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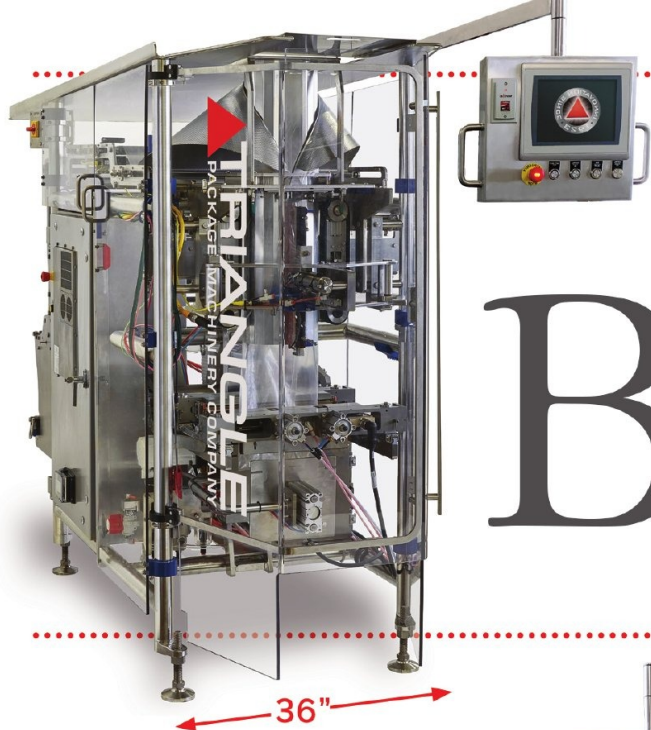


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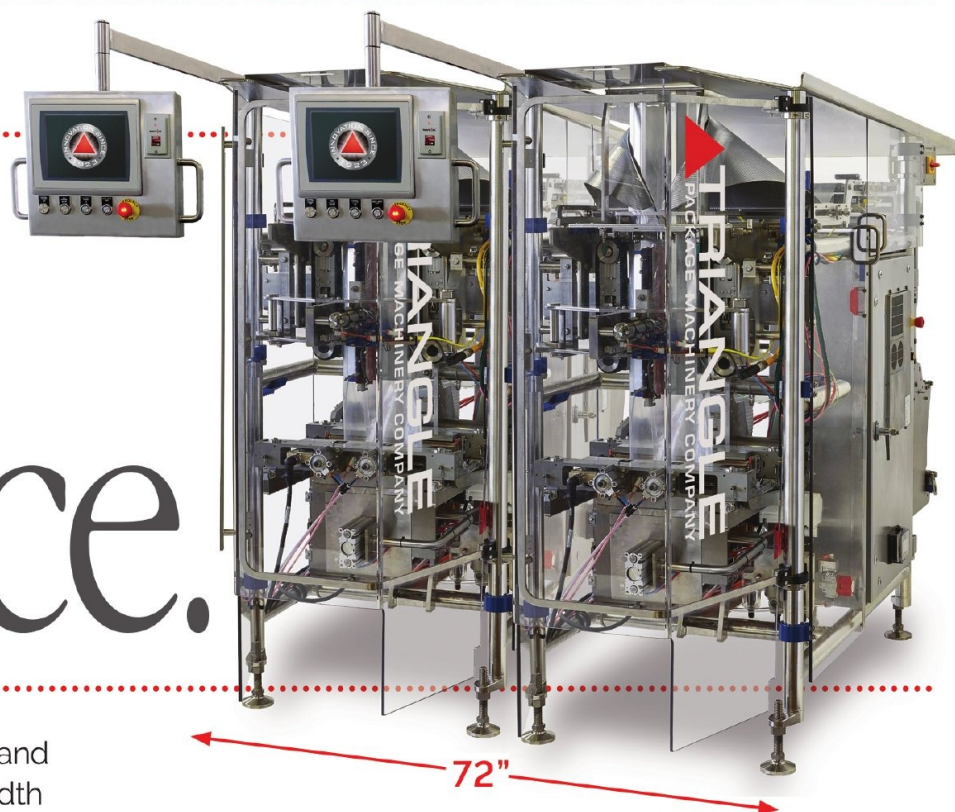


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## EDITOR'S NOTE

### Meeting the Big Moment

Creativity in package and label designs are booming in the cannabis industry with packaging providing a large percentage of available brand sales opportunity. However, the current state of cannabis legalization in the U.S. makes creating a nationally recognized brand very difficult... but not impossible. Many in the industry still remain hopeful that the Federal Government will remove cannabis from the Federally scheduled narcotic list. In doing so, the wall surrounding each states ability to export would be brought down and doors would open up for the industry. But until this happens, we are still faced with obstacles.

Regardless of the challenges, companies within the cannabis industry are still finding ways to use packaging to help build brand recognition by promoting their products on social media and promotional materials, and many state level groups are being formed to fill the void of federal level certifications in classifying cannabis farms as organic as well.

For consumers, when it comes to selecting the best CBD product the packaging needs to be reflective of the brand's transparency and contain the valuable education

needed to make an informed purchase. In fact, research shows that the majority of Americans are unaware of the benefits of CBD. This lack of education opens the door for CBD packaging to be used as a valuable resource in educating consumers on product benefits.

Indeed, as more and more states are legalizing cannabis, we continue to focus on its packaging with significant growth in this sector. Amongst the articles in this issue, you will find "Packaging Must Meet Marijuana's Big Moment" which discusses this further. Also a topic we plan to cover more frequently in *Packaging Technology Today* throughout 2021.

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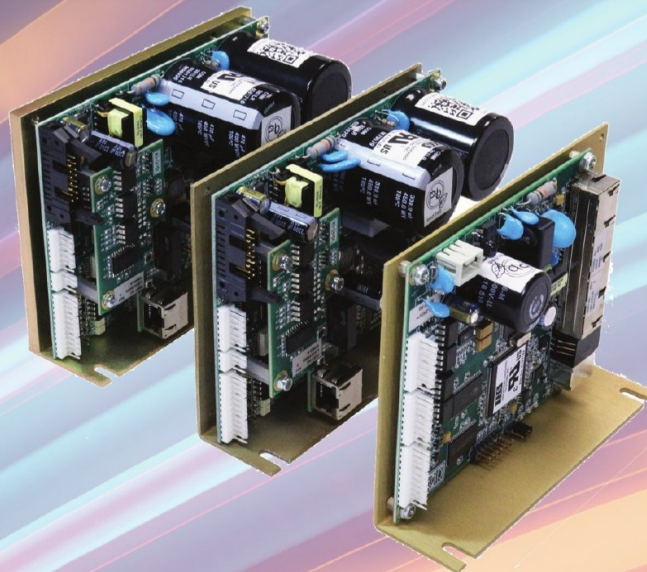
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**Tubular cable conveyors can significantly adapt to packaging needs while reducing product damage, energy use, noise, and maintenance**

# **FLEXIBLE FOOD PACKAGING SYSTEMS:**

## **BOOST PROFIT WITH GENTLE CONVEYING OF VALUABLE PRODUCT WITHOUT USING AIR**

By Karl Seidel, Marketing Director of Cablevey Conveyors

**I**n food processing, greater adaptability in packaging is required as the market continues to shift from share-size bags to single-portion packages. This change requires advanced packaging machines that provide flexible packaging materials, sizes, high speeds, and lower reject rates.

However, packaging size reduction requires additional adjustment of other parts of processing technology to ensure that the packaging line can cope with the produced amounts efficiently. For this reason, food processors – particularly of snacks and other high-value products – need to invest in adaptable transfer systems that can ensure the gentle and sanitary movement of specific amounts through different production stages.

This is particularly true of valuable products susceptible to damage such as nuts, chips, etc. as well as small or individual sized packages of coffee, cereal, and dry pet food, where material breakage and loss is a costly problem that can harm the bottom line. Even a difference

between 1 percent waste and 5 percent can mean the difference between profit or loss.

To convey such delicate food product, packagers and processors should avoid conveyors that may force the fragile material through stressful phases during transport that could impact its integrity, while still meeting high throughput requirements. Given this need, some packagers are reconsidering conveying fragile, high value products using high velocity air power through tubes, bends, or sweeps before it is unceremoniously dumped into bins or containers.

In the coffee industry, for example, processors go to great expense to roast whole beans. However, the beans can be damaged by high velocity air conveyance, compromising flavor and aroma, according to Gary Schliebs, a process engineer and director of plus one percent at Engineered Solutions, a consulting firm that works in the food industry and markets food industry conveyor equipment globally.

When a whole macadamia nut is broken, its value can drop by half.



Instead of a premium price for whole nuts, damaged nuts are often sold at a substantial discount, and often crushed for use in cooking or processing further upstream in the food packaging industry.

“Many high-value food products can be fragile and need very gentle handling. Otherwise, whole forms can be broken, crushed to bits, and even turned to powder. This significantly lowers the value of the product, and damaged portions may need to be removed or disposed of to prevent perceived quality issues that could prompt customers to turn to other brands,” said Schliebs. “In some cases, more than 10 percent of delicate product can be damaged by high velocity air-power systems. The cost to the packaging industry is compounded because the damage often comes at the end of the process, after considerable value has been added, only to have it degraded by a poor choice in the selection of transfer conveying equipment,”

### **The limitations of air conveyors**

Food packagers and processors need to be aware that a wide range of fragile, high dollar value food products can be prone to excess breakage when conveyed at high velocity by air-power, such as in pneumatic and aeromechanical systems.

Pneumatic conveyor systems utilize air by creating air pressure above or below the atmospheric level. These systems use filters that require regular replacement. The two main types of pneumatic conveyors – dilute phase and dense phase – differ by speed and pressure, and both can be configured as a pressure or vacuum system.

In dilute phase conveying, the food product is suspended in the air as it is transported through the conveying pipe at extremely high velocities of typically 3,400-5,000ft/min. While the product usually has minimal breakage during straight pathways, most systems have bends and sweeps where it can be forced through constricted areas, quickly change direction and be damaged. In such cases, high-dollar value food often can be too fragile.

Dense phase pneumatic conveyor systems, where the product is not suspended in air since it is heavy or abrasive, function at lower velocity than dilute phase. However, with air speeds of about 700-1,500ft/min., delicate food items are still susceptible to breakage at bends and sweeps.

While aeromechanical conveyors have a different method of conveyance, these enclosed, high-capacity mechanical systems can also degrade delicate product. With these systems, a wire rope with evenly spaced discs within a tube travels at high speed, running in sprockets at each end of the conveyor. This generates an internal air stream traveling at



the same high velocity as the discs that carry product along in the tube. However, these conveyors may also force vulnerable materials through stressful phases during transport, which could impair their integrity.

“Any fragile or friable food product conveyed at high velocity is prone to damage, particularly if it changes direction or exits with impact. This can be the case with both pneumatic or aeromechanical conveyors,” said Schliebs.

### **A gentler approach boosts profitability**

According to Schliebs, a gentler alternative to protect sensitive, high-value packaged food products is to utilize tubular cable conveyors. These systems move product through a sealed tube using a coated, flexible stainless-steel drag cable pulled through on a loop. Solid circular discs (flights) are attached to the cable, which push the product at low speed through the tube without the use of air, preserving product integrity and minimizing waste.

“Food industry manufacturers can decrease product damage down to 1-2 percent with a slower process like a tubular cable system. With it, product is gently transferred at low speed, so there is minimal to no damage,” says Schliebs.

In the packaged food industry, tubular cable conveyors are utilized for products such as snacks, nuts, cereal, coffee, pet food, beans, and seeds. The systems can convey up to 2000 cubic feet per hour (56m<sup>3</sup>/hr.) of flakes, pellets, shavings, crumbles, granules, regrind, chunks, parts, prills, and powders with numerous lay-outs using multiple inlets and outlets.

Since the material is carried between the flights, it is also much easier to safely convey some sticky or easily compacted materials in a tubular cable conveyor than in air-powered conveying systems, where such materials can form plugs.

“With pneumatic or aeromechanical conveying systems, any soft or sticky material, like dried fruit, can smear and adhere to surfaces,



particularly at bends and sweeps that change direction, which is not an issue with tubular cable conveyors," said Schliebs.

According to Schliebs, the tubular cable conveyor's modular construction can also help reduce product damage by enabling it to slide out on a gentler gradient, rather than simply drop out, as is more typical with conveyors utilizing air.

"To minimize product damage, it is important for food industry manufacturers to not only transfer gently, but also get product in and out of the conveyor safely and gently as well. That is more achievable with a tubular cable conveyor that allows product to slide down rather than drop out the end," says Schliebs.

For packaging lines, in fact, most tubular cable conveyors have interchangeable components that allow the conveyor to be easily expanded or reconfigured to change the length, conveying path and the number of inlets and outlets. These modifications are more complex and time-consuming with a pneumatic conveying system because it has more components and electrical connections.

Also, another bonus of such systems is that the "footprint" can be quite small compared to other conveyor systems, and that really helps with tight and compact packaging and manufacturing areas.

"Because of the 'bespoke' design of each tubular cable conveyor system for customer specific requirements, we can tailor the design to be very 'non-intrusive' in the work area and not hinder access for people and maintenance, as other systems can. This is a real bonus for safety, access and saving floor space, which is another cost to manufacturing," said Schliebs.

### Less energy use, less noise

On food packaging and process lines, since pneumatic systems convey product at high velocity, this typically requires larger, power-hungry motors that run fans, blowers and rotary valves. In a dense phase system, a pressure tank requiring compressed air consumes additional power.

In terms of noise level, pneumatic conveying systems also generate considerable noise. Aeromechanical systems, running at high speed, generate considerable motor and disc noise as well.

Given that smaller motors are used, tubular cable systems are quieter overall and utilize much less energy.

"A low-speed tubular cable system is quiet enough to easily have a conversation around it while it is running," says Schliebs. "In regards to energy, it utilizes about one-tenth that of pneumatic systems. For dense phase models, the electricity savings by using a tubular conveyor can be sizeable, with 1-year ROI in some cases." ■

### About the Author

Karl Seidel is marketing director of Cablevey Conveyors, a mechanical conveyor manufacturer that serves the specialty food, coffee, nut, powder and pet food markets. The company acts as a disruptor to traditional conveying solutions by manufacturing and commissioning enclosed tubular drag cable and disc systems globally.

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**Adding lubrication has always been felt necessary to the smooth application and removal of aseptic closures. Recent engineering efforts have eliminated that need.**

# ELIMINATING CLOSURE LUBRICATION IS A CRITICAL KEY TO THE SUCCESS OF AN ASEPTIC PACKAGED BEVERAGE

By Mark Hewett and Jeremy Yocca

**B**oth the physical structures and industry applications of aseptic packaging have evolved in recent years, driven by what this unique type packaging offers to manufacturers of certain beverages. It extends the shelf life of products—the number and variety of which increases over time—without refrigeration. This, in turn, significantly reduces losses from spoilage prior to sale. It also lowers the costs of those products' shipping and in-store display by allowing products to be both moved and shelved at ambient temperatures rather than refrigerated.

As a result of the increasing number of ways they can benefit manufacturers, distributors and retailers, not to mention their increasing popularity with consumers, leading to higher demand, aseptic packages have steadily evolved. This includes one of the most critical elements of the aseptic package, the closure.

This evolution of aseptic packaging has culminated in today's top-quality aseptic closures, which are lighter in weight, linerless and (depending on the manufacturer) lubrication-free. Today, such closures seal a wide variety of beverages from fruit-based juices and dairy products to enhanced sports drinks and clear water.

Typical aseptic closures carry lubrication that has been added to the resin makeup before molding to make closure application easier and smoother. An extensive engineering effort has now produced a new aseptic closure that is lubrication-free. The closure features a linerless plug design that enables smooth application by the packager and easy removal by the consumer without the need for added lubrication.

The elimination of these lubricants has been an especially important evolutionary step. Certain products packaged aseptically are sensitive to the lubricants. Bottlers of water have found the lubrication occasionally



imparted a slight taste to the product. In addition, during application, some European companies have found that these lubricants can also create a challenge for the filler's aseptic sterilization process. During wet sterilization, especially of fruit drinks, the lubricants can be washed away and accumulate in the operation's filtration system, which in turn increases the frequency of changing filters and consequently raises the cost of managing the system.

As a result of the elimination of the lubricants, the consumer can still comfortably remove the closure, while bottlers can apply closures efficiently and no longer have to contend with interference in the productivity of their closure sterilization process due to clogged filters.

### Successful characteristics

The most successful aseptic closures share a number of features that contribute significantly to the success of a product. They incorporate the tamper-evident bands that are a necessity in today's food safety-conscious market. Linerless closures help reduce package weight and material cost. A closure design that performs well without lubrication provides the consumer with easy opening and benefits the packager by providing easy closure application while removing a potential source of product adulteration and production shutdown by keeping



**Opening the closure on a bottle is the first engagement between the consumer and a packaged beverage.**

system filters lubricant-free.

Opening the closure on a bottle is the first engagement between the consumer and a packaged beverage, even before the first sip of the beverage. This is the first opportunity for the brand to make a positive impression. It is the moment when the closure manufacturer's extensive investment in design, engineering and approval testing will pay off for the brand owner. ■

### About the Authors

Mark Hewett is director of technology commercialization with Silgan Closures. Jeremy Yocca is a senior packaging engineer with Silgan Closures, specializing in aseptic packaging.

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# ADAPTABILITY, AGILITY, AND MAINTENANCE...THREE KEYS TO PACKAGING SUCCESS DURING COVID-19

By Sander Smith Produce Manager at Wexxar Bel

**U**ndoubtedly, phrases such as COVID-19, social distancing, essential workers and quarantine represent defining images of the turbulent, challenging year that was 2020. But perhaps adaptability and agility should be added to that list as well. That's because nearly every business within the food, pharmaceutical, manufacturing and packaging sectors had to adapt to the suddenly changing business landscape that occurred almost overnight, with the agility to make the necessary decisions quickly and decisively.

Companies have had to deal with regional restrictions that dictated different levels of shutdown from one state to another. This led some to temporarily alter their business model and target a different audience. For many food manufacturers with labor intensive packaging operations, social distancing requirements, coupled with a surging demand or significant change in product mix, posed further challenges to navigate and overcome.

Industries needed to adapt and be agile in 2020, and that same outlook seems to be holding true into 2021 as well. For many companies,

that meant new adding space to employees where there wasn't in the past. Enter mobile packaging machines. If your packaging line is designed to be mobile, then equipment can be moved throughout a facility to accommodate changing social distancing mandates.

Realizing that conforming to these newfound distance requirements is going to be a critical component to success in 2021, companies have been reaching out to OEMs for advice on solutions they can quickly implement. Manufacturers, have responded in kind by redesigning compact, modular packaging lines that typically were staffed up to three to four employees, to now manned with a single operator, while still maintaining adequate productivity. This allows companies to maintain production goals, while providing a safer work environment for employees.

Along with adaptability and *agility*, a third term to include that can sometimes get lost in the shuffle is *maintenance*.

It's equally important not to neglect basic maintenance procedures during COVID-19. To ensure packaging machinery and equipment are operating at a high level, Matrix Packaging Machinery, a ProMach



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brand, recommends companies follow these important maintenance guidelines:

**Keep it clean** – One of the simplest things you can do to keep your machinery running well is to keep it clean; the cleaner a machine is, the better it will operate. Cleaning should include all mechanical parts and be performed once a shift. It's important to always turn off and disconnect power to the machine prior to cleaning.

**Don't ignore preventive maintenance** – If you're experiencing an increase in production, it may be tempting to push back the preventive maintenance schedule for your machines – it's critical to not skip preventive maintenance. Packaging machines are engineered to be serviced at specific intervals. Delaying service could lead to premature component failure and a longer, more costly downtime when you can least afford it. Cleanliness and preventive maintenance go hand-in-hand; don't cut corners and skip these two essential steps.

**Keep spare parts on hand** – Hopefully, you have a bench stock of spare and consumable parts, such as belts, knives and heating elements readily available. This will obviously help facilitate quick repairs and minimize machinery downtime. If you don't have an adequate bench stock set up, some OEM suppliers can perform a parts audit and prepare a recommended parts list of common replacement parts to keep in stock. Essentially, a parts audit helps you develop a parts plan, streamlining the inspection, repair, and maintenance processes for your packaging equipment.

**Schedule a service call** – Most reputable OEM suppliers are still conducting service calls with customers. If your OEM supplier does handle your machines' preventive maintenance, those field-service visits will likely occur as scheduled. An uptick in business means it's more important than ever to keep those maintenance appointments. Keep in mind that some service and troubleshooting can also be done through remote monitoring.

The companies that are staying ahead of

the game are the ones that have been able to adapt to the current landscape – ones that are agile enough to go out there and get it done.

Some people are calling this the new normal. While that remains to be seen, our current situation is an environment we all likely will be working in for some time. As 2020 rolls over to the new year, the key to success lies in finding those opportunities and be in position to quickly act upon them. That takes adaptability and agility...and of course maintenance – three words that will come to define 2021. ■

## About the Author

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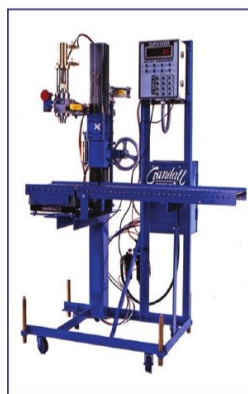
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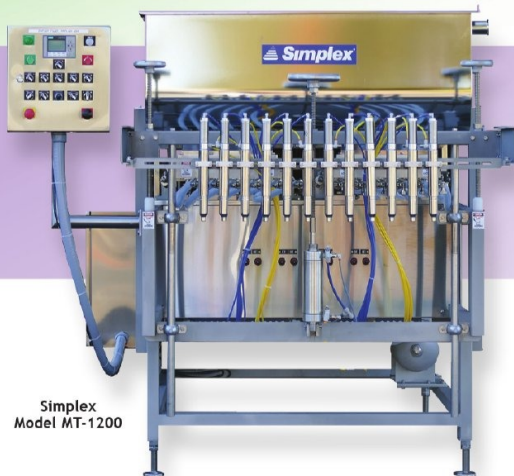
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Total Fat	<1g	1%**
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When it comes to selecting the best CBD product the packaging needs to contain the valuable education needed to make an informed purchase.

## WHAT TO LOOK FOR WITH CBD LABELING

By Chase Terwilliger, CEO of Balanced Health Botanicals

After spending hours researching what CBD is and how it works, many people wanting to try CBD are often hesitant to make that first purchase. Some are afraid of purchasing the wrong type of product for their needs. Others are afraid of being taken advantage of after learning that many products on the market contain little, if any, CBD.

When it comes to selecting the best CBD product, as with any product on the shelf, the packaging needs to be reflective of the brand's transparency and contain the valuable education needed to make an informed purchase.

In fact, research shows that 80 percent of Americans are unaware of the benefits of CBD\*. This lack of education allows the opportunity for a brand's packaging to be the key source to educate the consumer on the value CBD can bring to their lives.

It's important to note that true leaders in the space will never make medical claims not supported by science, will ensure their products have true bioavailability, and will never mislead the consumer with weary marketing tactics that just use the three letters "CBD" in front of a product.

Before you make a product selection, it's important to know you are selecting a high-quality product that is as pure and potent as the manufacturer claims. As you look at your potential products packaging, here are the suggested items to look for in order to make sure you are making the best purchase:

### #1 Extraction Processes

It is important to choose a CBD product that is manufactured by a company that follows Good Manufacturing Practices in their extraction process. The CO2 extraction process is the most popular as it involves filtering liquid CO2 through a series of chambers packed with industrial hemp that controls temperature and pressure.

### #2 Third-Party Testing

When purchasing CBD, it's important to select products from companies that have their hemp oil tested by a third-party lab. Third-party testing ensures your products don't contain harmful chemicals or microbial contaminants and verify that products are as potent as the manufacturer claims. Since any company could claim their products are tested, it's best to purchase your products from a company that lets you see the test results.

### #3 THC Levels

You can use viewable third-party test results found by scanning a QR code on a reputable company's package in order to view test results for the exact batch to confirm that the CBD product you select meets regulatory requirements. You need to ensure that delta-9 THC levels do not exceed 0.3%. If your product contains more than 0.3 percent THC, it is no longer classified as hemp.





#### #4 Growing Methods

It's important to purchase products from companies that insist on natural farming practices. When hemp is grown using natural farming practices, the plants used to create your products are grown without chemical fertilizers, pesticides, or herbicides.

#### #5 Reputation

You should always purchase from companies who value transparency and follow industry guidelines such as the U.S. Hemp Authority. As a good rule of thumb, look for companies that share verified customer reviews and print earned product seals such as Self-Affirmed Generally Recognized as Safe (GRAS) Status, NSF International's Good

#### CLAIMS TO OVERCOME TRIAL BARRIERS

Manufacturing Practice Registration, ISO 9001, Natural Farming Practices, Lab-Tested Potency & Purity, and U.S. Hemp Authority on their labels.

#### #6 International Imposters

The more you know about the company that makes your CBD, the better. Some CBD companies are passing off low-quality products from international manufacturers. Many of their so-called "hemp oil" products are made with hemp seed oil. Hemp seed oil, while a hemp product, does not contain CBD. Product descriptions for these questionable products can be quite convincing, so it's important to be able to verify the CBD content of a product. That number should be specified in milligrams.

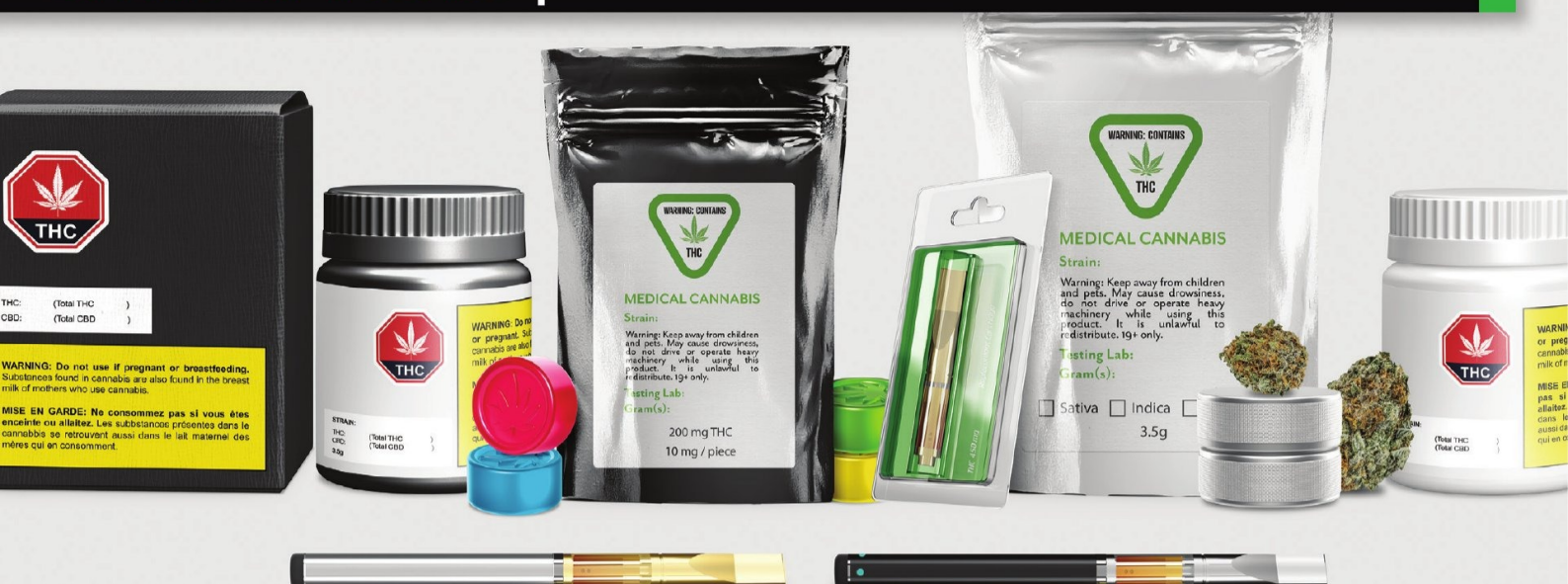
Learning what to look for can be difficult, but once you are confident that you are choosing a CBD product that fits your needs and your lifestyle, the process gets easier. When you have enough information to verify you are purchasing a high-quality product from a reputable source, you can proceed with confidence.

As leaders of the #CBDMOVEMENT™, CBDistillery is on a mission to be the premier educational resource and "one-stop-shop" for consumers curious about hemp-derived CBD from purchasing product to simply



wanting to learn more, which starts with our product packaging. In fact, according to a recent survey of CBDistillery customers, 84 percent feel that our new packaging better educates them about the benefits of CBD compared to many other packages in the marketplace.\* ■





## PACKAGING MUST MEET MARIJUANA'S BIG MOMENT

By Mauro Merico, Cannabis Packaging Specialist for Hoffmann Neopac

**A**dd four more to the cannabis club. This past November, Arizona, Montana, New Jersey and South Dakota joined eleven other states, as well as the District of Columbia, in legalizing marijuana for adult recreational use. More than two dozen other states have recognized cannabis for medical use. And of course, our friendly neighbors to the north, Canada, have had legalized marijuana for years now.

The boom won't stop there, because marijuana's momentum is continuing to build. According to Gallup, a full two-thirds of

Americans now favor full cannabis legalization – up from under 40 percent just a decade ago. Per Marijuana Business Daily, despite an unprecedented pandemic U.S. retail marijuana sales were on pace to rise 40 percent in 2020, and approach \$37 billion by 2024.

For packaging companies, opportunities abound. Everything, of course, needs a package, and the marijuana industry is, in reality, several smaller industries comprising cannabis products in a wide variety of formats. Edibles, flowers, CBD creams and vape pens top a lengthy list of products flooding a still-fledgling marketplace.

This means that, depending on the format of the cannabis product, its packaging will be charged with providing differing combinations of benefits. First and foremost, of course, any package must sufficiently protect a product, ensuring its safe journey along the supply chain, onto store shelves and through end user consumption. And in a regulated, adults-only landscape like marijuana products, child-resistance also becomes a mission-critical packaging aspect.

Of course, we all know that packaging also can serve as a differentiator. Here, packaging in the cannabis sector will be graded on



CR Mini for both THC and CBD infused gummies.





a curve, depending on the product format. Generally speaking, flowers, edibles and cannabis-infused products have an easier time distinguishing themselves from competitors based on the product itself; for example, flowers have an incredible range of potencies and strains, cannabis-infused seltzer can come in a wide array of flavors, and edibles can be cookies, cakes, brownies, etc.

Vape pens are somewhat less varied. With an increasing push to ban flavors for fear of youth addiction and lung damage, vaping sticks have been pushed toward standardization. This means packaging becomes an important point-of-purchase sales tool.

CBD creams, liquids and oils are arguably the least capable of differentiating themselves by product alone. Let's face it: most of them are similar and, when they aren't, the nascent nature of the marketplace means consumers don't have a point of reference to distinguish between them. Here, packaging becomes an essential aspect of differentiation, one capable of making or breaking a company entering the increasingly cluttered cannabis sector.

As Cannabis Packaging Specialist for a market leader of tins and tube solutions, for the sake of staying in my lanes of expertise let's discuss those two formats.

Let's start with the products that have an easier time standing out via their own uniqueness. For edibles and flowers, tins present a highly attractive packaging for a variety of reasons. First, they are inherently sleek. Tins offer a smooth, broad surface suitable for elaborate decoration even after mandatory government warnings are included. Tins also get high marks for protect protection – some are even airtight – and reclosability, and can be equipped with reliable child-resistance mechanisms.

Finally, tins check another important box: they are recyclable. As consumers continue to demand packaging that is more eco-friendly, this benefit should not be underestimated. Consumers in North America and around the world have long been associating metal packaging – think soda cans – with guilt-free recyclability, and will favor cannabis packages that lean into that sentiment.

Tube solutions come into play with creams, oils and liquids, and a variety of boxes must be checked in a category where packaging plays an outsized role in product differentiation. Most importantly, both tubes and tins must exhibit barrier properties that sufficiently protect formulations that, in cannabis, can have a wide range of sensitivity to moisture and oxygen and an equally broad range of seep-through propensity. Child-resistance also is a must. If your tube or tin doesn't meet Norm 16 CFR § 1700.20 standards... well, go get yourself another one.

CBD creams are often used as topical pain relievers (think arthritis), so tubes in that sec-



**With tins, an important differentiator is sustainability.**

tor must also be easy to open for seniors and, ideally, be compatible with a wide range of application devices – including dropper tips, roll-ons and brush heads – for simplified use.

But as discussed, packaging – whether a tin or a tube – must also differentiate a CBD product, because those tend to either be similar or seem similar. Perception is reality, and the way consumers perceive a tube housing a CBD cream or oil can make or break a brand. Naturally, one way to do this is with dazzling aesthetics; to that end, tins or tubes must comprise substrates that are easily printable, providing the widest-possible range of graphics options and decorations.

But as with tins, an equally important differentiator is sustainability. An increasingly eco-minded set of consumers want reassurance that the tube they're buying won't sit in a landfill for the next century, meaning that ideal tube solutions assure them otherwise. My company has introduced a range of tube, EcoDesign, comprising packages made from recyclable and/or biobased materials – including ones made from sugarcane and spruce tree granulates – that exude sustainability. Another possibility is mono-material barrier tubes, which better align with existing recycling streams by comprising just one primary material, all while providing exemplary product protection. ■

## About the Author

Mauro Merico is cannabis packaging specialist for Hoffmann Neopac, a developer and supplier of high-quality metal and plastic packaging solutions. Its longstanding customers include global pharmaceutical, cosmetics and consumer goods manufacturers in the European, North American and Asian markets. [www.hoffmann.ch](http://www.hoffmann.ch)

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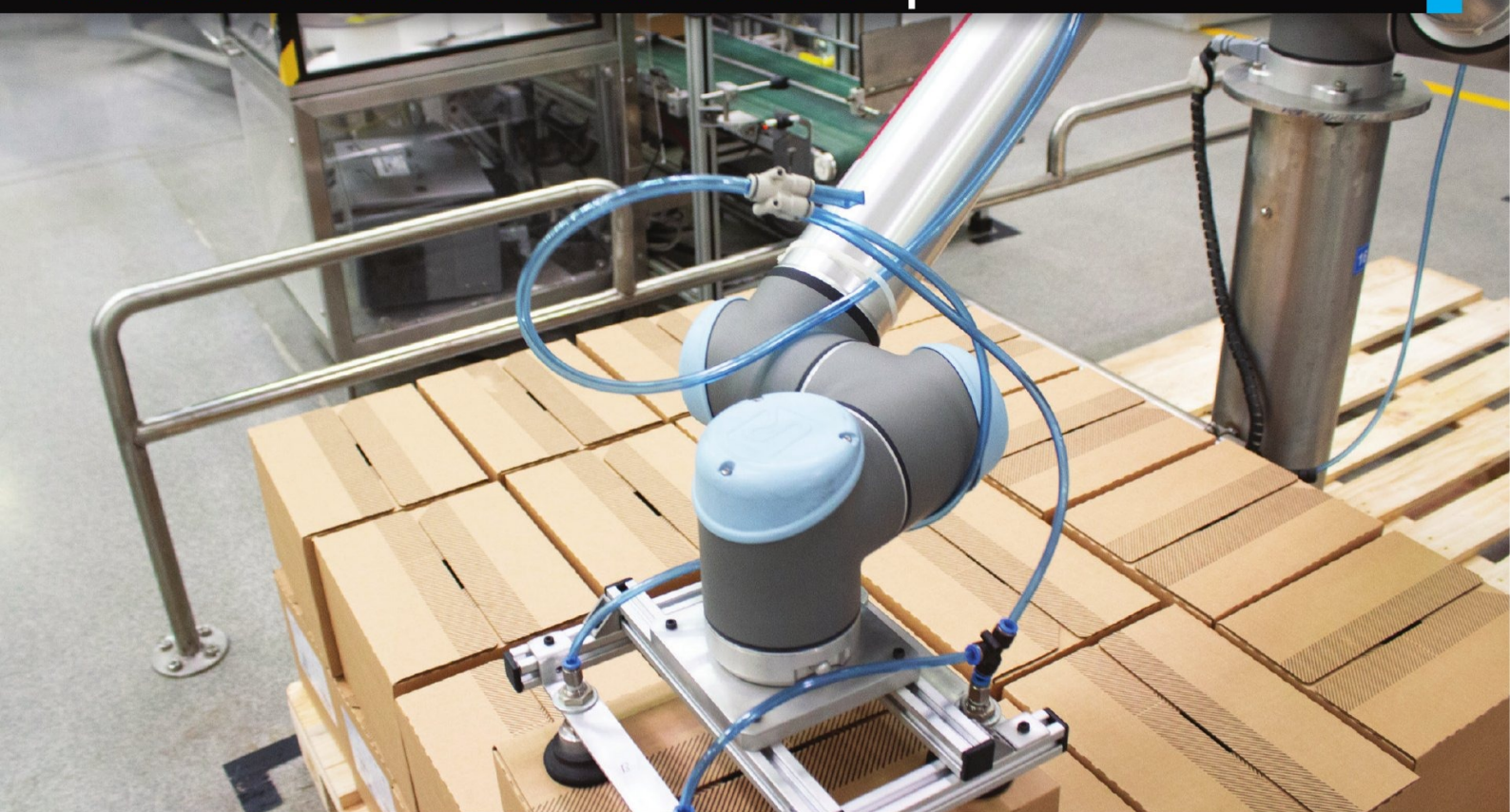
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L'Oréal India deployed a UR10-powered system for palletizing at its Pune facility. Source: Universal Robots

# UNIVERSAL ROBOTS POWER FLEXIBLE, EASY TO DEPLOY PALLETIZING AUTOMATION

By Joe Campbell, Senior Manager of Applications Development, Universal Robots

**C**ollaborative robots (or 'cobots') from Universal Robots are a proven technology for palletizing applications at companies of all sizes. Building on Universal Robots experience as the world's most successful cobot maker and spurred by customer demand, Universal Robots and its partners have developed a range of easy to deploy palletizing-focused Application Kits designed to provide users with all the hardware and software required to get started on palletizing applications. Available through the UR+ platform, Universal Robots' palletizing Application Kits provide manufacturers with a wide variety of ways to get cobot-powered palletizing tasks up and run-

ning quickly, easily and at a fraction of the cost associated with traditional, competing palletizing systems.

## **Palletizing's Pain Points**

Manual palletizing requires workers to bend, lift and twist for hours on end. Over time, this unergonomic task can cause repetitive strain injuries and musculoskeletal disorders, endangering worker health and driving up labor costs. With manufacturers already facing challenges around hiring and retaining skilled labor, the case for freeing workers from palletizing tasks through the use of cobots is compelling. Some manufacturers have found that cobot-powered palletizing can act as an effective tool for at-

tracting new workers, due to the ergonomic enhancements it brings and the 'Wow' factor associated with safe and flexible collaborative robots.

Traditional industrial palletizing systems have been around for decades, but they are inflexible and difficult to reconfigure, making them a poor fit for high mix/low volume and seasonal manufacturing. Traditional systems also require fencing, have a large footprint, are time consuming to operate and require outsourced expertise for programming and maintenance.

By contrast, cobot-powered palletizers provide faster cycle times, faster ROI, lower TCO (Total Cost of Ownership), greater flexibility and come with a small footprint.



Additionally, cobots can be deployed in close proximity to humans without the need for safety fencing. Thanks to different flavors of intuitive palletizing control software, cobots are also easy to deploy, regardless of your company's level of prior robotics experience.

Unilever's Katowice, Poland facility, which specializes in tea packing processes, deployed six UR10 robots to handle palletizing tasks. Prior to the implementation, operators spent around 70% of their time packaging and 30% palletizing. With cobots palletizing around 1,100 boxes during an eight-hour shift, throughput and productivity at the facility improved and operators are now free to focus on more ergonomically friendly tasks.

Meanwhile, Darex, a family-owned USA-based manufacturer of drill and knife sharpeners, successfully deployed UR5 cobots on screwdriving, box erecting and palletizing tasks in its Oregon facility. Two employees with no previous robotics experience took UR's free online training course and were able to program the entire solution themselves. The deployment resulted in a 30% optimization of Darex's packaging & palletizing processes.

### Empowering productivity

UR+ is the industry's largest and most comprehensive ecosystem of certified peripherals -- including software, vision systems and accessories such as grippers--designed to integrate seamlessly with UR cobots. UR+ Certified Application Kits are hardware and software packages focused on a specific application, such as palletizing, assembly and inspection. Universal Robots' palletizing Application Kits include all the software and hardware you need to quickly deploy palletizing automation.

### Intuitive cobot palletizing

Powered by a UR10e cobot, the Cross Palletron 3000 Application Kit is a fully collaborative palletizing system with user friendly software that eliminates need for complex robotic programming. Developed by seasoned robot integration specialists Cross Automation, the Kit is extremely mobile (it is easily moved using a dolly), can handle payloads of up to 18lbs and can pick eight boxes a minute. This Kit comes with Rockfarm's remarkable 'Pally' palletizing software, which provides UR cobot users with an easy-to-use interface for creating palletizing patterns and programs.

### Safety first

Developed by Columbia/Okura, a company with decades of traditional palletizing automation experience, the miniPAL Applica-



**Unilever has deployed UR10 cobots to handle palletizing tasks at the company's Katowice, Poland facility. Source: Universal Robots**



**Darex deployed a UR5 cobot from Universal Robots to handle packaging and palletizing tasks. Source: Universal Robots**



**The Cross Palletron 300 Application Kit comes with a 7th axis, which increases the cobot's work envelope compared to 6-axis systems. Source: Universal Robots**





**The miniPAL's compact design includes a lifting column for all tall loads, dual stacking locations for continuous load building and built-in fork pockets for easy mobility. Source: Universal Robots**



**The Vention Cobot Palletizer Application Kit allows users to design palletizing configurations online. Source: Universal Robots**

tion Kit is a UR cobot-powered palletizing solution that can handle a payload of up to 22 lbs and can palletize up to twenty boxes per minute depending on pattern, product and payload. The miniPAL Application Kit comes with Pally software, safety area scanners, safety mats and infeed conveyors, all of which are designed to speed palletizing automation deployments while ensuring safe operations.

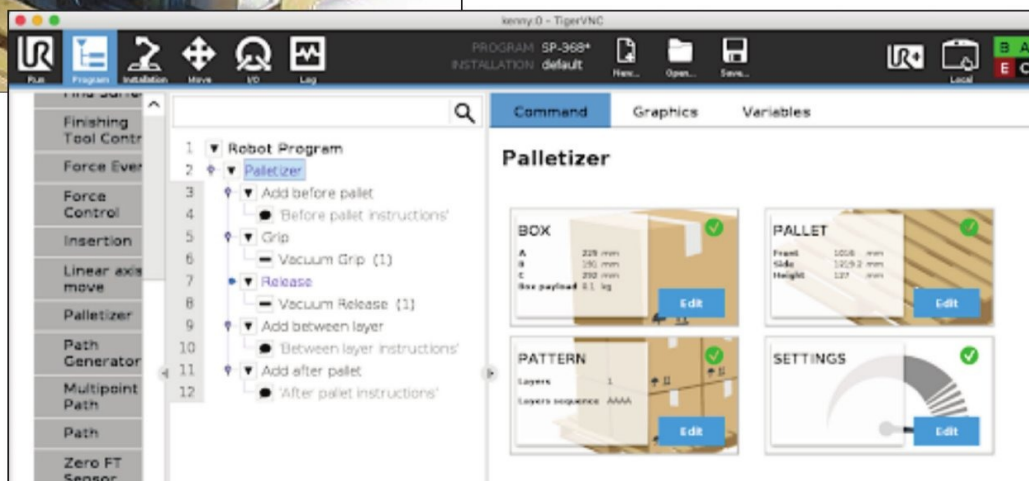
## Design your palletizing cell online

Vention's Cobot Palletizer is based on an ingenious CAD platform that allows you to design your entire palletizing system online. Users can choose from a library of turnkey designs or design a palletizing cell from scratch using different types of box feeders and grippers. The kit includes a choice of vertical actuators, a choice of box feeders and grippers, Pally palletizing software and a choice of safety equipment. The ability to design your system online provides extra flexibility and assurance that the final deployment will be a good fit for your facility —this is an especially important consideration for companies where floorspace is at a premium.

## Easy to use cobot palletizing

Robotiq collaborated with Universal Robots on the development of the Robotiq Palletizing Solution. This Application Kit comes with Robotiq's unique Material Handling Copilot software, which enables synchronized motion between the Kit's 7th axis and the cobot so they can both move at the same time. This ease to use software allows users to reduce cycle times. This Application Kit can handle a payload of up to 17.5 lbs and can palletize 13 boxes per minutes depending on weight, dimensions, surface, pallet dimensions and layout.

These UR-cobot powered palletizers are now being rolled out at a wide range of manufacturing sites. Universal Robots has seen that especially smaller companies, that find it difficult and time-consuming to source and integrate all these different elements into a cohesive palletizing system, are benefitting from this new turnkey palletizing approach. ■



**Robotiq's Material Handling Copilot software, provided as standard with the Robotiq Palletizing Solution Application Kit enables quick and easy setup in three steps, based on box dimensions and height, pallet dimensions and pallet pattern. Source: Universal Robots**



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Biotech pioneer Bavarian Nordic relies on new isolator filling line from Syntegon Technology

# FLEXIBLE PRODUCTION: MEETING THE GROWING DEMANDS OF THE BIOTECHNOLOGY SECTOR

By Matthias Angermaier, Product Manager Barrier Systems at Syntegon Technology

**V**accines for human viral diseases are among the most successful inventions in medical history: smallpox was declared extinguished in 1980, and poliomyelitis is nearing global eradication. New vaccines employing biotech innovations are changing the way we prevent illness. However, they also lead to a number of challenges in research and development, scale-up and safety requirements. Moreover, they must be cost-effective and ensure a fast time to market. As a result, the biotech company Bavarian Nordic relied on state-of-the-art technology and expertise from Syntegon Technology (formerly Bosch Packaging Technology) for its new isolator filling line for freeze-dried and liquid vaccine serums.

Biotech researchers are pursuing new vaccines to prevent illnesses such as HPV, hepatitis-B and encephalitis. Improvements in research, manufacturing, and delivery mechanisms are facilitating their work worldwide. More people than ever now enjoy faster access to more effective vaccines against a broader spectrum of infectious diseases. As a result, the biotech sector has experienced significant changes regarding the number of companies involved in vaccine manufacturing, as well as the production systems they use. There is a variety of new challenges in this area: vaccines must be developed, produced, and delivered with a short time to market, while process costs must be kept down without compromising patient and employee safety.

### Comprehensive filling line expertise

In view of its ongoing growth, biotechnology pioneer Bavarian Nordic decided to expand its production capabilities and built a new pro-

duction facility at its site in Kvistgård, Denmark. Bavarian Nordic is a fully integrated biotechnology company based in Denmark, Germany, Switzerland and North Carolina, USA, focusing on the development, manufacturing and commercialization of life-saving vaccines. To counter the above-mentioned challenges and developments, the new facility needed a complete isolator filling line for liquid and lyophilized substances. With 25 years of experience on the pharmaceutical market, Bavarian Nordic knows that change and innovation are key factors in order to stay competitive in today's volatile market environment.

"Our main goal for this investment was to create a processing line to freeze-dry active substances in order to extend their shelf life, and to process our liquid products," explains Bo Seligmann, director production support at Bavarian Nordic. "On the other hand, we also wanted the new line to generally enhance our capacities for contract filling services." After evaluating all possible options, Bavarian Nordic decided to purchase all the components for the filling line from a single source, and ultimately chose a completely integrated solution from Syntegon Technology. "Because of the complex requirements for this project, we wanted all machines and processes to be synchronized as smoothly as possible," says Seligmann. "Syntegon Technology's line competence was exactly what we needed."

### Output and safety combined

The company selected a vial isolator filling line from Syntegon with an integrated third-party freeze dryer. The highly complex isolator line combines nine machines and complies with GMO/biosafety level 2, the typical level for production plants that work with live atten-



uated vaccines. The line's core is the filling machine MLF 5088CS, which combines a high output rate of 400 vials per minute with optimal safety standards and with an integrated 100 percent in-process control (IPC). The filling machine is equipped with the patented single-use dosing system PreVAS, which reduces the need for complicated cleaning procedures and minimizes the risk of cross-contamination. The entire system is completely contained in the isolator line, avoiding operator exposure to products.

The line further comprises a washing machine RRN for flexible and optimal cleaning of the vials, an HQL tunnel for the safe and reliable sterilization and depyrogenation of the pre-cleaned containers, as well as a downstream VRK capping machine. Following filling and capping, the vials are transferred to an RAN outside washer for external cleaning. This ensures that no substance particles adhere to the outer sides of the vials; an important factor in protecting the operator and healthcare workers from the live viruses. The fast H2O2 airlock ISS ensures the fast and contamination-free transfer of goods into and out of the isolator. As stand-alone machine, it can be bio-decontaminated regardless of the current isolator status. Moreover, the isolator line is decontaminated twice: the first time as the standard process before production start, and once more immediately afterwards to inactivate any product residue that might still be in the line.

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### Two processes at once – for more efficient production

"For us at Bavarian Nordic, it was important to use reliable and proven standard machines to ensure high product quality", says Seligmann. In addition, the line had to be as compact as possible to reduce facility footprint, and as flexible as possible to fill a wide variety of vial formats. The machines support fast format changes. As a further highlight, the layout of the line enables Bavarian Nordic to perform different processes simultaneously. Since the freeze-drying process can take several days to complete, this allows Bavarian Nordic to use the line efficiently for parallel filling of liquid products in the meantime.

Efficiency is also relevant in terms of time. Since Bavarian Nordic processes live viruses, the rapid processing of the sensitive liquid



**Filling station with 100 percent IPC and integrated dose in/out system.**



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ingredients is crucial. "This means the new machines need to work quickly and absolutely reliably," Seligmann explains. The active virus serums are delivered in a frozen form, defrosted to roughly five degrees and then filled. They are kept cool throughout the filling process, otherwise the integrity of the active substance could be compromised. By reducing the humidity inside the isolator, the Syntegon experts made it possible to fill cold product (2 - 8°C).

### A first and highly successful cooperation

The complex line was delivered to the Bavarian Nordic site in Kvistgård in August 2019, and Operational Qualification testing was finalized seven months later in February 2020. "Syntegon Technology was very committed to the defined schedule, and the collaboration was very constructive," says Seligmann. "It was very beneficial to have a thorough design phase where we discussed the layout and the requirements. In fact, subsequent changes amounted to less than one percent. That is a remarkable achievement that saves time and money."

A thorough risk assessment by the Bavarian Nordic and Syntegon experts and full alarm and function test at Syntegon Technology's site in Crailsheim ensured that each individual machine worked as expected. The Syntegon experts also supported Bavarian Nordic during the qualification phase. "Syntegon know their machines best and they did the work very efficiently. "To finalize this project within such a short time period was only possible thanks to the professional collaboration between the experienced Bavarian Nordic project team, the Syntegon team and the third-party freeze drier supplier," Seligmann adds. "The cooperation with Syntegon was a first for us. Based on this experience, I can recommend carrying out such projects in cooperation with Syntegon Technology." ■





## **Tamper-Evident Neck Bander Features Clear Safety Door for Constant Monitoring, Worker Protection**

The Pharmafill NB1 tamper-evident neck bander from packaging machinery manufacturer Deitz Co., Wall, N.J. features a clear safety door. Included as standard at no extra charge, the plastic safety door is designed to protect workers from contact with the operating mechanism and allow constant visual monitoring while safeguarding the shrinkbands and machine internals from contamination. The hinged door is set at the front of the neck banding machine for easy access to the film drive mechanism and, when opened, the machine automatically stops operation. After replacing or checking the banding and closing the safety door, operation may resume at the touch of a button on the HMI screen.

Ideal for food, pharmaceutical, nutrition, and other companies concerned with both worker safety and sanitary operation, the NB1 neck bander automatically applies tamper-evident shrinkbands and sleeve labels onto bottles, jars, tins, and other containers. The shrinkbanding machine works with all heat-shrinkable banding materials from 25 mm – 123 mm in width applied over caps ranging from 14 mm – 76 mm in diameter at speeds up to 100 bottles per minute. The neck

bander may be raised or lowered in height to match the height of the safety door to the conveyor for convenient access.

For more information, visit [www.deitzco.com](http://www.deitzco.com).



## **New-Tech Standing Pouches Cut Fresh Food Waste**

Fresh produce packaging innovators, StePac Ltd. are gaining growing interest in the retail sector for its functional standing pouches. The resealable bags are crafted with the company's proprietary Xgo™ advanced modified atmosphere/modified humidity (MA/MH) technology. They're designed to significantly lengthen the shelf life of fresh produce and reduce waste in the supply chain as well as in the consumer's homes. The pouch enhances consumer experience and concurrently helps raise the fresh food packaging sector to greater ethical standards by contributing its part to the global waste reduction effort.

Divine Flavor, LLC, a San Diego, Calif.-based, grower-owned distributor of fruits and vegetables and part of agro giant Grupo Alta, have already adopted StePac's new standing pouches. The attractively designed Xgo standing pouch is cleverly engineered to combine shelf-life extension capabilities by actively slowing the aging and ripening process, with convenience in an attractive "grab-n-go" retail packaging format.

Xgo standing pouches allowed the company to shift to packing fresh produce in the final retail format at source. Impressed by the consistent performance, the Divine Flavor technical team fully adopted the protocol in 2020 for direct field-to-home refrigerator packaging of its Persian cucumbers for the U.S. market. It is now arousing the interest of fresh produce distributors around the globe.

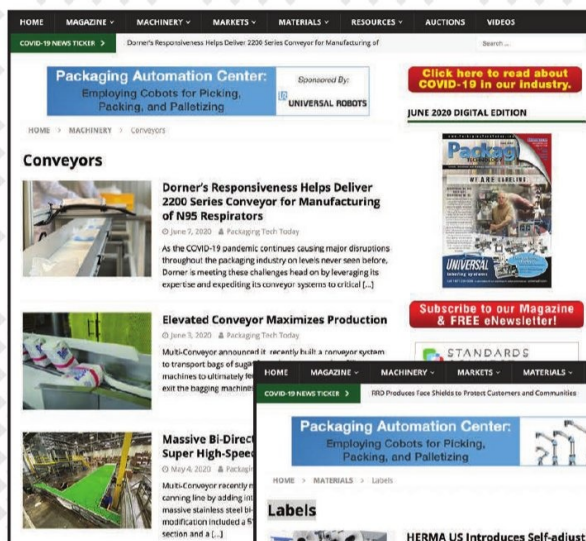
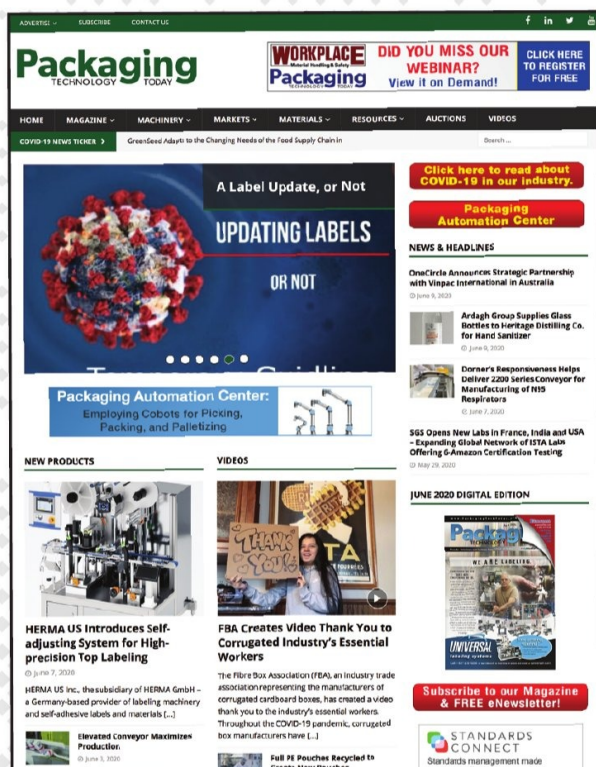
The Xgo standing pouch life extension capabilities are due to unique properties inbuilt into the packaging matrix that functions to lower oxygen (O<sub>2</sub>) and increase carbon dioxide (CO<sub>2</sub>). This creates optimal conditions for slowing respiration and senescence (aging) in plant tissues, inhibiting the growth of mold and other microorganisms, thereby preserving freshness and valuable nutrients. The StePac technology limits dehydra-

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# Packaging

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tion and product weight loss during storage, shipment, and home use and has inbuilt condensation control, that ensures high visibility of the packed products even under challenging supply chain conditions.

StePac's breakthrough pouches are resealable and are also available in fully recyclable formats, contributing to a circular economy. They can be decoratively printed for personal brands to evoke instant product recognition while on the shelves and come with a convenient grab handle.

For more information, visit [www.StePac.com](http://www.StePac.com).



## High Speed Barrier Packaging Film for Horizontal Form-Fill-Seal

Innovia Films is launching the next film in its new Propafilm™ Strata range of transparent high barrier, mono structure, packaging films. SLF is a chlorine free film that delivers exceptional barrier levels to oxygen, moisture, aroma and mineral oils.

It has reportedly been designed with a wide sealing range making it perfect for high-speed horizontal-form-fill-seal packaging of biscuits, bakery and confectionery type products.

Like all Propafilm™ Strata films, SLF reportedly provides a very effective barrier to aroma, and oxygen even at high relative humidity levels. It is printable, glossy and is food contact compliant globally. SLF has also been classified as Made for Recycling by Interseroh.

For more information, visit [www.innoviafilms.com](http://www.innoviafilms.com).

## Triangle's New Delta Bagger

Triangle Package Machinery Company announced its new Delta vertical form fill seal (vffs) bagger. The Delta bagger is easy to operate and offers quick and easy changeovers of forming tubes, film rolls, and sealing jaws. And, with numerous smart technology features such as IO Link enabled sensors, it's designed to grow with your business.

The Delta vffs bagger can run up to 100 bags per minute, including pillow, gusseted, flat bottom, and EZ Stand bags. Its



rugged, sanitary design features a solid stainless steel frame and a pivoting control box that allows access from all sides, making washdown and maintenance simple and efficient.

With many end users facing such challenges as a reduced workforce and less skilled operators, the Delta bagging machine includes key features that make operation simple, safe, and consistent, including:

- PLC recipes control sensors and actuators for easy and consistent set-up;
- Optional RFID log-in for controlled access;
- Rockwell Automation CompactLogix PLC;
- Pneumatic valves located for visibility during operation and easy access for maintenance;
- Optional split control box for access to low voltage hardware without disconnecting power;
- Designed and built in the USA.

Ideal for a range of markets, the Delta intermittent motion bagger can be integrated with a combination weigher, auger, cup filler or liquid pump.

For more information, visit [www.trianglepackage.com](http://www.trianglepackage.com).



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