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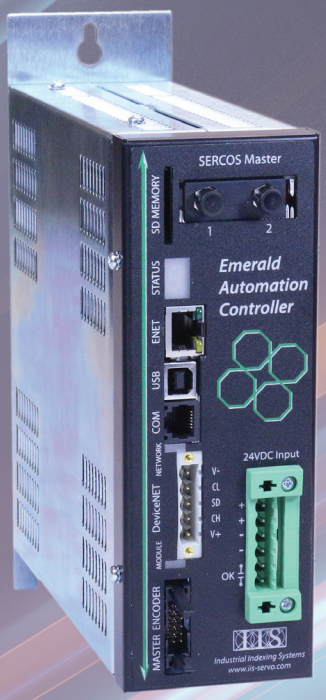

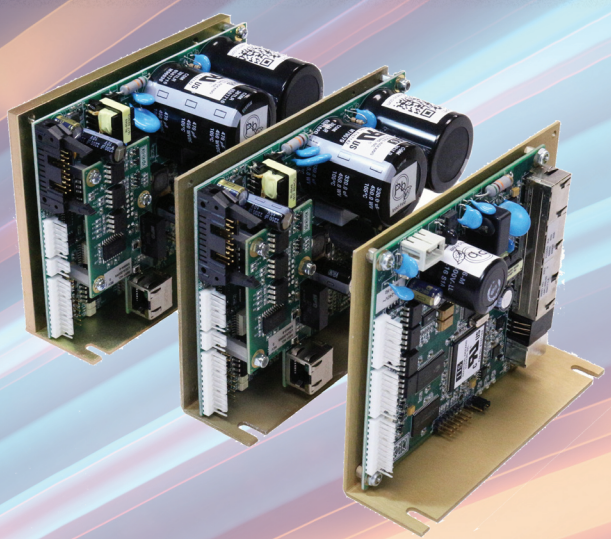

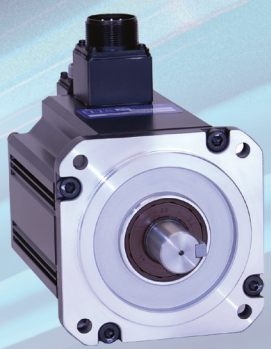

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EDITOR'S NOTE

Showing Off

Welcome to the August issue of *Packaging Technology Today!*

Bringing us all back up to speed… it's show time! What will your company be showing off at PackExpo 2021, taking place September 27 – 29 at the Las Vegas Convention Center?

Luckily PackExpo will be taking place in person this year, however, we can expect the formality of the show to change a bit as COVID-19 regulations continue to change in Las Vegas. As we await the final guidelines, one thing is certain… the show will go on.

All of us at Packaging Technology Today have been anxiously waiting to schedule our booth visits with your company. This year, I will be looking specifically to stop by to discuss upcoming editorial opportunities with you. Looking ahead to 2022, we will continue to cover trending topics such as:

1. The rise of eCommerce – Indeed, a top trend in 2020 and 2021 has been eCommerce packaging. Let's talk about what you are doing to keep up with the eCommerce boom.
2. Augmented Reality/Smart Packaging - Smart packaging has always been one of my personal favorite topics. Watching the growth of how packaging can educate customers while telling a story and bringing products to life, has caused some hype. An area we can expect to see continued growth in well beyond 2021.
3. Robotics and Automaton – As more packaging plants turn to robotics and automation to speed up production and increase accuracy, let's discuss how your company is transitioning new areas.

If you would like to discuss how your company can participate in editorial opportunities, feel free to email or call me to set up a booth visit.

Enjoy,

Joan Mantini

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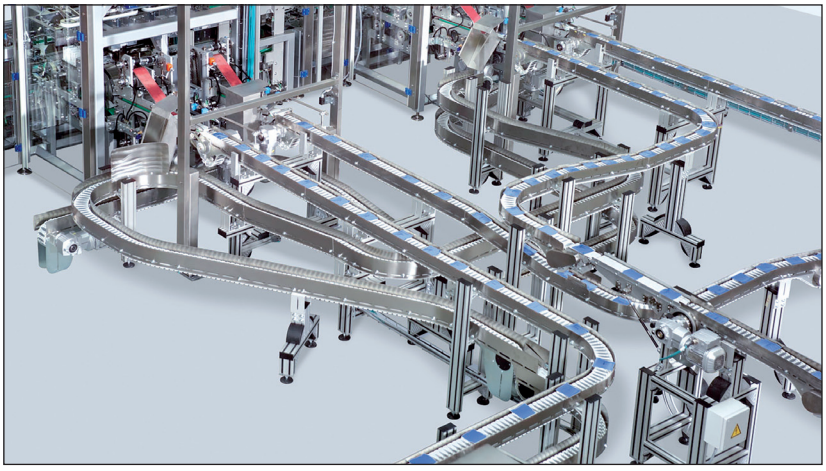

COVER STORY

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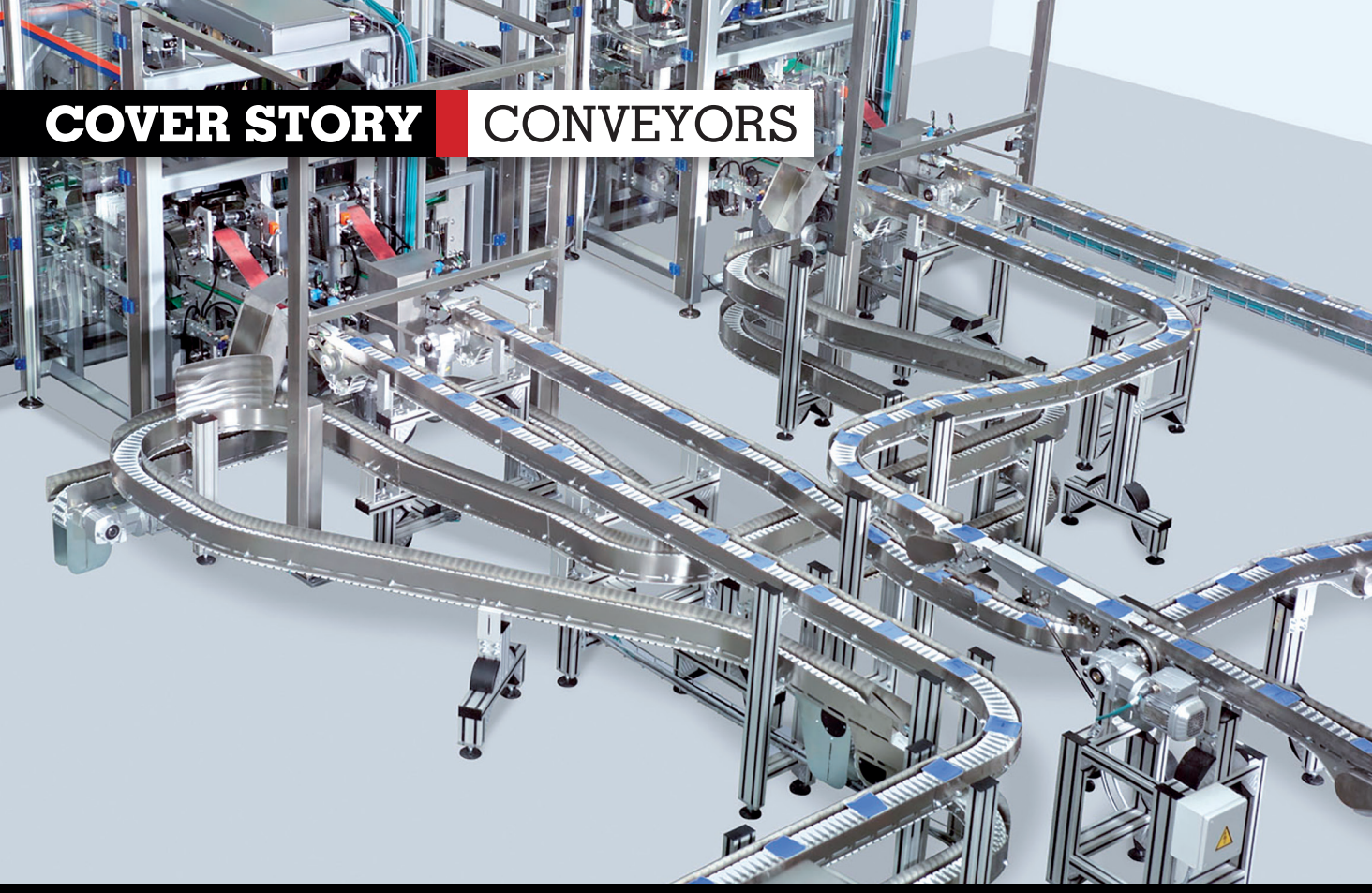


Today's advanced plastic chain conveyors, such as Bosch Rexroth's VarioFlow plus system, provide the modular flexibility and quiet, efficient transport today's packaging lines require to maximize throughput and productivity.

CONSIDERATIONS FOR CHOOSING THE RIGHT CONVEYORS FOR PACKAGING LINES

By Justin Quattlebaum, Product Manager for VarioFlow plus Conveyors

It's really no cliché to say that change is nearly the only constant in the packaging industry. Whether a packaging line is filling bottled water, liquid hand soap, battery packs or picnic plates, consumer packaged goods operations are constantly faced with the need to be agile and responsive to changing consumer trends, new product fads and innovative packaging concepts.

Coupled with the potential for unanticipated demand disruption, such as the massive spike in demand for household products during the COVID-19 pandemic, it's clear that packaging operations must have production platforms that enable efficient changeovers and reconfigurations of packaging workflows, technology that minimizes downtime when changes are necessary.

One of the most critical components for an agile, modular packaging line is its transport technology. Today's modular plastic chain conveyor systems incorporate design and technology features such as increased flexibility and more interchangeable conveyor modules. They also respond to several other key industry trends, such as larger and heavier packages, increased reliability and uptime through more reliable belts, chains and gearboxes and the ability to easily incorporate Industry 4.0 capabilities such as sensors into existing conveyor systems.

As the industry's needs have changed and evolved, so too have the key features and capabilities of plastic chain conveyor systems. Choosing the right system is critical when implementing a new packaging line or upgrading existing facilities. Understanding what capabilities the latest generation of plastic chain offers can help packaging lines make the best choice for their current and future requirements.

Key role of conveyors in packaging operations

At one time, conveying systems were seen as one of the last considerations as packaging lines were designed and equipped. It was relatively common to find that the design and layout of packaging lines focused on packaging machinery, and conveyors tended to be treated as simply

tasked with moving products from station to station.

However, today's generation of modular chain conveyor systems have demonstrated the central role and importance of a high-quality, high-performance transport system in efficient, well-organized packaging, assembly and material handling applications. Current chain conveyor systems function to sustain uptime and productivity and maximize the return on capital investment in the entire line.

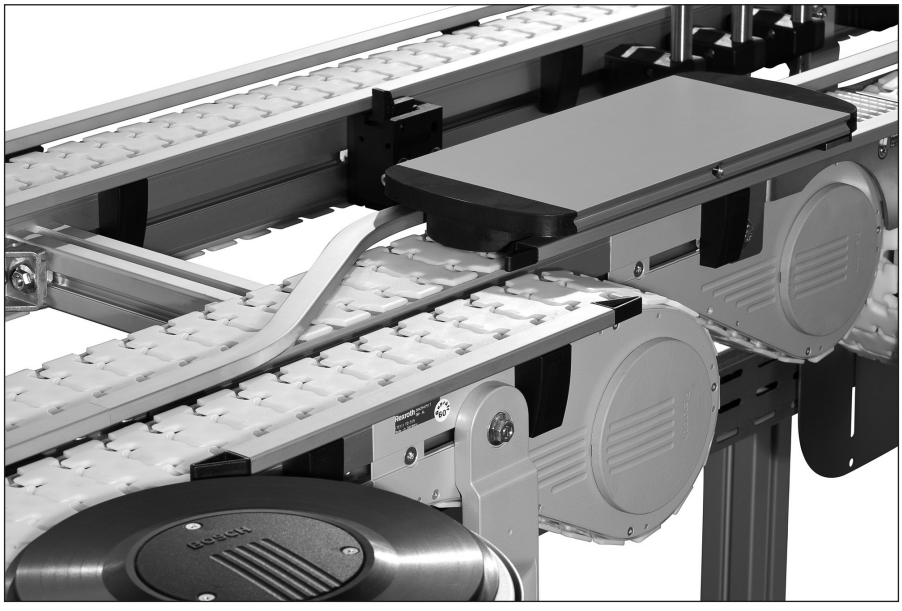
One of the most valuable contributions that flexible chain conveyors make to packaging lines is their modularity: the ease with which different components can be combined into the perfect layout and flow for a given production operation, and then the equal ease with which they can be modified and reconfigured to respond to changing product needs as market and consumer tastes evolve.

Modularity and flexibility are two of the most important considerations to assess when choosing a chain conveyor system. In addition, modular chain conveyors can relieve bottlenecks and other product flow challenges via line buffering and accumulators. They can also support rapid changes in process speeds, infeed/outfeed demands, production disturbances and changeovers for product dimension changes or labeling updates.

Chain conveyors that are engineered to maximize modularity feature components that can be easily combined for custom layouts. These components can include the flexible chain, guide components, curves, motors and gearboxes. Variable configurations can accommodate different package sizes and shapes and different climbs and descent rates when moving product from one level to another on a line.

New materials and multiple plastic chain options like those offered by VarioFlow plus give packaging line operations options as they design solutions for their unique product and operational requirements.

It's also important to assess the qualities of the plastic chain itself. A stable chain that can handle high tensile forces (today's leading chain conveyors support up to 1250 N) at high speed can save system cost by reducing the number of drives needed over a given length.



Standardized modular components such as diverters, accumulators, stop units and curve units make it easy to adjust and reconfigure transport layouts based on constantly changing consumer preferences and packaging formats.

New features offer improved performance and value

Leading chain conveyor manufacturers have continued to invest in their systems, incorporating advances in existing features as well as new capabilities to enable them to provide more versatile functionality and performance for packaging lines.

They have invested in improving core components of the conveyors to make all the components across different models highly interchangeable. With the introduction of common profile design, common slide rail design and a more uniform chain design, one leading conveyor system can now handle, under normal transport, up to 250 kilograms (kg) in a single line.

This is making it possible to provide packaging operations the ability to create much longer straight runs if they need to, based on their plant's footprint and specific production requirements. However, with the introduction of gear motors with an IE3 ef-

Leading conveyor manufacturers support their products with state-of-the-art digital design and configuration tools like Bosch Rexroth MTpro software, which enables product selection, configuration and ordering from a single tool.

ficiency rating, these longer runs remain energy efficient. The motors use the same amount of power that was previously used for shorter lengths; the newer motor-gearbox combinations can also be tuned to boost the power output so that heavier loads can be handled on the same conveyor.

These gear motors also offer an expanded range of throughput speeds — one conveyor provider supports throughput rates from three meters per minute up to 60 meters per minute for some very fast packaging applications, such as pill bottle filling or blister pack sealing.

There have also been advances in plastic chain design to accommodate a wider range of material weights and configurations and the way those materials need to be moved through packaging lines. In one example, a manufacturer needed to move lightweight metal and plastic product lids up multiple inclines. The conveyor manufacturer provided plastic chain with a flocked surface that provided just enough friction to hold the product in place as it moved upward without damaging the lids in any way.

Other improvements in plastic chain's design and the materials used in it, combined with refinements in the slide rail design, have significantly improved the coefficient of friction for the entire system. This provides several key benefits: conveyor moving parts last much longer and require less frequent maintenance intervals, the overall system runs more quietly, and the reduced friction also contributes to improved overall energy efficiency.

Conveyors offer a simple yet creative platform to help packaging companies guide products through specialized motions at relatively high throughput speeds. For example, if a packager needs to change the orientation of a box or package, to flip it over, turn it around or otherwise change its position on the chain, companies will sometimes purchase complex handling machines to perform the task.

However, sometimes a conveyor system can incorporate a guide rail positioned at 90 degrees to the flow of product, at just the right angle, to change the orientation of the product; or, if the package needs to be flipped over, it can be dropped off a ledge from one conveyor to the next to accomplish the move. Using these methods depends on several factors, such as the product being conveyed, the shape and dimensions of the package, how stable it is terms of center of gravity, and how fragile the contents may be.

Integrating chain conveyors into Industry 4.0 operations

Many leading packaging operations are making large-scale investments in Industry 4.0 technology and controls, seeking to capture, analyze and leverage real-time data about a host of automation operations to continuously fine-tune and improve their operations.

In many ways, chain conveyors can be viewed as the "backbone" of any successful implementation of I4.0 capabilities, since the con-

veyor transports the product from start to finish in the packaging flow. Companies are beginning to invest in "smart conveyors," using sensors or RFID tags to precisely track the flow of every item through the system.

There have also been significant moves to replace pneumatic actuation of diverters and other positioning devices on some conveyor platforms with electric actuation, which can incorporate I/O sensor and control data that connect with automation PLCs for a complete picture of the conveyor's operating conditions.

Conveyors are also being engineered to more easily integrate into electronic production floor Kanban systems so that the rest of the line and the plant knows how "the backbone" is operating. Combining this data with AI-based real-time analytics will enable packagers to rapidly find an issue on a line and resolve it with as little human intervention as possible, helping lower total cost of ownership and improve return on investment.

Working through the conveyor options

Modular plastic chain conveyors are high-performance, versatile components of any modern packaging line, offering the reliable operation and flexible configurability today's packaging operations need to meet constantly changing marketplace and consumer preferences.

Whether a company is installing a new packaging line or is considering upgrading or significantly redesigning existing facilities, it makes sense to work with conveyor technology providers who supply expert engineering support and online design and configuration tools. There are also advantages to working with companies that supply conveyors across multiple global markets — particularly if the consumer product company has packaging lines in multiple locations.

By engaging with a conveyor expert early, they can understand the unique space and footprint conditions of the facility where the conveyor will be installed, as well as the packaging processes, throughput and quality control requirements at both a packaging machine and assembly station level, as well as how the whole line works as one system.

They can provide recommendations and special features that can help ensure that the line operates with the efficiency, throughput and reliability needed to meet all production goals. ■

About the Author

Justin Quattlebaum is the product manager for VarioFlow plus Conveyor.

ALUMINIUM

PLEASE DECORATE RESPONSIBLY!

By Rob Day, CEO at Tonejet

Aluminium is an infinitely recyclable material, with over 75 percent of all the aluminium ever produced still in use today. And yet craft brewers often feel they have no choice but to contaminate aluminium beverage cans with plastic labels or shrink sleeves. Here is a look at beverage can decoration, the damage caused by the use of plastic labels and sleeves on cans and why alternative digital technologies are the sustainable solution.

Did you know?

- Used aluminium drink cans can be recycled and back on supermarket shelves as new drink cans in as little as 60 days.
- Recycling aluminium takes 95 percent less energy than producing it from its raw materials.

The low-weight, shelf-presence and freshness benefits of the aluminium can mean that it has fast become the container of choice for beverage brands. This is especially true in the booming craft beverage market, which now extends beyond beer to hard seltzer, water and cocktails. Aluminium is also one of the most sustainable packaging materials, being infinitely recyclable: the reclamation and smelting process does not alter its properties (as it can with other materials) and it can be re-used again and again.

With the increased popularity of craft beverages comes an increased need to stand out to the consumer, leaving many smaller artisan producers looking for affordable short run decoration methods. This, more often than not, results in aluminium cans being labelled or sleeved using plastic materials and adhesives. Plastic must be used as it will survive the can filling and washing process, but it has a detrimental effect on the recyclability of the can. PVC is still the most popular material for labels and shrink sleeves: its use creates additional steps in the recycling process and increases the number of cans which are rejected at the recycling center and end up in landfill.

The use of PVC creates additional steps in the recycling process and increases the number of cans to end up in landfill.

The desire to be carbon-neutral and a growing awareness of sustainable digital packaging technology is driving the adoption of new direct decoration technologies for some, but the majority of craft beverage producers remain unaware that the use of plastic label materials compromises the sustainability of the otherwise 100 percent recyclable aluminium can. To wrap a material that can be indefinitely recycled in any kind of plastic seems illogical.

Organisations like The Aluminium Association are helping to drive awareness and recently produced a container design guide aimed at maximising full circular recycling of aluminium. The guide explains that in the U.S., an increased use of plastic labels and ring-pulls, shrink sleeves, adhesives and other unrecyclable components is diluting the value of aluminium causing operational and compliance problems for recyclers and safety issues for workers.

As a result, authorities are beginning to legislate against the use of shrink sleeves and labels. In Quebec, for example, beverage cans must not carry labels or sleeves that represent more than 1 percent of the package total weight. Since aluminium is so light, a label will typically add 10 percent to its weight, so cannot be used. A total ban on the use of plastic shrink sleeves on beverage cans is predicted later this year.

As we have seen in other packaging markets, digital innovations will revolutionise this industry. Mass-market beverage cans are offset-printed directly when the can is manufactured, but this analogue approach in uneconomical for shorter runs. It is now possible using inkjet technology to print directly onto the aluminium can with no setup costs, making short runs possible. For craft brewers, this removes the recycling headaches associated with plastics, is lower in cost and provides a higher quality result than labelling or sleeving, indistinguishable from that of a traditionally printed can.

The Tonejet Cyclone addresses the customized and personalized marketing segment with a system that prints directly onto beverage cans.

Direct-to-can digital decoration has moved from technology conference topic to commercial reality in the last two years and continues to grow. Both craft beverage producers and global brands should understand the opportunity afforded by digital packaging for beverage can decoration.

Two digital approaches are currently available: piezo drop-on-demand inkjet (using UV curing inks) and Tonejet, which deposits food safe pigments digitally before over-coating with standard beverage can varnishes. UV curing inkjet inks suffer emissions problems when burned off in the can recycling process and should therefore be used with care. ■

ADDRESSING IMMINENT ENVIRONMENTAL CONCERNS FOR CANNABIS PACKAGING

By Cherlene Erauda, Marketing Coordinator at Calyx Containers

2021 will be a groundbreaking year in U.S. cannabis legalization, with key states such as New Jersey, New York, New Mexico, and Virginia ratifying adult-use and decriminalized possession. As the industry scales, it is now more important than ever to address the imminent environmental concerns associated with increased, widespread demand and production.

The cannabis industry holds both great responsibility and great potential for sustainable packaging as it is a niche of consumers and businesses alike. Consumers directly impact the industry's carbon footprint. And with the rise of environmentally conscious markets, there will be increased expectations for sustainable innovation that other consumer packaged goods are also currently experiencing.

However, the cannabis industry has extremely specific issues concerning sustainable packaging design. These cannabis-related businesses must carefully consider numerous conflicting licensing and compliance regulations, which could generate even more waste if sustainable practices are not adapted at an industry level.

The most prominent issue is that marijuana packaging designs must adhere to Child Resistant (CR) tamperproof requirements and other crucial compliance standards. These requirements cause tailored issues when it comes to recyclability and sustainability. A packaging solution might appear to be eco-friendly, but if it is lined with multiple layers of different materials such as metal and mylar, it can cease to be so. When two materials are bonded together – such as a metal container manufactured with a CR plastic ring, or Polyethylene (PE) foam seals adhered to Polypropylene (PP) caps – the final product is too impure to recycle at waste collection facilities.

Compliance solutions such as a CR zipper on bags pose the same problem. However, even cannabis bags without a CR zipper can also be considered non-recyclable. This is due to the same issue; multiple materials used to manufacture the bag itself.

And although packaging technologies in other industry sectors such as food and beverage have begun to create recyclable or biodegradable films, none of these solutions require an additional CR mechanism. If blending various materials together disallows them from being taken apart, and with no existing infrastructure designed for this type of packaging, it's likely that these products will end up in landfills at the end of their lifecycle. The cannabis industry, as the odd man out, would need to find another innovative solution regardless.

Labeling cannabis packaging poses its own issues, as the additional

Labeling cannabis packaging poses its own issues, as the additional material required to stay compliant such as paper or ink, can disrupt recyclability.

material required to stay compliant such as paper or ink, can disrupt recyclability. These strict regulations apply to all facets of cannabis labelling, such as properly signaled health warning labels, an adequate space provided for batch specific information, and even the permitted level of opacity. These laws and regulations also differ state-by-state, meaning that these packaging brands should be prepared to adjust their products and services to the current climate of the industry as well as the varying needs of customers.

Hundreds of thousands of labels are printed daily for the scaling demand of cannabis consumer goods. Unfortunately, not all of them are sustainable. Certain packaging solutions offer white or clear labelling on a compliant, recyclable, opaque container. But metallic labels, which are also offered, must be peeled off prior to recycling. There continues to be a considerable need for cannabis packaging designs that allow customized, compliant labelling to optimize brand identity without hindering the container's recyclability.

Infrastructure for sustainability

Another important factor to creating a sustainable packaging solution is establishing the infrastructure to collect and sort the waste. If a consumer doesn't take the correct steps to dispose of their packaging, it is likely to end up in a landfill. There needs to be a process to address these particular materials at end of lifecycle so that material recovery facilities, reclaimers, and buyers of recycled materials can make use out of what would otherwise be landfill waste.

Successful sustainable packaging companies should not only offer environmentally conscious products, but also integrate sustainability into their business practices. Packaging and inventory management companies such as Calyx Containers go beyond conscious raw material selection by incorporating sustainability into all stages of the product's lifecycle. Sustainable companies seek to minimize waste, energy, and material during the entire process, from manufacturing to transit to the end-consumer. Business decisions such as using less packaging material, optimizing space utilization during transit, and decreasing transit time by sourcing domestically create an efficient system that also positively impacts our planet. Conscientious business practices can be incorporated into retail as well, such as give back programs or loyalty rewards for returning a container. The more we incorporate sustainability into the evolving culture of cannabis, the better our industry will be because of it.

Sustainability in the cannabis space is complex, but must be addressed to properly encourage consumer-conscious decisions. While adapting to compliance standards in the current legalization climate, companies have the opportunity to set the standard of using sustainable, recyclable, or biodegradable materials to offset their carbon footprint. This industry, like many other industries, has a lot of work to do in terms of implementing sustainable business practices. At the same time, the cannabis industry has the most to benefit from creating a circular economy, as the niche demand creates the opportunity for companies to provide a branded experience in line with their sustainable values. In a nutshell, the most successful cannabis packaging brands do not sacrifice an exceptional customer experience relating to design, durability or customization, for necessary compliance standards and eco-friendly goals. These brands recognize the ripe opportunity and adapt their business to the modern day culture of cannabis. ■

About the Author

Cherlene Erauda is a cannabis industry professional based in Boston, MA. Her experience as a medical budtender cultivated her passion for the plant and the people around it. As a 2020 graduate of Bryant University, Cherlene has experience as a co-editor for the Bryant Literary Review publication, and as a major event specialist catered to international and multicultural-domestic students.

6 TRENDS IN DAIRY PACKAGING

By Devin Partida, Contributing Writer

The dairy industry is like most others in that it must continually innovate to keep pace with market trends. One of the ways it does that is by updating its packaging. Here are six trends for people to keep an eye on in the coming months.

1. Convenience-Centered Packaging

Dairy manufacturers must consider several factors when choosing the best kind of packaging for a product. For example, does the container keep the food fresh? Is it durable enough? Convenience is also an increasingly important aim.

Chip Simenz, vice president of sales for U.S.-based supplier ProMach Inc.'s flexible packaging line, said, "Packaging is being driven by consumers who want products that are packaged for convenient use."

That might mean squeezable sour cream that makes it easier for a person to dispense the desired amount to top a baked potato or a bowl of chili without causing waste. In another recent example, Elopak debuted a cap that stays connected to a beverage carton. People don't have to worry about dropping it or accidentally placing it on a dirty surface.

2. Plastic-Free Containers

Many company leaders and consumers are increasingly conscious of the problems that single-use plastics cause for the planet. Government leaders have started to crack down on them, too. For example, more than 125 nations have restrictions on single-use grocery bags. That move away from plastic also extends to dairy containers.

Finnish packaging specialist Kotkamills recently announced its plastic-free ice cream containers. The range includes bowls and cups, as well as larger box-type packages for retailers. The dairy sector has historically used plastic as a main material and coating for ice cream containers. However, this new option combines two paperboards to create packaging that offers the required moisture resistance and hygiene.

3. Increasing Options in Dairy Packaging Automation

Leaders from companies that engage in dairy packaging often realize that setting aside portions of their budgets for automated equipment could help. Those options can speed up the workflow while reducing the chances of strain or repetitive motion-based worker injuries.

For example, automated lift tables adjust to the appropriate height as a person adds or removes weight. That feature saves time and energy, especially when the tables have ergonomic designs to support human movement.

Robots also exist to help with pick-and-place tasks and handle delicate items, such as slices of cheese or flexible containers of yogurt. This allows companies to maintain high output levels while achieving excellent accuracy rates.

Individually wrapped cheese plastic wrappers does a good job of keeping the product fresh, but it's often not recyclable.

4. Resource Waste Reduction in Packaging Approaches

Besides investigating options to keep production levels high on dairy packaging lines, decision-makers also want to look at ways to reduce unnecessary resource usage. Such goals can tie into their corporate social responsibility goals, particularly with more consumers eager to support sustainable companies.

TetraPak now offers milk-packaging machinery that cuts greenhouse gas emissions plus minimizes the steam and water usage associated with containerizing the liquid. It also reportedly causes up to a 30 percent reduction in a company's operating costs.

In a related example of a trend, Brave Robot makes an animal-free dairy product with a whey protein with ingredients identical to what's in cow's milk. The company will begin printing its carbon footprint on each package of ice cream. It's reportedly 34 percent smaller than that of other dairy brands.

5. Recyclable Cheese Packaging

People who eat single cheese slices typically have to peel the plastic wrappers off them first. That material does a good job of keeping the product fresh, but it's often not recyclable, due in part because the film features multiple materials.

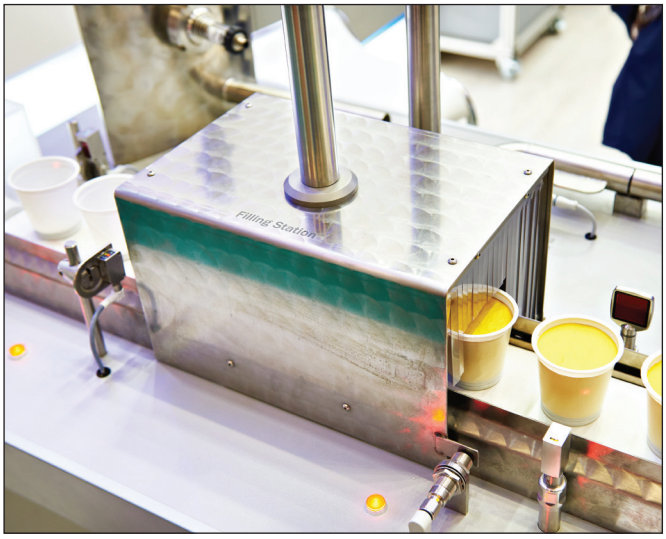
A collaboration between Mondi and Hazeleger Kaas allowed the two companies to create a new, more eco-friendly, single-material option. It features polypropylene thermoplastic in the main material and label. Thus, the entire packaging is fully recyclable.

The new design is also lighter, but it features the same level of protection as the earlier, nonrecyclable types. Andre Roeterdink, a procurement manager at Hazeleger Kaas, mentioned saving 9.2 metric tons of plastic annually due to the new design.

6. The Return of Refillable Milk Containers

From the 1920s to the 1960s, glass milk bottles were commonplace in parts of the world, including the U.S. and the UK. One of the benefits is that companies could reuse the containers after customers returned them. However, after that span, many countries switched to non-glass containers, mostly for convenience reasons.

That trend is coming back, though. Morrisons is one of the largest supermarket chains in the UK. It's putting glass milk bottles back on shelves in an 11-store trial. The company expects the decision will bring a sense of nostalgia to people who recall getting their milk delivered in similar containers decades ago. Additionally, consumers can return the bottles to the point of purchase, making them available for reuse.



Leaders from companies that engage in dairy packaging often realize that setting aside portions of their budgets for automated equipment could help.

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In Australia, a business called The Udder Way offers an alternative to the numerous plastic milk jugs that coffee shops go through in a typical week. It's a reusable, 18-liter milk keg and tap system. Company founder Ed Crick says each one can save up to 7,000 single-use plastic milk containers in its lifetime.

Dairy Packaging Stays Current

These six trends provide a glimpse into the changes manufacturers are making to ensure their offerings suit customer preferences and societal priorities. More of them should become apparent over time as dairy brands make ongoing efforts to stay relevant and keep profits high. ■

About the Author

Devin Partida is a BizTech and supply chain writer covering the latest in retail and packaging innovations.

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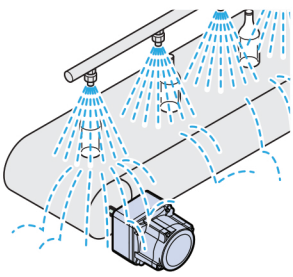

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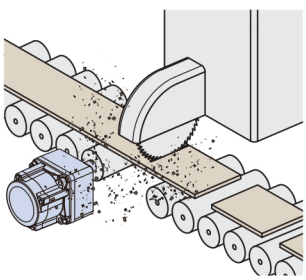

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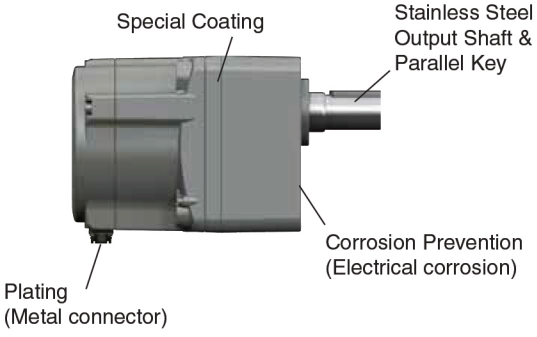

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THE VERSATILE LIFE OF POLYSTYRENE

By Cassie Bradley, Sustainability and Circular Economy Manager at INEOS Styrolution

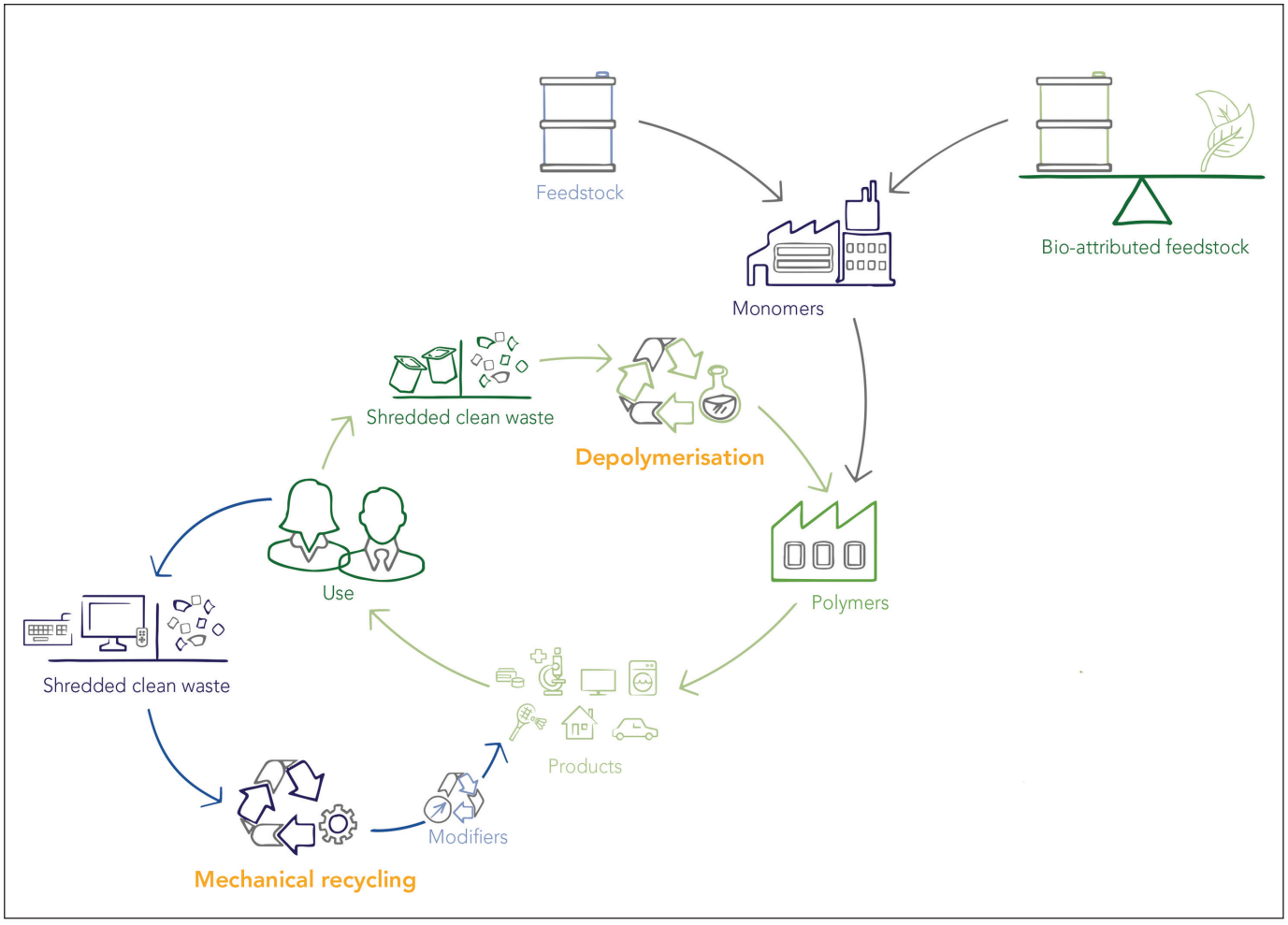
Ninety years ago, the first ready-to-use polystyrene was invented. Its beginnings go back even further to 1839 when German pharmacist Eduard Simon first discovered polystyrene by isolating a substance from the bark of a styrax tree. He noticed the new substance did not evaporate when heated, but instead thickened into a jelly. He called the new material styrene oxide, not knowing that he had just witnessed the very first polymerization of styrene (German: Styrol) rather than oxidation.

Polystyrene today

Since its inception, this valuable and sustainable material has enabled innovations in industries including healthcare, construction, food packaging and more, making it indispensable to our modern way of life. You are likely to find the highly versatile, safe, and hygienic material in products you use daily, such as the thermal moisture protection within the lining of refrigerators or in food packaging to extend the shelf life of food, keeping it fresher and safer while preventing food waste.

A circular life for polystyrene

Much like polystyrene continues to enable innovation in industries globally, advancements in recycling technologies for polystyrene also continue to occur. Due to the recent commercialization of several technologies, polystyrene has emerged as one of the most versatile closed-loop products. Using this valuable product to create a circular economy takes the "single" out of single-use products, including food-packaging materials, which means the benefits of polystyrene can be utilized again and again.



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Beyond the recycling techniques, polystyrene itself also has many inherently sustainable properties, which enable it to play a vital role in designing products for recycling and positive environmental impact.

First, polystyrene's material strength and rigidity often mean less material overall is used to create each package in the first place. In form alone, a polystyrene foam coffee cup, for example, is composed of more than 98 percent air. This means that very little plastic material is actually needed to create the cup. The unrivaled insulating properties are a bonus, eliminating the need for additional material in the form of a cup sleeve. Of course, these principles apply to applications other than just coffee cups and are a great way to meet the "reduce" goal from the "3Rs": reduce, reuse, recycle.

After initial use, the advantages of polystyrene also emerge during the sorting process. In the coffee cup example, both the cup and the lid can be made from polystyrene. Regardless of whether the cup is made from foam or rigid polystyrene, this single material combination means that the cup and lid do not need to be separated prior to disposal in the recycling bin. Whereas when using other materials, the lid would need to be separated from the cup before recycling, especially if one or both of the components are non-plastic.

Once it arrives at a sorting facility, polystyrene is one of the best sortable plastics* as its molecular properties hone unique signaling capabilities that allow for easy and extremely precise automated sorting.

How depolymerization of polystyrene works

After polystyrene is sorted, its unique chemical structure allows it to break down easily using advanced recycling technologies such as depolymerization, although additional technologies such as dissolution, pyrolysis, and gasification can also be used. In depolymerization, for example, the process breaks polystyrene down into its original molecular components, then purifies the material before feeding it back into the polymerization process to become polystyrene again.

This cycle can be repeated over and over without degrading the quality of the polymer. This is unlike traditional recycling, in which the recycled product requires that it be supplemented with virgin materials to maintain the polymer's properties. By using certain advanced recycling technology methods, recycled material is safe for use in food and drink contact or even medical equipment applications. This means your recycled polystyrene coffee cup may actually become a life-saving medical product one day versus being down-cycled or sent to a landfill.

Lower emissions impact

According to a study from Good Company** commissioned by the American Chemistry Council that compared pyrolysis-based advanced recycling air emissions to common manufacturing emissions, the emissions from advanced recycling facilities are similar to or lower than the emissions from common facilities such as college campuses, hospitals and food manufacturing. Advanced recycling processes occur without oxygen, meaning there is no combustion and, therefore, low emissions.

Additionally, INEOS Styrolution has done studies on the life cycle assessment (LCA) of advanced recycled polystyrene. Results show making styrene from post-consumer polystyrene waste has a greenhouse gas (GHG) savings of 37 percent less when compared to fossil-based styrene. Additionally, upscaling and optimization of by-products allow for GHG savings up to 50 percent lower than that of traditional virgin (fossil-based) styrene monomer production.

The future of polystyrene

Committing to closing the loop to move towards a circular economy for plastics is the next step in the evolution of polystyrene. Companies are working closely with plastic recycling technology partners with the goal of increasing global access to advanced recycling technologies. As polystyrene continues its ever-evolving story, we hope to ensure the polystyrene of today will be in continual use well beyond the next 90 years, too. ■

About the Author

Cassie Bradley is the sustainability and circular economy manager at INEOS Styrolution.

*http://www.ineos-styrolution.com/news/polystyrene-proven-to-be-one-of-the-best-sortable-plastics-in-the-waste-stream

**https://static1.squarespace.com/static/5e1380910c47256ea5b5c982/t/60535908f6ee2e1aff1bc2bf/1616075028828/Advanced+Recylcing_Emissions_Whitepaper_Report-3.18.21.pdf

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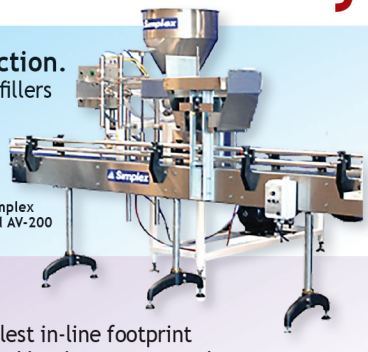
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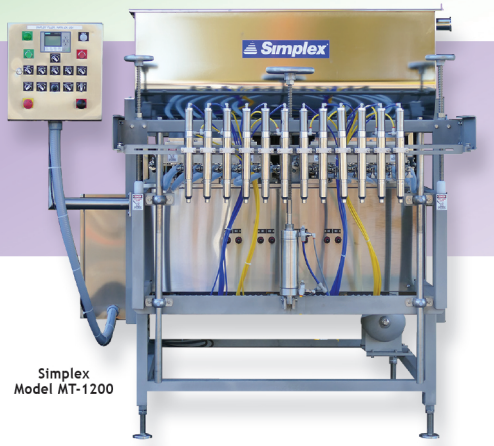

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PACK EXPO Las Vegas at a Glance

Live, in-person technology in action for the first time in 18 months is just one of the many features of PACK EXPO Las Vegas and Healthcare Packaging EXPO, taking place September 27-29 at the Las Vegas Convention Center. Show producer PMMI, The Association for Packaging and Processing Technologies, plans to reunite the packaging and processing community with over 1,500 exhibitors, targeted, world-class education and countless networking opportunities spread across four expansive halls at the Las Vegas Convention Center.

"Registration is already exceeding expectations, and we anticipate well over 20,000 packaging and processing professionals in attendance this September," said Jim Pittas, president and CEO, PMMI in July. "These numbers indicate an industry eager and more ready than ever to get back together. With thousands of attendees from CPGs and pharma companies already registered to attend and 1,500 exhibiting companies, this is the one place that will unite the entire industry this year."

In today's manufacturing environment, processing and packaging often come together as an integrated system, making it more critical than ever to bring both packaging and processing solutions under one roof. To meet this growing need, The Processing Zone returns with front-of-the-line solutions such as homogenizing, heat treating, forming/sizing and coating to help increase efficiency, achieve total system integration and ensure food safety. New in 2021 is the Processing Innovation stage, focusing on the latest processing breakthroughs.

Additional pavilions include the PACKage Printing Pavilion, showcasing the latest in cost-effective digital printing solutions; The Containers and Materials Pavilion, displaying the latest in new recyclables and bio-based materials, printable films, flexible, resealable and plant-based packaging; The Reusable Packaging Pavilion: sponsored by the Reusable Packaging Association (RPA), highlighting sustainable packaging solutions and the Confectionery Pavilion, home of the Candy Bar Lounge, sponsored by Syntegon Packaging Technology and hosted by the National Confectioners Association (NCA).

The brand-new PACK to the Future exhibit takes attendees on a journey through the evolution of packaging and processing, how the industrial and scientific revolutions led to rapid innovations and mass production and how the digital revolution is shaping the future. This curated exhibit includes nearly 30 historic packaging and processing machines dating from the late 1890s to the late 1970s with imagery supplied by museums and instantly recognizable consumer packaged goods brands including Coca-Cola, General Mills, Kellogg, Hormel, Anheuser-Busch and Merck. The PACK to the Future Stage will highlight future technology, including innovative sustainability initiatives, eCommerce solutions, smart packaging and artificial intelligence.

The Technology Excellence Awards allow attendees to rec-

ognize and vote on innovative exhibitor technology new to PACK EXPO Las Vegas and Healthcare Packaging EXPO. Winners will be announced at the show on Tuesday, Sept. 28. Additional packaging award winners from the past year-plus will reside at The Showcase of Packaging Innovations®, sponsored by WestRock, and located within The Containers and Materials Pavilion.

Education is a hallmark of any PACK EXPO event, with PACK EXPO Las Vegas and Healthcare Packaging EXPO once again featuring free 30-minute exhibitor-hosted seminars on breakthroughs and best practices at The Innovation Stages. The Forum offers free, 45-minute learning sessions on the latest industry trends, including hands-on activities, small group discussions and Q&As with leading organizations like the OpX Leadership Network, CPA, the Association for Contract Packagers and Manufacturers, The Organization for Automation and Control (OMAC) and PMMI Business Intelligence. Attendees can also learn the latest trends and benefits of reusable packaging in the Reusable Packaging Learning Center.

The Packaging & Processing Women's Leadership Network (PPWLN) breakfast: The New World of Work, combines networking and education, with a panel discussion of key industry trends, like moving to digitalization and automation on the plant floor and their impact on workplace diversity.

In addition to driving more women into the industry, the Workforce Development Pavilion, located in the North Hall, is a one-stop-shop for strengthening and growing the packaging and processing workforce. Learn about PMMI U offerings, or attend a PMMI U workshop on Risk Assessment, Certified Trainer or Fundamentals of Field Service (separate registration required).

PACK EXPO Las Vegas and Healthcare Packaging EXPO also offer activities aimed at getting students excited about careers in packaging and processing with robotics teams from Las Vegas area high schools showing their robots in action at the Future Innovators Robotics Showcase, sponsored by Rockwell Automation and The Amazing Packaging Race, sponsored by Emerson, bringing teams from colleges and universities to complete tasks at the booths of participating exhibitors.

To keep track of all the new additions as well as old favorites, attendees can use My Show Planner to check the schedule of booth activities, add education sessions, plan routes around the show floor and even schedule meetings in advance with exhibitors to maximize time in Las Vegas.

Visit packexpolasvegas.com for more information and to register. ■

PACK EXPO Products Spotlight

Cama North America
Booth C-3614

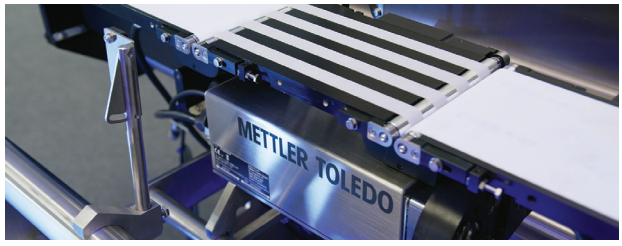
"Cama will showcase its CL169 side-load cartoning machine and FW748 wrap-around case packer. Part of the BreakThrough Generation (BTG) Series, both machines offer fast RFID-based changeovers and the flexibility to run a wide range of packaging formats without increasing machine footprint. In addition, Cama will demonstrate its Augmented Reality (AR) capabilities." Visit www.camagroup.com

Insignia Die Cutter
Booth N-10011

The Insignia Die-Cutter produces folded cartons, flat line boxes, labels, retail hang tags, card carriers, PSA stickers and more. With its ease of operation, fast set-ups and changeovers, Insignia fits in all type of packaging facilities. Die-Cut, kiss-cut, crease, emboss, plus automatic matrix removal make Insignia a powerhouse production built machine available in four sheet sizes. Visit www.rollemusa.com/diecut, (800) 272-4381.

FlashCell
Booth C-1814

METTLER TOLEDO will demonstrate several new technologies, including FlashCell™, a new load cell for C-Series checkweighers, the T60 Integrated 360 Series vision system which provides serialization and aggregation of bottles and vials, two new metal detection systems, and a new x-ray inspection system for high speed confectionary lines. Experts will be available to discuss the features and benefits of each. Visit www.mt.com/pi, 813-889-9500. See us at Pack Expo Booth C1814



Questar Polyester Films
Booth SU-7742

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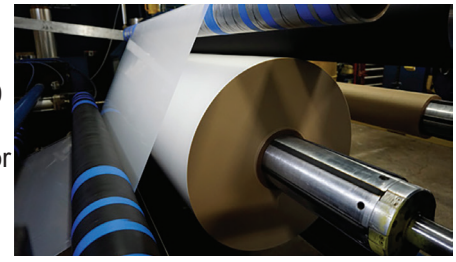

PACK EXPO Products Spotlight

Print and Apply Label System
Booth N-16002

The MPERIA® A-Series print and apply label system is simplicity in its finest form; enabling consistent and precise label placement with an advanced safety design in a compact frame that enables easy installation on your production line—even in confined spaces. Built with your production in mind, the A-Series is the industrial label print and apply system you've been looking for. Visit https://matthewsmarking.com/product/automatic-labeling-machine/ for more info.

Viper Thermal Inkjet Printer
Booth C-5000

The Viper thermal inkjet printer offers a versatile yet cost-effective solution for coding and marking applications with up to 0.5" (12.7mm) of print height per printhead. Viper TIJ utilizes hi-performance Funai® no-mess ink cartridges to print up to 600 dpi hi-resolution codes on a variety of porous and non-porous surfaces. Squid Ink Manufacturing, www.squidink.com.

RSM520HD-DIGI-VARICUT
Booth N-18004

As a manufacturer of digitally printed folding boxes and in-mold labels, you are on your way into the future with the new RSM520HD-DIGI-VARICUT. This machine features a hybrid drive technology for format-independent processing of digitally printed packaging materials & films. The innovative drive technology combines continuous and vector rotary die cutting technology in re-registration mode allowing minimal tooling investments. Visit www.cutting-creasing.com for more info.

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VFFS Bagger
Booth C-2614

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LIVE Machine Demo - Complex Converting with inline Heat Seal Pouching – Booth C-1617

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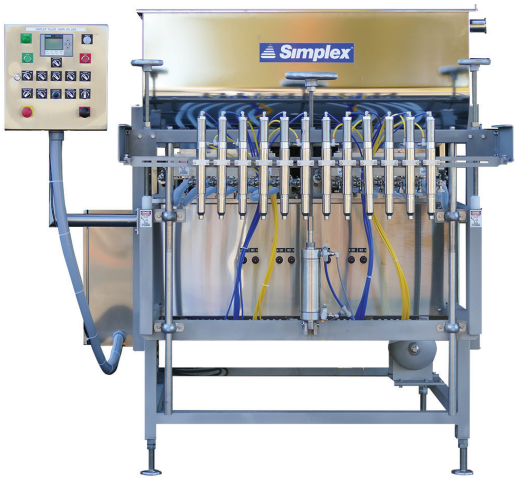

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