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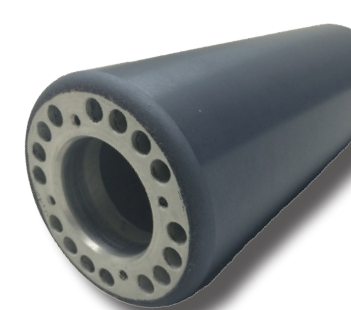
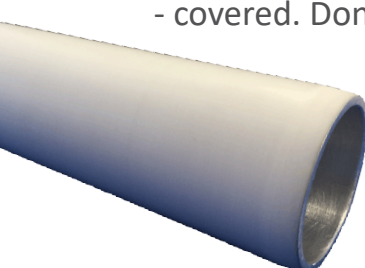
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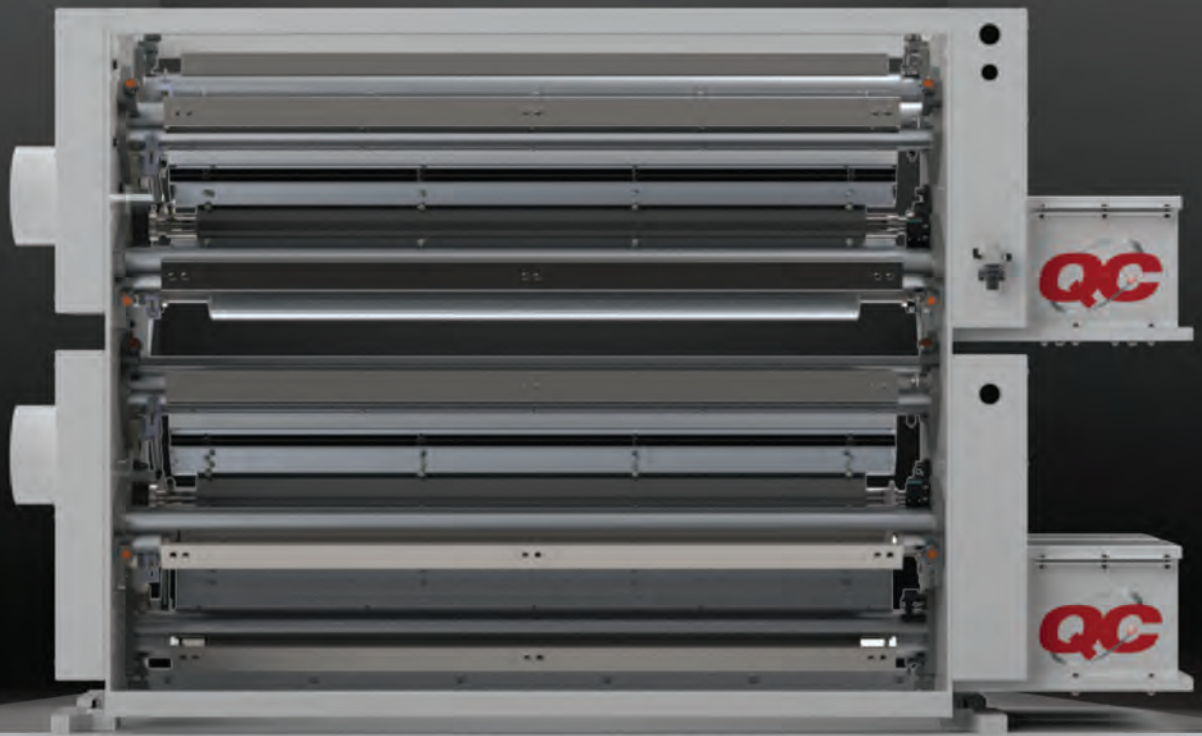
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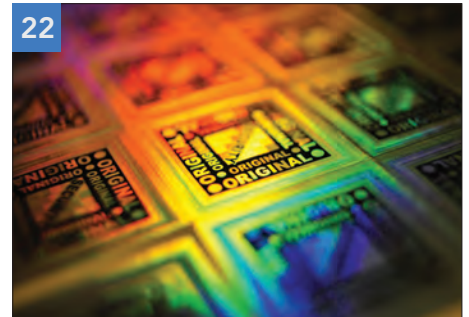
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## An EXPO Experience



**Angel Morris**  
Editor

For those interested in getting to “see, hear, touch and discuss the solutions and innovations shaping the future of packaging and processing,” PACK EXPO Las Vegas is surely on your radar this month. Taking place September 11-13, the event is set to draw 30,000-plus attendees, showcase 2,000 exhibitors, offer more than 100 free sessions and address more than 40 vertical markets. “Whether your next frontier is building a line or automating it, scaling up e-commerce, sustainability or refining your supply chain, you’ll find cutting-edge solutions for improving every aspect of production,” accord-

ing to PACK EXPO Las Vegas organizers. “Come to discover how they’ll transform your products, your lines and your company.”

According to its producers — PMMI, The Association for Packaging and Processing Technologies — the show ranks as the most comprehensive packaging and processing event in North America in 2023 and offers opportunities to address packaging and processing needs; discover new technologies and products; network with industry experts, peers and students; and learn about industry trends, hot topics and best practices.

Jim Pittas, PMMI president and CEO, said the industry’s positioning toward unprecedented growth makes a world-class trade show more crucial than ever: “PACK EXPO Las Vegas attendees can tap into our ever-growing industry, gain critical insights on market trends, move projects forward, forge relationships and see the latest technologies — all in one place.”

While attendees can expect many familiar show features to return, new things are planned, as well, including a focus on sustainability. Sustainability Central and the accompanying Sustainability Stage, “will serve as an interactive destination offering an expansive look into what sustainability means and will provide actionable sustainable solutions in manufacturing, materials and design.” There’s still time to register at <https://www.packexpolasvegas.com/>.

In the meantime, check out this edition’s cover story regarding the implications of innovation on testing and measurement, based on an international survey of packaging professionals. The role of custom steel racks in protecting flexible packaging rolls is also addressed, and, following PACK EXPO’s lead, this issue touches on sustainability and its emerging trends in label making, too. May your knowledge grow EXPOentially!

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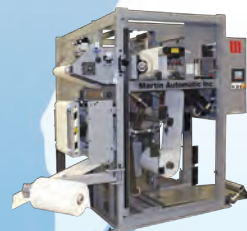


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# Testing Standards a Significant Challenge in Packaging Development

*The Implications of Innovation on Testing and Measurement*

By **Toby Lane**, Product & Applications Manager, Industrial Physics

The global packaging industry is currently experiencing a significant level of transformation. In order to capture the first-hand experiences and attitudes of those operating within the industry, Industrial Physics conducted an international survey of packaging professionals within consumer goods, food and beverage, and medical and pharmaceutical industries.

The research revealed the strong, sector-wide appetite for

packaging innovation, with almost all (96 percent) of packaging decision-makers agreeing that it is important for companies to explore new packaging developments.

It was highlighted that high demand for packaging innovation from those within the industry is motivated by ensuring the quality and safety of packaging. However, the company's latest research also illustrated the pressure that packaging professionals are facing

to overcome challenges around expertise and testing in the race to innovate and out-pace competitors for market share.

## Applicability of Testing and Standards

Widespread innovation within the packaging industry is undeniably presenting opportunities for both manufacturers and customers seeking to differentiate their prod-





Sophisticated equipment makes it easier than ever for businesses to manage testing internally.

ucts for the end user. However, there are still complex challenges to be overcome to support the safe and structured development of new packaging products.

The global research uncovered that the four biggest challenges in testing new types of packaging are: The high cost of expertise (62 percent), limited testing facilities (48 percent), lack of in-house expertise (38 percent) and that current testing standards are not applicable (36 percent).

In fact, the professionals surveyed cited difficulty around testing and standards throughout the research in relation to innovation and development for packaging and materials. Across the sectors surveyed, almost three in four decision-makers (71 percent) agreed that testing standards are a significant challenge.

This implies a considerable threat where innovation is rife, but

many manufacturers do not have access to the expertise and equipment required. As a result, new products are at risk of being developed without meeting the quality and safety standards required for their intended packaging applications.

If packaging is developed without the knowledge and means for testing, then there can be serious ramifications in sectors such as food and beverage where the packaging is a key determinant of whether the contents are fit for consumption when they reach the end user.

However, the perception that the current testing methods are not applicable today is less about the methods adopted and more about the innovation in materials being introduced. For example, recycled polymers are typically formed with a mix of recycled and virgin material. The level of processing that the recycled ma-

terial has undergone will result in the material behaving differently under test conditions because of the reduction in average molecular chain length that occurs with each processing step.

Therefore, standardization proves challenging to establish, and characterization of the material becomes ever more complex — this is because its behavior is dependent on the prior working lifecycle of the recycled portion.

Therefore, despite obstacles to overcome in specific applications such as recycled polymers, at a broader level the testing methods that have been adopted across the industry remain just as applicable today in ensuring the quality and safety of packaging manufactured.

Where there are instances of new materials that behave differently and don't have a bank of data or research for manufacturers to

draw upon, identifying the expertise required to translate the practices of typical testing standards to the material is a challenge and often doesn't translate to the wider industry unless collaboration is facilitated. Therefore, at an industry level, there needs to be greater collaboration between packaging professionals and industry bodies to ensure that standards and guidelines are developed in line with the industry's pace and with as much insight as possible.

For businesses where the knowledge is not yet held internally and innovation is being stalled as a result, attending packaging and materials events is a great place to start — this allows experts to connect with other experts across different specialisms who can help.

## The Cost of Recyclability

The research from Industrial Physics also demonstrated the significant focus for packaging professionals on:

- Reducing waste (57 percent);
- Improving sustainability (55 percent); and
- Increasing the recyclability of packaging (54 percent).

In the plight for greater recyclability, the exploration of new materials can also lead to a significant cost for businesses. Where recycled materials are adopted in packaging development, manufacturers face a greater level of defects and data sheets with greater variability.

As a result, the risk of batches not meeting standards and being rejected is increased. In addition to this, to guarantee quality and safety with an unpredictable material, businesses must employ



**71%**  
of packaging decision-makers see testing standards as a significant challenge when adopting innovative packaging solutions.

a greater level of testing, which inherently incurs a considerable cost whether conducted in-house or if outsourced.

Despite these challenges, demand is only set to grow and there must be transformation to accommodate greater sustainability in the packaging industry beyond simply the materials developed. For example, there are multiple materials already used in packaging that could be made readily recyclable if the appropriate systems were put in place via cooperation, investment and infrastructure — the obvious example being thin-film plastics which are often rejected simply because they pose a risk of clogging machinery. There is also greater uniformity and information sharing required in the approach to

recycling to improve and guarantee the success of waste reduction.

## Getting Ahead

One of the greatest opportunities for packaging innovation in today's landscape was identified in the research as the approach to testing and measurement. The sophistication of the testing equipment available today has made it easier than ever for businesses to manage the testing process internally without the requirement for a specialist user.

Furthermore, investing in the equipment to take the process in-house allows businesses to save time, increase agility and gain expertise. These benefits can help businesses accelerate a safe and structured approach to packaging development to meet innovation goals and gain a competitive advantage. ■

*Author's Note: The entire IP report can be found at [https://industrialphysics.com/campaign/packaging-innovations-2023/?utm\\_medium=publication&utm\\_source=pressrelease&utm\\_campaign=thoughtleadership23](https://industrialphysics.com/campaign/packaging-innovations-2023/?utm_medium=publication&utm_source=pressrelease&utm_campaign=thoughtleadership23)*

## ABOUT THE AUTHOR

Toby Lane earned a degree in Materials Science & Engineering with Business Management from the University of Birmingham. He has spent four years working in engineering roles within the Materials Testing industry — gaining experience that covers fatigue, fracture and, more recently, general polymer characterization. He supports the Ray-Ran product line at Industrial Physics, advising on customer applications and developing the range of test and inspection solutions within the plastics market.

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# Emerging Trends Steering Label Making Towards Sustainability

By **Alaina D'Altorio**, Marketing Specialist, Smith Corona Labels

Consumers nowadays take great consideration about the impact goods they purchase have on the environment. This has led to a growing awareness of sustainability in all things commerce — and labels are no exception.

Because labels play such a crucial role in the global supply chain, the label industry is setting goals to reduce its carbon footprint with more sustainable alternatives. They're also aiming to meet customer needs and expectations with greener options.

However, it's not just the final product that matters. Each step of the label manufacturing process has its own effects on the environment as well.

Whether it's saving energy and reducing emissions, improving safety with transportation, responsibly sourcing raw materi-

als or providing alternative label products for recyclability purposes, the label industry is pushing for a more sustainable supply chain while creating a better label in the process.

## Energy Efficiency with UV Curing

Label manufacturing from start to finish can be a lengthy process. Not to mention one that requires an abundance of energy. One area this rings true is during the silicone curing process.

Typically, the most common way to cure silicone is by using thermal heat. Laminators run silicone-coated release liners through large ovens that generate high temperatures (around 200 degrees Fahrenheit) for the necessary chemical reactions to take place.

Unfortunately, these ovens utilize natural gas, which generates large amounts of energy and releases harmful emissions into the atmosphere. These volatile organic compounds (VOCs) include pollutants like carbon, nitrogen and sulfur, and pose a risk to both human health and the environment.

However, curing silicone through ultraviolet (UV) light is a method that is gaining traction. Unlike traditional drying methods, UV utilizes electricity instead of heat.

This reaction instantly cures the silicone, resulting in a reduced production time. More importantly it can result in significant energy savings up to 75 percent when compared to thermal methods. UV curing also releases fewer harmful emissions into the environment.

As an added benefit, UV curing provides more reliable and consistent results with label release as well as increasing durability and gloss characteristics for film materials.

## Sustainability Through Transportation

Sustainability with label manufacturing doesn't just extend to the product being made in the factory. Transportation of key materials to the company also has its effects on the environment.

Take the previously mentioned UV curing process. For this method to work properly, a highly



UV curing utilizes electricity instead of heat and provides an instant cure to silicone for less energy use and fewer harmful emissions.

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Release liner like PET is a sustainable alternative that can be recycled and repurposed for other various items after use.

pure nitrogen gas must be used – 99.999 percent to be exact. Typically, label manufacturers will have this hazardous material delivered via truckloads.

However, depending on the company size, this results in bulk deliveries occurring weekly or even daily. The frequency of these deliveries increases the amount of harmful CO2 released into the atmosphere.

One remedy to enhance sustainability in this instance is through the addition of an on-site gas production system. By producing nitrogen gas on-site with the right equipment, the need for nitrogen truck deliveries decreases substantially. The result is a significant carbon footprint reduction.

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for label manufacturers, it represents one of the most effective ways label manufacturers can scale their business in a more sustainable manner.

## Responsible Sourcing of Raw Materials

Deforestation is still a pressing global issue that continues to have negative environmental impacts. A 2022 McKinsey report stated that each year around 10 million hectares of land are cleared — that's the size equivalent of South Korea.

For label production, paper is still the leading material used for both facesheets and release liners. So it makes sense to install sustainability initiatives where it all begins: Harvesting the raw materials.

To meet greener goals, many pulp and paper companies are taking initiatives to responsibly source exactly where their raw materials come from.

Using materials from local forestries that will replant trees after harvesting is one way to do this. One paper company claims it plants four trees for every one that is harvested to curb deforestation. This way natural resources are not depleted and suppliers can set responsible expectations for what they're taking.

Other companies utilize teams of foresters to help protect resources. These hired personnel work closely with landowners to determine appropriate timber harvesting as well as requirements for future reforestation.

## Recyclable Release Liner Alternatives

The life cycle for many label products is a short one. Because most quickly find their way into the trash, recyclability is essential for a smaller carbon footprint. Take release liners ...

Around 87 percent of U.S. release liner consumption is paper-based. However, each year hundreds of thousands of tons of paper liners sit in landfills and add unnecessary waste to the environment. This is due to the difficulty separating the silicone coating from the facesheet.

Options promoted as fully recyclable by many in the label industry are film liners. One example of this is polyethylene

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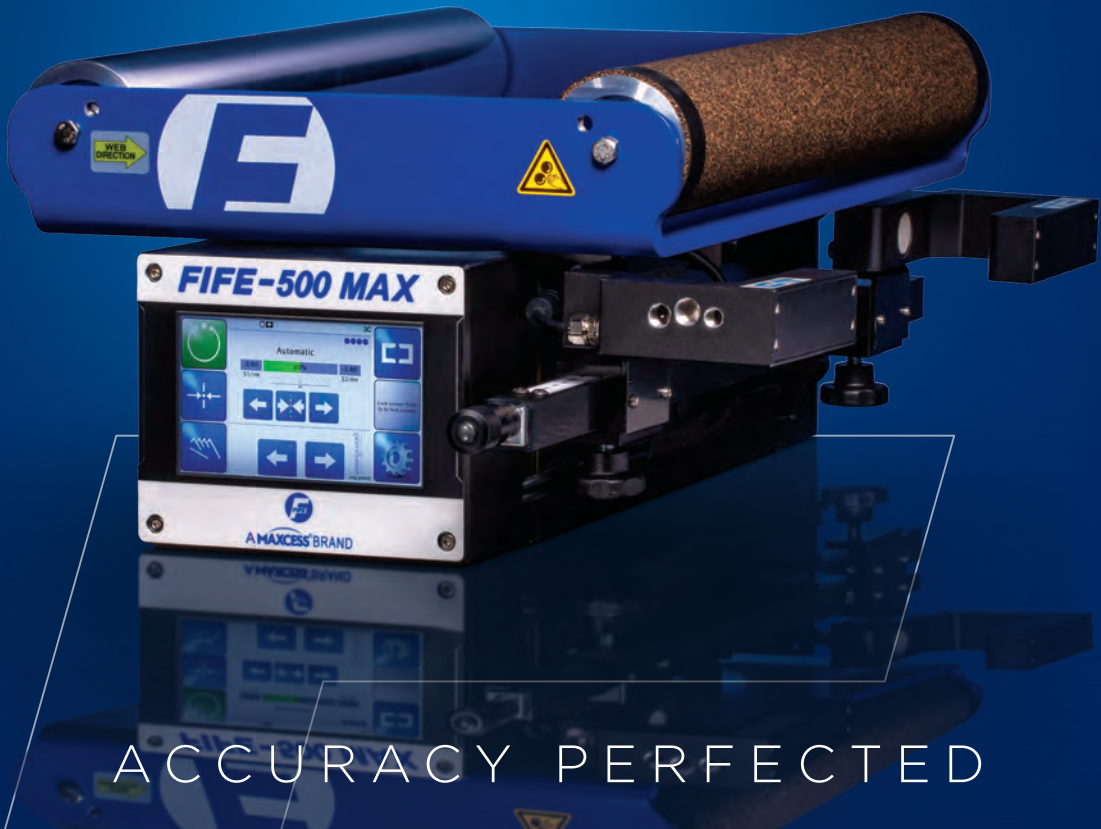




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terephthalate (PET), mostly due to it being the closest alternative to paper liner.

PET liner is thinner and produced with a significantly less silicone coating, which enables a more efficient recycling process.

After its use, the liner can be ground up and molded for reuse as various plastic items.

Zero waste release liners are also gaining attention in the industry. These alternatives are made of biodegradable and compostable

materials, like plant fiber, and undergo a natural decomposition process when they reach the end of their life cycle.

In total, these options reduce the amount of waste sent to landfills for much greener practices.

## The Future of Label Manufacturing is Green

As a growing number of organizations, businesses and consumers embrace environmental responsibility, we can expect to see significant advancements in the sustainable production of labels. These eco-friendly initiatives provide optimism that the future of label manufacturing will not only enhance product quality, but also contribute positively to the health of the planet. ■

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## ABOUT THE AUTHOR

An industry innovator, Smith Corona Labels provides high-quality labels to end-users at the lowest cost possible thanks to their unique vertically integrated system. As the Content Marketing Specialist for Smith Corona Labels, Alaina D'Altorio is responsible for writing and discussing topics on their blog relevant to all things label related: Industry news, material shortages, trending innovations and more. She can be reached at [daltorio@smithcorona.com](mailto:daltorio@smithcorona.com) or through [www.smithcorona.com](http://www.smithcorona.com).

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# Protecting Flexible Packaging Rolls with Custom Steel Racks

By **Craig Heil**, Manager, Steel King Industries

To protect product quality and longevity, the food, beverage and personal care industries rely on flexible paper, foil or plastic-based packaging. However, before printing and converting into myriad finished packaging sizes, massive full or partial rolls of materials often must be stored for extended periods without any creasing, crimping or damage that could compromise product integrity or branding.

Although some in the industry rest the heavy rolls of

packaging materials on wood frames prior to use, this can cause compression damage and is not conducive to stacking. The challenge is that flexible paper, foil or plastic rolls can weigh as much as 5,000 pounds with 60-inch diameters and 72-inch lengths. So, setting a heavy roll down on any surface can leave an imprint or deform it, compromising quality and potentially making some of it unusable.

The ideal solution would be to hang each roll utilizing steel

racks and inserting an integrated, supportive steel mandrel through its core. This arrangement enables safe storage and transfer of the roll by forklift to the production line.

Now, a growing number of flexible packaging industry professionals, converters and OEMs are turning to what is becoming an industry best practice: Custom steel racks that not only ensure roll integrity during storage but also facilitate safe conveyance by forklift to printing or converting areas while optimizing storage density.

The heavy-duty rack facilitates hanging and supporting each roll through its core with a sturdy steel mandrel that eliminates the compression damage of placing the material on a surface. The rack and mandrel are tailored for each roll's specific size and weight, and some are designed to accommodate several partial rolls. Additionally, the rack can be designed to maximize storage density by enabling stacking.

For years, leading domestic providers of flexible packaging have turned to professional rack companies for custom steel shipping racks to store and move rolls. It is important to find a company specializing in the design and production of a variety of fabricated steel material handling products including storage racks and multi-use rigid, collapsible and adjustable shipping racks.

Storage and material handling



Using custom engineered storage and material handling racks can better protect high-profile wrapper products while requiring less space.

specialists can customize rack size, weight capacity, construction materials and other factors. CAD solid modeling software and techniques can be used to design the steel racks and mandrels. Look for a company whose in-house, professional engineers are experts at analyzing OEMs' operational systems and processes relative to the type and size of the rolls.

You should be able to request design configurations that tailor the racks to a specific manufacturer's products and industry. To optimize storage capacity, companies often want stackable racks, or racks that can hold single or multiple partial rolls. To promote safety [when using forklifts] some like fork tubes, fork stirrups or steel u-shaped straps welded to the

**For years, leading domestic providers of flexible packaging have turned to professional rack companies for custom steel shipping racks to store and move rolls.**

bottom of the rack.

The design depends on the type and shape of the mandrel being used to hang the roll and whether the rack will be stacked or not. A lot depends on the roll's size and weight, which really is the biggest factor in how each rack is designed.

Although the packaging, converter and manufacturing industries have tolerated some

paper, foil or plastic roll damage as a cost of doing business, using custom-engineered storage and material handling racks can better protect high-profile wrapper products while requiring less space. Industry professionals that adopt this best practice technique can substantially improve the integrity of their product and brand as well as the efficiency and safety of their storage and material handling. ■

**ABOUT THE AUTHOR**

Craig Heil serves as a manager at Steel King Industries ([www.steelking.com](http://www.steelking.com)), a leading manufacturer of storage rack, shipping rack and material handling products since 1970.

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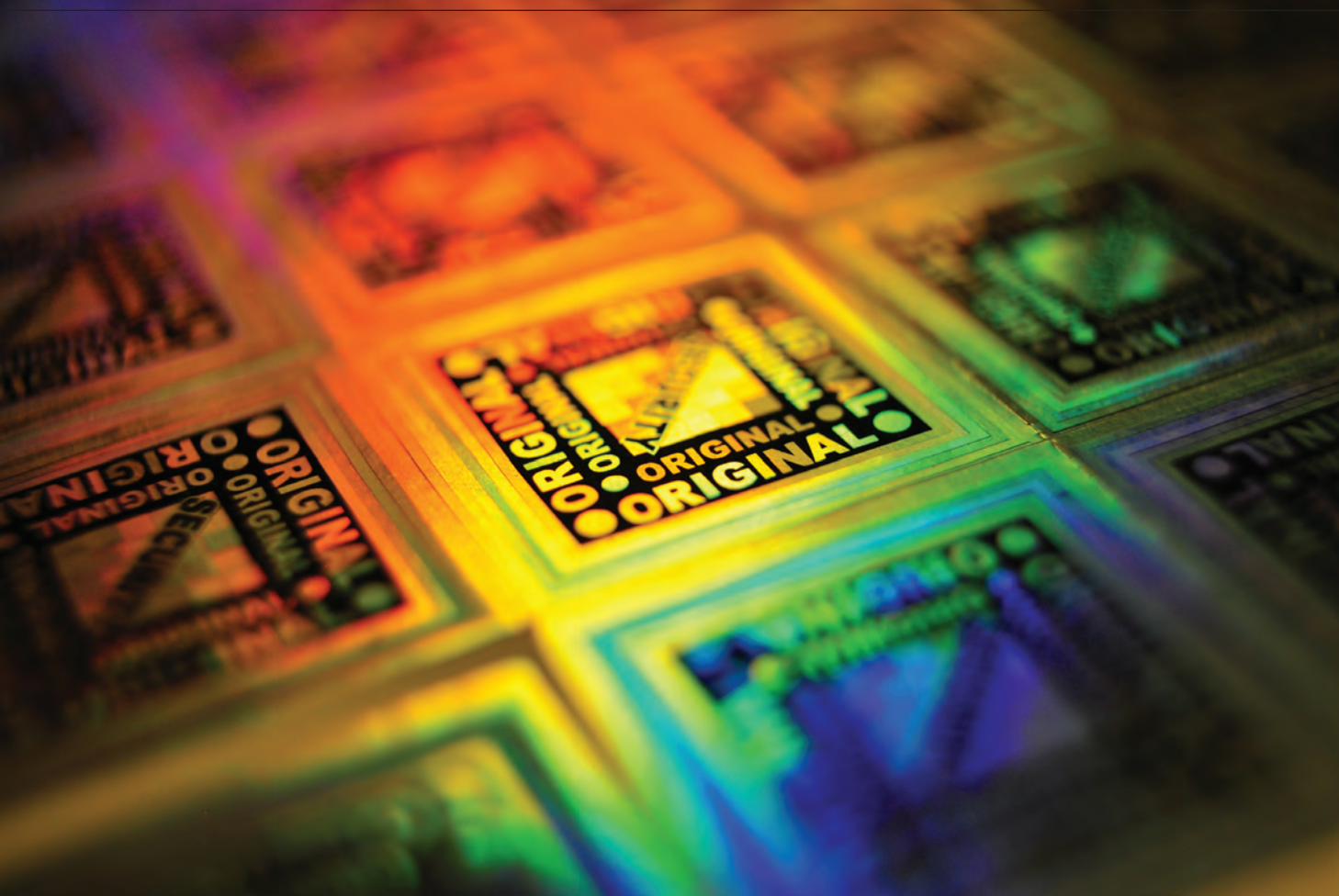


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# The IHMA: Driving 30 Years of Hologram Growth

Established in 1993, the International Hologram Manufacturers Association (IHMA) has evolved into a global voice on authentication and security devices. Now, five former chairs — and one general secretary — reflect on 30 years of holography growth while offering a glimpse of an exciting future for the technology.

## What do you see as the key ups (and downs) of holography over the last 30 years?

**David Tidmarsh (DT), first chair, 1993 – 1995:** Despite

the potential of holography as a security feature following its role on payment cards, convincing companies to adopt holograms for security was tough because holography was expanding rapidly in retail packaging and stationery, and many felt it lacked security credentials (unique, scarce, tightly controlled, etc). The two defining events which changed this negative perception was the establishment of the IHMA Hologram Image Register and the adoption of holograms by the European Central Bank for the first euro

banknote series.

**Dr. David Pizzanelli (DP) chair, 1995 – 1998:** The 1980s saw a surge of pioneering companies racing to create a brand-new business out of embossed holograms; first came 3-D display holograms and just a few months later ‘2D-3-D’ promotional stickers with their dazzling rainbow diffractive colors. The 1990s saw the rise of small holograms used for brand protection on a wide range of products, such as tea, coffee and cigarettes. As the technology became more widely disseminated





David Tidmarsh



Dr. David Pizzanelli



Francis Tuffy



Ian Lancaster



Manoj Kochar



Dr. Paul Dunn IHMA Chairman

the security value diminished and the industry became more consolidated; however, the innovative technology of embossed holograms and diffraction gratings is still flourishing today.

**Francis Tuffy (FT), chair, 1998 – 2000:** When the IHMA was formed, the industry had gone through an amazing growth spurt taking it from the laboratory, through gallery and museum exhibitions to partial acceptance as a visual tool for packaging, marketing and security. Today, holography is routinely used in all three of these application sectors.

**Ian Lancaster (IL), general secretary of the IHMA, 1993-2015:** Adoption and continuing use of holograms on the euro, increased use of holographic optical elements (HOE) in lighting, head-up displays (HUD) and the

simplification of origination using computer systems have definitely been ups. When it comes to downs, the failure of display holography to make a discernible impact in the visual world — advertising and promotion, decorative, medical imaging etc. — has been disappointing. The confusing misuse of ‘hologram’ and ‘holography’ to describe updated Pepper’s Ghost and similar effects must also be addressed.

**Manoj Kochar (MK), chair 2016 – 2018:** To my mind, the key to the growth of the industry has been the application of holograms on banknotes, identity documents such as passports and visas, and also credit cards. These applications were a huge endorsement to the hologram as a protector against counterfeiting. This led to further adoption across various

other sectors. The widespread proliferation of the technology in markets like India and China have also contributed enormously to the overall growth of the industry. Advancements in origination and mass replication technologies have ensured that the industry has kept pace with the growing demand for larger volumes as also the innovations in optical features.

**Paul Dunn (PD), chair 2019 – present:** The growth in related technologies and market acceptance of holography has been a very positive factor over the past 30 years, particularly in security and packaging applications. In anti-counterfeit and authentication applications, holography has played a leading role over this time period. In contrast, display and holographic art has not experienced the same growth as ma-



Malawi 5000 foil image

materials and facility costs are high and opportunities are limited for new holographers. New applications for display technologies are emerging but time will tell how well these will fare.

**What obstacles must be overcome to secure future growth?**

**DT:** In security, the emergence of new security features. We have already seen this with the emergence of micro-optics lens and plasmon-based features. In time, counterfeiters find ways to mimic even high technology security features, so new technologies do evolve. And the use of physical documents for security is declining as digital technologies evolve. The use of holograms in packaging, stationery and display however, would appear to have more resilience in the medium to long term.

**DP:** Embossed holography has long lead-times and expensive tooling costs, but when compared to ink-based printing, embossed



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Mozambique holograms

diffraction structures are amazingly versatile, providing multi-color images in a single pass, from a color photograph in diffraction hues, to 3-D images with parallax, even short video portraits. Features such as kinetic guilloche patterns can be combined with micro-text down to the sub-micron level. Combined with light-sensitive photopolymers, volume holograms, micro-lenticulars and fly's-eye arrays, can be created. Different structures provide a myriad different optical effects and will continue to provide excellent value in the future.

**FT:** Cost has to be considered as a limiting factor to the growth of holography, as although we have seen production efficiencies over

the past 30 years, it is still a relatively expensive option in many applications.

**IL:** Lighting (for display holograms) and cost.

**MK:** Over the years the hologram has obviously lost its novelty value, but the industry needs to create a new generation of optical effects and color control technologies to keep the technology interesting and unique. And with the constant cost pressures, such developments need to be priced optimally.

**PD:** Over the years, alternative optical technologies have started to emerge to challenge holograms in both display applications and in particular, security applications. Light Field display systems, using a multiple lens technology called Integral Imaging, are making significant inroads to display applications such as advertising, medical imaging and educational applications. Together with large-format projections and Peppers Ghost, they form a body of 3D imaging methods they call holography, but these technologies have no basis in true holography.

Perhaps more significant are the optical technologies emerging in the security applications to rival holograms. Optical technologies such as micro-lenses, micro-mirrors and plasmonics, are examples of developing technologies already in use today, with other developments in progress. Although perceived as obstacles to hologram growth, the challenge for the hologram manufacturers is to assess if these are true obstacles or opportunities to work together to provide even greater security. High material and facility costs will remain an obstacle for the holographic art and display market.

**How should the IHMA position itself for the next 30 years to meet the changing needs of its members and the wider industry?**

**DT:** The initial requirement of the IHMA to put holography on the global map, in particular in the security, packaging and stationery industries, has been achieved. But these are now mature markets so there is need for change if membership has peaked. In security the word “hologram” has largely been replaced by “diffractive feature” as this embraces more technologies and companies. Are there other light-based technologies that could benefit from joining an association? I would suggest that a work group is formed with the specific objective of identifying potential technologies, industries

and/or organizations that could benefit from membership of a mature and well-managed association. The name IHMA should not inhibit the research — a new name could mean new life.

**DP:** Over the last 30 years the word “hologram” has been broadened to include a whole range of different visual effects and almost every type of 3-D projection system, from Pepper’s Ghosts to Virtual Reality viewers. Holographers no longer have ownership of the term “hologram” and the IHMA may have to open its membership to companies making novel imaging devices that the general public accepts as holograms in order to adapt to the wider industry.

**FT:** The industrial sectors that use holography are shifting.

Medical imaging, VR headsets, Holopresence and large-format displays are just some of the areas that are seeing the advantages of diffractive over refractive optics. The IHMA should look to expand its membership beyond traditional hologram manufacturers to include these sectors.

**IL:** I agree with Francis on this one. The IHMA needs a wider remit — more outward looking than ever before. Part of the IHMA’s mission is ... encouraging the understanding, use and development of holograms and holographic technology. While implementing this is currently a challenge, it is necessary for the growth and continuing role of the organization.

**MK:** The IHMA should also



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perhaps expand its presence to the authentication segment whereby the other authentication technologies are also invited to the IHMA platform to promote collaboration with the security hologram industry and develop new solutions to meet the changing needs of the marketplace. Besides security and decoration, the hologram also finds use in projection, display and imaging, data storage. These applications are set to grow and the IHMA must make an effort to bring such technologies within its fold so that it truly remains the global voice of the hologram technology.

**PD:** It is certainly changes to the wider industry that has taken the focus of the IHMA board recently. The introduction of an

increasing number of non-holographic optical security technologies and new display and stage concepts that question the definition of the term “holography,” are challenges we need to face.

The next update to the Hologram Image Register, already in planning, is to broaden the range of optical security features to include new non-holographic technologies. All these factors have a clear implication to the International Hologram Manufacturers Association name itself. Will we need to change the name of the Association? Most likely. The Board is already looking to expand the association membership to a wider range of manufacturers and markets beyond the traditional hologram manufacturers and looking

to introduce a new range of support and services to ensure value to members. If we want to be an effective association to current and new members markets, further and significant changes will need to be made. ■

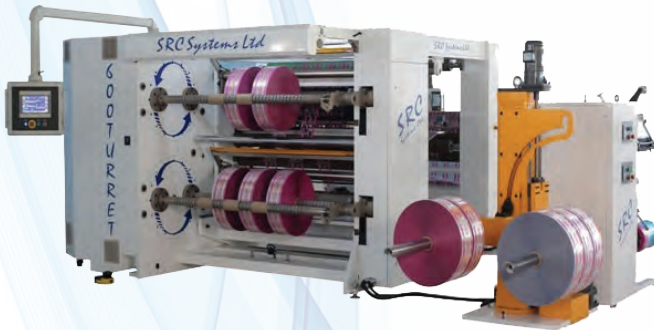
## ABOUT THE IHMA

The IHMA ([www.ihma.org](http://www.ihma.org)) is made up of more than 80 of the world's leading hologram companies. Members include the leading producers and converters of holograms for banknote security, anti-counterfeiting, brand protection, packaging, graphics and other commercial applications around the world, actively cooperating to maintain the highest professional, security and quality standards.

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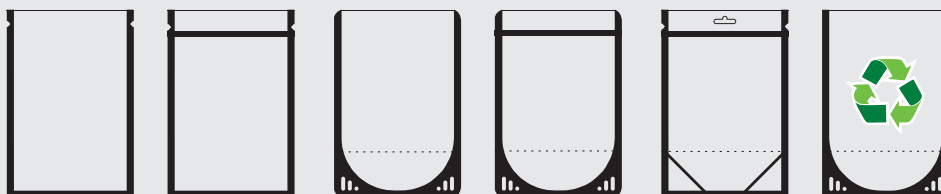
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# Takes on Tapes, Labels & Liners

By Susan Stansbury, Industry Consultant

Tapes, labels and liners individually, and as they overlap, represent so many facets of converting and equipment, and inevitably miss some of the latest. Nevertheless, here are some notes.

Tapes offerings are among the most diverse product lineups. The big differences, from masking to electrical, sealing and other segments include varying substrates, adhesives and characteristics. As Tesa Tape indicated, “Functional tapes do more than just connect two objects to one another. These adhesive tapes have additional properties that allow them to be conductive, insulate, grip and shield electrical components.”

Substrates for tapes run the gamut of materials. Filament tapes alone can incorporate polyester, polypropylene and glass yarn filaments, often to increase strength for strapping and other specific applications.

There are different types of adhesives available for tapes: Acrylic, hotmelt and solvent-based with different properties. Pressure-sensitive adhesives include silicone, acrylics and rubbers. For example, silicone adhesives are used in medical applications and for transdermal patches.

Years ago, I participated in trials to match various adhesives with various release liners. We knew that the level of adherence and release is greatly impacted by the choices made. In some cases, those levels were impacted by time and by other steps in production including radiation sterilization; certain combinations that were supposed to release tightened instead.



Prototyping and machine trials are critical for desired outcomes when disparate combinations are in play. The possibilities are demonstrated by Tesa International which touts more than 7,000 solutions. Today, noted Tesa, “the focus is on sustainability and energy-saving processes.”

Tesa has achieved good outcomes with its extensive sustainability initiatives, “particularly in the areas of environment and energy, sustainable supply chains and ethics.” As a result, the company has received “EcoVadis Gold status,” the EcoVadis platform is an independent assessment system for companies that measures sustainability performance.

Labels offer solutions with use of papers, fabrics or other materials which are attached to products and containers. For example, Pixelle Specialty Solutions features label face stocks for these representative specialty categories:

Prime, direct thermal, thermal transfer, wet strength and pressure-sensitive. A reminder of the range of purposes for labels:

- Identification (genuine vs. fake);
- Marketing and branding;
- Compliance and usage warnings;
- Medical, cosmetic and food information;
- Usage, disposal and recycling; and,
- Contents and composition.

In addition, according to Pixelle, their “extensive range of barrier coatings take the performance to the next level. Seal in aromas, block grease and more with advanced barrier technology that can help to replace single-use plastics with one of the most renewable substrates on the planet.”

Brand appeal often steals headlines in the labeling arena. Optimal printed surfaces include

matte and various gloss levels, and coating conversions. Label growth is frequently dependent on the appeal of printed materials as well as continued diversity. According to recent reports, the global print label market is expected to grow to \$44.80 billion this year at a compound annual growth rate of 6 percent. Ink dispensing systems and management software programs for achieving repeatable quality and reducing ink costs has made major impacts.

Flexographic, gravure, screen and digital methods are increasingly offering sustainable print solutions for labeling. Brand leaders are conscious of consumer awareness where waste and green approaches are part of the product story. According to Dan Aberly

of Legacy Flexo, manufacturers are building presses, each with flexo, digital and UV capabilities for efficiency and features. Beyond aesthetics, labels find niches in areas like weather resistance where UV varnishes protect against moisture.

Attractiveness is always a driving factor in many applications. Wausau Coated Products noted the recent launch of Castile Bright Silver Foil - Dual Metal Roll Label Stock.

Numerous aspects of processing impact label niches. At Contract Converting LLC, its precision slitter-rewinders can run all grades of paper, tissue, board stocks, films, foils, laminates, nonwovens, printed and unprinted materials. According to Robert

Saari, Contract Converting President, supplying into label markets includes these customer targets:

- Pressure sensitive;
- Tag and label;
- Flexible packaging;
- Food and beverage;
- Pharmaceuticals;
- Home care;
- Personal care;
- Industrial/Commercial; and,
- Retail.

According to Joe Ooten, Packaging and Label Director, at Konica Minolta Business Solutions, "Over the past few months, we have begun installing our AL 400 label press. Its industry-leading high opacity, single-hit digital white is setting new standards!" In these technical label processes,

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Liners for tapes and labels exhibit all the similar issues including improving efficiency, sustainability and increasing the range of products. Additions of inline quality inspection, automation, software management systems, interactive tools and seamless manufacturing from production to packaging are among the efforts. In the case of labor shortages, the pace of further automation has to step up. A Wisconsin converter said recently, "We would run 24-7 every day if we could find more workers."

Considerations when sourcing these technical products include having food-grade or medical-grade qualified papers

and films, recycled substrates and luxury aesthetics. Layflat and properties for smooth processing are specified by converters. Companies such as Wausau Coated offer facestocks, liners and release performance.

Expertise and learning are imperative in these factories. David Roisum, web handling expert, helps clients explore the wide range of economics including the costs of machines, the useful lifetimes of machines, startups, waste, delay and customer complaints.

Seminars such as PMMI's Chicago, October 3, program for Packaging Robotics keep the industry current with AI integration and examine return on investment factors. Rockwell Automation offers 3D interactive tools for

systems to assess plant lifecycle profitability and asset management through demonstrations for teams, engineers and operators.

Those who thrive in producing tapes, labels and liners must chase and capture the ever-changing technologies that move these industries forward. ■

## ABOUT THE AUTHOR

Susan Stansbury is a converting advocate with extensive experience in paper, converting, printing and related industries serving in roles including sales, marketing and product development.

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Experts from the PACK EXPO Partner Program will address industry hot topics September 11-13. (Image courtesy of PMMI)

## PACK EXPO Las Vegas Returns in September

PACK EXPO Las Vegas — a show produced by PMMI, The Association for Packaging and Processing Technologies — features the latest packaging and processing solutions, and opportunities to network and learn about industry trends, hot topics and best practices. The show runs September 11-13 at the Las Vegas Convention Center.

### Special Events and Networking

Various networking and special events are offered before and during the show, including:

- September 10: PMMI Foundation Golf Tournament at the Bali Hai Golf Club, and PACK gives BACKTM fundraiser for the PMMI Education Foundation at the Bellagio Hotel & Casino, with a private performance of O™ by Cirque du Soleil®;
- September 12: The Packaging & Processing Women's Leadership Network Breakfast; and,
- September 13: The Amazing Packaging Race returns, sponsored by Emerson. Students from across the U.S. race to solve problems and tasks at participating booths.

### Free Educational Opportunities

Education is a major focus at PACK EXPO, and sessions are free for registered attendees. Simply take a seat and participate in presentations at:

- Central Hall: Industry Speaks Stage (Booth C-1141), Innovation Stages (Booths C-2051, C-2058, C-2151), and The Forum (Booth C-2158);

- North Hall: Processing Innovation Stage (Booth N-10511); and
- South Hall: The Reusable Packaging Learning Center (Booth SU-8000).

### The Show Floor

More than 2,000 suppliers, showcasing innovations for more than 40 vertical markets will be located in an array of pavilions, including:

**Central Hall** — Meet experts from leading packaging and processing associations at the Association Partner Pavilion (Booths C-1145–C-1354);

**South Hall** — The new Healthcare Packaging Pavilion on the South Hall lower level features solutions for pharmaceutical, biopharmaceutical, nutraceutical and medical device manufacturers;

The Confectionery Pavilion, hosted by the National Confectionery Association in South Hall upper level features the latest trends in aeration, batch refining, shaping, cluster production and the Candy Bar Lounge (Booth SU-7201), sponsored by Syntegon Packaging Technology;

The Reusable Packaging Pavilion in the South Hall upper level is sponsored by the Reusable Packaging Association, featuring solutions to reduce waste, cut costs and gain supply chain efficiency; plus, the Reusable Packaging Learning Center (Booth SU-8000);

**North Hall** — Sustainability Central is home to the Sustainability Stage (Booth N-9967) with speakers and educational exhibits featuring packaging design,

materials, manufacturing processes, recovery methods, logistics and data. Look for the PACK EXPO Green icon to find exhibits and educational sessions focused on sustainability.



The new **Logistics Pavilion** features e-commerce solutions, warehousing, fulfillment, distribution logistics and transportation service providers.

**The Processing Zone** hosts the Processing Innovation Stage (Booth N-10511) and solutions designed to increase efficiency, achieve total system integration, ensure employee safety; plus, front-of-the-line solutions such as homogenizing, heat treating, forming/sizing and coating.

**The Containers and Materials Pavilion** displays the latest innovations in paperboard, glass, metal, plastic, flexible, and resealable packaging, and The Showcase of Packaging Innovations® (Booth N-9550) is sponsored by WestRock.

**The PACKAGE Printing Pavilion** showcases digital

printing and cost-effective solutions for smart, short-run, on-demand, variable data and personalized packaging.

See the Future Innovators Robotics Showcase (Booth N-9769) and meet robotics teams from Las Vegas-area high schools. Also meet the winners of the 2022 PACK Challenge (Booth N-9026) from Waterford Union High School in Waterford, Wisc.

### Professional Development

The Workforce Development Pavilion (Booths N-9000–N-9026) is a one-stop shop for resources to strengthen the workforce. Learn about PMMI U offerings, popular training workshops and meet students interested in careers in the industry.

Special programming is available throughout the event for young professionals and first-time attendees, and experienced industry executives help attendees locate packaging and processing solutions through the Ask the Experts program (Booths C-1100, C-5699).

*Register and learn more about PACK EXPO Las Vegas at [packexpolasvegas.com](http://packexpolasvegas.com).* ■



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## R2R USA Conference 2023 Heads to Milwaukee in October

Registration is open for the 2023 R2R USA Conference, organized by the Association for Roll-to-Roll Converters (ARC) (formerly AIMCAL), October 2-5, 2023, at The Baird Center (formerly The Wisconsin Center) in Milwaukee, WI. The packed agenda for ARC's flagship technical program includes more than 90 presentations in seven tracks. The location, in the heart of the Midwest converting corridor, was chosen to make it easy for many converters to participate.

"Most people attend the R2R conferences to solve a technical problem or make new connections," said Chris Kerscher, ARC executive director, adding, "This conference is designed to offer ample opportunities to achieve both goals. We plan to draw a large local audience and are offering special discounts to converters (anyone processing or handling a continuous web of paper, films, foils or textiles)."

"This will be the first R2R USA Conference held under our new name," noted ARC President Andy Jack.



"The Milwaukee location is a nod to both our roots in metallizing, coating and laminating, and our broader present and future with ever-evolving opportunities for roll-to-roll converting."

The multi-track agenda includes sessions on Flexible Packaging, R2R Battery Manufacturing, Sustainability, Coating & Laminating, Vacuum Web Coating, Vacuum Metallizing, Web Handling, Adhesives & Coatings, Market Forecasts, Gravure Coating and



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Exhibitors

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Attendees

Printing. Included with the attendee registration at no added cost is Introduction to Converting & Converting Process Basics October 2 and Web Handling Fundamentals, Coating Fundamentals, Drying Fundamentals and Vacuum Fundamentals throughout the conference.

Technical sessions occupy only part of the schedule. Other meeting highlights include VIP keynotes, panel discussions, networking activities and a large exhibit floor with 10x10-foot exhibits. Exhibitors include: Adphos, Atlas Converting/Kampf Machinery, Bobst, BST North America (Accuweb), Daetwyler, Delcom Instruments, Delta ModTech, E+R Group, Enercon Industries, Erhardt + Leimer, Faustel, Finzer Roller, Flexo Concepts, Fuji Shoko America, Greycon,

Heat Technologies, Inteplast Group, INX International, ISRA Surface Vision, IST America, Macro Engineering, Madico, Mahlo America, Maplesoft, Maxcess International, Midwest Print Solutions, MMC Ryotec, MWES, New Era Converting Machinery, Nordson Extrusion Dies Industries, Olbrich, Polymag Tek, R2R Technologies, RK Printcoat Instruments, SAM North America, Siemens, Troika Systems and Vetaphone.

Exhibit space is still available. To view the floor plan, go to [www.rolltoroll.org/2023-r2r-usa-conference](http://www.rolltoroll.org/2023-r2r-usa-conference) and click on "Be an Exhibitor." For more information about exhibiting or other sponsorship opportunities, contact ARC Member Outreach Director Tim Janes at 803-948-9469 or [tjanes@rolltoroll.org](mailto:tjanes@rolltoroll.org).

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### Winner of 2023 WISE Announced in October

The winner of the 2023 Women in Industry Scholarship for Excellence will be announced at the 2023 R2R USA Conference. Established in 2021 to encourage and commend women who have chosen careers in the roll-to-roll industry, the first WISE award was presented in September 2022 to Mary (Katie) Burdette-Trofimov, Ph.D. of Franklin International (Ohio).

The WISE is awarded to women working in the roll-to-roll converting industry and recognizes those who have overcome significant challenges, invested in STEM degrees and are making important contributions to the industry. The scholarship funds are applied directly toward the winner's student loan balance.

The Women's Leadership Committee of ARC encourages donations to the scholarship fund and has set an endowment goal of \$100,000. Levels of support include Diamond Sponsor (\$10,000+), Gold Sponsor (\$5,000), Silver Sponsor (\$1,000) and Friends of the Scholarship Fund (any amount from individuals or businesses). Sponsors receive recognition on the association website, social media posts and a scholarship sponsor plaque.

For more information about the WISE or the Women's Leadership Committee, contact 803-948-9470 or visit [www.rolltoroll.org/wise-scholarship](http://www.rolltoroll.org/wise-scholarship).

### ARC Supports Member Companies at 2023 Trade Shows, Conferences

ARC was on duty at a handful of recent trade shows and conferences to support member companies: ICE Europe 2023, Munich, Germany; International Battery Seminar, Orlando, FL; AWA Global Release Liner Industry Conference & Exhibition, Denver, CO; Converters Expo 2023, Green Bay, WI; FLEX Conference & Exhibition, San Francisco, CA.

Upcoming events where ARC will exhibit or staff a tabletop display include SVC Tech-Con 2023, Washington, DC; The Battery Show North America, Novi, MI; Labelexpo Europe 2023, Brussels, Belgium; PACK EXPO Las Vegas 2023. ■

# Sustainability and Labor Considerations for Pouch Converting Machines

Interview with Scott Fuller, Product Line Manager, Pouch Equipment, North America

*CMD designs and manufactures high-performance equipment for blown film and flexible package converting, including patented high-speed rotary draw tape trash bag lines, pre-made pouch packaging equipment, film and bag folders and winders. CMD offers full technical support, parts and service for customers globally. Custom equipment design is available.*

## What do converters tell you is their number one criterion when sourcing equipment?

Our customers and partners consistently site process reliability as being the number one most important deliverable they want in a new pouch system.

Reliability - defined not only as a robust machine, but as a quantifiable performance metric. For example, CMD customers reported an average of 90% uptime reliability with the new 760-SUP, based on 2021 and 2022 production reports.

## What have converters shared as a chief source of irritation or dissatisfaction with their current pouch converting equipment.

With the high cost of material and labor today, waste and inefficiencies rank high among complaints we hear about some OEM equipment from converters. Reducing both planned and unplanned downtime, for example, is an important aspect of lowering wasted time and material. This is a main benefit of machines designed for reliability, with state-of-the-art controls, predictive maintenance alerts and user interfaces with real-time production data.



**Scott Fuller**  
Product Line Manager, Pouch  
Equipment  
North America  
+1 (920) 740-8728  
Scott.Fuller@cmd-corp.com

## How can a pouch converting system help converters manage today's labor challenges?

Historically, pouch systems were dialed in and monitored by very proficient operators and maintenance personnel – many of whom have either retired or moved. Machines with quick change and easy maintenance features are helpful for younger, less experienced operators. The job is more attractive with easier-to-use systems, helping with retention.

Simple, HMI touch screens basic, repeatable adjustments – and the small features of machine should be simple and easy to use.

## What's New in the Pouch Converting Industry?

Sustainability continues to grow, and the recycle-ready pouch is prominently used in marketing and pouch equipment today must be well-designed to convert sustainable materials to allow converters to effectively respond

as brand owners adopt these new substrates across more products. The CMD 760-SUP now includes patented Intelligent Sealing Technology on all seal stations, ensuring reliable quality on all film types for all pouches.

E-commerce also continues to grow, and the packaging used by the large online stores continues to evolve. CMD is developing a new system for converting a variety of e-commerce bags package pouches, designed for high product quality, efficient output, and simplified operation.

## What types of things influence return on investment for a pouch converting system

Accomplished through innovative design throughout the pouch machine, features that will enhance return on investment might include:

**Easy operation** – quick adjustments and changes while running, a simple, clear touchscreen interface to reduce errors and easy access to critical components for operation and maintenance efficiency.

**Quick Changeovers** – from job to job and when changing out wear parts, changeovers should be fast to reduce non-productive hours on the machine.

**Less Waste** – greater efficiencies throughout the operation of the machine will reduce waste in terms of the time that the machine is not operating, materials, and labor. With the CMD 760-SUP design, customers reported an average of less than 2% run time waste based on 2021 and 2022 production reports. ■

# Staying Competitive

## Important Considerations When Approaching Warehouse ASRS Investments

By Tom DiNardo, Vice President of Global Automation, Signode

Meeting consumer demand and delighting customers are fundamental to building a competitive advantage in manufacturing and distribution. With modern advancements in supply chain and packaging technologies, companies in all verticals that may have once comfortably enjoyed their market share are facing more intense competition than ever. Industry veterans and newcomers alike are raising the stakes with competitive pricing and rapid order delivery offers.

The key to meeting demand, sustaining growth and future-proofing warehouse and distribution center operations lies in fully embracing automation, which frequently involves implementing Automatic Storage and Retrieval Systems (ASRS).

The challenge of fulfilling orders is a classic Catch-22: The more orders are fulfilled, the faster expectations rise to fulfill orders.

This means more products need to be consistently on hand, and in turn, more resources and capacity are needed to carry out operations and meet demand. Without support from automated warehousing solutions, there can be diminishing returns due to the limit on how quickly distribution center personnel can unload trucks, palletize and depalletize, drive forklifts, shelf and unshelf products, and get shipments out the door to fulfill customer expectations.

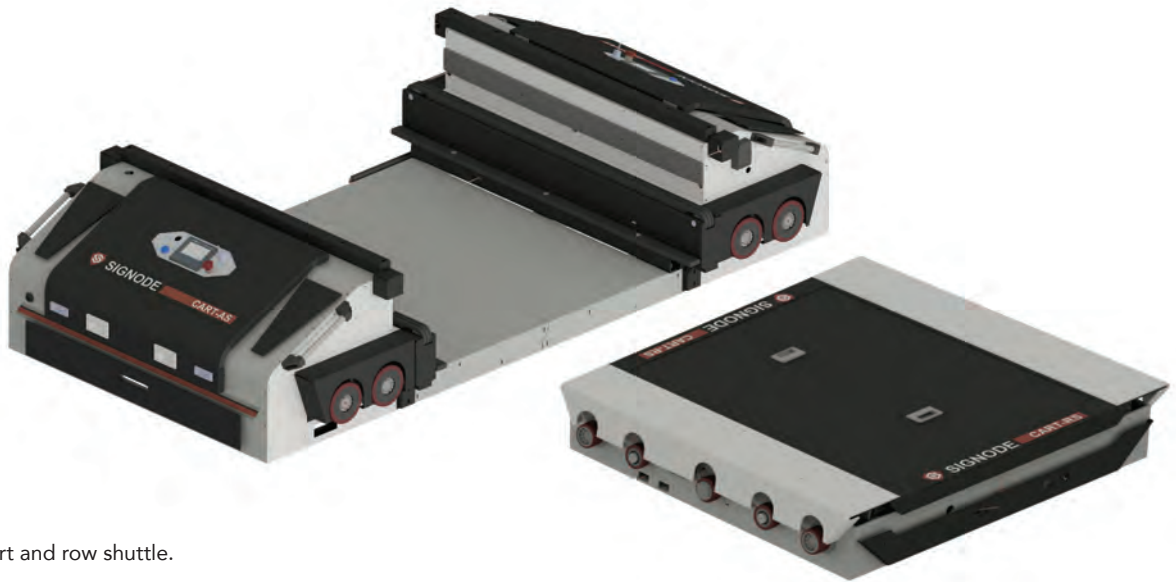
ASRS serve as highly versatile options and are growing in popularity and implementation. According to Business Wire, growth within North America's ASRS market is projected at a compound annual growth rate of 9 percent through 2026. As these systems represent a significant investment and can redefine end-of-line operations, several factors should be taken into consideration before

determining if they are right for your operation.

First, you must have a base understanding of how an ASRS functions within a larger operation. These systems sit squarely in the intersection of logistics, robotics and software, and use all three in conjunction to amplify the capabilities of warehouses and distribution centers. This versatility provides suitability for all types of warehouses, regardless of age, size and floorplan.

Second, it serves to know how the benefits of an ASRS are directly derived from its components. The buildout itself consists primarily of modular shelving with high level capacities, navigated by an integrated network of powered carts and lifts that carry, store and retrieve pallets. The software behind the automation technology drives these systems, providing customizable logistics





Aisle cart and row shuttle.

that empower any operation. This allows the ASRS to navigate the unique logistics challenges of every respective industry and corresponding storage facilities, thereby improving inventory management, optimizing operational resources and most importantly, meeting customer demand.

The software behind an ASRS is robust enough to serve as the primary source of logistics automation for the entire facility, but it is also adaptive and nimble enough to integrate with other third-party logistics software platforms as well. As storage needs frequently shift

within facilities to meet supply, demand and product diversification, ASRS are designed to grow and adapt with their users by adding additional modular components onto the existing setup, or adapting software to changing business dynamics.

Beyond the machinations of the system itself, you should consider how streamlining logistics for products with varying needs can improve your ability to deliver products in their intended, ideal condition. The speed and automation of retrieval, mixed with the logistics of the operation make

it naturally efficient. For example, an ASRS can automatically store the most frequently needed products, or those with the shortest shelf life, in areas for the fastest retrieval possible. Simultaneously, it can place items with a surplus at more remote areas of the facility, and automatically backfill these items from deep storage to easy picking zones as demand dictates. The algorithms that manage these decisions can be adjusted based on seasonality, portfolio changes and other dynamics impacting product mix and priority.

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The most cutting-edge innovations within ASRS allow picker carts to move at higher speeds, handle pallets with heavier loads and operate in extremely cold environments — as low as 13 degrees below zero. Depending on

your warehousing demands, these differentiating factors in ASRS functionalities should be part of the decision-making process.

As powerful as these systems are, they can demand specialized service and ongoing upkeep.

When considering the purchase of an ASRS, you should confirm that manufacturers can provide not only seamless build outs, but also expertise in ongoing service and support from a preventative maintenance perspective. Vetting providers for expected availability to trained service professionals can help proactively minimize downtime and maximize ROI.

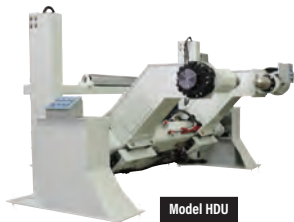
Beyond access to operational service and preventative maintenance, leading ASRS practitioners are equipped to collaborate with clients to make sure your exact needs are incorporated from the outset. Every facility is influenced by industry, local and global factors that should be constantly monitored for ways to further improve utility.

Companies that carefully examine all these aspects before implementing an ASRS are more likely to maximize productivity and profitability. Some have reportedly documented unprecedented growth numbers, with specific operations reporting an increase in units shipped by more than 450 percent after incorporating the ASRS. Now is the crucial time to look to the future and to solidify your operation's viability — and ASRS can be the key. ■

**ABOUT THE AUTHOR**

Tom DiNardo oversees Signode's global commercial activities for Automation and Systems Integration and is responsible for automation operations in North America. DiNardo's automation experience spans multiple industry segments, supply chain management, manufacturing and product marketing.

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# Textured Rolls Create Attractive and Functional Substrates

By **Mark Hines**, Vice President – Sales & Marketing, Precision Roll Solutions

Textured rolls, also known as coating rolls, metering rolls and anilox rolls, use patterns measured in lines per inch to deliver specific attributes and appearance characteristics to paper, film and foil substrates.

**After pattern development, manufacturing processes make the difference.** Finalizing the embossing pattern is the first step in creating a consistent impression. Once a pattern is defined, high-quality embossing rollers

are critical to bring embossing patterns to life. Engraving precise textures onto a roll surface requires understanding tolerance and application requirements. Choose a roll supplier that follows strict procedures that produce a consistent quality embossing pattern. It is also important to specify embossing equipment sturdy enough to withstand years of handling heavy embossing rolls.

While there are multiple techniques to engrave roll patterns,



Embossing machinery should be designed to last many years handling large, heavy embossing rolls.

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Five sample patterns for tissue and towel.

depending upon the final application, all of them start with a clean base roll.

Reconditioning rolls allow manufacturers and converters to maintain their sustainable manufacturing processes by recycling rolls. The refurbishment process involves turning down the used roll in order to start with a clean steel surface.

Once a base roll is established, electroplated copper is bonded to the steel surface, precision polished, engraved and finished with a layer of chrome to protect that surface. The following engraving processes are used for both new and reconditioned rolls.

**Mechanical engraving** – The oldest form of producing textured rolls uses a knurling tool to press

into the copper surface and transfer the engraving pattern. Regular soft copper is used for mechanical engraving, with additives to make the copper surface harder if needed.

The mechanical engraving process works well if the pattern features one cell size to put down a uniform coating, such as glue, often used in various forms of



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packaging materials. Mechanically engraved rolls can also be used to put a pattern into a packaging substrate, such as a foil or film.

**Electromechanical engraving** – Hard copper is used for this technique, with a diamond stylus as the engraving source. The stylus vibrates and pokes holes into the copper in the shape of an inverted pyramid. The copper surface is highly polished, and the stylus provides more precision in the production of coating rolls and metering rolls.

Electromechanical engraving is the preferred technique for the packaging industry. A greyscale image is sent to a machine that automatically varies cell depths to print a simulated tonal range. Producers of laminate flooring, wood grain marble simulations, paneling, countertops and packaging foils use this type of textured roll.

**Laser/chemical engraving** – this process is reserved for specialized pattern embossing rolls that the first two methods can't accomplish. A black lacquer is sprayed on top of the copper, and then the image is sent to the laser. The laser then removes just the paint coating to expose the copper beneath it. The roll then goes to an etching machine that uses ferric chloride acid on the copper. These rolls can be used to put images on labels or even individual pills for the pharmaceutical industry.

For decades, embossing rolls from Industrial Engraving, GB Embossing, and IR Engraving have benchmarked industries using rigid and flexible plastics, tissue/towel, napkins, fine paper, nonwovens, metals, packaging and more. Together as Precision Roll Solutions, these experienced teams manufacture embossing production rolls that impart uniform patterns and engineered applications to a wide spectrum of consumer products. ■

#### ABOUT THE AUTHOR

Industry veteran Mark Hines has 30-plus years of experience serving the global paper, tissue converting and packaging industries. At Precision Roll Solutions, Mark brings together a vast network of precision roll and texture experts to solve customer challenges.

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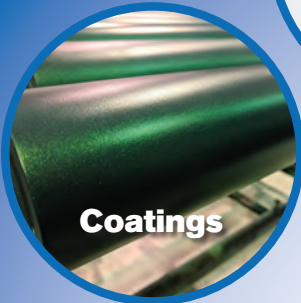


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