large enough and financially stable enough take on multi-million dollar projects. Our experience, expertise, and

product offerings allow us to compete with the largest companies in our industry, while our vertical integration and efficiencies allow us to be price competitive with our smaller competitors. We listen to what the customer is trying to accomplish and use our experience to provide the best fit for the application. Our in-house manufacturing brings us efficiencies that keep us very competitive and make us the best value in the industry.CFR is a privately held Wisconsin -USA based system integrator for the dairy and food industry.

We design liquid and dry ingredient process systems with an emphasis on turn-key solutions. Our stainless steel manufacturing campus in Marshfield, WI is the largest of its type in North America. Our food product Drying and Evaporation experience dates back over 150 years with our acquisition of CE Rogers.



Our unique mix of engineering, fabrication, automation. installation and project management make CFR a great choice for your next food processing project.

We present a unique set of capabilities that include:



- **Engineering**
- **Fabrication**
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- Installation
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Email: sales@gotocfr.com | www.gotocfr.com

### DCI, Inc.



DCI, Inc. is a world leading manufacturer of stainless-steel storage and processing vessels, agitators, and integrated systems for the food and dairy, beverage, pharmaceutical, biotech, chemical, cosmetic, animal health, and wine.

DCI can provide standard tanks and processing equipment such as processors, fermenters, bioreactors, silos, horizontal and vertical storage tanks, aseptic media and batch tanks, mixing tanks, whey crystallizers, DCI Dynamix-

er, and the VARO HPT. In addition to our standard equipment, DCI can custom-engineer and build equipment to fit your company needs and can certify your tank to meet all your ASME, ASME-BPE, PED, CE, FDA, CRN and 3A requirements.

In addition to processing tanks and vessels, DCI offers top-quality agitators and mixers including our own line of stand-alone PharMix Agitators. Our PharMix agitators feature a patented (US Patent No. 10,641,394 B2) in-vessel hygienic coupling and ASME BPE compliant hygienic shaft seals (atmospheric or pressure). Our PharMix agitators can meet any mixing need.

DCI has a highly qualified Aftermarket team of specialists who can retrofit tanks, provide field service modifications to modernize older tanks



and pressure vessels in the field, and supply all your parts and components.

DCI's dedicated team of professionals strive to provide you with the best quality, value, and service. From our salesmen to estimators, engineers, project managers, drafters, procurement specialists, and fabricators, we work together to provide the best service and strive to exceed your expectations. We have always approached every project with the understanding that the

quality of our products ensures the integrity of yours.



### CONTACT

DCI, Inc. | 600 54th Avenue North | St. Cloud, MN 56303

Phone: 320.252.8200 | Email: Sales@dciinc.com

www.dciinc.com



### **Endress+Hauser**



Endress+Hauser is a global leader in measurement instrumentation, services and solutions for industrial process engineering. They provide process solutions for flow, level, pressure, liquid analysis, gas analysis, temperature, recording and digital communications, optimizing processes in terms of economic efficiency, safety and environmental

impact. The company serves a variety of industries, including chemical, oil & gas, food & beverage, water & wastewater, life sciences, power & energy, and primaries & metals.

Endress+Hauser, a Switzerland-based company, was founded in 1953, and expanded operations to the U.S. in 1970. More than 80% of all Endress+Hauser instruments ordered and shipped within the U.S. are manufactured in the U.S. This means customers can rely on Endress+Hauser to deliver the products they need quickly. This strong manufacturing base is complimented by a complete network of sales



partners and service locations to support its customers - wherever their instruments are installed.

Premium services, customized solutions, project management and IIoT applications round out Endress+Hauser's offering, helping customers gain efficiency, increase quality and maximize plant availability.



#### CONTACT

Endress+Hauser | 2350 Endress Place, Greenwood, IN, 46143 USA Phone: 888.ENDRESS | Email: info.us.sc@endress.com www.us.endress.com

# Frick® Industrial Refrigeration



Engineering creativity ... a proud, highly-skilled manufacturing team ... and the most elite installation contractors in North America. That's what has made Frick® the heart of industrial refrigeration for over 135 years. With Frick, you can experience the convenience of a single-source company

that manufactures and supplies all the components necessary to fulfill your industrial refrigeration needs, thanks to our full line of industrial refrigeration equipment for food and beverage applications. We make rotary screw compressor packages and packaged equipment with variable speed drive. Models are available with capacity control from 100 percent down to 10 percent of full load. We also make condensers, evaporators, AcuAir® Hygienic Air Handlers, vessels, heat exchangers and controls. And our QuantumTM HD control panels with state-of-the-art technology lead our industry in performance and reliability. Frick compressors and air handling units offer energy efficient and cost-reductive solutions. Our high quality materials, innovative design and modern manufacturing methods provide unmatched quality, reliability and energy efficiency for your application, allowing you to maximize your energy savings. The food and beverage industry can



place high demands on industrial refrigeration equipment, but Frick® refrigeration engineers continually refine products to make them more energy efficient and cost effective. So you can rely on Frick industrial refrigeration systems to work behind the

scenes to meet those exceptional demands for critical processes, while providing the highest levels of dependability in an environment where failure is not an option.



### CONTACT

Frick® Industrial Refrigeration | 100 CV Avenue, Waynesboro, PA 17268 Phone: 717/762-2121 | Email: TO BE DETERMINED www.frickcold.com



# MWC 2021 Manufacturing Innovation Award Supplier Profiles



## **Fristam Pumps**



Fristam is the leading manufacturer of high-performance stainless steel pumps, blenders, and mixers. Our equipment is designed for precision and durability to outlast and outperform all others. Made in the USA our delivery times are

measured in weeks, not months and we employ an expert staff of engineers to help you determine the best solution for your application.

#### **Positive Displacement Pumps**

Fristam offers the widest selection of Positive Displacement pumps to fit a broad range of applications, from our heavy-duty, high-pressure FKL to our gentle, standard-duty FL2 to our low-pulsation, highsuction FL3.

#### **Twin Screw Pumps**

Fristam's FDS Twin Screw pump was designed to be the easiest to operate and maintain, most reliable, robust and long-lasting twin screw pump available. It transports an impressive range of products gently and reliably.



#### **Centrifugal Pumps**

Fristam centrifugal pumps serve as the industry benchmark for quiet, efficient, low-maintenance operations. Our line includes standard-duty, heavy-duty, high-pressure, front-loading seal and self-priming centrifugal pumps.

#### **Mixers And Blenders**

Fristam mixers and blenders provide consistent, repeatable results and dramatically reduced blend times.

At Fristam, we know one size doesn't fit all. That's why we offer a wide selection of pumps. Learn how Fristam can boost your operation's productivity.

#### CONTACT

Fristam Pumps | 2410 Parview Road, Middleton, WI 53562 Phone: 800/841-5001 | Email: fristam@fristampumps.com http://www.fristam.com/usa

# **LEAP (Lansing Economic Area Partnership)**



**LEAP** is a nationally recognized top 20 economic development organization proudly representing the Lansing tri-county region in the heart of the Great Lakes State-Michigan. Situated at the confluence of three major highways and the Grand River, Lansing is home to the Michigan

State Capitol and the first land grant college in the US, Michigan State University, one of the world's top research universities.

LEAP is a private-public partnership made up of business and community leaders from across the Lansing region. A diverse team of talented economic developers powers our work focused on four key areas of economic development:

- · Attracting new business and people from outside the region
- Expanding and retaining existing businesses in the region
- **Supporting entrepreneurs and startups**
- Creating and marketing the Lansing region as a top choice community

Lansing has been an industrial powerhouse for well over a century, beginning with Ransom Eli Olds innovating around the automobile.



Drawing on generations of strong work ethic in manufacturing, our region's economy has grown and diversified with notable strength in four industry clusters:

Agricultural and Food Technology

Engineered For Lasting Performance

- **Automotive & Future Mobility**
- Insurance Services and InsurTech
- MedTech, Accelerator and Life Sciences

Whether your business is in growth mode and looking at new location options, identifying incentives or talent pipeline, or launching operations in the US for the first time, the LEAP team can assist you in ensuring business success in the Lansing region of Michigan.

#### CONTACT

Keith Lambert, Vice President of Business Attraction LEAP | 1000 S. Washington Ave., Suite 201 | Lansing, MI 48910

Phone: 517.331.2990 | Email: keith@purelansing.com www.purelansing.com



# **METTLER TOLEDO Product Inspection**



METTLER TOLEDO is the world's largest manufacturer of product inspection equipment, delivering a wide range of solutions for foreign body protection, regulatory compliance, and improved profits. Systems range from economical to state-of-the-art with customized material handling solutions.

Safeline metal detectors automatically reject all types of metal contaminant in all types of bulk and packaged products. Safeline x-ray inspection systems use high-performance image processing to detect and reject all types of dense physical contaminants, as well as measure mass, check for missing or broken product, and confirm fill levels to guarantee product and package integrity.

CI-Vision machine vision systems verify label content and integrity to prevent recalls. The use of these systems in your food safety program can help you prove due diligence, pass regulatory audits, and protect your brand.



Hi-Speed checkweighers are offered in a wide range of sizes and configurations to handle nearly any package type or design at high speeds to ensure accurate product delivery, reduced giveaway, and an optimized production processes.

As a member of OMAC,

METTLER TOLEDO is committed to connectivity and data storage and retrieval to help meet regulatory requirements. Inspection systems can be connected using a variety of methods, including our own ProdX data collection and management software, which provides full digital track and trace and real-time food safety compliance.

#### CONTACT

# METTLER TOLEDO

Mettler-Toledo | 1571 Northpointe Parkway | Lutz, FL 33558 Phone: 813-889-9500 | Email: pi.marketing@mt.com www.mt.com/pi

### **MHM Automation**



**H&C De-Palletizing** Robot as part of a Robotic De-Boxing Cell

MHM Automation designs and supplies automated systems for food processing. They understand the challenges processors face and develop solutions to deliver better quality product with improved food safety and reduced reliance on manual labor.

The company is recognized as a technology leader, with its equipment installed for some of the world's most prominent names in dairy and meat

For primary processors of cheese, MHM Automation provides complete line automation from the cheese tower to palletizing, including the BetaVac vacuum

packing system and Milmeq Cheese Cooling Tunnel, renowned for its reliability and simplicity of operation.

For primary processors of meat and fresh produce, they offer complete line automation from packing to palletizing. Equipment includes AiCo box erectors, lidders and closers, and Milmeq Chilling and Freezing Tunnels or Milmeg Plate Freezers for fast, energy-efficient freezing.



**Milmeq Cheese Cooling Tunnel** 

For secondary processors, the H&C reverse packaging system provides complete process automation at the front end of the processing line. Functions include de-palletizing, de-boxing, debagging and defect detection. Integrated vision systems allow for variability in product shape and size.

MHM Automation's point of difference is their ability to develop custom solutions in response to each processor's needs and integrate them within the existing production line.

Talk to one of their industry specialists about how automation could benefit your processing operation and get your plant future-ready.



### CONTACT

MHM Automation | Green Bay, WI • Natalie Cleveland, US Sales Manager Phone: 920-438-9969 | Email: n.cleveland@mhmautomation.com www.mhmautomation.com



# MWC 2021 Manufacturing Innovation Award Supplier Profiles



### **MSKTD & Associates, Inc.**

#### ARCHITECT OF RECORD FOR THE MWC PROJECT



Food processing and hygienic facility design requires a unique approach to building design and engineering.

Our clients must be nimble enough to meet the demands of the market.

MSKTD takes pride in our ability to keep pace with them, designing award winning facilities with the highest degree of cleanliness and efficiency.

MSKTD offers our clients decades of design experience uniquely tailored to hygienically delivered projects. Featuring:

- Architecture Interior Designer Landscape Architecture
- Mechanical Electrical Civil Structural Engineering
- **Cost Estimating Sustainable Design**

MSKTD understands our clients' needs for confidentiality, growth, flexibility, and a balance between budget and image.

Designing to SQF, BRC, AIB, eGMP, HACCP, as well as USDA and FDA Standards, we specialize in the following project types:

- Ingredients
- **Dairy & Nutritionals**
- Poultry, Meat & Protein
- **Prepared Foods & Sauces**
- **Baked Goods & Confectionary**



Your next project deserves our level of expertise and care, MSKTD looks forward to the opportunity to deliver it.



#### CONTACT

MSKTD & Associates, Inc. | 1715 Magnavox Way, Fort Wayne, IN, 46804 Phone: 260.432.9337 | Email: fortwayne@msktd.com

www.msktd.com

# Ryson International, Inc.



The Ryson Narrow Trak Spirals are super compact vertical conveyors designed to handle small loads. They are great space savers with high throughput.

Our nesting slats have the capacity to reliably end-transfer small cartons and packages or side-transfer small bottles or containers in a single file or in a continuous mass flow. The spiral conveyors are equipped with our 6" or 9" wide nesting slats which provide an efficient flat conveying surface without gaps. These spirals can run at speeds in excess of 200 fpm.

The Narrow Trak spirals offer a significantly larger elevation change capacity than what is

currently available in the small package marketplace. These spirals are also a good alternative to side gripper conveyors because they can run at high speeds and do not need to be adjusted for varying product sizes. This compact unit is equipped with the Ryson proprietary low friction chain slat arrangement which assures high capacity, high speed, low energy consumption, low maintenance and long life. This new model

is especially beneficial for the food, beverage, pharmaceutical, nutraceutical and personal care companies.

Ryson products are crafted with great care in our modern manufacturing plant in Yorktown, Virginia. Our full inventory of spare parts enables us to provide the high level of service our customers have come to expect from Ryson.



You Tube Channel



For more information about Ryson's Vertical Conveying Solutions, visit www.ryson.com, or watch them run on our YouTube Channel: www.youtube.com/user/RysonSpirals

### CONTACT

Ryson International, Inc. | 300 Newsome Drive, Yorktown, VA 23692 **Phone:** 757.898.1530 | Email: sales@ryson.com

www.ryson.com



# MWC 2021 Manufacturing Innovation Award Supplier Profiles



# Shambaugh & Son, L.P.



Founded in 1926, Shambaugh & Son, L.P. is a single-source, vertically integrated, Design-Build construction and engineering firm that provides complete Project Planning, Design and Construction services for highly automated and hygienic food, beverage and pharmaceutical processing facilities

throughout the USA, performing \$900+ million in construction projects each year with our 2,750+ employees. Headquartered in Fort Wayne, IN, Shambaugh has 30 offices strategically placed in 23 cities across the U.S.

What sets us apart from others is the full spectrum of specialty selfperform services we offer. Shambaugh not only leads the facility design, construction and commissioning efforts, but also designs in-house and self-performs all the major specialty disciplines of a complex processing facility including Total Project Construction Management & Modeling, Process, Mechanical, Refrigeration, Electrical, Automation Engineering, Prefabrication, Temperature Controls, and Voice/Data/Video/Security.

Shambaugh has been nationally recognized with top industry awards for innovation, successful projects, productivity, quality and safety,



including the most recent awards: 2021 Manufacturing Innovation Award for the MWC, LLC Cheese Processing & Whey Drying Facility, 2019 Food Plant of the Year for the Valley Milk New Powder Manufacturing Facility, and 2018 for the Dairy Farmers of America Milk Powder Drying Facility recognized for both

Sustainable Plant of the Year and Manufacturing Innovation Award. In all, Shambaugh has been Design-Builder of 16 Award Winning facilities specializing in FDA, USDA, OSHA and cGMP construction requirements.

Shambaugh is a subsidiary of EMCOR Group, Inc. (NYSE: EME), a Fortune® 500 company with 2020 revenues of \$8.8B.



#### CONTACT

Dan Ritzert, DBIA, Senior Vice President SHAMBAUGH & SON, L.P. | 7614 Opportunity Drive, Fort Wayne, IN 46825 Phone: 260.497.1727 | Email: dritzert@shambaugh.com www.shambaugh.com

## **Zepnick Solutions, Inc.**



For over 20 years, Zepnick Solutions, Inc. has specialized in the design and delivery of personalized high-value business solutions for our customers in the Food Packaging, Dairy Processing, and Paper Processing industries.

ZSI incorporates proven, real-world automation principles, designs, concepts, and equipment solutions. Our demonstrated, low-risk, approach ensures that every ZSI project is a business success for our customers.

From the tower or brine to the pallet, ZSI offers fully integrated equipment systems and individual components. Our engineered solutions are available on a time and material basis, design for direct purchase basis, or complete turnkey basis to meet your needs.

Our Electrical and Control Engineers use the most current analytical tools when applying proven technology to deliver reliable automation solutions, including 480V power distribution, PLC controls, safety systems, robotics, and vision.



system debottlenecking, and packaging line integration.

Our team of dedicated professionals is committed to excellence and creating positive memorable experiences. Let us take the stress out of your project!

ZSI Mechanical Engineers work closely with our Control Engineers to develop innovative solutions to solve your toughest challenges. Services include 3D Modeling, USDA compliant custom machine design & fabrication, rate analysis &



### CONTACT

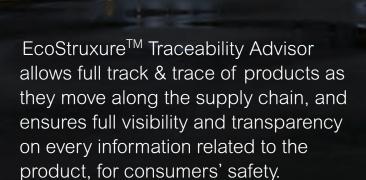
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# Agricultural roots run deep in Lansing, Michigan.

Our growing AgTech and Food Innovation ecosystem is sprouting with top agriculture talent from globally-ranked Michigan State University, alongside leading R&D support for innovative food processing, distribution, and production companies and facilities, and traditional agricultural commodity suppliers.

purelansing.com/foodtech

### **CONGRATS MWC!**

# 2021 ProFood World Manufacturing Innovator of the Year

The St. Johns Dairy Processing Campus project (MWC) is one of the largest value-added agricultural projects in Michigan history.

The State of Michigan's \$15.7 billion dairy industry is home to the most productive cows in the nation. The MWC facility will reduce Michigan's oversupply by 80% and reduce distance and transportation costs for Michigan's dairy farmers.

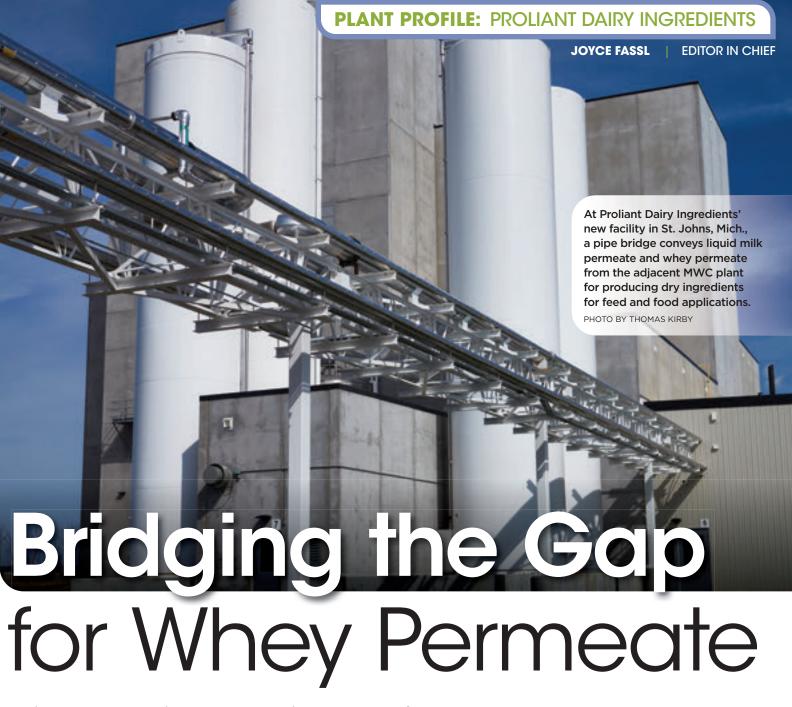
LEAP is proud to have led this economic development project in the Lansing region from real estate site selection support and enabling of key property, to facilitating business support programs and incentives, to building talent partnerships and connections to area industry.





Keith Lambert VP Business Attraction

keith@purelansing.com (517) 331-2990



Proliant Dairy Ingredients receives whey permeate from MWC's concentrate process via a pipe bridge, where it is dried on the world's largest permeate dryer of its kind. The collaboration provides environmental savings and maximum return for both facilities.

ENTRAL MICHIGAN HAS a giant milk supply.
In fact, Proliant Dairy Ingredients chose it as the location for the company's second facility for producing dry ingredients for feed and food applications largely for that reason.

Founded in 1975, Proliant is part of the Lauridsen Group, a privately owned holding company consisting of seven independent companies. Its 100,000-sq-ft greenfield facility in St. Johns, Mich., is located

adjacent to the new MWC cheese and whey processing plant. Proliant's plant provides a needed outlet for the by-product from the adjoining MWC facility. (See cover story on MWC on page 23 of this issue.)

#### **Maximum return on investment**

The site for MWC and Proliant was conceived as part of an agricultural campus. The concept materialized when Proliant agreed to acquire the neigh-

#### **PLANT PROFILE: PROLIANT DAIRY INGREDIENTS**

The bottom section of the facility's powder collection silo from the dryer is shown here. This equipment feeds the packaging system.



PHOTO BY PHIL WESTON FOR MIRON CONSTRUCTION



Top: The ground floor level of the Proliant plant contains 3,500-gal crystallizers. Right: At the 28-ft level is Proliant's milling and sifting area, where the top of the vacuum filter receiver and vacuum blower are visible.

boring site and connect the facilities via a bridge that brings whey permeate from the MWC plant to the Proliant facility. This ensures costs associated with shipping valuable whey permeate are kept to a minimum, providing maximum return for both plants.

The pipe bridge connecting Proliant with MWC

# Technopak 50lb/25kg Hygienic Powder Packing Equipment



Headquarters:

Technopak Ltd PO Box 58 627 Botany Auckland 2163 New Zealand Phone: +64 9 274 6730 • Fax: +64 9 274 6731 www.technopak.co.nz

U.S. Service Division:

Technopak LLC Michigan St.

Taycheedah Wisconsin 54935 USA Phone: +1 970 590 6783

Technopak designs, manufactures and installs hygienic 25kg bag filling and packing lines for the dairy, infant formula, nutrition and pharmaceutical industries.

Our systems are built to meet the highest international sanitary and hygiene standards including FDA, USDA, 3A and EHEDG.

Modular designs future-proof your investment, enabling you to increase the capacity of your line anytime by adding extra modules at low cost.

Our experienced team is dedicated to providing the best possible solutions for all our customers. Look to us for a complete turnkey system or component to improve your powder packing system.





PHOTO BY PHIL WESTON FOR MIRON CONSTRUCTION

is supported by 30-ft diameter caissons, columns, and long span joists, according to Paul Christensen, project executive for Miron Construction. "It stretches approximately 265 ft between the buildings," he says. "It was critical for the two separate projects to coordinate the orientation of the pipe bridge and start/stop points between the different piping systems including COW [condensate of whey] water, steam, steam condensate, CIP [clean-in-place] return, permeate, and process water."

Proliant's other plant in Melrose, Minn., has a sim-

ilar arrangement with Land O'Lakes. Both Proliant facilities process liquid milk permeate and whey permeate into dry ingredients for feed and food applications.

According to Josh Vander Velden, director of operations for the St. Johns facility, Proliant's products consist of VersiLac and Proliant 1000, which are high-quality, cost-effective, soluble dairy product solids (whey permeate). "The products are shipped to over 30 countries for food applications, including bakery, confectionery, dairy foods, drink mixes, and prepared foods," he states. "Feed applications include pig starter diets and

calf milk replacers."

The new plant runs 24/7/365 and includes mixproof valve blocks, a central CIP system, and a 25-kg Technopak packaging line with Caloris Engineering and Advanced Process Technologies systems handling the permeate transfer from MWC.

The facility features a vertical design with separate equipment and processes on each level. Every level also has two doors that open into two separate operation rooms, simplifying maintenance access. A central control room monitors and runs all operations.

# Just add $N_2$ or $CO_2 \dots$

# The perfect recipe to enhance meat mixing product quality and hygiene

Our Freshline® bottom injection cooling systems (liquid nitrogen or  $\rm CO_2$ ) make meat processing easier. They inject liquid cryogen into the blender or mixer/grinder providing rapid, precise temperature control prior to forming or further processing. Combined with our proprietary CIP system, which removes containments preventing plugging and bacteria, food processors can expect improved processing speed, hygiene and product quality.

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email: sales@relco.net | visit: www.relco.net Offices in the USA. Brazil. The Netherlands, and New Zealand

#### **PLANT PROFILE: PROLIANT DAIRY INGREDIENTS**



PHOTO BY PHIL WESTON FOR MIRON CONSTRUCTION

At the 59-ft level, the Relco dryer can be seen, along with the bottom of the bag house's cones and blower package.

#### Facility design best practices

According to Christensen, the 14-month construction portion of the project was completed in June 2020. The facility's design was a collaboration between E.A. Bonelli, Miron Construction, and Proliant, Christensen states. "The collective group came together to implement years of experience and industry best practices for the facility design."

Shared utilities between Proliant and MWC-and the fact that permeate doesn't need to be trucked out to a separate facility and, instead, is processed next door—are some of the outstanding sustainability achievements of the project, explains Christensen.

Two of the project's challenges were managing the unknowns during COVID-19 and maintaining a workplace where employees were comfortable to come to work. "In collaboration with Proliant and the nearby MWC plant, we enacted several measures, including third-party temperature screenings; daily cleaning of the building, trailers, toilets, and all other common touch points; virtual meetings; and FaceTime job walks," adds Christensen.

#### World's largest permeate dryer

Proliant focuses on enhancing value for customers by providing technical support to show how permeate can be used in applications, says Vander Velden. "The market continues to increase as opportunities are identified." Today, the St. Johns facility is on track to produce 65,000 metric tons per year with stateof-the-art equipment and the world's largest permeate dryer, supplied by Relco. 🔾

**Advanced Process Technologies** 

www.apt-inc.com

Caloris Engineering www caloris com

E.A. Bonelli + Associates

www.eabonelli.com

Miron Construction www.miron-construction.com **Powder Process Solutions** 

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# CLEAN-IN-PLACE EFFICIENTLY EFFICIENCY

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CIP 2.0 is designed for food, dairy, and beverage plants. Our systems are designed to be scalable to meet your needs today and in the future. CIP 2.0 incorporates smart machine technology to enhance performance, flexibility, and reporting.

Based on the Rockwell Automation® control platform, CIP 2.0 controls cycles using process parameters.

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- Allows authorized in-house users to make and track all changes.
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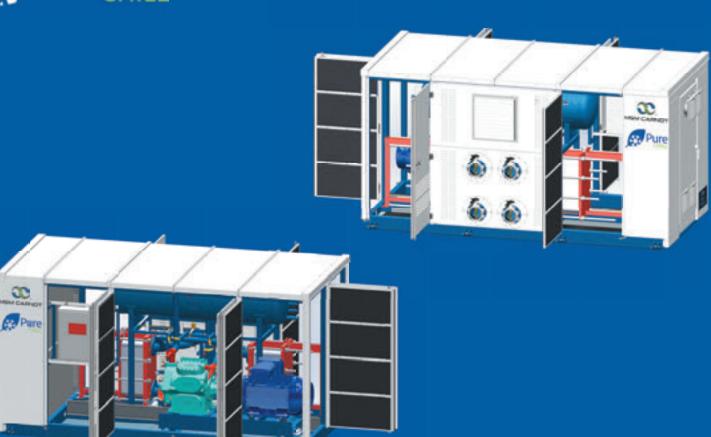








# **Low Charge Ammonia Chiller**



#### **DESIGN FEATURES:**

- Direct Drive Piston Compressor
- Flooded Plate & Frame Chiller
- PLC-Based Control System with touch screen user interface
- High Efficiency Oil Management System
- Vibration Isolation Drive Base
- Ammonia leak detection
- Built-in ventilation

Pioneer and leader of Natural Refrigerant Based Refrigeration Systems that are safe, sustainable, and energy-efficient in all climates.



**AARON HAND** | EXECUTIVE EDITOR

# Pushing Change to Keep Workers Safe, Plants Running

The COVID-19 pandemic prompted food and beverage manufacturers to implement several new safety measures along with cutting-edge technologies geared toward maintaining production in a booming market. As we move forward, which of those changes will take root?

OR MORE THAN A YEAR, the COVID-19 pandemic has brought unprecedented change to the food and beverage industry-difficulties in keeping workers safe, disruptions to the supply chain, and in many cases booming demand. But as more people get fully vaccinated and some normalcy returns, what will producers do with the lessons learned?

More than likely, food and beverage manufacturers will carry those lessons into new projects. They will take into consideration new ideas about worker density and hygiene, air flow and filtration, automation and robotics, and a whole host of other details.

"Masking will eventually go away, but the leftover impact on the facilities will not," says Jeff Matis, senior project director for CRB, which designs and build plants in the industry.

#### The next pandemic

The consensus from food and beverage companies is that they expect to see another pandemic in the notso-distant future, and they need to be prepared. In fact, 78% of food and beverage executives say they're actively preparing for a future global pandemic, according to a study from AIB International. Close to one-third



of respondents expect another pandemic within four years, and half expect one within the next decade.

Regardless of expectations for a coming pandemic, nobody wants to be caught off-guard. According to AIB's survey, 61 percent of respondents said their company did not have an adequate plan in place to deal with the COVID-19 pandemic when it began.

"Nobody is seeing this as a one-time event," says Brian Bernard, president of Spec Engineering, a firm focused on system design and process equipment integration. "There will be others."

In many food plants, workers are in close proximity, causing concerns for spreading contagions.



PHOTO COURTESY

Kraft Heinz made a significant investment in an automated on-demand CIP system at its plant in Wausau, Wis., that helped to reduce the amount of interaction needed with operators.

The industry needs to be more flexible and more resilient going forward, says Scott Hodel, director of process engineering and capital project management for Hixson, which specializes in the design of food and beverage and other technology projects. "Even if it's not COVID-19, it'll be the next COVID or the next virus that comes five years from now," he adds.

Producers have dealt with contagions in the past, but this one has been particularly jarring. "All of the clients that we're dealing with have talked about how they can reconfigure, redesign, and provide enhanced capabilities in the event of future contagion," Matis says.

It's affecting the food and beverage industry in a variety of ways. "Facilities that we're designing have always been focused on hygienic control and on maintaining a level of hierarchy. That's always been overlaid with allergen and other segregations," Matis says. "Now there's another level of development, and they're looking at how their facilities can be tweaked in the event of a contagion to minimize impact."

Throughout the manufacturing environment, there is increased focus on reducing the spread of germsadditional places to wash hands, no-touch faucets, more foaming stations and boot washes, Hodel says.

Because the food and beverage industry already has such high standards in hygiene on the manufacturing floor, not as much change is happening specific to the process, according to Matis. "The processes we're laying out now focus more on the ability to provide some form of segregation and decontamination of workstations with enhanced automation to reduce personnel interaction."

Even pet food production is akin to good manufacturing practice (GMP) environments, Matis adds. "They're equivalent to human-grade levels of food

sanitation," Matis says. Working with companies like Freshpet, he sees firsthand how conscious they are about quality processes and cleanliness monitoring.

#### Keeping up with demand

Pet food companies have seen considerable growth through the pandemic as more people forced to stay home decided to adopt a new pet. In the U.S., pet food and treat sales grew by close to 10% over 2019, according to the American Pet Products Association.

"Pet food has been growing nicely anyway, but there's been an exponential bump over last year," Bernard says. "We're working on four plants right now—three greenfield, one a brownfield refit—for the pet food industry."

Freshpet announced early in the pandemic that it would significantly expand production capacity with the construction of a new plant in Ennis, Texas. While growing to meet demand, Freshpet also made changes to address potential future contagion concerns to protect its workers.

Those processors fortunate enough to have done well in the pandemic still face challenges. Keeping production running at the levels needed requires being able to bring enough workers into the plant and keep them socially distanced on production lines. But the pandemic itself has exacerbated an already-existing challenge manufacturers faced in finding workers.

The Sikich Industry Pulse, which surveys manufacturing and distribution executives throughout the year, points to the difficulty industry has in filling positions. According to some of the latest responses, while 56% of those surveyed plan to grow their workforce in the next six months, only 5% are confident in their ability to obtain the talent required.

The meat sector was hit particularly hard by the coronavirus and has struggled perhaps more than others with absenteeism (see "Pandemic Gives Boost to Smaller Meat Processing Plants," page 64).

#### Automation's role in the workforce

Quality has always been a significant goal of automation. "The more you can automate, the more consistent your process can be," Hodel says. "A by-product of that is that there are fewer human interactions."

Reducing labor is another common goal. And, of course, that would also reduce the density of people in a facility and alleviate staffing issues. As a result, automation might be looking pretty attractive to more manufacturers in the face of COVID.

"In today's world, it's all about automation. It reduces the headcount," says Jeff Lewandoski, senior partner/project manager at Dennis Group, which focuses on designing and building food processing plants. "But you can't do that in all instances."

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Dennis Group is working on a project for a beverage company where the filling, bottling, and packaging processes are easier to automate, Lewandoski says. Not so easy, on the other hand, are lines where cutting and chopping of food items take place.

In a world where innovation is common, increased automation might come in a later phase of a product's development, as it did with a leading snack food manufacturer. "They take these two snacks and put it in a bag," Bernard explains. "It's done on a line, but it's a new product, so it's not all automated because the volumes aren't there yet."

Instead, the process required several workers packing boxes by hand. Spec Engineering was asked to space workers apart while keeping the line running.

"In the short term, we elongated the line, provided separation, and simple barriers. We had an air manifold that proactively drew the air away and brought it to an in-plant HEPA filter with UV," Bernard says. "It made all the employees comfortable, kept the line running at a better productivity, and invested in new conveyors and an air handling system."

Fast forward, the single-serve snack line is still selling well, and it's good timing for the company, Bernard says. "Now the capital is being planned to fully robotically automate the line. They can eliminate the issue and increase the speed by 3.6 units per minute," he says. "Short term, we help operators work safely and hygienically. And then the big trend for those that can is to move to robotics."

# Pandemic Gives Boost to Smaller Meat Processing Plants

IF THERE'S ANY FOOD SECTOR that's been impacted by the COVID-19 pandemic, it's certainly meat processing. From the get-go, meat plants—where workers typically work shoulder to shoulder and have to shout to be heard over loud machinery—were hit hard and quickly became coronavirus hotspots. Plants were closed, operations suspended, and the big meat producers in particular had to figure out how to make production safer for their workers and for the supply chain.

"It really affected some of the big plants in a very negative way. And then it affected the whole supply chain," says Dan Sambrooks, president and CEO at Diligent Innovation, which makes meat processing equipment and also designs meat plants and their production lines. "I've been in this business basically my whole life. I've never seen anything that's affected the meat business and supply side like this."

Changes made in reaction to the coronavirus will likely stay in place long-term. "I don't know that the Plexiglas dividers will ever go away. There will be increased awareness because COVID-19 had such a profound effect on the industry," Sambrooks savs.

Ultimately, though, Sambrooks marvels less at the day-today shift in operations that COVID-19 caused in meat processing operations than he does at the profound effect the pandemic has had on the business overall.

Consumers are increasingly turning away from the big operations in favor of getting their meat from smaller producers. They want to know how the animal was raised, if it received antibiotics, the environment it was raised in, and if it was handled humanely.

These trends were already taking root before, but the pandemic just compounded them. "COVID-19 just accelerated it to a staggering level," Sambrooks says. And while big meat processing plants in particular have struggled to keep their workers virus-free, smaller producers have benefited from a significant increase in business.

In a recent customer meeting, a meat producer in Portland, Ind., noted that it was booked up for the rest of this year and into next year—a situation that is not unlike many other small meat producers these days. "The pandemic has really shifted the whole business," Sambrooks contends, noting that consumers have been driven increasingly to get their proteins from a more local source. "It's really given a shot in the arm to the smaller manufacturers and medium-sized producers."

In fact, Diligent Innovation doesn't have a single small to medium-size meat customer whose business has been adversely affected by the pandemic, Sambrooks contends. "They've all seen a minimum 30 to 40% increase year-overyear in business and continuing."

Plant operators are trying to manage this sudden growth, Sambrooks says, making plans to add or update equipment and production lines, but it's not always easy. "A 30% number on an operation that's not used to managing that type of growth—it's something for them to get their heads around," he says.

Though COVID-19 had more profound adverse effects on some of the bigger meat organizations, large plants have been better able to implement automation to counteract common workforce woes. Sambrooks notes that finding enough people to work in meat processing plants has been a problem his whole career, and COVID-19 has only compounded that. "A lot of that was already in process just simply because the workforce was so limited," he says. Now, some of the big plants are short 100-150 workers every day, he adds.

A large part of the automation is in the packaging end of the line because food tends to be more difficult to automate on the front end. "It's a challenge in our industry with automation, especially on the harvest end of the business. Not all the animals are uniform—they're not the same size, and they're not presented in the work cell in the same manner," Sambrooks says. As vision systems get better, integration from one machine to another will get better as well, he adds.



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Building a new plant in Ennis, Texas, to meet growing demand in pet foods, Freshpet also made changes to address future contagion concerns.

Over the past half a year, Spec Engineering has been planning, designing, and quoting an increasing number of robotic systems, according to Bernard.

With so much continued need for social distancing, attention turns continuously to the amount of space needed for those requirements. Here also is where robotics can help. "Some existing facilities are locked in by the space they've got, so they could supplement with cobots," Hodel suggests.

One factor that Dennis Group has been working on with its clients is to space human-machine interface (HMI) screens more throughout the facility. "There was a single operator station in the past because that made the most sense. One operator can control a whole line," Lewandoski says. "Now they're rethinking that. If you have a couple different folks on that HMI, do you really want to put them shoulder to shoulder? In times past, the answer was yes. Now they want to add more functionality to a single HMI, but space those out a bit."

Even before operations leaders at Kraft Heinz knew the pandemic was on its way to the U.S., they made a significant investment in an automated on-demand clean-in-place (CIP) system at the company's Wausau, Wis., plant, which Spec Engineering installed in December. "It was already being considered before the pandemic," Bernard says. "But as the pandemic was coming, they needed to get it in right away."

Hodel has found that clients who aren't necessarily ready for all the latest emerging technologies now are more amenable to at least leaving space for future additions. He references Industry 4.0 trends, along with data dashboards and IT-level controls. "There will be more robotics, more cobots [collaborative robots]—that trend will continue," he says. "If it's not the right fit yet or the client is not ready, they might still plan something in for the future. That maybe wouldn't have happened a few years ago."

#### **Need for flexibility**

Increased flexibility has long been needed on the manufacturing floor, but it's another trend that the pandemic has compounded as producers struggle to repurpose lines in the face of unequal market growth the service sector suffering as restaurants closed while grocery stores couldn't keep product on shelves. Manufacturers needed to be flexible enough to handle the changes in package configurations, Hodel notes.

Bernard got a call in May from a customer in Chicago that blends spices. "He said, 'Come down here right away, we have a major problem," Bernard recalls. "For food service, he had a high-production line, and it was down to 30% capacity. His retail line was smaller, more customized, and it was booming; orders were through the roof. For the grocery stores, he couldn't keep up. He said, 'I need a new line, and I need it yesterday.""

Though the level of flexibility varies by client, it helps to plan for flexibility early in the planning stages, Hodel says. "Some clients have facilities that were master planned a few years ago. ... Now there's a more heightened sense of awareness for flexibility," he says. "Sometimes they're hemmed in by facility restraints. Sometimes you just don't have the space to do everything you'd like. But there's a broadened awareness and willingness to do these nice-to-have features."

#### **Connected assets**

During the pandemic, increased connectivity has really come into play with suppliers and customers for commissioning and troubleshooting. "Most of our clients had remote access in place before the pandemic, but they're more fully utilizing it to their advantage now," Hodel says. "If there's an issue with downtime, or if something is not working the way it should, we can get in and make a fix from remote access."

Remote support, remote monitoring, and remote access have all become important over the past 10 years, Bernard agrees, and will continue to be enabled. "The good news is I think we were already in a good position," he says. "The [plants] that didn't have that in place are putting it in place immediately."

Now that the ice has been broken, many of these pandemic practices will continue. "Sometimes it takes a catalyst to get you to adopt a technology that's already there," Hodel says. "Where we used to have a lot of face-to-face interaction with clients, we're doing that more remotely, and it's been successful."

Spec Engineering moved to remote factory acceptance tests (FATs) without much guidance in place initially. "A leading confectionery manufacturer ended up doing three of their FATs in our plant before the equipment shipped. Remotely, they'd say, 'We want



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this, or we want that," Bernard says. "We had to just jump in. The first one was not as well thought out as the following one. We had to learn, build protocols, build checklists."

Hearing from CPGs across the industry about the need for this type of guidance in the midst of COVID-19, PMMI's OpX Leadership Network released best practices and leadership guidelines for executing virtual FATs (vFATs) in June 2020. The addendum to OpX's existing FAT product,



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available for free download at opxleadershipnetwork.org, tackles how to most effectively use communication and connection technologies to interact remotely with OEMs.

Ultimately, Spec Engineering learned to do those remote FATs effectively. "That's going to be a gain in general. We can save a lot of potential time in planning and scheduling," Bernard says. The pandemic pushed them to that level of capability out of necessity, he adds. "Old school, you went to the factory to see, to feel, to touch, to engage, to test. Except for touch, you can do all of that remotely. There's a wide acceptance of that going forward."

#### The need to regulate air flow...

Many food companies are taking a hard look at their ventilation and filtration, according to Lewandoski. "Before, you could put a single HVAC system in a whole production space. We're being asked now to look at systems by area," he says, explaining that this is done to limit the effects of a potential airborne illness.

Because of increasing concerns about indoor contagions, some new plant designs are incorporating a greater percentage of outside air, Matis notes. But that leads to higher energy consumption because of the heat and humidity control required.

It's also important to keep an eye on the overall facility pressurization if you increase the amount of outside air, Hodel says. "It can start impacting rooms that are adjacent," he says. "You have to have well thought-out pressurization schemes."

This adds considerable cost to the facility. however, and some clients are not willing to spend that kind of money. So they're also looking at their filtration systems to see if they can achieve the same results.

"Filtration's one thing, but how you manage the air circulation is another," Hodel says. There's more call these days for creating corner pockets to sweep the air to, rather than sweeping it across the whole room so that any contaminants aren't being so widespread. "There's a heightened awareness and interest in HVAC. People are more aware of filtration, and making sure filters are changed."

#### ...and the flow of foot traffic

There's also a heightened awareness of how people are flowing through the plant. Facilities are rethinking their modes of entry, in particular. "Almost all the facilities that we're now

designing are taking an enhanced look at how personnel enter the facility. It's a more controlled entry," Matis says. "As we lay out basic facilities, we're always keeping one eye on how we can control traffic in order to minimize human-to-human contact."

Reevaluating the flow of personnel is easier to do when designing a greenfield project, but must get more creative in brownfield situations, where a typical entry has workers entering in a single door, all going to a timeclock, and then going to a locker room to change. "Now the shift change is the biggest problem," Lewandoski says, noting that manufacturers are trying to figure out how to enforce social distancing as workers enter the building.

There needs to be more points of access, Lewandoski says, and shift changes need to not happen at the same time. At brownfield sites, he sees a focus on temperature taking, along with some staggered shift times. "It's harder when your design is the old-school way," he says. "There are more precautions on looking for the symptoms as opposed to segregation."

Setups are still evolving, but an example of how brownfield sites are handling the change in protocol is to switch from a single point of entry going into a security station to now multiple points of entry. This might require more security guards, or in some cases facilities are relying on turnstiles or key card access instead.

"There are a lot of exits that are deemed emergency exits because they're required by code. We're looking at how to utilize those to facilitate more one-way traffic," Hodel says.

#### A way forward

There are more post-pandemic lessons to be learned, and ideas are evolving. "This is still young, relatively speaking. We're still learning," Lewandoski says. "Engineers can come up with a lot of great solutions, but they cost money."

Every new measure is designed to keep workers healthy—not only through the current pandemic, but for future pandemics as well. "Human safety is becoming as important as food safety," Lewandoski says. "They're now one and the same."

In many cases, the trends that will continue forward were in the works before the pandemic, but got a considerable push because of it. Now that momentum is there, many of those will continue. "There's increased awareness of the importance of things that we already did as good practices anyway," Hodel says. •

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**AARON HAND** | EXECUTIVE EDITOR

# CO<sub>2</sub> Refrigeration Helps Cranberry Processor Overcome Logistics Challenges

Developing a freezing facility to support its original processing plant, the cranberry grower wanted something that was energy-efficient, environmentally friendly, and easy to operate. The system calls on food retail experience to provide the best industrial solution.

ITH A TYPICAL HARVEST period of just four to six weeks in late fall, Canneberges Bécancour has to take advantage of every day available. In fact, it's one of the most productive cranberry farms in North America, processing about a half million pounds of cranberries a day during the harvest season.

But it's also important that Canneberges Bécancour make haste in getting those cranberries out to customers from its farm and processing plant in the Bois Franc region of Quebec, Canada. "Once harvested, cranberries need to be delivered over significant distances in a short time frame," says Bob Hampson, one of Canneberges Bécancour's founding partners. "Unfrozen cranberries that face long transit times can pose serious challenges and risks to the distributors."

Because of this, Canneberges Bécancour called years later on Hampson—who had sold the cranberry business back in 2009—to help develop a freezing facility to support the original 17,000-sq-ft processing plant. Hampson drew on his experience with his family-owned cold storage business, working together with Luc Decubber, Canneberges Bécancour's general manager, to decide on a refrigeration system, and then eliciting help from Carnot Refrigeration to develop a system with optimum efficiency.

"If the berries could be frozen at the site of harvest before they are shipped across North America, the logistics become much more manageable and the risk is significantly reduced," Hampson says.

#### **Energy efficiency and environmental benefits**

As they considered a refrigeration system, Hampson and Decubber focused on three key considerations: The system could not use halocarbons, it could not use ammonia, and it needed to be able to run without skilled refrigeration operators.

"We did not feel as though halocarbons were a good choice for the environment or atmosphere," Hampson says. "Plus, practically speaking, given the global polit-



PHOTO COURTESY OF DANFOSS

With about 80 cranberry bogs, Canneberges Bécancour processes about a half million pounds of cranberries per day during a typical harvest.

ical pressure to eliminate them, it didn't make good business sense to use them in this new facility."

Ammonia is a more environmentally friendly and efficient material, but Hampson and Decubber were concerned that even a small leak could ruin an entire crop of cranberries—as much as 25 million pounds at its peak. "Additionally, the town fathers were averse to the construction of an ammonia facility," Hampson adds.

An ammonia/CO<sub>2</sub> system was considered early on. However, in addition to the local restrictions on ammonia, it was a prohibitively complex system. Canneberges Bécancour wanted something simpler to operate.

System requirements included 100% CO<sub>2</sub> refrigeration; 400 tons of refrigeration (TR), primarily freezers;



PHOTO COURTESY OF DANFOSS

The cranberry freezing facility uses a CO2 refrigeration system that mimics supermarket refrigeration racks. It operates in subcritical mode on most cooling days and in supercritical mode only when necessary.

maximum energy efficiency, including minimal time in supercritical mode and maximized heat recovery; and fully automated controls. With guidance from Carnot Refrigeration, the team ultimately decided on a CO<sub>2</sub> refrigeration system that would be operated in subcritical mode on most cooling days and in supercritical mode only when necessary. The system design also would enable heat recovery for underfloor heating, space heating, and process water.

"When Luc and I found Carnot Refrigeration, we were pleased to learn they had already constructed two other industrial facilities using CO2 refrigeration systems in Quebec and had good experience with the type of system we were looking to use," Hampson says.

#### **Learnings from food retail**

Carnot has deep roots in the food retail industry, but has since broadened into industrial refrigeration facilities, as well as data center cooling. With the experience in food retail, Carnot was able to offer a system that best served Canneberges Bécancour's requirements. "Transcritical CO2 has a well-established place in the food retail industry," notes Marc-Andre Lesmerises, CEO of Carnot Refrigeration. However, its extension to industrial applications has been limited primarily because of a lack of knowledge about the systems and also established ideas about industrial refrigeration, he adds.

The approach to the design is akin to rack systems used in supermarket refrigeration. Three rack systems were developed for the cranberry freezing



PHOTO COURTESY OF DANFOSS

The CO<sub>2</sub> refrigeration system depends on Danfoss ICM TS expansion valves to expand the high-pressure supercritical CO<sub>2</sub> gas to a cold lower-pressure two-phase fluid.

facility, each containing 13 reciprocating compressors. Carnot uses all high-pressure components in its package: 120 bar (almost 1,800 psi) on the high side of the system, and 80 bar (almost 1,200 psi) on the low side of the system. This eliminates the need for a backup or "stand-still" condensing unit in the event of power failure.

The system also depends on Danfoss ICM TS expansion valves to expand the high-pressure supercritical CO<sub>2</sub> gas to a cold, lower-pressure, two-phase fluid. "We have been using Danfoss valves in our systems from the beginning of our endeavor into transcritical CO<sub>2</sub>," Lesmerises says. "Not only are the valves extremely reliable, but Danfoss has extensive expertise in both industrial and commercial refrigeration—as well as in using CO<sub>2</sub>—that has helped us to design and implement very successful and efficient systems."

An RC Intelligent Recovery System allows the refrigeration system to go beyond simple heat recovery by using the available energy for heating applications. In addition, each unit can be converted from a cooler to a freezer and vice versa.

#### The results

Canneberges Bécancour needed the facility to be completed within six months. Ultimately, they were able to complete the work in just 17.5 weeks. The installed cost for the entire refrigeration system and machine room was about \$4,000/TR, and the nominal design power consumption about 2.2 kW/ TR-both well within the normal range for industrial refrigeration systems.

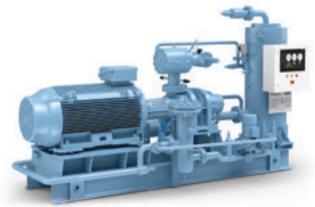
Expanding its plant to double production capacity, Canneberges Bécancour planned to use similar 100% CO<sub>2</sub> refrigeration systems from Carnot Refrigeration. "I've been associated with cold storage and freezing for most of my career, and I've never seen a better refrigeration system than this one," Hampson says. 🔾

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## SYSTEM ALLOWS FOOD PRODUCTION FACILITIES TO FREEZE PALLETIZED PRODUCTS FASTER

When integrated with warehouse management software, the QuickFreeze system allows users to freeze each pallet on its own schedule by varying the dwell time based on the SKU. The QFM freezing, cooling, and tempering system features a dedicated fan and plenum that rapidly pull air through each pallet placed in front of the unit, rather than blasting air at it, and lidar-powered occupancy sensing that shuts off the system when product reaches the target temperature, or the pallet is removed. Dwell times can be changed remotely through a web interface or an application programming



interface (API). Compatible with existing racking, the expandable system can be monitored via a cloud-based dashboard.

QuickFreeze by Tippmann Engineering | quickfreeze.com

# FOOD PROCESSING INDUSTRY IN NORTH CAROLINA

#### FROM BAKERIES TO FISHERIES,

the food processing industry in North Carolina
is a diverse and growing sector that extends
across the entire state. In fact, more than
62,000 people are employed by the state's
1,000+ companies. Our recipe for success in
this sector is quite simple; companies enjoy
easy access to raw materials and a rapidly
expanding consumer base. It's all tied together
by a skilled workforce familiar with operating
in a regulated industry.

#### THE NORTH CAROLINA WORKFORCE

- ▶ Ranked #1, Largest Manufacturing Workforce in the Southeast
- ▶ Ranked #2, Competitive Labor Environment by Area Development, 2018
- ▶ Elite higher Education 53 colleges and universities including the Tier 1 research universities NCSU, Duke, and UNC
- ▶ 22,500+ STEM Degrees Annually



Learn more at: www.electricities.com



#### HEATER/CHILLER UNITS SAVE SPACE AND MONEY

Available with single- and dual-zone temperature control, Delta T Systems heater/ chiller units combine variable speed compressors and fan motors with a heating loop to control temperatures within 0.5 °F in a variety of production processes. The standard single controller and Industry 4.0-ready program can control two processes at different temperatures and pumping capacities, log data, and predict future issues. Fully configurable and compact, the units have chillers that can be air or water cooled with a capacity

up to 30 tons and temperature ranges from -10 °F to 100 °F, and a heating unit capacity up

#### **Delta T Systems**

deltatsvs.com

to 36 kW.



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#### **AUTOMATION, BATCHING & WEIGHING SPECIALISTS**

#### **SOLUTIONS:**

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- Semi-Auto "Kitchen Systems" >
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- Automation Including:
- Pneumatic Conveying Liquids / Dry Products

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**DEVELOP** With our application experience we develop a customized solution to meet your goals & make your process more efficient.

> You profit from our 45+ years of experience in baking, food processing, industrial process, process equipment,

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- Barcode/RFID Scanning
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www.sterlingcontrols.com

#### SPIRAL FREEZER DELIVERS BETTER **HYGIENE AND SUPERIOR PERFORMANCE**

Built with externally mounted fan motors and stairs, the JBT Northfield spiral freezer has a fully welded enclosure with minimal overlapping joints, an open-profile frame, sloped surfaces, and capless solid plastic rails to eliminate bacteria harborage sites. The CleanFREEZE freezer offers high-volume freezing, chilling, and cooling of a range of packaged and individual quick-frozen (IQF) food products, such as bakery, handheld snacks, trayed ready meals, and frozen pizza. It is available with an open sanitation system that defrosts, rinses, washes, disinfects, and dries the unit in less than 4 hr.

JBT | jbtc.com





## **EYE-FLEX® CONVEYOR BELT**

## Heavy-duty, metal modular conveyor belt

- Long lasting, extremely durable
- High load capacity
- Flat carrying surface
- Modular design, customizable for your application
- Many options available such as side guards, chain drive, and flights



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## YOUR RECIPE AUTOMATED TO PERFECTION

Shick Esteve, world leader in process automation, is **excited to announce the acquisition of W.D. Laramore Manufacturing** an industry leader in the field of flour reclaim systems. The addition of Laramore provides Shick Esteve with a product that fits perfectly in its already industry leading portfolio.

#### **CONFIDENCE.**

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Whether it's storing, sifting, metering, weighing, transferring or flour reclaim systems, Shick Esteve is your complete ingredient automation system provider. *Contact us* to learn more.

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#### PLANT FLOOR **NEW PRODUCTS**

#### SLICER/APPLICATOR OFFERS SANITARY DESIGN AND EASIER, REPEATABLE SETUP

The **Grote slicer/applicator** slices a range of food products, such as jerky, sandwiches, bread snacks, and frozen and to-go meals, including pizza, cordon bleu, and lasagna, directly onto processing lines. It slices and applies or bulk slices at rates up to 150 strokes per min per lane, and stacks and shingles up to 120 strokes per min per lane. It features an open-channel frame, watershed electrical enclosure, IP69K motors, touchscreen controls, setup via telescopic guarding, and customized height, frame orientation, head, and lane configurations.

**Grote** | grotecompany.com



#### RADIATION-SHIELDING CURTAINS **MEET 3-A SANITARY STANDARD**

XrayCurtains.com curtains conform to a range of FDA, EU, and USDA requirements for food contact materials in USDA-regulated facilities, as well as the 3-A Sanitary Standard. Used with food inspection systems, the flexible, lead-free, rubber radiationshielding food contact X-ray curtains are suitable for repeated use with aqueous foods and fatty foods, such as raw meat, fish, and poultry. They withstand cleaning and bactericidal treatment temperatures up to 180 °F. A variety of curtains and custom panels are available to meet the requirements for most X-ray scanner systems in the food industry.

**XrayCurtains.com** | xraycurtains.com

#### SYSTEM TURNS MEAT SCRAP AND TRIM INTO HIGHER-VALUE **PRODUCTS**

The Powerheater system turns raw scrap and trim, such as poultry, beef, or pork, into shapes ranging from crumbles to strips or cubes of irregular shapes and sizes that mimic the appearance, texture, and bite of natural, whole muscle products. Ambient product fed into the continuous processing/cook system exits cut and cooked to the desired temperature at speeds up to 1.2 tons/hr. The system also creates vegetable analogues with the shape, texture, appearance, and bite of natural meat products. Typical applications include ingredient production for pizza toppings, snacks, fast food, ready meals, soups, and pet foods, such as chunks in gravy or jelly or meat-based snacks.





#### LIQUID MIXERS IMPROVE PROCESS YIELDS AND CYCLE TIMES

Engineered for hygienic environments or general industrial applications, Brawn Mixer liquid mixing systems can be designed for open- or closed-tank configurations. Built for mixing volumes up to 5,000 gal, the B Series liquid mixers feature motors with severe-duty and explosionproof designs, stainless-steel construction, and ratings up to 5 hp. The mixers are suitable for a range of continuous process applications, including blending, solids suspension, gas dispersion, heat transfer, and low- or high-viscosity liquid mixing, and can be fully integrated upstream or downstream.

Brawn Mixer | brawnmixer.com

#### **DICER OFFERS CONTINUOUS OPERATION TO ACHIEVE HIGHER CAPACITIES**

Built for dried fruits, bakery products, and nuts, the Urschel dicer produces uniform dices in the small- to intermediate-size range. The Affinity CD-L dicer, granulator, and strip cutter features a feed spindle, feed drum, and 5-hp (3.7 kW) motor that work together with the cutting components, while an optional integrated oil spray system lubricates the circular knives to assist in the processing of sticky products. Sanitary in design, the dicer has a food zone completely separated from the mechanical zone. Equipped with stainless-steel product contact parts, the dicer can be operated at high or low speeds depending on the processing goals.

**Urschel Laboratories** | urschel.com



Employing pressure and friction, the **Equova rotary press** operates continuously at a speed of < 1 rpm to develop the pressure differential and frictional resistance to dewater a variety of types of sludges. The preassembled, compact system delivers high cake solids and quality filtrate.

Equova | evoqua.com



#### **BATCH CONTROLLER IS LOW COST AND EASY TO USE**

The ABC-2020 automatic batch controller works with water meters with pulse output and a valve, pump, or both. A start/stop button indicates the controller status through blinking patterns. Line sizes range from  $\frac{1}{2}$ - to 2-in. The controller can be purchased as part of a complete batching system with a valve and a hot or cold multi-jet water meter or a positive displacement meter for vertical installation. Custom systems are available.





## MIXING AND DRYING SYSTEM OFFERS ACCURATE, CONTROLLED HEATING

The **Eirich mixing and drying system** combines microwave and fluidizing blending technologies. The OptimaDry system has a high-

power microwave generator that converts electricity to microwave energy that is carried through an aluminum duct to a blending tank, where material is processed to a homogeneous blend and heated/dried simultaneously. The tanks come in working capacities from 1.5 to 400 cu ft, while the modular, scalable generators are either magnetron or solid state, with operating frequencies from 896 to 928 MHz.

**Eirich Machines** | eirichusa.com



### FLEXIBLE FITTINGS MEET HARSH AND HYGIENIC APPLICATION DEMANDS

Made of stainless steel, the **Calbrite hazard-ous location fitting** has a flameproof barrier gland with an operating temperature range of -76 °F to 185 °F, while the hygienic fitting features a straight external thread. The hazardous location Flex compression fitting is corrosion and oil resistant and has a nylon compression seal, compound barrier, and flameproof barrier gland. The hygienic Flex fitting is corrosion and oil resistant. Suitable for knockouts or threaded entries, the compression fitting is comprised of a nut, insert, and nylon compression seal.

Atkore | atkore.com

## WALL BRACKET SOLUTION HELPS ENSURE HYGIENIC STORAGE OF CLEANING TOOLS

Intended for use in food processing plants, industrial kitchens, and employee break rooms, the **Vikan wall bracket solution** is comprised of four products. The hygienic Hi-Flex wall bracket system stores up to five products via attachable hooks and grip bands, while the single-hook module stores individual products with hanging holes, and the double-hook module stores two products with hanging holes. The grip band module stores almost any product with a handle. The solution comes in 12 colors.

Remco | remcoproducts.com



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As more and more brands and SKUs enter the market, how do you make your product stand out from the crowd? A great brand identity supported by great graphic designs is one way to create a competitive edge. P.E. Labellers and Axon, product brands of ProMach, offer labeling and sleeving systems that can accommodate a virtually unlimited range of container types, shapes and sizes. From P.E. Labellers' pressure sensitive, cold glue, hot melt and roll-fed labelers to Axon's shrink sleeve and stretch sleeve labeling systems, we offer the broadest range of labeling technologies in the industry. If you have a product that needs a label, a shrink sleeve or a stretch sleeve, give us a call to discuss your application.

800-598-8601 / PELabellers.com / AxonCorp.com







#### SKID SPEEDS UP PRODUCTION WHILE ENSURING QUALITY OF POWDERED PRODUCTS

The Gericke formulation skid integrates feeding, weighing, and continuous mixing of multiple ingredients as a single step. Modular and self-contained, the GFS-C skid enables food manufacturers to test and perfect formulations, and then expand to full production using the identical system without additional equipment. The skid can be used as a standalone unit for formulation or integrated into existing processes. It features FDA-approved materials in a GMP-compliant design.

Gericke USA | gerickegroup.com







#### MIXERS ARE COMPLETELY EXPLOSION **PROOF**

Meeting a range of dispersion, emulsification, and homogenization requirements, Ross explosionproof mixers can be supplied with a NEMA 7/9 operator station, prewired and mounted to the mobile mixer cart. The portable, rotor/stator inline high-shear mixers feature elastomers that make them suitable for use in extreme-duty processes with chemically aggressive fluids. The controls can be customized to include a viewing window for process variables and an intrinsically safe thermocouple attached to the motor's internal thermal switch. Allstainless-steel construction, sanitary tri-clamp connections, 3-A certification, a double mechanical seal, washdown motor, and other options are available.

Charles Ross & Son | mixers.com

#### SOLUTION HELPS ENSURE FOOD SAFETY AND QUALITY STANDARDS COMPLIANCE

A cloud-based solution, the Novolyze platform digitalizes food safety and quality programs by aggregating, normalizing, and centralizing data



and transforming it into actionable insights. The digital, SaaS-based food safety and quality platform includes environmental monitoring (EM) capabilities that streamline activities associated with pathogen, hygiene, and allergen monitoring, including surface, air, and water testing, in a factory environment. The EM capabilities include the digitization of the factory layout and hygienic zoning, scheduling, and the execution of sampling plans, remediation, reporting, and trending activities.

Novolyze | novolyze.com

Withstands harsh, corrosive washdowns

Reduces maintenance and downtime

Yonkers, NY USA



## COVERS CONTROL A BROAD SPECTRUM OF ODORS

#### **Anue Water Technologies covers**

remove all odors, including those from sulfide and ammonia, in food and beverage plants, eliminating the need for chemicals or scrubber equipment. Custom engineered to fit each application, the covers consist of geomembranes fitted with carbon-embedded pockets. Typical applications include tanks, sludge pits, open channels, vessels, fowl offal, truck bays, vertical vents, and fugitive emissions from vent covers.

#### **Anue Water Technologies**

anuewater.com

## SPRAYING SYSTEM ELIMINATES PROBLEMS ASSOCIATED WITH PLUGGING OF SPRAY NOZZLES

Engineered to meet the latest ANSI Z50.2 and GMA sanitation standards, the **GOE spraying system** can apply topical coatings of a range of liquids and slurries, including glazes, preservatives, coatings, oils, sauces, batters, chocolate, butter, and flavor-infused coatings.

All the liquid or slurry not applied to product is recovered and used. Available in standalone, portable, and retrofit to existing line configurations, the VPLS liquid/slurry sprayer features a totally enclosed, self-contained system hood and body; all-stainless-steel construction; and Allen Bradley controls.

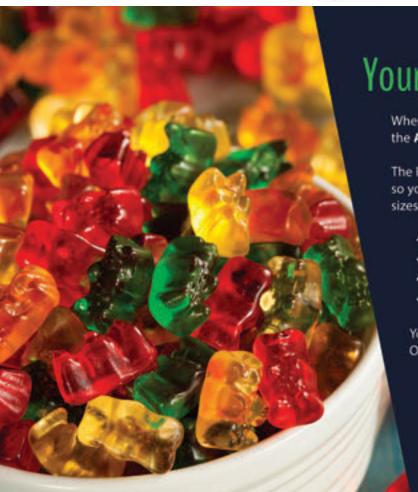
General Oil Equipment | goe-spray.com



### POWER SUPPLIES ARE EFFICIENT AND ECONOMICAL FOR STANDARD APPLICATIONS

**Wago power supplies** include a space-saving housing with pluggable connectors. Offering 12 VDC, COMPACT 787-1201, 787-1211, and 787-1221 power supplies are equipped with a removable front panel and vibration-proof, spring-pressure connection technology with push buttons. Each power supply comes with worldwide approvals, including UL 508 and EN 60335-1.

Wago | wago.us



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When you need speedy powder induction and 100% dispersion, the Admix Rotosolver high shear mixer is your solution.

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Your Ingredients. Our Expertise. Outstanding Results.

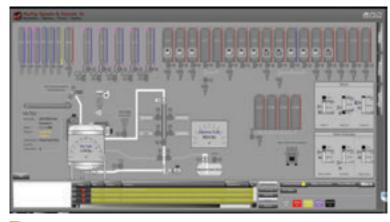


See how.

admix.com | 800-466-2369







#### **BATCHING MODULE ELIMINATES ERRORS, ENSURE LOT** AND MATERIAL TRACEABILITY

The Sterling Systems batching module is intended for the batching of solids and liquids. Capable of providing ingredient material traceability and batch validation, the BatchPro-SA batching automation and control application module can be incorporated into semi-automatic or automatic systems. Remote supervisory control using the Sterling Systems software app allows browser-based operation and report generation; exporting of data to integrate with corporate ERP systems is available. Each batching automation application is custom engineered.

Sterling Systems & Controls | sterlingcontrols.com

## CLAYTON STEAM BOILERS Advancing **Boiler Technology** Worldwide ► SAVE SPACE ► SAVE TIME ► SAVE MONEY 800.423.4585 info@claytonindustries.com www.claytonindustries.com Clauto STEAM SOLUTIONS

#### METAL DETECTORS CONDUCT **AUTOMATIC QUALITY CONTROL TESTS**

Designed to isolate and separate metallic materials in snack packing lines, including pretzels, nuts, popcorn, cereal, and potato chips, Fortress metal detectors have slim case-through dimensions, allowing them to be located between vertical form/ fill/seal pouch packing systems and weighing equipment. The Stealth Vertex units continuously funnel one bag of product at a time as it drops from the scale, and inspect the free-falling products by mimicking the signal disturbance in the least-sensitive position in the aperture. Validated test results are automatically logged and digitally saved.

Fortress Technology | fortresstechnology.com



#### HANDHELD HMI IS SMALL **AND LIGHTWEIGHT**

The IDEC human-machine interface (HMI) has contoured hand grips, a hand strap, and a wall hanging bracket. The HG1P handheld unit includes a hardwired emergency stop button, selector switch,

and three-position enabling switch. It is

configured with WindO/I-NV4 software. A common mini-USB cable or USB-A memory stick can be used to download configurations and save data. Available in serial and Ethernet models, the HMI supports industrial communication protocols, such as Modbus TCP/IP, Modbus RTU, FTP client, FTP server, webserver, and user communication.

IDEC | us.idec.com



#### PUMP IMPROVES FOOD PRODUCT QUALITY THROUGH **GENTLE HANDLING**

The Watson-Marlow pump provides flows to 255 m<sup>3</sup>/hr. Featuring an EHEDG Type EL Aseptic Class I-certified hygienic design, the Certa 800 Sine pump is rated at a maximum pressure of 15 bar and delivers pump speeds up to 400 rpm, as well as 10.64 liters of flow per revolution. A sinusoidal rotor handles soft solids without blockages or damaging ingredients. The pump is suitable for dairy applications, as well as the transfer of food products containing soft fruit, diced vegetables, or meat.

**Watson-Marlow Fluid Technology** Group | wmftg.com

#### SHAFT COLLARS ARE DESIGNED FOR FOOD PROCESSING APPLICATIONS

Machined from FDA- and USDA-approved 303 and 316 stainless steel, Stafford shaft collars and mounting components are suitable for food processing equipment, conveyors, and packaging systems requiring frequent washdowns. Corrosion resistant, they come in

one- and two-piece, hinged, set-screw, and flanged styles with a range of bore configurations. The collars and mounting components come in 1/4- to 10-in. standard I.D. sizes.

**Stafford Manufacturing** | staffordmfg.com



The Siemens motion control program provides download ready-to-apply function blocks, such as camming, cross-cutter, gearing, flying saw, jog path, load sharing, positioning, rotary knife, splice control, and synchronism, from an online library. Built-in simulation tools allow the testing, validation, and optimization of an application code, independent of physical hardware. The integration of safety technology

enables safety and standard control over one network, drive-based safety including motion functions, and a safety acceptance test integrated in an engineering tool. Uniform system diagnostics are automatically generated during device configuration.

**Siemens** | siemens.com





#### FORKLIFTS ARE DESIGNED FOR PRODUCTIVITY AND FUEL EFFICIENCY

Built with a compact chassis, Mitsubishi internal combustion forklifts are intended for a range of indoor warehouse applications, from moving pallets and dock-to-stock to transfer-

ring loads across a variety of run distances. FGC35CN-FGC40CN internal combustion cushion tire forklifts feature an on-board self-diagnostics display that delivers immediate truck status. Equipped with a computerized electronic fuel



injection system, the engine enables high levels of torque and horsepower, while maintaining compliance with all CARB and EPA emissions regulations. The forklifts are available with a 7,000- to 8,000-Ib capacity.

#### **Mitsubishi Logisnext Americas**

logisnextamericas.com



#### **SEAL SAVES ENERGY AND KEEPS OUT CONTAMINANTS**

The Rite-Hite seal creates a barrier at the "fourth side" of the loading dock. The PitMaster II underleveler seal has a black vinvl main curtain that is secured to the dock leveler and follows its motion to seal the front of the leveler pit from side to side, bottom to top, while the leveler is operated. Mounted to the pit walls, side seals cover up gaps between the dock leveler toe guards and pit walls, while HMWPE plates attach to the leveler subframe on the right and left sides, filling air gaps between the dock leveler and the pit walls. Options include lip corner seals, bumper filler pads, and bumper covers.

Rite-Hite | ritehite.com

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## **Connected Devices Enable** Continuity in Milk Production

Communication technologies accelerate the advance of milk production and help to optimize operations in support of the nation's food supply during the COVID-19 pandemic and beyond.

AIRY FARMERS OF AMERICA (DFA) is a cooperative composed of more than 13,000 family farmers from across the U.S. It helps farmers operate their plants, find outlets for their products, and invest in new business opportunities. Brands they represent range from nationally recognized names such as Borden and Breakstone's to specialty brands like Plugrá and La Vaguita.

The cooperative operates more than 85 manufacturing facilities producing milk and dairy products. Like many manufacturers, DFA members have seen their operations' safety and productivity impacted by COVID-19. To help support the nation's food supply during the pandemic, Cisco donated an array of collaboration technologies to DFA to help it develop more flexible manufacturing processes, enable workforce continuity, and increase its ability to collaborate in real time.

Funded by Cisco's Country Digital Acceleration program, which is active in 34 countries, Cisco supplied Cisco Webex room kits, DX-80 videoconferencing kits, Webex Teams and Webex Expert-on-Demand software, and RealWear HMT-1 hands-free "head-mounted tablet" devices to help DFA connect its teams across the country in multiple manufacturing facilities.

The collaboration equipment and services Cisco donated provides manufacturing workers with secure, remote access to experts and first-line support teams working from home or at other plants. Specifically, it gives DFA real-time visibility into operations through hands-free video devices, which enables DFA's workforce to remain productive while adhering to physical distancing guidelines. The access to experts these technologies facilitate will help DFA "shift production, optimize resources, and increase resolution time as it adapts to changing demand," says Carlos Rojas, global manufacturing lead for Cisco Industry Solutions Group.

The first phase of this donation, which was completed in June 2020, was deployed to four sites



PHOTO COURTESY OF DFA

across DFA's operations, including its largest processing facility in Portales, N.M. Others included in this first phase are in Ventura, Calif.; Zumbrota, Minn.; and Schulenburg, Texas. The second phase focused on accelerating machine data over the secure Cisco Webex Teams platform for remote diagnostics, according to Roias.

#### **Team collaboration**

To enable real-time communication between DFA co-workers, Cisco Webex Teams technology is being used to provide workers with access to documentation using RealWear HMT-1 head-mounted devices for routine process evaluations, maintenance, and training. With everyone using Cisco Webex Teams, users don't need to rely on disconnected methods such as text messaging, phone calls, or emails to connect. Instead, a quick Teams message in a project space allows for collaboration between the necessary resources and keeps all the related data connected and retrievable.

The Dairy Farmers of **America** cooperative helps farmers operate their plants, find outlets for their products, and invest in new business opportunities.



PHOTO COURTESY OF DFA

Cisco donated an array of collaboration technologies to DFA to help it develop more flexible manufacturing processes, enable workforce continuity, and increase its ability to collaborate in real time.



PHOTO COURTESY OF CISCO

RealWear HMT-1 head-mounted devices enable real-time communication between DFA co-workers.

"For example, if a production manager notices that a line is not operating at full health, he or she can directly connect with the plant operator via Cisco Webex Teams to discuss steps to remediate the issue," says Dan Malyszko, director of operations for system integrator Malisko Engineering, which was involved in the implementation of the Cisco technology at DFA. "Likewise, a maintenance manager looking for status updates on a motor control center issue can be notified by field personnel with pictures, videos, or annotated files showing their progress."

The combination of a retiring skilled workforce and the social distancing and travel issues created by COVID-19 means that plant personnel will not always have the available experience on hand in every situation. Cisco's Expert on Demand technology, accessed using the RealWear HMT, can close this experience gap by connecting workers from the plant floor to plant management or experts at other locations while allowing them to keep their hands free to work, rather than having to hold a smartphone or tablet, Malyszko says.

By turning the augmented reality glasses in the RealWear HMT into a voice-activated collaboration headset, the Webex Expert on Demand application can connect frontline workers to knowledgeable experts. This technology allows workers to enhance their productivity through multi-party video calling, Cisco notes. It provides the ability to annotate images, and share the annotations between the expert and frontline worker, as well as share key documentation, all in real time.

Capabilities of the Expert on Demand technology combined with the RealWear HMT include:

- Launch two-way or multi-party video meetings hands-free and collaborate with remote experts to resolve problems at the source without requiring workers to be onsite.
- · Request and receive a call back from an individual expert or an entire team.
- · Search the company directory to find the right expert or teams to resolve an issue immediately.
- Access resources such as documentation for common troubleshooting steps.
- · Share screens to see more easily what's being discussed and give an expert the ability to share content live.
- Frontline workers and experts can augment live streaming with annotations to help resolve problems faster and provide guidance for day-to-day activities.

These capabilities not only provide plant personnel the means to report an issue, but can also provide a solution without the need for costly travel or trial and error, Malyszko notes. "For example, if an operator notices a deviation in a critical process control point and is unsure of what to do, with a few short voice commands the operator can request help or call directly to the necessary resource to assist in resolving the issue," he says.

Remote Expert technology can even be used to cross the IT/OT divide. "If plant engineering and maintenance personnel are installing new hardware from corporate IT and need all hands available to rack the equipment, with guidance from either Malisko Engineering or corporate IT, they can safely and properly execute the job with the hands-free assistance of the RealWear HMT," Malyszko says. Q

Cisco www.cisco.com

Malisko Engineering www.malisko.com

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David Roberts Lubriplate District Manager TN, AL, GA & Northern FL



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**AARON HAND** | EXECUTIVE EDITOR

## **Inline Seal Inspection** Maintains Quality of Retort Pouches

Investing in a state-of-the-art production facility, the Brazilian pet food manufacturer also opted to move to 100% inline seal inspection for its flexible pouches, eliminating concerns about poorly sealed product getting to the customer.

> HE GLOBAL PET FOOD market reached nearly \$97 billion in 2020 and is projected to register a CAGR of 4.8% through 2026, according to Reportlinker.com. But perhaps more important than the pure numbers is the idea of growing pet humanization—a shift from pet ownership to parenting, a growing bond that brings with it a willingness to spend more on pets.

Top-quality, nutritional, flavorful pet food is more important in this market than ever. Special Dog Company, established in Brazil two decades ago, deployed a state-of-the-art production facility in Santa Cruz do Rio Pardo in 2019 to increase its product portfolio and keep up with the growing market. When it did so, an important requirement set forth by the company was to move to 100% inline seal inspection to safeguard the packages and the wet pet food inside.

In 2020, the pet food maker produced more than

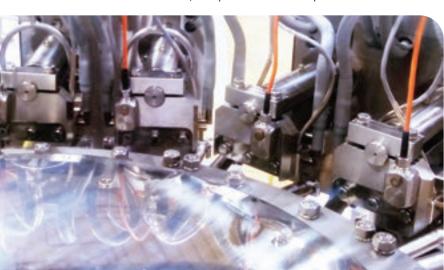


PHOTO COURTESY OF ENGILICO

The sealing bars of the rotary packaging machine are equipped with SealScope sensors that detect product in seals, wrinkles and folds that cause leaking packages.

22 million packages, or more than 2.2 million kg of wet pet food, according to Production Manager Octávio Soberón. The food is packaged in retort packages, including flexible pouches and aluminum trays. Sealing of those filled packages is the culmination of a complex process and is essential to protect the food's quality once it leaves the plant. Incompletely sealed packages, and packages with product spillover outside of the seal, both negatively impact the packaging processes. Exposed product results in contaminated machines, as well production and labor time lost to cleaning, manual sorting of bad packages, etc. If the poorly sealed packages leave the production site, the impact could be even greater, with potential risk for expensive product returns, call backs and brand damage.

These were all key factors in choosing a 100% inline seal inspection system. "The sealing of flexible packages is a critical phase in the packaging process," Soberón says. "Even with a top-quality packaging machine, bad sealings could occur from time to time." Defective seals are often caused by wrinkles, folds, or product in the sealing area and lead to open or leaking packages.

Wet pet food is especially prone to sealing concerns. Because many glutinous sauces or gels are used in the recipes, it can easily stick in or around the package's sealing area during the filling process.

Badly sealed pouches are a major concern during the sterilization process because, when the pet food is heated, it might leak and pollute the autoclave. The disruption to production and man-hours for autoclave cleaning has a domino effect in cost. Worse, if compromised packages are not detected, they can lead to reduced shelf life, liability for health risks, and broad recalls.

"Packaging is also responsible for making sure the product gets from the factory, through transport and distribution, and on to retail and the home without any loss to the integrity of the product,"

Soberón says. "At the latter end, it may also be responsible for providing barriers to oxidation and moisture migration, which can affect palatability and the nutritional composition of the product."

#### 100% seal inspection

For the packaging of the retort pouches, Special Dog Company has installed a multi-head weigher, followed by a high-speed rotary filling machine from Toyo Jidoki. To inspect the sealing of the retort pouches, Special Dog

Company extensively researched the market and ultimately opted for the SealScope inline seal inspection system from Engilico. "The SealScope is installed in the sealing bars of the filling machine," Soberón says, explaining that the filling machine is also followed by an X-ray inspection system to detect metal contaminants.

SealScope's approach to inline seal inspection is unique. Vibration sensors are retrofitted on the sealing jaws of the dual-lane rotating packaging machine at two stations in the carousel. The sensors measure the vibration response during the closing of the sealing jaws and compare that to a reference model of correctly sealed packages. Product getting into the seal, or wrinkles or folds in the seal, can create a change in the vibration. The package is rejected when the deviation is higher than a user-defined limit.

"The devices measure and record the impact in each sealing bar, resulting in a standard curve. If any debris or turned Teflon tape occurs, the impact will be affected, and the curve will be different," Soberón explains. "Thus, the software compares the curves and, respecting the tolerances, accepts or rejects the pouch."

This automated, 100% inspection leads to immediate benefits. Every single package is inspected, so manual inspection can be considerably reduced. It is still a good manufacturing practice (GMP) to double-check the sealing manually, Soberón says, but "with the SealScope inline, the number of pouches inspected manually is much lower than a line without this device." Random physical sampling includes destructive burst testing along with other human inspections, taking 5 to 6 minutes per package.

By rejecting the defective packages, the outgoing quality is immediately improved. "The non-destructive seal testing made directly on the sealing bars greatly improved our line efficiency from pre-



PHOTO COURTESY OF ENGILICO

vious manual inspection methods," Soberón says. Since installing SealScope, the pet food company has not received a single complaint regarding sealing issues, he adds.

#### **Optimizing the packaging process**

Because SealScope inspects every product, it also serves as a continuous monitoring system—not only for the sealing process but indirectly for the complete packaging line. Any variance detected in the sealing process indicates systematic errors in the packaging process. User-defined warnings prompt the operator to take preventive corrective actions—cleaning the sealing station, replacing the Teflon protection foils, etc.—to avoid further process drift and keep the machine in optimal shape.

SealScope also enables optimization of packaging productivity. Often, packaging machines run either too slow or too fast, creating adverse effects on quality. SealScope helps to determine the optimal machine speed where production output and package quality are maximized.

With the ever-increasing demand for high-quality wet pet food, Special Dog Company plans to further extend its production capacity, according to Soberón, who says the factory was built with expansion in mind. "The bottleneck is the filling machine, which is running at 120 ppm," he says. "The plans for the near future are to install another filling machine, which is going to double the current capacity."

With the new filling machine also will come a second SealScope. "For the installation of the new line, Engilico's SealScope system is going to be there, for sure," Soberón says. 🔾

#### **Engilico**

www.engilico.com



Thanks to a 100% inline seal inspection process, leakfree packages ensure product quality and leave no unwanted residue on machinery.



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Aerzen USA, Inc www.aerzen.com/en-us	86	Frick by Johnson Controls www.johnsoncontrols.com/frick	38	www.packexpolasvesgas.com www.hcpelasvegas.com	
Air Products www.airproducts.com/LIN-IS	57	Fristam Pumps Company www.fristam.com/FKL	33	PE Labellers • Axon (ProMach brands) www.pelabellers.com • www.axoncorp.co	81 om
Ampco Pumps Company www.ampcopumps.com	22	Gericke USA, Inc. www.GerickeGroup.com	2	PFI - Precision Food Innovations www.pfi-global.com	10
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Atkore International www.calbrite.com/flex-conduit-and-fittir	<b>74</b>	Graphite Metallizing Corp www.graphalloy.com	82	Redzone www.rzsoftware.com/redzone-tv	11
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EnSight Solutions www.ensightsolutions.us	63	MSKTD and Associates www.msktd.com	31	Wire Belt Company of America www.wirebelt.com	77
Eriez www.eriez.com	73	Munson Machinery Co. Inc. www.munsonmachinery.com	7	Zepnick Solutions Inc. www.zepnick.com	42



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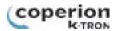
























































































































































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## **MES Provides Vision Needed** in Competitive Distillery Sector

The Bourbon Trail is facing tight margins and ever-growing market erosion, making the insights from Parsec's TrakSYS software particularly helpful in terms of resiliency, asset reliability, and energy management. But the food and beverage industry overall could benefit from capabilities in OEE, recipe management, track and trace, and much more.

VER THE PAST 12-15 YEARS, the food and beverage industry has embraced the manufacturing execution system (MES) as a musthave for the automated execution of orders, integrating from the enterprise resource planning (ERP) layer through to the plant floor to drive production efficiencies throughout, according to Jim Mansfield, senior manager for system integrator Matrix Technologies.

Matrix—founded more than 40 years ago in Toledo, Ohio, and now with about 300 employees in seven locations—is one of the larger system integrators and engineering firms in manufacturing. It works in a variety of industries, including food and beverage, consumer packaged goods, life sciences, automotive, and chemicals. Considered a technology-agnostic system integrator, Matrix has relationships with a wide array of software stack providers.

For the past few years, Matrix has been working with Parsec and its TrakSYS MES platform. Like Matrix, Parsec works in a range of manufacturing industries; Matrix is working with TrakSYS now on new opportunities in the specialty chemical sector. But the system integrator has also found that TrakSYS is particularly suited to the distillery business, where competition is tough, and margins are tight.

Here, Mansfield and Jeff Panning, MES/MOM senior project manager for Matrix Technologies, offer their insights on the benefits that MES and manufacturing operations management (MOM) systems can provide to food and beverage production, especially among distilleries.

#### **PFW:** Why would food and beverage manufacturers want to use an MES/MOM system in their operations?

Panning: One of the big benefits is visibility to your equipment performance so you can make investment decisions. One of our premier distilling company clients had a shrink wrap machine that they were having



Jim Mansfield, senior manager, Matrix **Technologies** 



Jeff Panning, MES/MOM senior project manager, **Matrix Technologies** 

problems with the infeed on that machine. They went through a continuous improvement project to determine what the problem was and implement a solution. When it was time to make investments in other machines, they just didn't have the data.

Once they had TrakSYS in place, they were able to measure downtimes—how much downtime they have and the types of downtime. They were able to measure performance, availability, and quality before they made the investment and updates on one of the machines, and then again afterwards. They were able to get some visibility on what the difference was, and it helped cost-justify investments for the rest of their machines.

#### PFW: What makes Parsec's TrakSYS different from other MES platforms?

Panning: One of the big advantages is the scalability, and the inclusion of everything in the package. Basically, you buy the TrakSYS package, and then based on what you're trying to accomplish, you can buy different types of licenses. But the functionality is all there. It's everything from OEE [overall equipment effectiveness] to quality test forms to track and trace, and more. You get that all in the package, and then based on licenses, it allows you to scale the number of users, number of events, number of tasks that you're dealing with, and things like that. So it's really very scalable. Clients like that. They can start on a single line or a single piece of equipment. And as they see successes, they can justify additional investments.

The final piece is just working with Parsec. They offer everything from training to companies like Matrix or the client. They are more than willing to hop on calls and help with the solution upfront, and they have a great technical team that helps with any questions along the way.

One more advantage is the platforms on which TrakSYS can run. It can run everything from a server at a plant to a corporate-wide server to a public cloud or private cloud. And it can basically run everything from a desktop computer to a laptop to a tablet to a smartphone. It's very flexible as far as its functionality on all those devices.

Mansfield: I want to speak briefly to the concept of the multi-site rollout. For those companies that are looking to take five or six sites and make sure they look, taste, feel, smell like the previous site they've had such success with, that's another strength within the TrakSYS solution set. Jeff spoke to the extensibility and the scalability. But when we finish with preliminary rollouts and we're able to start the next plant, we're already 50, 60, 70% done with the application, based on this huge, strong library of code that we've developed. This practice provides speed to market and that is a huge differentiator.

#### **PFW**: What makes TrakSYS a particularly good fit for the distillery market?

Mansfield: The distillery industry is very highly regulated. And very competitive. I challenge you to go down into the Bourbon Trail—you can pretty much go from one distillery to another and hit a good 300yard drive and hit the next. So competition is tight, and margins are extremely thin.

Our distillery partners also have a real focus on resiliency, asset reliability, the energy management side of things, and understanding the power of, for instance, water reuse and the impacts of burner management. Think of energy as an ingredient. These are all things that Parsec's TrakSYS does extremely well.

#### **PFW**: What other ways are your customers having success with TrakSYS technology?

**Mansfield:** Utilizing data sets is another big focus. There are so many different pieces of equipment in any given food and beverage plant that can be used in condition-based monitoring. Being able to move a company from a traditional rounds-based maintenance program to predictive, where you're able to replace a motor before it fails—simply change it during the next planned shutdown. So you're beginning to remove unplanned downtime events.

Also, TrakSYS has the ability of the track, trace and genealogy—from raw goods coming into the door, all the way through the production environment and even as the product is shipped out to the food and beverage customers. Track and trace is growing and extending, so it's an area that our clients want to understand. If they do happen to have a recall or if something happens from an agricultural standpoint to some of their ingredients, they now have the ability to go back and understand what that looks like, and why. Again, root cause analysis for the entire supply chain.

Panning: I recently had a conversation with a distilling client that was ready to take TrakSYS from the packaging area and put it into the distillation area. They're really interested in measuring variances in the process—things like temperature, whether the temperature is falling outside a certain range as they're going through that process, specific gravity, and things like that. It's going to give them better, more real-time data about those various factors. It's going to help them improve their quality, improve the throughput, reduce resources to make the product.

#### **PFW**: What advice can you offer manufacturers implementing MES/MOM?

Mansfield: MES and MOM, IIoT, I4.0—they're all journeys. And it is so inherently important that, specifically in the food and beverage industry, you slow down to speed up, take the time to find a partner, a software provider and systems integrator, that understands what it means to go through a deep-level discovery before you go out and start looking at technology stacks, and before you start trying to just go after a specific piece of functionality.

**Panning:** It truly is a journey. I think the projects I've seen that have been most successful are ones where the client is really looking at it as a journey where installing TrakSYS and getting it up and running is really step one. After that is incorporating it into their continuous improvement processes and programs, really leveraging TrakSYS as the tool to provide them the data they need to make better investment decisions and then make improvements in the process. It's an iterative process, moving from one improvement to another. Q

Matrix Technologies www.matrixti.com

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