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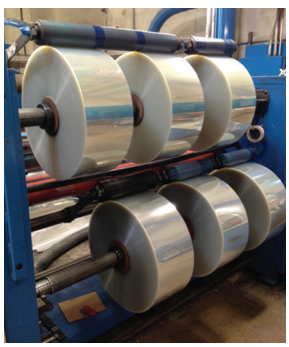

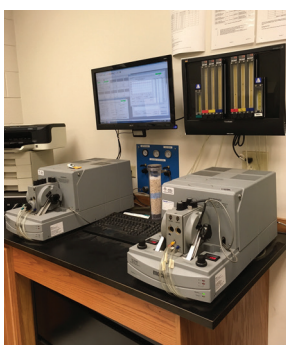

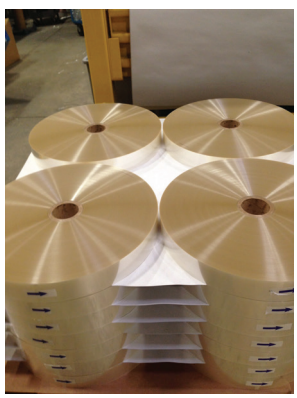

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# EDITOR'S NOTE

## Sustainability is Nothing New…

As we celebrated Earth Day last month, my inbox was flooded with emails highlighting what the packaging industry was doing to take part in this annual event celebrated around the world. Although we have designated just one short day to promote this movement, the topic of sustainability has been trending in our industry, on a daily basis, for well over two decades now.

Indeed, packaging is an inevitable part of global markets and its need for protecting products was seen more than ever during the COVID-19 pandemic, as we witnessed more and more consumers have shifting shopping habits to online. However, Earth Day was created to raise awareness so that consumers, governments and manufacturers could no longer ignore these problems. In response, sixteen U.S. states now have regulations that specifically target packaging waste, and I am quite certain we can expect more states will mimic these regulations, targeting both the materials implemented and the ways recycle methods.

Looking beyond the U.S., France, Germany and the UK are introducing fees for non-recyclable packaging, and Thailand and Chile are introducing bans on plastic bags. China also has plans to improve recycling, ban plastic bags, and introduce measures to reduce single-use plastic packaging, and Mexico City has introduced a ban on most single-use plastic items.

The good news is that brands are responding aggressively to meet the need for more sustainable packaging options. Many companies have made sustainability commitments, and many are aiming to reach their goals by 2025. It will be here before we know it!

I have enjoyed seeing some of the solutions and innovations being brought forth in new materials, machinery, shipping, and more! It has also been enjoyable watching the goals that have been set by numerous companies in our industry. Keep 'em coming!

**Joan Mantini**
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# HOW SPC-POWERED QUALITY CONTROL CAN TRANSFORM YOUR BOTTLING ENTERPRISE

By Kyle Cahoon, External Programs Manager at InfinityQSÆ International, Inc.

When you crack open a bottle of your favorite beverage, you're about to enjoy a drink that is more than a simple mix of ingredients. It's the result of a complex set of manufacturing processes that bottling companies closely monitor to deliver a consistent, high-quality final product.

For bottlers, quality control is crucial for more than simply detecting defects. Collecting and analyzing quality data can actually help bottlers identify concerning trends, which can help them prevent production issues before they occur. Moreover, they can use insights derived from their data to further optimize processes, reduce costs, and uphold compliance with quality and safety regulations.

In short, quality data amounts to more than something bottlers collect "just to keep an eye on things." It's a valuable resource, rife with insights for strategic operational improvements.

But given the complexity of the bottling process—and the sheer volume of data generated each step of the way—it can be a major challenge for companies that operate multiple facilities to implement quality programs and standardize best practices across their entire organization. The big picture just isn't clear enough.

## A bird's eye view from the cloud

Bottlers (and manufacturers at large) have long relied on paper checklists, spreadsheets, or legacy systems for quality management. Critical quality data are siloed within individual sites, making it virtually impossible to view, compare, or analyze performance across lines, prod-

**Bottlers can prevent defects and improve quality at every step of a bottle's journey.**

ucts, shifts, or plants.

Even statistical process control (SPC) systems—the industry gold standard for decades—can be similarly limited. Though they're great for real-time quality control on the shop floor (and we've got 30 years of experience to prove it), these systems are typically hosted on-premises and are thus deployed on a plant-by-plant basis. So yet again, data silos prohibit cross-plant analysis for multi-site organizations.

Fortunately, that's all beginning to change as bottlers embrace a more modern approach—cloud-based SPC software. These Software-as-a-Service (SaaS) solutions support operations on the plant floor, while providing the "bird's eye view" bottlers need for enterprise-wide quality initiatives.

## Empowerment on the plant floor

First, a quick refresher on SPC. It's an industry-standard methodology for measuring and controlling quality during the manufacturing process.

On the plant floor, SPC software automatically collects product and process measurements in real time, comparing those data to pre-determined control limits and rules to detect violations. Operators are alerted when data fall outside of the limits, who then take immediate corrective action to save costs and prevent defective products from reaching customers.

And the potential doesn't stop there. Plant managers and quality teams can take a closer look at measurements that still fall within manufacturing limits to identify where processes can be further refined. Bottlers can thereby prevent defects and improve quality at every step of a bottle's journey—from receiving to water treatment, mixing, bottle blowing, filling, and all the way through packaging and palletizing.

Let's look at the fill line in particular, where SPC can make a huge impact on quality, compliance, and profitability. In the bottling world, each and every bottle must meet net content requirements to maintain compliance and ensure customer satisfaction. Underfilling risks costly fines and a damaged brand reputation, yet overfilling spikes production costs through significant amounts of product giveaway.

SPC software integrates with filling equipment and sensors to automatically capture data. Scale integration can calculate net content volume. The system alerts operators if data values violate control limits or run rules, so timely corrections can be made. Further analysis of filling data—such as fill-head performance, product-to-product differences, or the effect of speed on filling—can highlight ways for bottlers to optimize the process. And when bottlers hit fill targets with greater precision, they eliminate excess waste and increase profit margins per bottle. In fact, one beverage bottler reported saving over a million dollars per year thanks to fill height optimization, on just one line.

Now think about the potential cost savings when those best practices are applied across an entire organization.

## Enterprise-wide transformation

That brings us to the exponential value of SPC at the enterprise level, and the big picture of quality made possible by centralized data. SaaS-based SPC systems collect, centralize, and standardize company-wide quality data into a single cloud repository, where those data can be sliced and diced in a million

ways, using a wide variety of analysis and statistical tools.

For example, SPC software with "stream grading" functionality can analyze and aggregate data streams from all products, lines, processes, and plants—rolling them up into a simplified, easy-to-interpret visual format. Corporate executives and quality specialists can then clearly compare performance and assess quality levels across the enterprise.

This big-picture insight empowers bottlers to:

- Ensure corporate quality standards are followed at all sites;
- Zero in on problem areas in need of immediate attention;
- Uncover opportunities for continuous improvement projects;
- Identify and implement best practices across all plants; and
- Prioritize quality team resources for the greatest impact.

## SPC in action for the world's leading bottled water company

Many bottlers around the globe already enjoy the benefits of SPC-powered quality control, including Nestlé Waters. With a portfolio of 48 brands produced in 87 manufacturing sites located in 30 countries, Nestlé Waters set out to maintain its position in the marketplace through continuous, company-wide quality improvement efforts. Nestlé Waters implemented an SPC software solution for real-time visibility over production processes—within individual sites and across the enterprise. The company now easily monitors, reviews, and trends real-time quality data across all their facilities, continuously improving products and processes.

Though Nestlé Waters' story is a great example of success in a global organization, the benefits of cloud-based SPC software are easily attainable for bottlers of any size. So, no matter if you're operating a single plant or hundreds, the result is across-the-board transformation in quality, productivity, consistency, safety, and compliance—and ultimately profitability. ■

**About the Author**

**Kyle joined InfinityQS International as an application engineer in August of 2010. He currently works onsite with clients to provide customized implementations of InfinityQS products, lead fundamental training and follow-up consultations.**

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# LABEL BE NIMBLE, LABEL BE QUICK

By Gary Paulin and Mark Lusky

This play on the nursery rhyme saying, "Jack be nimble, Jack be quick" is an apt description of why custom digital label printing and flexible packages/pouches go together so well. These labels provide the ultimate ability to pivot affordably on short notice, a very valuable asset in a fast-changing world.

In sharp contrast to such label technologies as shrink wrap that can be cost-prohibitive for small quantities, custom pressure-sensitive labels can be very economical in quantities as small as 50. As pandemic developments have proven, the ability to be nimble and quick is invaluable. One need look no further than product manufacturers regearing their labeling and packaging to reflect COVID-specific protection starting first quarter 2020.

And they're quick. Unlike flexible packaging/pouch and shrink-wrap production turn times running 4-6 weeks (or more), digital labels can be produced and shipped within 72 hours (even faster in some circumstances).

Other flexibility quickly becomes apparent in such areas as creative changes, and ability to order pre-produced plain metallic or one-color flexible pouches in inventoried bulk quantities—then order/apply adhesive labels as needed. This eliminates committing to huge quantities of printed pouches, in turn creating massive waste if there's a need to pivot right away because of a new industry development, disclosure regulation change, competitive challenge…or pandemic.

Maximizing the plusses of combining flexible packages/pouches with self-adhesive labels merits attention to some details that can make a huge difference in how the finished product looks and acts. Following are two key tips:

**1. Assess adhesives and design approach, then test.** While adhesives aren't always top of mind, they should be. Especially with flexible packages/pouches, a label that will stay adhered uniformly is critical

**It is critical both for form and function that flexible packages/pouches have a label that will stay adhered uniformly.**

**As part of the testing process, think about how the package itself will be manipulated at different stages.**

both for form and function. A cracking, chipping label due to an inadequate adhesive screams shoddy—and that's a really negative influence on sales. As for legibility and clear presentation, top-quality label design and presentation that works well with a particular package type, shape and size is a must, along with reliable adhesion. Inability to easily read labeling information, including major health or other warnings—either because of design or adhesive issues—can subject the product manufacturer to reputation-damaging reports and legal liability.

To ensure both adhesion and design are all they should be, test out prototype(s) before making final choices and fulfilling an order. How does the product look when folded, crinkled, handled repeatedly? Does vital information "disappear" or become hard to read when the package is manipulated in certain ways? Are those ways acceptable or do they pose a problem? Does the label itself, including adhesive, withstand deterioration to an acceptable degree due to moisture or other trying conditions? Is there a reason to make labels removable, such as turning them into a "collectible?"

**2. Regear/revise as needed after testing.** With flexible packages/pouches, challenges of keeping everything appearing and functioning as needed can be tricky. If, after testing, there are problems in such areas as legibility, consider alternative presentations of information and disclosures. These can range from including QR codes or Augmented Reality features that enable consumers to link with other information platforms, to extended content labels that help present information in a way that isn't compromised by a folded or crinkled package.

In theory, if a product manufacturer meets disclosure requirements on the primary label surface and can present enough branding/messaging to capture consumers on first glance, it can make a lot of sense to offload other information to linked or extended content platforms unaffected by product handling.

Let's consider the example of a flexible pouch alcoholic beverage. While it would be a stretch to include recipes incorporating the beverage on the surface of the package itself, an extended content label could do the job admirably. Or, a smartphone-enabled QR code/Augmented Reality feature can direct consumers to a wealth of other, more in-depth information about everything from product history and compelling stories to cautionary content.

As part of the testing process, think about how the package itself will be manipulated at different stages—starting with production/printing and ending with the consumer. Will it be handled a lot, including shipping and delivery? Is it more likely to sit on a shelf until purchase? Both?

This additional level of testing will help determine needed modifications. To paraphrase the old adage, "A chain is no stronger than its weakest link," a flexible pouch/package is only as strong as its weakest point. Make sure you've covered all the bases. ■

### About the Authors

**Gary Paulin is vice president, sales and client services at Lightning Labels, a Denver-based custom label printer that uses state-of-the-art printing technology to provide affordable, full-color custom labels and custom stickers of all shapes and sizes. Mark Lusky is president of Lusky Enterprises, Inc., a marketing communications and content development company. Contact: sales@lightninglabels.com; 800.544.6323 or 303.481.2304.**

# MEETING THE DEMAND FOR SUSTAINABLE PACKAGING THROUGH SUSTAINABLE PRINTING

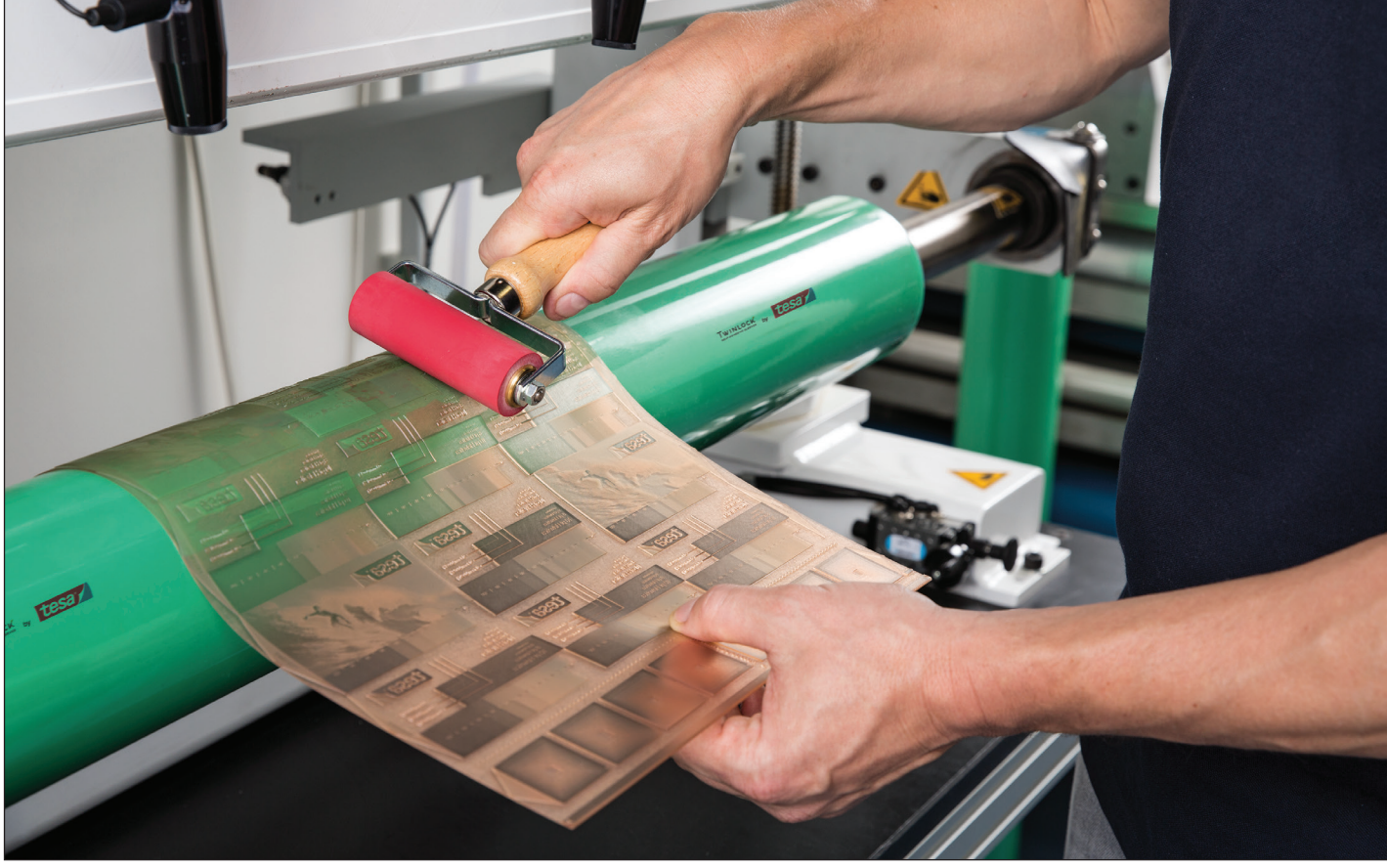
By Steve Molinets, Key Account Manager, FTA Implementation Specialist at tesa tape, inc.

From creamy, spreadable cheeses to ready-meal soups to premium pet food blends, the average consumer's fridge is no stranger to cup packaging and its suitability for diverse lifestyles and occasions. A single-serve yogurt, for example, may be thrown into a lunch bag and taken to the office, a larger portion of potato salad may accompany a family on an outdoor picnic and a container of resealable margarine may be used daily while cooking meals. These consumption settings will likely become only more varied as the world emerges from a pandemic—and, through it all, cup packaging must continue to deliver on product quality, safety and convenience. Additionally, the format must meet these expectations under the pressure of a supply chain scrutinized and stretched more than ever before as consumers continue to socially distance and cook at home at higher rates.

With these demands in mind, how will brand manufacturers adapt, and what kinds of technologies will they need to ensure a steady supply of high-quality goods? To mitigate risks while ramping up production, brands should remember packaging is often the first interaction a consumer has with an item. By finetuning the production line and leveraging the latest advancements in cup filling, sealing and overcapping equipment, manufacturers are well-positioned to deliver a more positive brand experience and build consumer loyalty.

## Meeting strict sanitization standards

Manufacturers have long been held to high standards of cleanliness on the production floor, but following the COVID-19 outbreak, operations are under a larger microscope. Cleanliness is of paramount concern as the industry works to meet high product volumes while also minimizing risk of germ spread. For the manufacturer, meeting reg-




**Switching from single-use tape to a re-usable adhesive plate mounting technology (as shown here) could help a packaging printer potentially save more than 120 tons per plant of solid waste for an eight-color wide-web process, while achieving significant cost savings.**

ulatory requirements ensures consumers receive a safe product and plant workers operate in a safe environment. Taking the right steps to properly sanitize production equipment helps to avoid costly recalls and preserve brand reputation.

With traditional cup filling, sealing and overcapping equipment, manufacturers often face challenges with components that feature uneven surfaces, tight spaces or nooks and crannies where product can become trapped—all characteristics of machine design that lead to difficult, tedious or sub-standard cleaning. Machinery that can instead be easily wiped or washed down reduces potential areas where food particles can linger and harbor bacteria. Also critical is the ability to conduct cleaning processes quickly and efficiently, allowing manufacturers to meet proper standards but minimize their downtime.

## Promoting product precision and quality

Today's consumers eye their products with more scrutiny than in the past. Not only has a SKU explosion created more choices, but the pandemic has placed extra emphasis on product safety and eliminating points of exposure to viral particles. To remain competitive, brand manufacturers must renew their focus on quality and reliability. Issues like inconsistent product volume across units, faulty seals and foreign particles are unacceptable and can quickly damage brand reputation. These defects are especially important to avoid as e-commerce and click-and-collect services become more popular, where products may not be visible until in the home and, if in unsatisfactory condition, inconvenience the consumer with additional trips to the store.

Standard cup sealers can often face issues of misalignment between container and lid, leading to a less-secure seal and increasing the likelihood of product leakage. The result is not only waste for the manufacturer and a mess for the consumer, but greater concerns around product freshness and potential spoilage. Additional risks around product quality are not necessarily visible to the consumer but are important for brand integrity. Some manufacturers provide additional quality control measures with certain machine upgrades. For example, more advanced packaging equipment is designed to flag foreign particles or contaminants that may be present in the cup during the prefill stage, as well as sanitize the cup thoroughly. If the machine fails to execute these tasks properly, the finished product can pose harmful threats to the consumer.

Beyond expectations of a safe, reliable product, consumers also take note of consistency and uniformity across purchases. Uneven fill levels from unit to unit or batch to batch will create frustration for the consumer, who will observe these variances as sloppiness or lack of attention to quality—not to mention product giveaway, which hurts the manufacturer's bottom line.

## Enhancing efficiency and output

In addition to mitigating risks, manufacturers serving the post-COVID market must also be prepared to produce at higher volumes—a challenge when most are already running 24/7 and cannot simply add more shifts. With CPGs under such pressure, uptime is everything. Each individual component on every machine makes a critical difference in overall production efficiency, pushing manufacturers to examine where their technology is falling short and possibly detracting from overall equipment effectiveness (OEE).

Existing designs for cup packaging equipment are sometimes subject to performance issues that increase maintenance needs and shorten lifespan, such as parts that fall victim to early wear and tear. In addition, typical machines can be bulky and require a large footprint but be limited in capabilities and fail to provide added value. As an alternative, manufacturers can employ high-speed equipment with durable components designed to last and technologies that complete additional tasks within the same amount of space.

**By reducing landfill waste from their production processes, packaging printers can help consumer-product companies meet their 2025 waste reduction sustainability goals.**

## The next generation of cup packaging technology

With the pressure to balance quality with quantity and deliver on both fronts, manufacturers can leverage emerging innovations in cup filling, sealing and overcapping equipment. With the right technologies in place, brands can take their production capabilities to new heights—potentially increasing output by more than 20 percent.

In regard to cleanability, new machines designed to protect water-sensitive areas and expose high-traffic areas enables manufacturers to meet stringent hygiene requirements with greater ease. A sealed rotary drive mechanism keeps critical mechanical components within a watertight box and behind a barrier wall, ensuring vulnerable parts are kept safe and dry while workers pressure wash the bulk of the machine. Also assisting with hygiene are innovative machines that utilize belt drives rather than traditional chain drives. A cleaner design that minimizes product catchpoints and promotes easier washdown, a belt drive expedites the sanitization process. Belts also avoid a common maintenance issue observed with chains, which often stretch over time and require frequent readjustment. Furthermore, belts promote precision across the production line and run more smoothly, contributing to greater output and OEE.

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Advancements around filler nozzles also yield tremendous benefits for manufacturers looking to run at higher speeds and minimize opportunities for error. New nozzles that can dive deeper into the cup help to reduce splashing, an important measure for liquid or semi-solid products with lower viscosity. The diving nozzles also help eliminate peaking, which occurs when product flow lacks a controlled cut-off and creates inconsistency in fill levels and product appearance. Protection against splashing and peaking helps the machine to stay cleaner and keeps the edges of the cup product-free and dry to foster a stronger seal. Ultimately, with these precision nozzles in place, manufacturers can fill containers faster and with fewer lanes.

When it comes to quality control, more intelligent cameras now serve multiple purposes. Designed within a complete verification system, vision technology inspects all materials to flag any holes or other damage, as well as ensures the right cups and lids are paired together. Lid detection capabilities also flag when a lid is missing entirely. Additionally, the cameras enable precise alignment with lids—a valuable feature when even a fraction of a millimeter can make the difference in a trusted or faulty seal. This system works in tandem with the larger production setup to pull rejected product off the line without halting or interrupting workflow, offering quality assurance while maintaining high speeds. Checking total product quality in the machine reduces production line sizes and third-party equipment that needs to be purchased and integrated. This can also minimize offline quality control checks once validated.

All of these elements, along with a more sophisticated machine design, help to enhance production and boost cup filling speeds approximately 25 percent compared to the rates of traditional equipment. Finally, if production or quality issues do occasionally arise and require a technician's attention, zone lighting helps to quickly pinpoint exactly where the problem lies, minimizing maintenance-related downtime.

## Sourcing a suitable partner

As manufacturers work to evolve along with the cup packaging market and the needs of their customers, engaging the right industry partners is the first critical step to improving production efficiency and scaling up output. By involving an equipment supplier that is in tune with brand challenges and targeted goals for growth, manufacturers are poised to make meaningful changes to their operations and make a lasting impact with consumers—far beyond the COVID-19 era. ■

### About the Author

**A self-described veteran of the flexographic printing industry, Steve Molinets is a key account manager at tesa who is committed to understanding his customers and gets excited about making their world just a little better. He is responsible for coordinating contacts within the corporate procurement, engineering departments and at the plant level to drive opportunities and projects at these accounts is a key account manager at tesa who is committed to understanding his customers and gets excited about making their world just a little better. He is responsible for coordinating contacts within the corporate procurement, engineering departments and at the plant level to drive opportunities and projects at these accounts.**

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# SHOPPING FOR THE PERFECT ECOMMERCE PACKAGING

By Tania Montesi, Global eCommerce Manager at H.B. Fuller

***"Since a growing percentage of purchases arrive at the consumer's doorstep, companies must ensure their packaging protects the contents and their brand image, while providing an environmentally friendly way to dispose of the packaging waste."***

In 2020, global eCommerce was estimated to grow 18 percent, only one point more than in 2019, but the pandemic accelerated demand as consumers chose shopping online over shopping at brick-and-mortar retailers. This was due to many reasons – to comply with lockdowns, overcome restrictive shops' opening hours, or simply limit exposure to others. In the United States alone, 7.4 million new online buyers started purchasing essential items online. This has become the "new normal," as studies indicate that 66 percent of new online buyers will continue online ordering post-COVID-19.

Those changes in consumer habits have greatly affected the global packaging market, which was valued at close to $50 billion in 2020. The influx of eCommerce usage has brought countless types of packaging to the market. The most common, making up 80 percent of packaging, is corrugated because it is cost-effective, versatile, lightweight and functional. However, there is a rise in demand for alternatives. For example, protective mailers are growing in popularity because they protect the contents of the package and also are cost-efficient. These mailers are primarily used for books,

**Last year, consumers began to choose online grocery shopping at an increased rate in as concerns about COVID-19 transmission and circulation restrictions took effect.**

apparel, electronic goods, and personal care products.

## Which markets are growing?

To better assess which alternative packaging to choose, we must understand the top growing eCcommerce market segments. Three eCommerce segments that experienced substantial growth in 2020 were online grocery shopping, cosmetics and personal care, and flower delivery.

### 1. Grocery

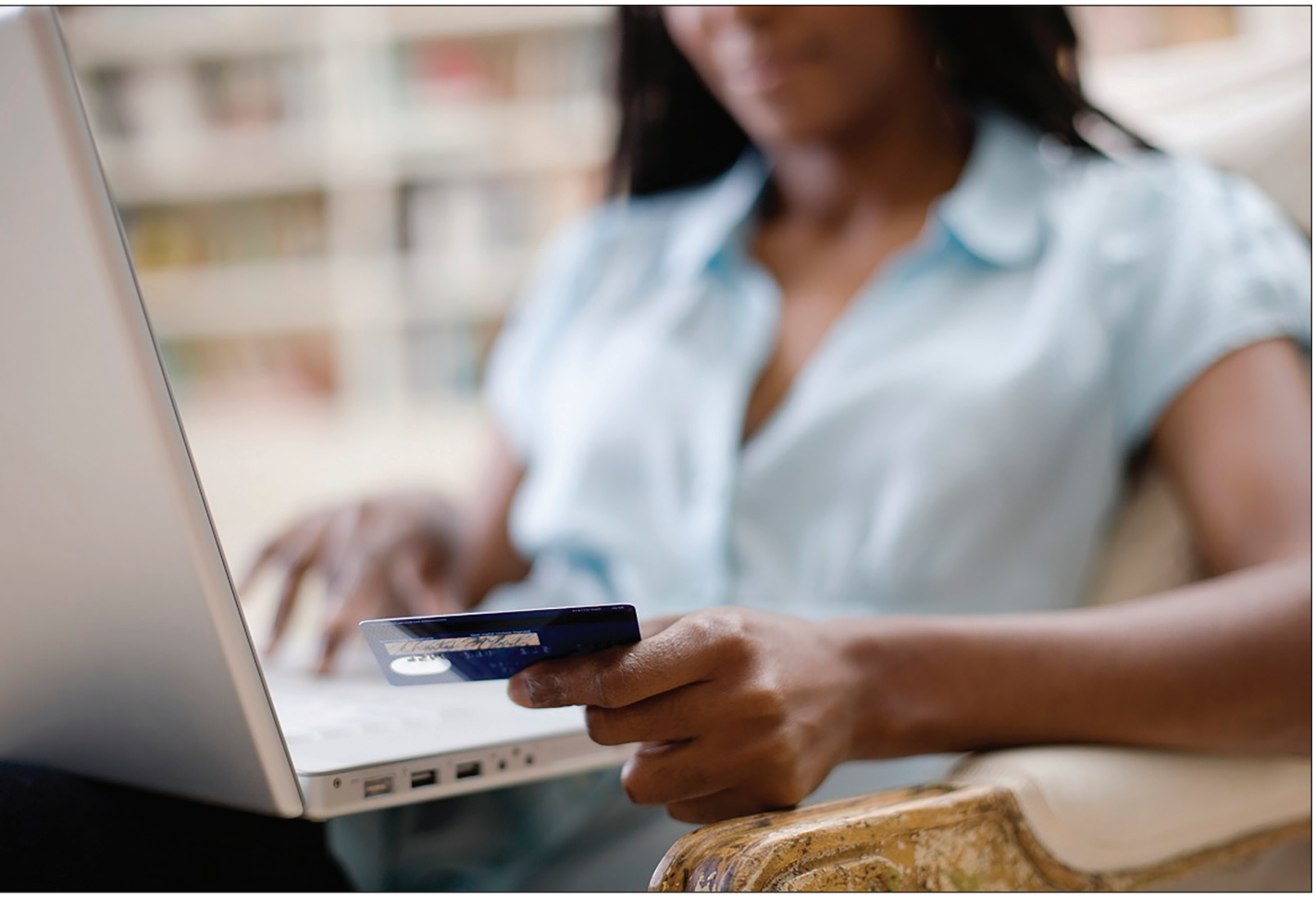
The fastest growing eCommerce category is food and beverage, which grew by an estimated 58.5 percent. Last year, consumers began to choose online grocery shopping at an increased rate in as concerns about COVID-19 transmission and circulation restrictions took effect. They prioritized the purchase of essential items, including non-perishable and perishable goods. While consumers had traditionally been cautious of having fresh produce and other perishable goods delivered, their concern for health and safety while out in public prevailed.

Today, Walmart (55 percent) and Amazon (40 percent) hold the greatest market share in online grocery shopping, although Amazon's share is growing at a much faster rate, gaining 33.5 percent from July 2020 to present. Will this trend continue? As restaurants reopen, 64 percent of consumers in the United States continue to order groceries online and cook from home.

**The influx of eCommerce usage has brought countless types of packaging to the market.**

### 2. Personal care and beauty

This was the second fastest growing eCommerce category with 32.4 percent growth. The personal care and beauty eCommerce



**The pandemic accelerated eCommerce demand as consumers chose shopping online over shopping at brick-and-mortar retailers.**

market was already set to grow rapidly, but the pandemic accelerated this pattern. Personal care and beauty items, such as toilet paper, soaps and hand sanitizers, were identified by consumers as essential items and were delivered to their homes.

### 3. Online flower delivery

While people stayed home, unable to celebrate life events with their loved ones due to restrictions on travel and gathering, demand for online flower delivery increased. In addition to life events, such as birthdays and anniversaries, bouquets became a way to celebrate the everyday. Flower deliveries became a contactless way for consumers to let others know they were in their thoughts.

## Spot the eCommerce packaging trends

Today's consumers are more aware of planet resources finitude and conscious of the affect their purchasing has on the environment. These indicators are causing brands to make sustainability commitments, which has a direct effect on the new generations of eCommerce packaging.

According to a custom consumer survey of 600 Millennials and Gen Z consumers in Europe by H.B. Fuller, "reduce excess packaging" is a number one or two priority for sustainable packaging initiatives. We have all received a small item in an oversized box, surrounded by air pillows or paper dunnage – or worse – a box inside of another box. This is not sustainable, nor do consumers approve of this packaging method. Plus, it's not cost-effective because it uses more than one single packaging to ship a product and freight costs are higher.

Brand companies and online retailers are looking at fit-for-purpose, or right size, packaging options. They are either carrying different packaging sizes to better accommodate the items or investing in equipment that scans the item and create a custom packaging for it. In either case, they also are looking to lightweighting, or only using the absolute necessary packaging materials needed and consuming fewer resources.

Since a growing percentage of purchases arrive at the consumer's doorstep, companies must ensure their packaging protects the contents and their brand image, while providing an environmentally friendly way to dispose of the packaging waste. It sounds like a tall order, but it's possible as recent advancements in sustainable eCommerce packaging solutions strive for smaller ecological footprint and facilitate the circularity in the industry. One thing is certain: with some brand companies launching ready-to-ship packaging and eliminating the need for secondary or tertiary packaging, others need to catch up or they risk being left in the cart. ■

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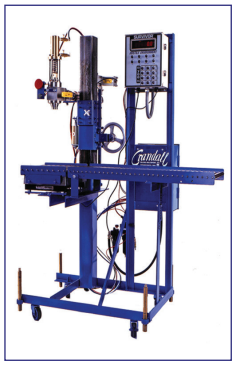

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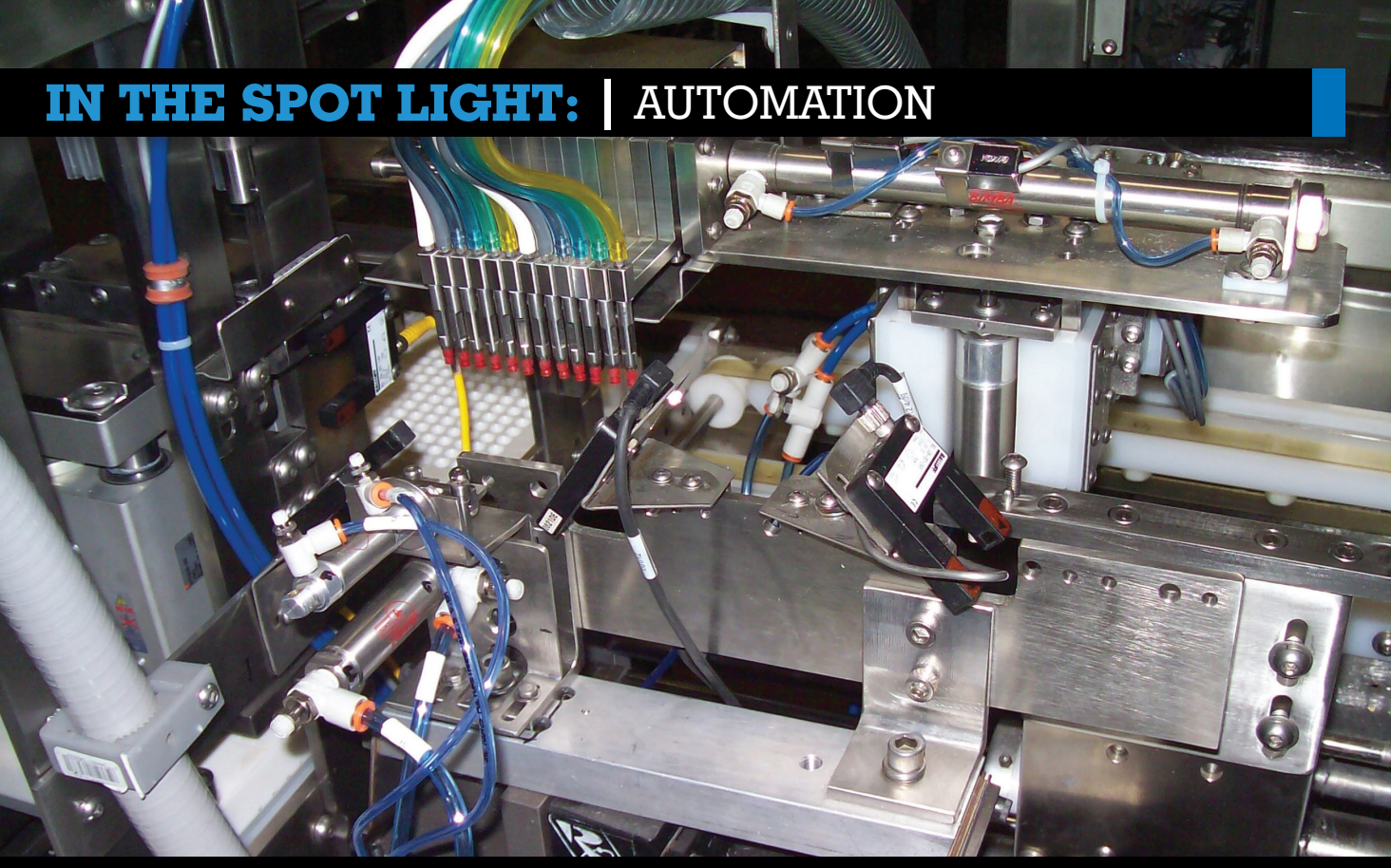


Off-the-shelf equipment will not accommodate every application, particularly those that are complex with robots and conveyors, as well as host of equipment for manufacture, assembly, packaging, labeling, and palletizing, that must be flawlessly coordinated.

# TAKING THE NEXT STEP IN PACKAGING AUTOMATION:

## OVERCOMING THE CHALLENGES TO AUTOMATE MANUFACTURING

**Working with an expert packaging device fabricator and integrator that is flexible enough to customize can help meet requirements while expediting completion**

**By Del Williams, Contributing Writer**

For packaging device manufacturers, the continual need to increase production speed and efficiency while reducing labor has spurred a shift toward implementing automated systems. However, off-the-shelf equipment will not accommodate every application, particularly those that are complex with robots and conveyors, as well as a host of equipment for manufacture and assembly in addition to packaging, labeling, and palletizing. that must be flawlessly coordinated. For this reason, even some large automation companies will not take on applications considered too difficult.

In such cases, packaging device manufacturers looking to increase the speed and efficiency of their production and packaging lines need an automation partner that can quickly and cost-effectively deliver tailored, even custom solutions. This includes the ability to design, build, and integrate high-speed, high-volume automated equipment and systems for some of the largest companies in the world.

For projects of any size, however, it can be crucial to partner with an expert sup-

plier to overcome a range of obstacles such as meeting specifications and regulatory requirements, system integration, and necessary customization, as well as completing the work on time and within budget.

"While implementing off-the-shelf solutions can be a starting point for some projects, automating and incorporating robotics frequently requires a custom solution that meets very specific process requirements. For this reason, even large suppliers in this space will often pass on opportunities if they are not easily resolved," says Leon Gurevich, founder and chief technology officer of Rapid Development Services (RDS).

RDS is an industrial automation equipment builder, providing design, engineering, integration and fabrication of production and packaging machinery. The company has implemented over 300 complex, robotic, assembly and manufacturing projects worldwide, and has been awarded more than 40 patents.

According to Gurevich, to avoid delays or failure on larger, more complex projects it is particularly important to work with a supplier that not only has expertise, but is also nimble and flexible.

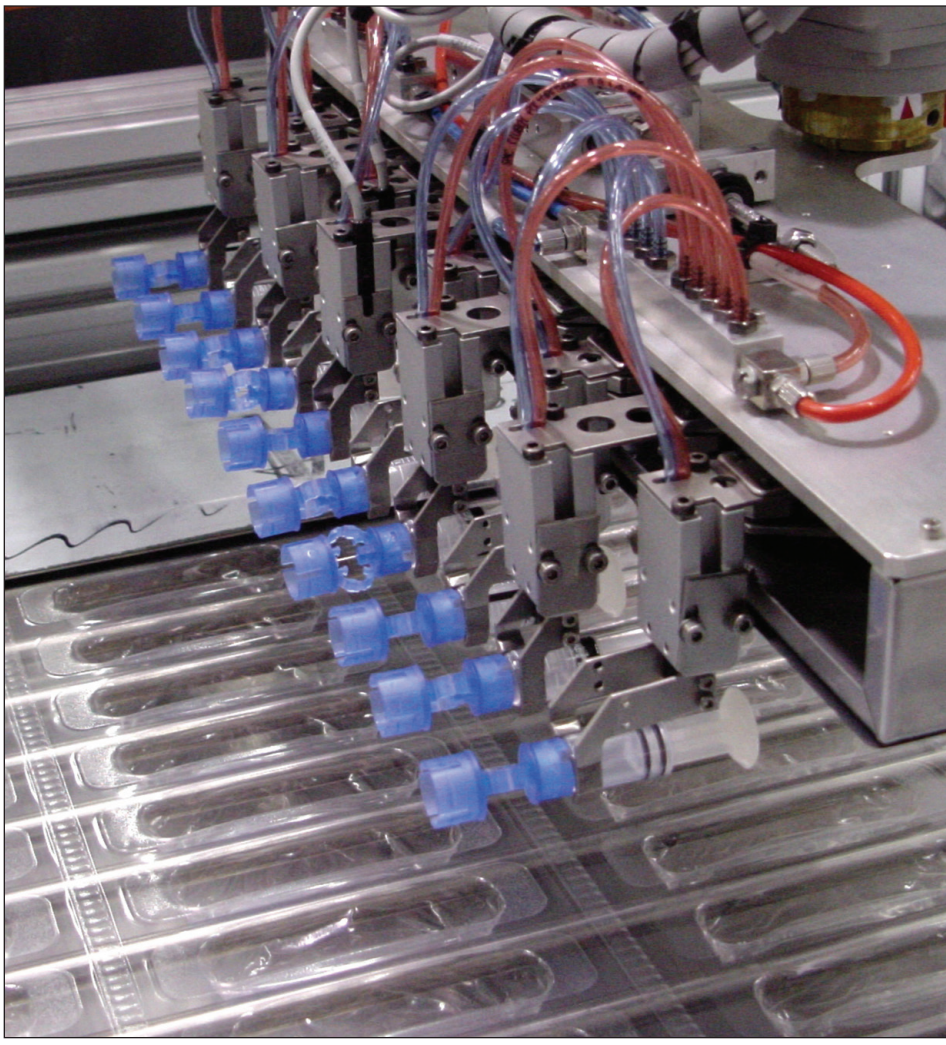
"When it comes to automating production, equipment can range from very small to complete lines several hundred feet long that can consist of robots, conveyors, vision systems, server drives, etc.," says Gurevich, who has worked with companies such as Medtronic, Johnson and Johnson, Abbott Labs, and Pfizer. "So, automation suppliers and integrators need a 'tool box' full of solutions including the ability to design and build from scratch in order to fit together all the pieces of the puzzle."

In the case of RDS, the company typically uses standardized off-the-shelf solutions and integrates it with other systems, but can design and manufacture equipment and sub-systems from scratch, as needed. This includes machinery such as packaging equipment, labeling/marking systems and palletizing automation, as well as automated assembly solutions, inspection systems, filling systems and machine tending automation.

As an example, after a major medical device manufacturer received FDA approval of a real-time insulin pump for continuous glucose monitoring, the company needed to automate production with specific attention to packaging.

RDS was called on to develop an automatic system to package insulin reservoir-syringes into a Multivac Form Fill Seal machine, followed by carton and case packing for ready-to-ship product delivery.

The reservoir-syringe was presented to the system in a bulk form. The robotic system utilizes vision inspection to check for the presence of subcomponents before placing reservoir-syringes into the Multivac machine's formed web cavities. The vision inspection identified the presence of the plunger, guard and overall geometry pattern of syringes by inspecting a set of 10 units per cycle. The system used two, six-axis robots, two Vibro-feed bowls, and the Multivac web machine to feed, pick, place, and seal reservoir syringes.



**A distinct advantage can be gained when working with an integrator like Rapid Development Services that can couple the knowledge of custom machine building with standardized robotics, as well as develop specific control and communication support between production machinery and operator or inventory management systems.**

With the robotic system, each of two cells packaged product at a rate of over 120 reservoirs per minute, for a total of 240 units per minute. The packaging system also had a carton erector, and the sealed packages were robotically inserted into cartons.

RDS initially installed the system in a California plant, which ran the robotic system

trouble-free in a clean room for over five years. At the company's request, RDS disassembled, moved, reinstalled, and started up the system at a new facility in Puerto Rico, where it has continued to run trouble-free three shifts per day for another 10 years.

According to the market research and consulting company Grand View Research, the global medical automation market is expected to grow at a compound annual growth rate of 9.9 percent from 2016 to 2024 to reach $79.4 billion by 2024. The company cites the rising prevalence of chronic diseases and the increasing adoption of automated equipment for diagnosis and therapy as the factors propelling market growth.

So, whether packaging device manufacturers need help automating their production, or the equipment used in other settings, partnering with an expert in automation can be the surest route to ensuring compliance, reliability, and efficiency.

Companies sometimes shy away from automation when only focusing on direct labor savings or short-term ROI," concludes RDS President Sunit Mishra. "However, if you factor in increased production speeds and improved quality along with reduced waste,

**For projects or any size, it can be crucial to partner with an expert supplier such as Rapid Development Services to overcome obstacles such as meeting specifications, regulatory requirements, system integration, and necessary customization, as well as completing the work on time and within budget.**

labor management savings, labor hiring and training savings as well as repetitive motion injury, the investment in automation usually provides an attractive ROI in the short term itself … not to mention, our history shows equipment life spans of well over 20 years, so the ongoing benefits continue to accrue to the bottom line for the life of the equipment." ■

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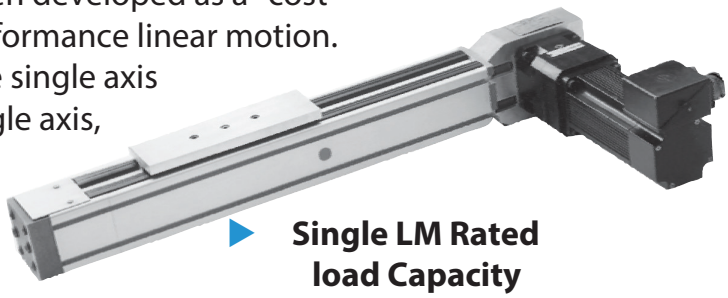

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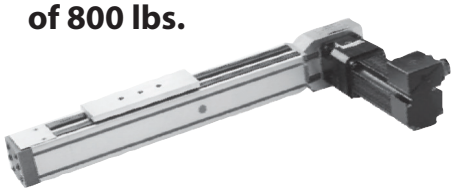

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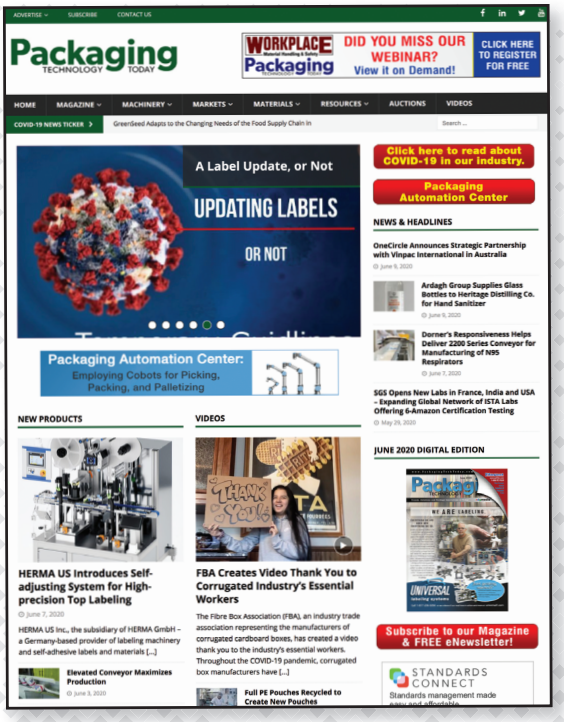

## Machinery

- Caps & Closures
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- Inspection/Detection/ Vision
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- Robotics/Automation
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- Thermoforming
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## Markets

- Beer/Wine/Spirits
- Beverage Packaging
- Cannabis
- Craft Beer
- E-Commerce
- Food
- Household
- Personal Care
- Pharmaceutical/ Medical

## Materials

- Adhesives/Sealants
- Cans & Bottles
- Films & Coatings
- Flexible
- Ink
- Labels
- Paperboard/ Corrugated Cartons
- Rigid Containers
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Stay in Compliance

# Combustible Dust Standard: NFPA 652

## History:

Combustible dust is any fine material that can catch fire and explode when mixed with air. OSHA defines combustible dust as "…a solid material composed of distinct particles or pieces, regardless of size, shape or chemical composition, which presents a fire or deflagration hazard when suspended in air or some other oxidizing medium over a range of concentrations."

This does not always mean the types of material normally considered either combustible or dangerous. It can include metal dust, wood dust, plastic or rubber dust, coal dust, biosolids, dust from certain textiles—even organic dust, like flour, sugar, paper, soap and dried blood.

## Why Standard is Important:

If a company has processes that create dust or use powders, then it has a responsibility to determine if a combustible dust hazard exists. NFPA 652: Standard on the Fundamentals of Combustible Dust, 2016 edition, became effective Sept. 2015. This standard was created to promote and define hazard analysis, awareness, management and mitigation. The standard also issues a new term, "Dust Hazard Analysis," or DHA, to differentiate this analysis from the more complex forms of process hazard analysis methods currently found in industry. NFPA 652 is the starting point for this analysis. It will guide you step by step in identifying hazards and what to do next.

The NFPA standards have required a process hazard analysis since 2005. NFPA 652 takes this requirement further by making this requirement retroactive to existing installations, with a deadline. A DHA is now required for new installations and upgrades to existing installations. The standard allows three years to complete this DHA. To illustrate the importance of this hazard analysis, many OSHA citations regarding combustible dust hazards list the lack of a hazard analysis at the top of the citation.

**X-Flo dust collector, which exceeds OSHA mandates for factory air quality. When the X-Flo collector is equipped with a Camfil explosion vent, it offers the highest combustible dust explosion protection in accordance with NFPA and ATEX standards.**

Combustible dusts are created during the transportation, handling, processing, polishing and grinding of the materials. Abrasive blasting, crushing, cutting and screening dry materials can also create dust.

The types of workplaces most at risk of combustible dust include:

- ✔ Food production
- ✔ Woodworking facilities
- ✔ Metal processing
- ✔ Recycling facilities
- ✔ Chemical manufacturing (rubber, plastics, pharmaceuticals)
- ✔ Grain elevators
- ✔ Coal-fired power plants

Any workplace that generates dust might be at risk, however. This is why it's essential to conduct a thorough risk assessment.

## Key Compliance Requirements:

The purpose of a dust-collection system is to remove and isolate dust away from people who can inhale it and process areas where it could accumulate and become a deflagration hazard. The DHA will identify the following conditions that may exist external or internal to the system that contribute to a fire or deflagration hazard:

- ✔ Presence of oxygen: Air is the oxidant
- ✔ Presence of fuel: Combustible dust where ever it is found, including floors, elevated surfaces, inside ducts, and inside process enclosures and machines
- ✔ Dispersion of fuel: includes pulse cleaning inside dust collector; use of compressed air for cleaning; and events that can dislodge dust from elevated surfaces
- ✔ Ignition sources: Sparks, electrical shorts, hot work, electrostatic discharge, flames, rotating equipment, hot surfaces
- ✔ Containment locations: inside pipes; inside dust collectors; and inside any process enclosure or machine

## Compliance Assistance:

Because so many different types of workplaces might contain potential combustible dust risks, it's essential to conduct a thorough risk assessment. Failing to comply with this standard can leave you open to serious fines and even more serious injuries, if an incident occurs.

OSHA offers a lengthy list of materials that could produce combustible dust: https://bit.ly/1Lni5C7

Become familiar with NFPA 652: Standard on the Fundamentals of Combustible Dust: https://bit.ly/2KD03Po. It provides basic principles and requirements for identifying and managing fire and explosion hazards from combustible dust.

OSHA looks to this standard for guidance when it comes to best practices for preventing combustible dust fires and explosions. Those who don't take the necessary steps to protect workers can be fined for violations under 18 different standards as part of OSHA's Combustible Dust National Emphasis Program: https://bit.ly/2Rd1Eh8. This includes the General Duty Clause and 29 CFR 1910.22, the main housekeeping standard.

Contact Andy Thomason , Sr. Applications Specialist
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The NFPA 652 - 2019 standard provide us with Fundamentals of combustible dust knowledge that we use when recommending solutions to our dust collection customers in the packaging industry. We reference NFPA 652 – 2019 as our starting point when discussing explosion protection strategies and equipment design with our customers. This is one for Camfil APC's most valuable tools in helping customers meet the 'Life Safety Goal'. *Camfilapc.com (833) 322-0820*

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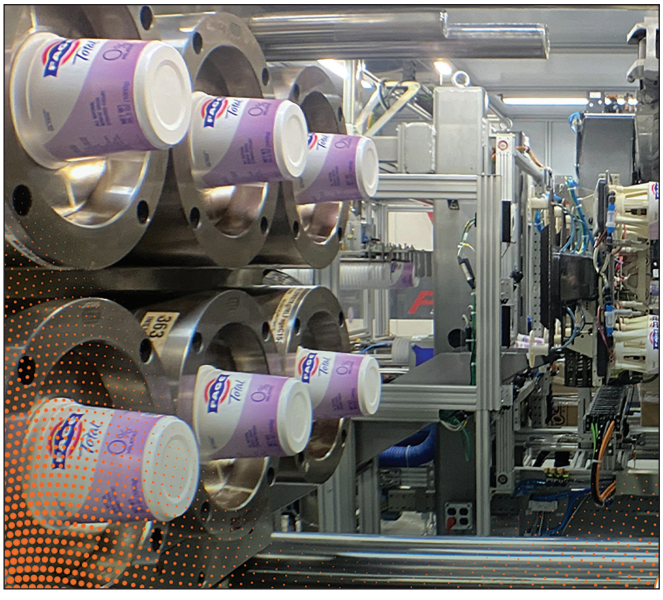
# Addressing Dust Challenges for Food Packaging

Dust can often be created during packaging as finished products are moved by conveyor or during the box or bag filling process. The "puffs" of compressed air used during the bag filling process can generate little puffs of dust while filling packages. This can cause an accumulation of dust over time if not addressed properly, which can also create several challenges during the packaging process to include:

- ✓ Cross-contamination: Packing lines for multiple products are often located in the same facility, creating a cross-contamination concern if fugitive dust is allowed to escape.
- ✓ Nuisance dust/aesthectics: Dust that settles on or in packaging is unappealing to consumers of packaged food products.
- ✓ Microbial growth: Dust that is allowed to settle on surfaces in the packaging facility or in between packaging layers provides a medium for microbial growth.
- ✓ Combustion risk: Food processing dusts—including flours, powdered milk, corn starch, wheat starch, sugar, tapioca, whey, cocoa powder and many spices—are highly combustible.

To address the challenges, food packaging operations must look at the whole process, including needs analysis, system design and engineering, collector and ductwork installation, filter selection, HVAC system integration, startup and commissioning, and aftercare and service. Calling the experts to help ensure your operations remains NFPA 652 compliant.

## SUPPLIER PRODUCTS



### CMG Plastics Expands High-Speed in-Mold Labeling Resources

CMG Plastics announced the expansion of its in-mold labeling (IML) capabilities in response to growing customer demand. The company, which currently operates twelve IML systems across two manufacturing facilities, has added a new, high-speed Ilsemann Automation In-Mold Labeling System. The newest IML line is the fourth to be installed at the company's NJ-based facility.

One significant benefit is that IML reportedly yields a 100 percent recyclable package, eliminating the need to physically separate product packaging from traditional pressure-sensitive labels or shrink sleeves that are often not recyclable.

Additionally, quick label changeover capabilities reportedly enable CMG to combine multiple SKU's during a production run giving customers flexibility on order quantities in addition to saving time. Another IML advantage is the ability to produce richer and more vibrant color schemes compared to other decorating methods.

CMG Plastics expects the global growth of IML among major food, beverage, and consumer products companies to continue, especially as advancements such as Digimarc's SmartLabel technology, an IML integration that enables brands to create unique consumer smartphone-enabled experiences with a brand's packaging are adopted.

For more information, visit https://cmgplastics.com.

### Full Wrap Labelling For Fish and Seafood

The variety of fish and seafood products is almost endless – as is the wide range of pack types and materials. An effective impression at the point of sale can only be successful however, if the pack design is true to the product and brand, as well as being in harmony with the labelling. MULTIVAC's full wrap labelling offers an innovative solution, which makes a lasting impression in the chill cabinet.

MULTIVAC offers an efficient and attractive alternative with its L 310 full wrap conveyor belt labeller. This flexible model with its patented, servo-driven press-on brushes makes it possible to automatically apply a self-adhesive full wrap label on up to four sides of a pack.

The maximum label width is 500 millimeters, and the labelling output is up to 120 packs per minute. Depending on the requirements, a wide range of thermal transfer or thermal inkjet printers can be integrated into the labeller.

Thanks to the automated labelling process, producers and packers could benefit from a high level of precision, process

reliability, and above all throughput. The labeller can be equipped with a zero-downtime function for even higher overall output. Optional label and print inspection ensures, that only perfectly labelled products get onto the market.

With its wide range of suitable label materials and adhesives, MULTIVAC reportedly offers the right solution for every requirement. In addition to PP and PET labels, materials made of paper or from other renewable sources are available for selection.

There are also practically no limits with full wrap labelling, when it comes to application scenarios and design variants. The possibilities range from a banderole for skin packs through to a complete full wrap envelope with cut-out sections and overlapping, and right up to an allover label for tray-packed ready meals.

For more information, visit https://multivac.com.

### New Sinamics G115D Distributed Drive System Specifically Designed For Conveyor Applications

With its new Sinamics G115D, Siemens is introducing a new, compact and powerful drive system specifically designed for horizontal conveyor applications. The drive system comprises the motor, drive and gearbox in one unit and is offered in two versions — wall-mounted and motor-mounted.

The Sinamics G115D drive system is characterized by a robust design with a high IP protection class (up to IP66 / UL Type 4X) and is suitable for use in harsh environments. Thanks to its compact dimensions, the Sinamics G115D can be easily installed in confined areas. The drive system can be operated reliably over a wide temperature range of -30 to 55 degrees Celsius (-22 to 131 degrees Fahrenheit), enabling operation in deep freezing applications.

Sinamics G115D is reportedly suitable for applications in intra-logistics and airports, as well as in the automotive and food and beverage industries. Its power ranges from 0.37 to 7.5 kilowatts (1/2 to 10 hp) for wall-mount applications and 0.37 to 4 kilowatts (1/2 to 5 hp) for motor-mounted applications. The drive system can be put into operation quickly and easily with comprehensive integration into the Totally Integrated Automation (TIA) portal including Startdrive commissioning software or the Sinamics Smart Access Module (SAM) web-server for Wi-Fi setup and diagnostics.

To be prepared for digital transformation and to enable cloud-based analysis, Sinamics G115D is integrated into the entire MindConnect portfolio and is compatible with MindSphere applications.

For more information, visit https://new.siemens.com.

### Twin Rivers Addresses Food Safety Concerns with Expanded EcoBarrier PFAS-Free Packaging Paper Offering

Fiber-based packaging leader Graphic Packaging International (Graphic Packaging) announced the launch of its ProducePack™ Punnet, an innovative paperboard alternative to plastic punnet trays for fresh fruit and vegetables. This new product, available for all commonly used punnet sizes, is fully recyclable and reduces plastic by up to 100 percent, depending on application.

As the market looks for fluorochemical-free (FC-free) papers, Twin Rivers Paper Company has invested in its PFAS-free (per- and poly-fluoroalkyl substances-free) grease-resistant food packaging brand, EcoBarrier. The company worked closely with the largest fast-food, quick-serve, and fast-casual restaurants to engineer a food-safe non-fluorinated product.

The expanded Twin Rivers FC-free line-up includes:

- EcoBarrier Plus: a top-of-the-line paper engineered for heavy grease applications, is ideal for greasy food applications such as fry bags, hamburger and taco wraps, hash brown pouches, and microwave food bags. Available in basis weights ranging from 18 – 45 pounds /29 – 73 grams per square meter (24 x 36/500); and
- EcoBarrier Choice: a fit-for-use substrate designed with lighter grease-resistant properties, is known for exceptional stain holdout and outstanding printability. It delivers medium to light stain resistance for packaging, including cookie bags, sandwich wraps, and carryout bags. Available in basis weights ranging from 18 – 60 pounds /29 – 98 grams per square meter (24 x 36/500).

EcoBarrier delivers Twin Rivers' hallmark converting performance in the areas of gluing, folding, printing, and laminating. Recycled content and chain-of-custody fiber certification are available upon request. Additionally, all EcoBarrier products are 100 percent recyclable, biodegradable, and plastic-free, making it the optimal substrate choice for sustainable packaging.

Both EcoBarrier papers are available with EZ Release™ for end uses needing exceptional release results. This proprietary formulation optimizes surface friction to produce nonstick functionality for baking, bacon layout, and other moist or fatty food applications.

For more information, visit www.twinriverspaper.com.

### Pneumatic Scale Angelus Breaks Out the Bubbly With Its CB50C System

To help craft beverage producers meet the growing demand for hard seltzers, ready-to-drink (RTD) cocktails, sparkling wines and higher-carbonation beers, Pneumatic Scale Angelus (PSA), a Barry-Wehmiller Packaging Systems company with nearly 130 years of canning experience, has introduced the CB50C counter-pressure integrated canning line.

Employing six individual filling heads and a single-head

seamer, the CB50C uses isobarometric counter-pressure technology, coupled with proprietary magnetic flowmeters, to deliver a system capable of one-milliliter filling precision. The line is reportedly rated for continuous operation at speeds up to 50 cans per minute.

Counter-pressure canning technology allows craft beverage producers to fill highly carbonated beverages, in excess of 2.7 volumes of carbon dioxide. In isobarometric filling, the can being filled and the product going into the can are at equal pressure, maintaining carbonation solubility throughout the filling process.

The CB50C has many of the same features as PSA's well-known CB50F and CB100F open-air canning systems. Magnetic flowmeter technology helps brewers get a perfect fill with little waste, and an under-cover gas flush system helps keep dissolved oxygen levels low. In addition, the company's high-speed, industry-leading double-seaming technology reportedly keeps ss sealed tight, extending critical shelf life.

For more information, visit www.psangelus.com.

**Graphic Packaging International Adds Innovative Paperboard Punnet to Sustainable Producepack Portfolio**

Fiber-based packaging leader Graphic Packaging International (Graphic Packaging) announced the launch of its ProducePack™ Punnet, an innovative paperboard alternative to plastic punnet trays for fresh fruit and vegetables. This new product, available for all commonly used punnet sizes, is fully recyclable and reduces plastic by up to 100 percent, depending on application.

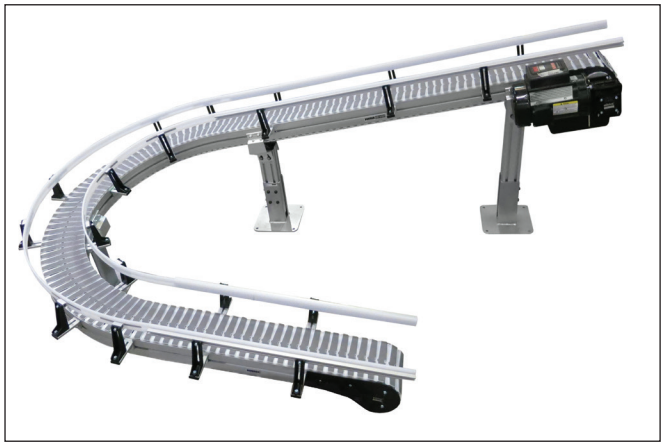
Designed with optimum operational efficiency in mind, ProducePack Punnet can be top-sealed at speeds equivalent to traditional plastic punnets. The sustainable solution reportedly works with existing machinery and tooling for plastic trays, meaning that minimal investment is required for packers looking to make the switch to paperboard.

For brands and retailers, the pack reportedly offers equivalent shelf life to plastic for certain produce items while reducing the potential for food waste. A range of board and barrier options is available, which have all been selected to ensure the package remains robust in cold storage and throughout the supply chain.

ProducePack Punnet can be supplied formed or flat, the latter offering carbon dioxide reductions in transit due to higher punnet tray volume per truckload.

In line with Graphic Packaging's Design for the Environment (DfE) approach, its features can reportedly be customized to suit various markets and potential applications. From tomatoes to berries and more, the unique solution ensures sustainability is at the forefront at each stage of the manufacturing process. ProducePack Punnet can also be graphically printed to maximize branding opportunities without the need for additional labelling.

For more information, visit www.graphicpkg.com.



**Gain Unlimited Configurations for Added Flexibility with the New FlexMove Helical Plain Bend Conveyors from Dorner**

For those applications that require the ultimate in conveyor flexibility, but with a small footprint to save valuable floor space, Dorner's FlexMove Helical Plain Bend Conveyors are the solution.

FlexMove Helical Plain Bend Conveyors reportedly provide customers with unlimited configurations, including flat to flat; flat to incline or incline to flat; or incline to incline. These

configurations, which also include inclines and declines through corners and straights, provide great flexibility for applications involving product buffering especially in corners.

FlexMove Helical Plain Bend Conveyors also come with a patented side roller chain to reduce corner friction.

Features and specifications of the new FlexMove Helical Plain Bend Conveyors include:

- Available on FlexMove Conveyors: FS (65 millimeters); FM (85 millimeters); FC (105 millimeters); FL (150 millimeters); FU (180 millimeters); and FV (260 millimeters);
- Minimum 500 millimeters radius helical bend corner;
- Corner angles: 45 degrees, 90 degrees, 135 degrees, 180 degrees, 225 degrees, 270 degrees, and 360 degrees;
- Incline and decline angles up to 12 degrees;
- Plain chain capable of incline / decline angles up to 7 degrees;
- Friction chain recommended for angles of 7 degrees to 12 degrees;
- Available in bearing chain and non-bearing chain models;
- Load capacity for both: 300 pounds; and
- Maximum speed for both: 180 feet per minute.

For more information www.dornerconveyors.com.

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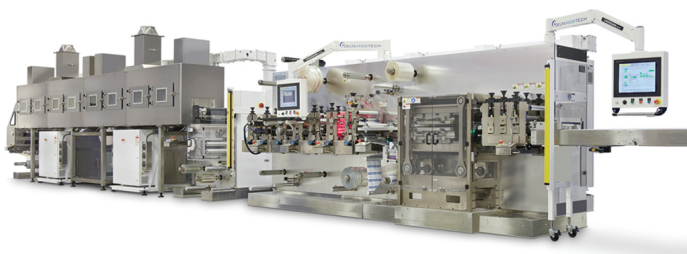

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