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**AVOIDING EV BATTERY
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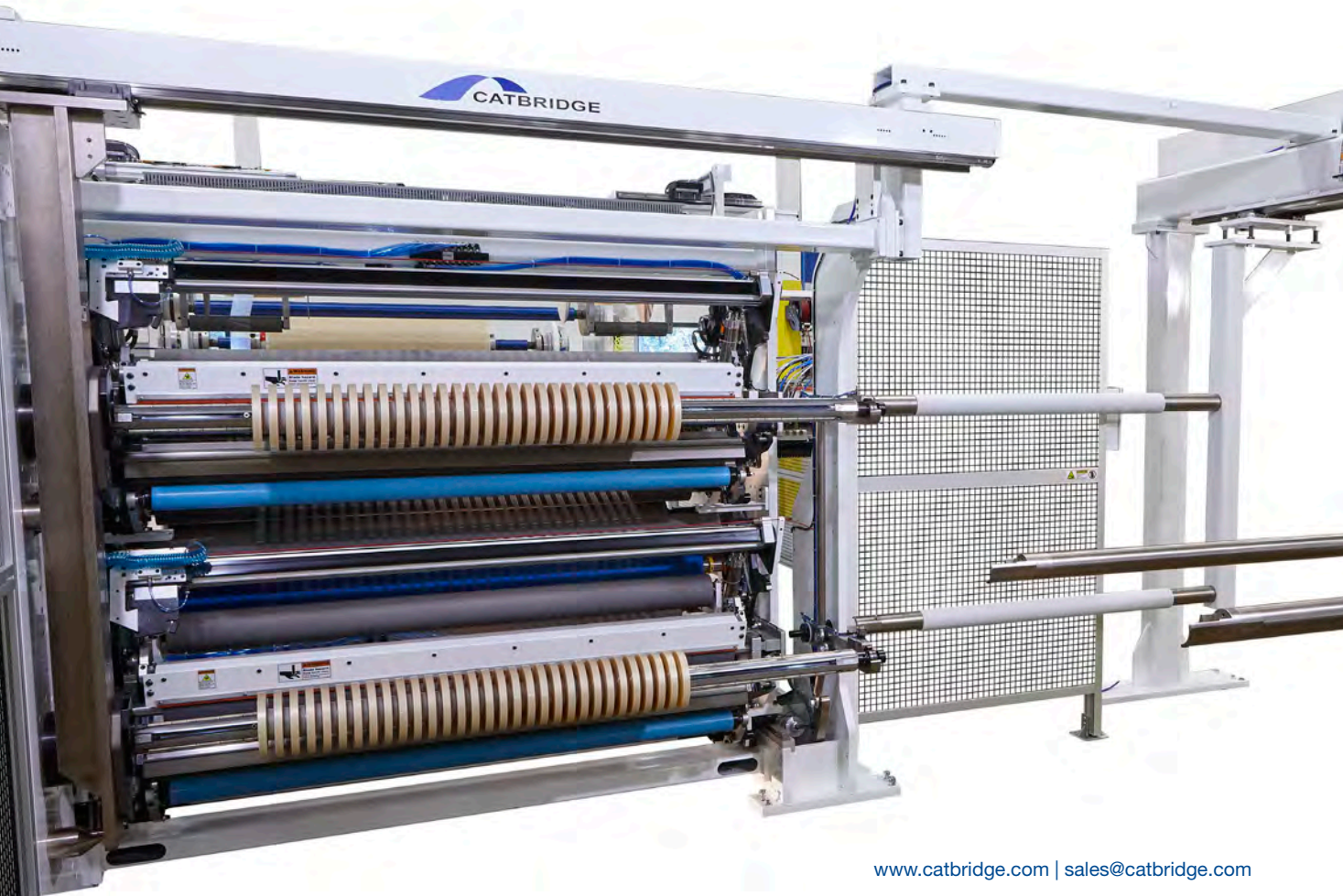
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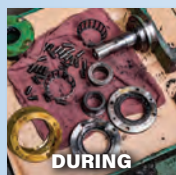
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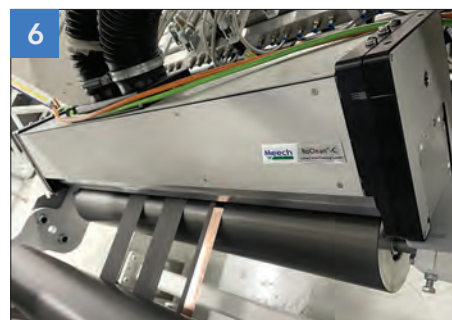


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The Prost Toast



Angel Morris
Editor

It seems fitting that our calendar at www.pffc-online.com fills up this month with a number of industry events, at the same time folks celebrate Oktoberfest around the globe. From the R2R USA Conference to Printing United, every week has something to offer in the way of education, training and resources, just as October festivals gear up to offer some of the same things.

The first Oktoberfest began October 12, 1810 to celebrate the union of the German prince of Bavaria with Princess Therese von Sachsen-Hildburghausen, and lasted five days, culminating in a horse race. The following year it was partnered with a state agricultural fair, then food and drink offerings became part of the celebration. Over time, the event grew to include pop-up beer halls rather than simple booths, with an opening keg tapped by the mayor of Munich. Today, parades, entertainment, rides, games and more welcome some 6 million tourists to Germany's annual event.

Those who can't make it to Munich can find Oktoberfests closer to home, especially in areas with large German populations. Mimicking the original event, these celebrations feature beer and food, but are also often rich in German history and tradition. For instance, you might purchase a Lebkuchenherzen cookie — Lebkuchen meaning gingerbread and herzen meaning heart — to share with the one you love. You'll discover the official colors of the event represent the flag of the German state of Bavaria, made of a light blue-and-white check pattern. To make a toast you'll replace "Cheers!" with "Prost!" and you might find yourself wearing a pretzel necklace ... a tradition started by brewer-monks who saw the holy trinity in the breaded treat's three loops and holes. If you're really in the spirit, you might dress in the dirndl (bloused top, full skirt and apron) or lederhosen (short leather pants plus suspenders and a hiking hat with a tuft of goat hair). And, you may end the day moving to music — perhaps doing the polka, waltz or, even, the chicken dance!

For pleasure or work, there is always knowledge to gain. Find ways to avoid thermal runaway in EV batteries in this month's cover story, and how to suppress static sparks to protect sensitive coatings in another. Tackling the no. 1 environmental concern in packaging is discussed, as is not leaving your corona treaters to chance in new line orders. Let's tap into learning ... "O'zapft ist!"

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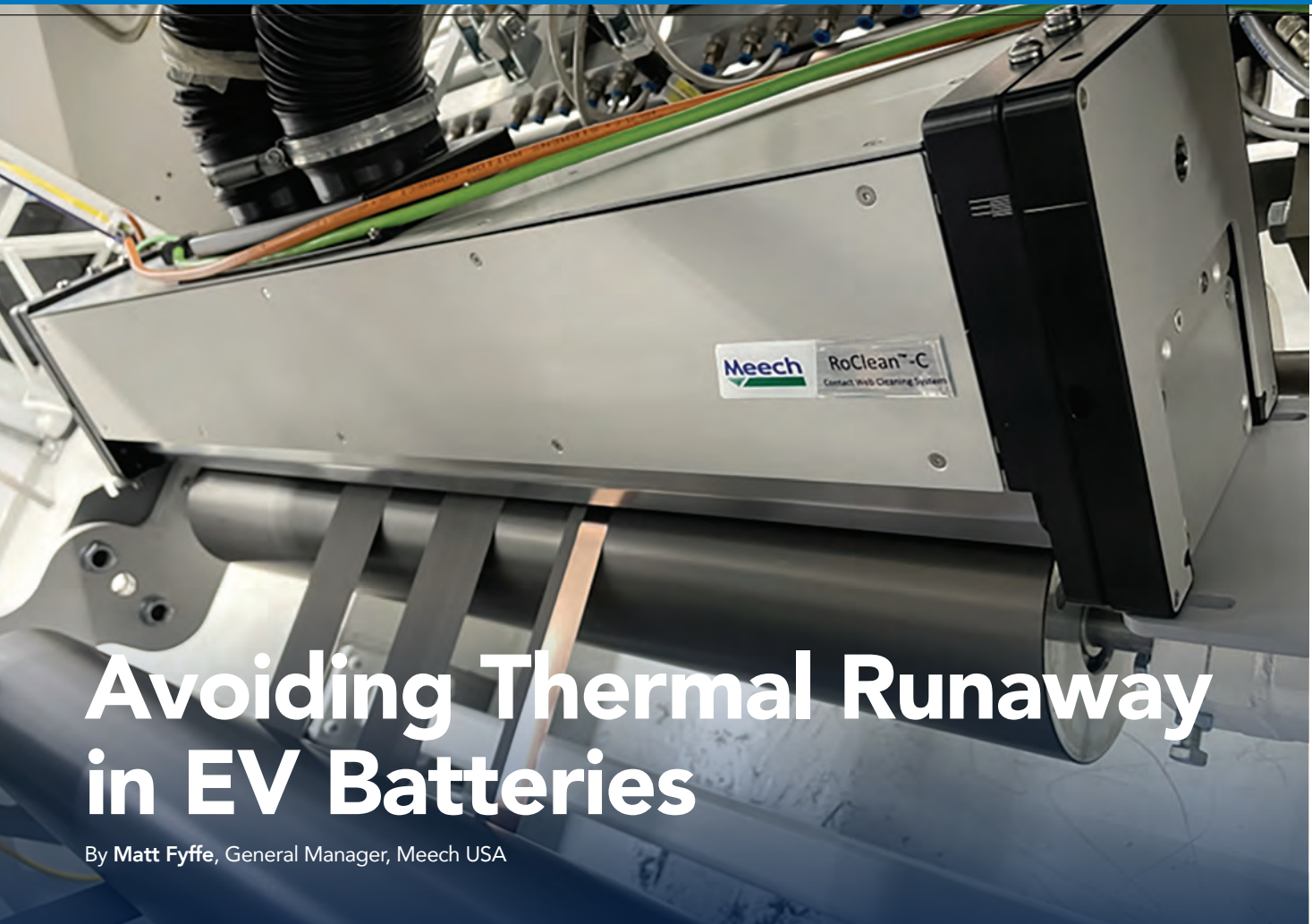
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Avoiding Thermal Runaway in EV Batteries

By Matt Fyffe, General Manager, Meech USA

Electrification of our society is accelerating. EVs, scooters, domestic appliances, domestic energy storage and green energy storage banks are all examples of this trend and new lithium-ion battery technology is having to advance at the same pace to make it all possible.

As this industry rapidly ramps up, there is a critical need to deliver battery components with zero contamination at each production stage, to help avoid the risk of thermal run-away downstream during the operational life of the battery.

Lithium-ion Batteries and Thermal Runaway

The smallest unit of a lithium-ion battery is the cell, which comes

in three principal form factors: Prismatic, pouch and cylindrical. In some electric vehicles, there can be up to 7,000 cells making up the battery pack, depending on the vehicle size and range.

Each of these cells are made up of an anode and cathode — separated by an essential insulative film, which prevents physical contact between the anode and cathode, while also crucially facilitating transportation of ions in the cell. Designers and manufacturers need to find the balance between mechanical robustness and effective porosity and transport properties. Any damage or weakness in the separator film has the potential to lead to an electrical shortage.

Under normal working conditions, the polymeric separators heat up and can sustain variable oper-

ating temperatures depending on the material and structural design. However, in the rare event that an electrical short occurs, chemical reactions can supersede the normal electrochemical processes (ion and electron flow) and more heat is generated than can be dissipated.

The short can very quickly accelerate, leading to ‘thermal runaway,’ meaning the battery can no longer be controlled and can become a potential fire and safety hazard. Whilst these instances are few and far between, even a small number of incidents can be incredibly damaging to individual brands and to the overall public perception of battery technology as more and more people consider adopting electric vehicles.

The recognized wider causes of thermal runaway are: Abuse

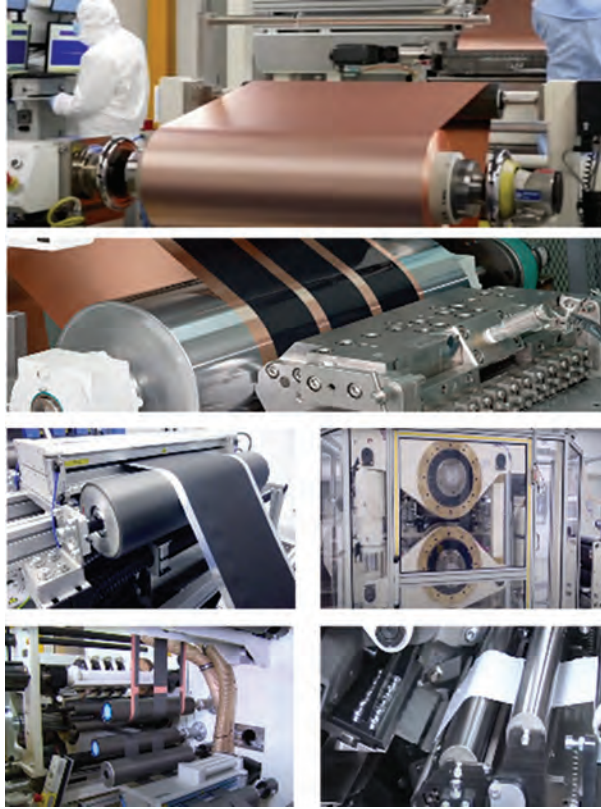
(heat, crush, penetration), overcharge and defects (including contamination) in the cells.

Contamination

One of the least understood causes of thermal runaway is due to manufacturing defects caused by contamination within the cells. As there are no universal standards in place, the in-built designs and manufacturing processes across multiple machine suppliers need to consider where contamination can occur and how to ensure dangerous inclusions can be avoided.

This is not an easy process as this is often outside of the battery designers' and machine builders' core competence and expertise. There are a number of primary contamination risk areas ... Pre-coating (maintains coating quality and layer thickness) — Thickness and quality of the coated web is essential (to maintain a uniformed structure within the EV battery). Any contamination within the coating would affect the performance within the structural layers and would be carried forward into the final construction. Prior to the coating stage of the copper/aluminium web, the use of a web cleaner on the substrate can remove surface contamination.

Coating roller cleaning (maintains coating quality and layer thickness) — Another contamination risk area in the coating process is the roller itself, which guides the web very accurately to the substrate coating. Either non-contact type (dynamic air flow), or a special-



Non-contact cleaners used for anode and cathode lines

ist abrasive brush contact type cleaner (combined with air flows) can be used. These will remove contamination to ensure there is no transmission to the underside of the web (so there is also no impact on coating thickness).

Pre-calendaring (maintains coating) — During this stage, the web and coating layers are compressed together to the exact required thickness, which also 'activates' the coating on the web itself. Cleaning prior to this critical stage prevents contamination being trapped in the coating, which could result in the coating layer being out of tolerance. Similar to the coating roller, the calendaring rollers may also need cleaning.

Post-slitting (reduces risk of soft electrical shortages) — The

slitting process can create a lot of debris made up of a combination of 'base material' and 'coating material.' This is a high contamination risk stage where cleaning is imperative to avoid the risk of future electrical shortages and expensive rejects.

The use of a web cleaner at this stage ensures that the particles are removed from the surface of the web and filtered away from the operating atmosphere to avoid re-contamination. Depending on the process and materials, contamination can be bonded or unbonded requiring careful analysis to choose the optimum contact or non-contact web cleaning solution. Slitting dust is highly likely in this

area and, as some coating materials have toxic content, special consideration is needed.

Post Cutting/Stamping/Laser Cutting of Electrodes (reduces risk of soft electrical shortages) — Like the post-slitting stage, during electrode cutting, particles and debris can contaminate the web. To avoid this, web cleaning at this stage will clean the surface of the substrate, leading to clean and clear separation layers. The same considerations apply around toxic dust removal and containment to respect the clean room environment and operator safety.

Static Control on Separator Film (reduces risk of soft electrical shortages) — The porous membrane must be placed between electrodes of opposite polarity, and it is permeable to ionic flow but crucially prevents electric contact of the electrodes. The

separator film is very sensitive to static charge created by winding, unwinding, friction on rollers, throughout the transfer processes.

Static charges generated on insulative materials such as the separator film attract ambient particles adding to contamination risk problems.

In extreme cases, if charges generated are high and not carefully controlled then small sparks may result leading to small 'dendritic burns' in the material. While not immediately obvious, these can lead to a loss in insulative properties and create shortages in the battery cell itself. In soak tests or in final vehicle use these would show up as a loss of capacity or over heating problems.

Throughout the separator film transfer, ionization bars should be located close to the film where charges are measured. Close range DC type bars can be 'tuned' to match the material and application to ensure rapid charge decay times and minimal residual charges are achieved. Most modern ionization technology is available in formats that suit short, medium and long-range applications.

Evidently, due to the complexities of cell manufacturing — be that based on lithium-ion or hydrogen fuel-cell technology — there are many processes where either static or contamination can build-up resulting in wide-reaching detrimental effects on the battery's performance and safety, not

to mention, profitability and market success. Manufacturers should consider static control and web cleaning equipment to minimize the risk of thermal runaway. ■

ABOUT THE AUTHOR

Matt Fyffe joined Meech Static Eliminators USA in 1994, starting in the role of marketing coordinator and inside technical sales. Since then, he has been involved in such areas as production and quality control, sales management and operations management. He was appointed General Manager in 2001 with responsibility for day-to-day operations of Meech USA and the development of Meech business throughout North, Central and South America.

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Portable Coating Line Provides Flexible, Affordable Option for Testing Coating & Laminating Methods

What are the main uses for the Portable Coater Line?

The Portable Coating Line (PCL) is designed to be a proof of concept machine to determine the best coating method(s) for a given coating and substrate. It has the ability to demonstrate 11 different coating methods within its modular frame, making it extremely versatile for evaluating how a coating will work with a given coating method.

Is the PCL available for use by customers for material trials at New Era?

We are currently in the process of fabricating a new PCL, and when it is complete, it will be available for demonstration at New Era. Our hope moving forward is to always have one in stock and available to our customers for purchase or demonstration.

Is the PCL primarily meant for use in lab environments or can it be used as a production machine as well?



Paul Lembo is Executive Vice President of New Era Converting Machinery, Inc.

The PCL is truly a lab coater, both in size and functionality. The machine is designed to have “table top” type portability, such that it can be operated in an office environment. The machine footprint allows it to fit through a 30” wide doorway and it can be run off a standard wall outlet. As mentioned above, it is designed as a proof of concept machine for

coating methods, and as such, it has a dryer which has the sole purpose of getting the material to a point where it can be rewound. In most cases this would prevent an end user from using the PCL as a production machine.

We understand that New Era has introduced some new features to its standard PCL, can you tell us some more about that?

After the prototype unit, we decided to upgrade the PLC and touch screen to an Allen-Bradley CompactLogix 5370 L1 Controller with a PanelView Plus 7 Standard Terminal Touch Screen. Additionally, the drives and motors are now SureServo (servo drives and motors with Ethernet communication). These changes contain more commonly used PLC and HMI hardware, programming architecture and increased drive performance.

Do you plan on exhibiting the updated PCL at any upcoming industry events?

We are constantly evaluating the benefits of bringing equipment to the various trade shows that we attend throughout the year. In the case of the PCL, we think that it is most attractive to converters that work with a wide range of coatings and substrates, likely across a number of industries. Given this, we think it makes sense to bring the PCL to a show such as ICEC USA this January in Orlando, FL. We brought the very first PCL to this show a few years ago and it sold on the show floor. ■



Suppress Static Sparks to Protect Sensitive Coatings

Static Sparks Cause Thermal Damage Causing Holes or Voids in Thin Coating

By Dr. Kelly Robinson, Founder, Electrostatic Answers

There is need to control static levels in manufacturing operations for three reasons; safety, product quality and operational reliability. Static sparks can ignite flammable vapors and shock operators. Static sparks can damage sensitivity coatings. And, static charges can cause coating defects in sensitive coatings. Also, in sheeting operations, charges can cause sticking and jamming resulting in machine downtime.

Static risks to product quality are especially important for sensitive products like silicone release liners. The release layer in Figure 1 usually has a coating thickness in the range 0.1 μm to 1.0 μm , which is very thin. This release

liner enables the pressure sensitivity adhesive (PSA) to reliably peel from the liner.

Thin coatings are prone to thermal damage from static sparks resulting in holes or voids. The hole in the release liner in Figure 1 could be caused by a static spark during the manufacture of the liner any time after the release layer was coated. Static sparks are only one of several root causes for holes in a release coating. Other root causes include bubbles or foam in the coating solution, contaminants in the coating solutions, contaminants on the Liner Support and dirty coating rollers. Producing high-quality release liners requires clean manufacturing operations.

Excellent static control is required for exciting, ground-breaking products having new chemical and electrical functionalities such as shelf-life indicators (e.g., oxygen sensing, moisture sensing) and coated circuit components (e.g., diodes, transistors). In addition to thermal damage, static sparks can change the chemistry of a sensitive coating resulting in functional failure. A static spark is like a miniature corona treater that, among other things, oxidizes a small spot on the web. Product failures can occur even with no apparent, physical damage such as a hole, void or burn mark.

Prevent static sparks that can damage the silicone release layer coated in Figure 2 by implementing good static control in the critical zone from the coater to the winding roll. Keep electrostatic fieldmeter (ESFM) readings in the **Low Static Green Zone** below ± 5 kV/in to suppress static sparks that can damage the release layer¹.

The coater in Figure 2 has good static control upstream of the coater so that a charge-free web enters the 5-roll coater. Take a few key ESFM readings, $E_{1_{\text{coat}}}$ through $E_{6_{\text{roll}}}$, using a handheld fieldmeter to decide if static control performance is OK, or if improvements are needed.

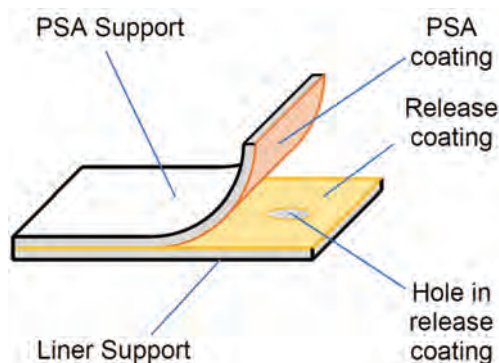


Figure 1 A hole in the release layer allows the PSA to adhere to the Liner Support.

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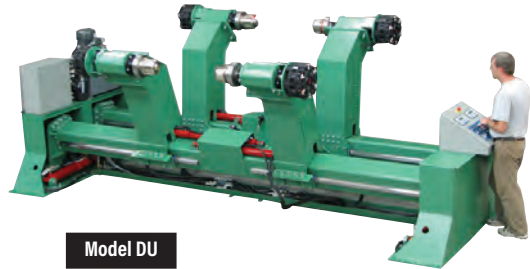
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ESFM reading $E1_{coat}$ in Figure 2 tells us if the coater adds a significant amount of static charge to the web. If $E1_{coat}$ exceeds ± 5 kV/in, install powered static bar $SD1_{coat}$ exiting the coater facing the back, uncoated side of the web.

Static bar $SD1_{coat}$ is prone to failure by contamination from mist from the 5-roll coater. Mounting $SD1_{coat}$ facing the uncoated web surface will help decrease the amount of contaminating mist near the static bar. Install an air-assisted static bar with clean, filtered air exiting from inside the dissipater housing flowing over the ionizing pins. This filtered air helps keep the ionizing pin clean extending the service life of the static dissipater.

ESFM reading $E2_{dry}$ in

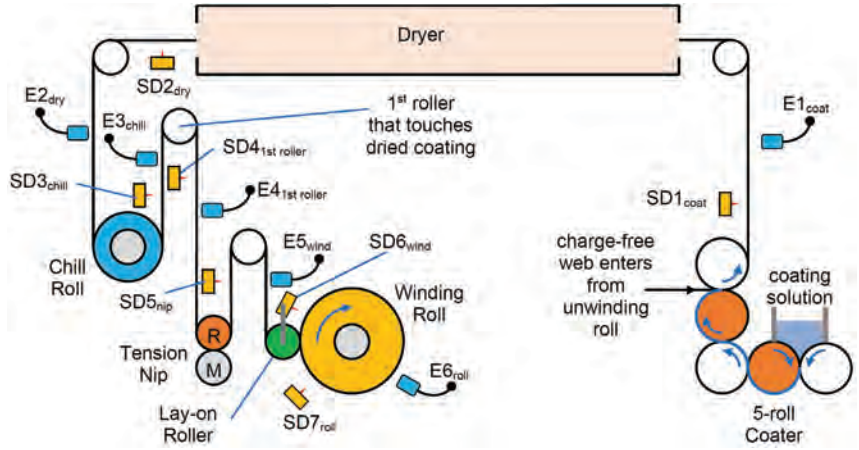


Figure 2 The silicone release layer is deposited by the 5-roll coater.

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Figure 2 tells us if the dryer adds a significant amount of static charge to the web. Keep $E_{2_{dry}}$ below ± 5 kV/in. If needed, install powered static bar $SD_{2_{dry}}$ exiting the dryer facing the back, uncoated side of the web because this is where the charge is deposited by touching the dryer idler rollers.

ESFM reading $E_{3_{chill}}$ in Figure 2 tells us if the chill roll adds a significant amount of static charge to the web. Keep $E_{3_{chill}}$ below ± 5 V/in. If needed, install powered static bar $SD_{3_{chill}}$ exiting the chill roll facing the back, uncoated side of the web because this is where the charge is deposited by touching the chill roll.

ESFM reading $E_{4_{1st\ roller}}$ in Figure 2 tells us if the first roller that touches the freshly dried coating adds a significant amount of static charge to the web. This first roller, to touch a freshly dried or cured layer, often adds a significant amount of charge. Keep $E_{4_{1st\ roller}}$ below ± 5 kV/in. If needed, install powered static bar $SD_{4_{1st\ roller}}$ exiting the first roller to touch the freshly dried coating facing the coated side of the web because this is where the charge is deposited by touching the roller.

ESFM reading $E_{5_{wind}}$ in Figure 2 tells us if the tension nip adds a significant amount of static charge to the web. Keep $E_{5_{nip}}$ very low, below ± 2 kV/in, because the web entering the winding roll should carry very low charge. If needed, install powered static bar $SD_{5_{nip}}$ exiting the tension nip facing the web surface that touched the rubber or polymer coated nip roller because this is where the charge is deposited by the tension nip.

ESFM reading $E_{6_{roll}}$ in Figure 2 tells us how much static charge is stored on the winding roll. Keep $E_{6_{roll}}$ below ± 5 kV/in. If the reading is too high, install $SD_{6_{wind}}$ facing the winding roll exiting the lay-on roller. Since this dissipater is mounted to the lay-on roller frame, this static dissipater is prone to failure caused by vibration. Use a dissipater that is mechanically strong. Look for a static bar design that has components epoxy-cast in a fiber-glass u-channel.

Install static dissipater $SD_{7_{roll}}$ in a fixed location outside of the rotation zone of the winder turret. Static bar $SD_{7_{roll}}$ must be a long-range static bar that maintains reasonable neutralization efficiency at the start of a new roll with just

a few laps on the winder core. Together, $SD_{6_{wind}}$ and $SD_{7_{roll}}$ will effectively dissipate charge on the winding roll.

Suppress static sparks to protect sensitive products by keeping electrostatic fieldmeter readings below ± 5 kV/in. If needed, improve static control using best practices.² For static dissipaters installed near coaters for silicone release liners, use air-assisted, powered static bars where clean, filtered air exits from inside the dissipater housing flowing over the ionizing pins. ■

- 1 <https://www.pffc-online.com/static-beat/15664-assess-static-risks-using-electric-fields>
- 2 <https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=9915453>

ABOUT THE AUTHOR

Dr. Kelly Robinson writes on static issues occurring in converting processes. Robinson founded Electrostatic Answers, has 40+ years of experience in industrial problem-solving and was named Top Manufacturing Consulting Services Provider 2023 by *Managing MFG*. He can be reached at Kelly. Robinson@ElectrostaticAnswers.com.

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The Importance of Specifying Your Corona Treater When Ordering a New Line Through an OEM

By Mark Plantier, Vice-President Marketing, Enercon Industries

Corona treaters are not the most expensive part of your new line, but get the treatment wrong and your new line will be producing scrap at record rates. That's why it's critical for converters and extruders to pay special attention to the corona treater being supplied with their new OEM lines. Buyers of new OEM lines who take a passive approach to the make and model of the corona treater being included with their order take a risk that their line may not perform up to expectations.

Be Proactive

There are two actions you can take to ensure you get the corona treater that best meets your needs:

1. Specify the corona treater brand of your choice to the OEM early in the quoting process;
2. Consult with your corona treater supplier early in the process to get additional recommendations on the best technology to meet your requirements.

Let's look at some common



Specify the features you want on your corona treater early in the OEM quoting process.

situations that can be avoided by following the "Specify Best Practice."

Small Application Details are a Big Deal

When it comes to corona treating, small details can have a major impact on optimizing the machine design. It's critical to let your

suppliers know if you want to have capabilities to run different types of films in the future. For example, some corona treater designs are not capable of treating metallized films. Likewise, some films are not as responsive to corona treating and will require significantly more treatment power.

Higher treatment power levels require larger power supplies, ground rolls, exhaust blowers and more. All of these items can increase the cost of your treater. Or worse, if these details are not unaccounted for, your corona treater may be incapable of properly treating those materials.

Line speed is another detail that can impact treater design and cost. Your line may be capable of running a certain speed, but if you are not planning to ever maximize the output you might be able to save money on your corona treater investment. *The goal is to build in future proof features without paying for capabilities you'll never use.*

Corona Treaters Integrated on OEM Equipment May Vary

It's important to note that a treater



Ensure the corona treater supplied in your OEM purchase is of the brand you specify.

you buy through an OEM may not be exactly the same design as when you buy it directly from the corona treater supplier. Corona treater suppliers and OEMs partner to optimize for fit and integration into specific lines. While most of the time this is a very positive, it can sometimes lead to surprises when the system is delivered and is different than the other corona treaters already installed in the plant.

Another aspect to consider is the time that transpires from an initial OEM proposal to an actual purchase. This can be several months to over a year. OEMs base their quote on information and cost estimated available at the time of the initial proposal. As the evaluation and buying process develops the corona treater is often forgotten due to the scale of the entire purchase.

By the time the order is placed, and then weeks or months later when the OEM places the order with the corona treater supplier, a lengthy gap has occurred. It's not unheard of for an OEM to find that costs have changed or the final application details suggest that the design of the corona treater should be altered for the specific application. By reviewing the details with the corona treater manufacturer earlier in the process this situation can be avoided.

Safety & Guarding Features

Another area that is often overlooked is machine guarding. Your facility may have adopted a very specific standard for guarding around a corona treater. There are

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numerous effective designs to ensure operator safety, including fixed guarding requiring tools to remove, sliding doors with safety interlocks, light curtains and e-stops. If you have a specific expectation for guarding, it's important to review with your suppliers.

Can the Corona Treater Supplier Provide Timely, Knowledgeable Support?

Today, business is conducted on a global scale. Large OEMS from other countries have sizable staffs locally available to assist their customers. Many have a working knowledge of corona treaters, but ultimately when you need technical support, your corona treater supplier is the one who will be the most helpful to your operation.

It's important to ensure your new line includes a corona treater that is well supported by the supplier with an available and well-trained support team. Support for corona treating requires expertise in mechanical, electrical and application engineering.

Smart converters and extruders take advantage of expert start-up assistance from their corona treater supplier. This ensures your installation will follow best practices and your team will be properly trained.

And don't forget about parts availability. Specify a supplier that you place confidence in their ability to deliver parts in a timely manner.

Specify the Corona Treater Early in the Process

To ensure the best experience with a corona treater on a new line, take a proactive approach with your OEMS. Make sure your current and future application parameters are well defined and communicated. Invite your corona treater supplier into the conversation early to provide insights and recommendations. Think about details like machine guarding, after sale support and your expectations relative to other corona treaters you own. ■

ABOUT THE AUTHOR

Mark Plantier is responsible for the global marketing of surface treating and induction cap sealing solutions for Enercon Industries Corporation. In educating the market on technology, applications and best practices, Mark has authored dozens of informative articles and produced more than 100 insightful educational webinars.

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Addressing Plastic Waste with Mono-web Coatings

By Rick Stokes, Vice President — Coatings Group in North America, Sun Chemical

As brands continue to focus on ways they can improve the sustainability of packaging, they feel an urgency to address plastic waste, especially plastics in the ocean. According to a survey¹ conducted by McKinsey & Company in April 2023, of all the various environmental concerns consumers have about packaging, plastic waste is the largest.

A recent report² from The Organization for Economic Co-operation and Development revealed that the amount of plastic waste generated each year has doubled during the last two decades, with about 40 percent of that coming from packaging. It's projected to more than double again by 2040 if significant changes aren't made.

This has led major brand owners to join various regional plastics pacts around the world to address this issue, including the US Plastics Pact, and make public

			Trial Prints
Adhesion		3M/610	100%
Scratch		Fingernail	Pass
Gloss		60°	58.3
Crinkle	Ambient	20x20	Pass
	Ice Water	30' in IW	Pass
Rub Resistance		500x/Ink to Paper	Pass
Water Resistance		10'	Pass
Heat Resistance		350/40psi/1"	Pass
COF	OPV-OPV	S/K	.276/.207
	OPV-Film	S/K	.306/.283
Coating Weight	OPV 2X	lbs/ream	0.24
	Total	lbs/ream	0.67
Transit Testing		90' Paint Shaker	Pass
Blocking		50psi/80%RH/49°C	Pass
APR	ΔL [84.19]	APR < 5.0	2.45
	Δa [-0.45]	APR < 2.0	0.19
	Δb [3.15]	APR < 2.0	1.00

An example of mono-web inks and coatings properties.

commitments to increase the rate of recycling and recycled material use in their packaging by 2025 and beyond.

Single-use plastics are also a focus of legislation around the world to address the plastic waste problem. Canada, for example, published the Single-Use Plastics Prohibition Regulations³, designating six single-use plastic product types as toxic and banning them under the Canadian Environmental Protection Act (CEPA) in a staggered timeline from 2022 to 2025.

All of these trends mean that packaging producers must redesign to avoid single-use plastics designations while also enhancing recyclability, reuse or biorenewability.

The transition from lamination to mono-web structures can save on the use of adhesive, film, processing time and final label weight — all of which reduce the environmental footprint and use of virgin resources. Mono-web structures can also decrease the weight of a package, ultimately reducing transportation emissions.

That being said, lamination has been and continues to be a very popular way to protect consumer goods in packaging. It protects and improves the longevity of the packaging substrate from general wear and tear. Inks and coatings adhere to it relatively easily and it is reliable.

The challenge now is that it isn't always sustainable. Many lamination structures combine multiple layers of plastic films that together are hard to separate from the packaging, making it virtually impossible to recycle, compost or use again in any meaningful way.

Mono-web inks and coatings have been developed to replace



A "5R" framework is a roadmap for existing and developing technology and product portfolios, as well as sustainable operational activities.

multi-play laminate structures using surface printing inks and an overprint varnish. Concern about mono-web packaging structures is that it could give up the protections that lamination offers.

The new mono-web coatings, however, can be very effective at providing many of these same properties. Although not readily visible and seldom recognized by consumers, these coatings bring unique attributes which allow today's packaging to perform as well as it does.

Not only can these coatings provide the scuff and scratch resistance needed to replace a protective layer of film, they can continue to provide the benefits that coatings provide in laminated structures. Shelf appeal can be improved through matte and tactile effects which can attract customers and promote sales. Slip packages within the coatings provide proper frictional properties to allow for high-speed filling, which reduces waste and production time. Oxygen barrier coatings can be incorporated to improve the shelf-life of the packaged foods. The protective coatings can also pull

double duty as a release coating so that cold-seal adhesives can be used to facilitate high-speed package filling.

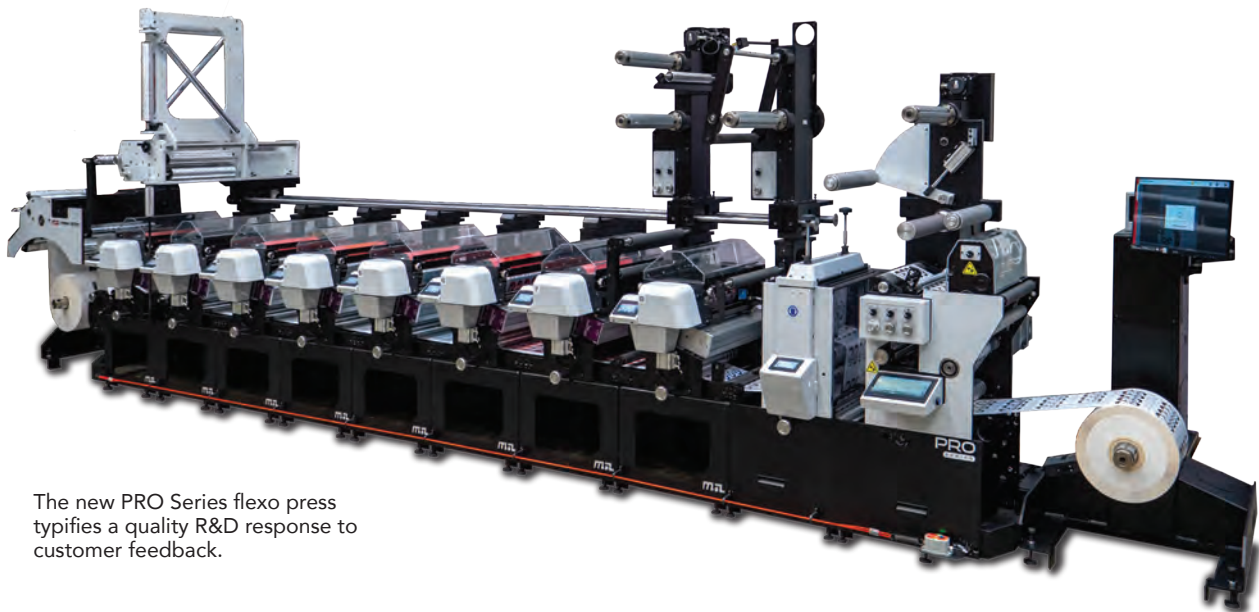
To achieve both the sustainability and performance attributes required for packaging involves inks, coatings and adhesives working together seamlessly. Being able to provide the full scope of solutions from one source can lead to synergistic benefits where the layers work together for a sum greater than the parts. A mono-web packaging structure, for example, must use inks and coatings designed specifically for that mono-web material.

Mono-web coatings can reduce the amount of plastic used and make plastic waste more recyclable. Investment will be needed in recycling facilities to capitalize on the generation of more recyclable plastic packaging. ■

- 1 <https://www.mckinsey.com/industries/paper-forest-products-and-packaging/our-insights/sustainability-in-packaging-us-survey-insights>
- 2 <https://www.oecd.org/environment/plastic-pollution-is-growing-relentlessly-as-waste-management-and-recycling-fall-short.htm>
- 3 <https://www.osler.com/en/resources/regulations/2022/government-of-canada-bans-many-single-use-plastics>

ABOUT THE AUTHOR

Rick Stokes advances and diversifies Sun Chemical's portfolio of coatings, adhesives and sealants by leading an experienced and accomplished team of product management, business development and application professionals. Building on its leadership position in inks, Sun Chemical has grown into one of the world's leading suppliers of coatings and adhesives to the printing and packaging industries. Rick can be reached at naimarketing@sunchemical.com.



The new PRO Series flexo press typifies a quality R&D response to customer feedback.

How Research & Development Brings Practical Solutions to Production Problems

By **Scott Warhover**, VP Engineering, Mark Andy Inc.

Much development work is required to keep a company's technology at the forefront of narrow web printing and converting. For the process of developing new technology and machines, of course the objective is to help customers become more successful. This requires a deep understanding of their needs and challenges, which certainly can evolve over time.

Companies must work with product management and sales departments to understand what customers say they want. This can also involve looking beyond the immediate market situation to provide something they don't even realize they need yet!

Converters today have a far higher expectation of the technology and its capabilities — high performance is a given, but this now comes with an increased interest in sustainability. Both short-term and long-term market trends must drive your work. Long-term industry trends are the most difficult but critical to observe and predict, as they have the greatest impact on developments. That said, companies must remain flexible enough to allow customers to thrive through short-term trends as well.

One of the long-term trends we have all seen developing is toward shorter runs and more proliferation of label variants, personalization and customization.

While this has been influencing equipment development for several years, the shortages during COVID drove a short-term swing away from this, back toward fewer variants (SKUs). Our solutions need to allow customers to push the limits of new trends, yet still adapt to these changes.

The trend still driving the most change is the continued growth of digital printing in our market space. As with any shift in technology, there are a many new approaches fighting for a share of this market. I believe we will see this settle down somewhat in coming years as the most productive and profitable methods become established and accepted.

Print speed, cost and quality will continue to be the drivers here.

RFID in labels and packaging continues to see growth, and I believe this will continue for quite some time. And, of course, owing to challenges in the work force and the global shortage of skilled personnel, everyone continues to experience the need for technology and automation to assist those operators with less experience.

There are two factors to a successful digital platform. As mentioned, the speed, cost and quality of the digital print is essential. But beyond that, the integration of the web transport and hybrid capabilities into these platforms is what transforms them into a complete and effective production tool. It is best to focus on both.

Working with converters and brand owners on the development of new technology is key to the product development process.

Also, incorporating developments such as sMArtlink into one's products allows all machines to produce and gather productivity data, as well as store this information, provide the tools to analyze this data and communicate it effectively with customer ERP/MIS systems.

Working with converters and brand owners on the development of new technology is key to the

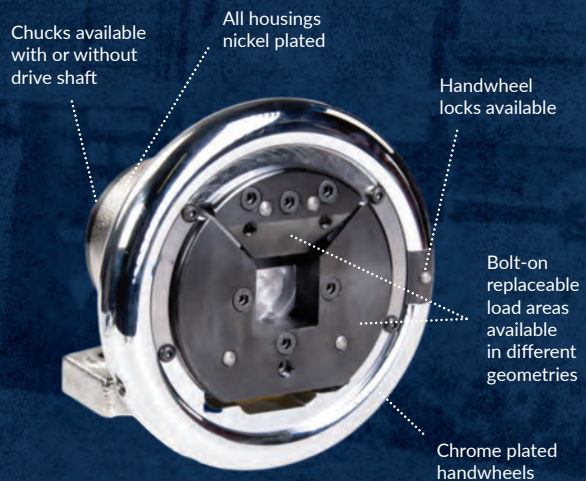
product development process. Everything is downstream of identifying customer needs. Working closely with them, both directly and through product management and sales, is essential to do so.

For example, say one converter customer asked for an affordable full servo press, while another indicated they needed either entry or mid-market digital capabilities, with the possibility of hybrid configurations. The response might be something like the Pro Series flexo platform, the first full flexo platform that can be built to run either left-to-right, or right-to-left, thereby fully enabling digital integration capabilities as well.

This merging of customers' needs led to the development of something new, something beyond

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the original target, which allows one to offer both a full flexo solution and improve digital productivity and flexibility.

Looking Ahead

Over the next 10 years, narrow web flexo will continue as the high productivity mainstay of production. Flexo continues to produce the lowest cost and highest speeds for long run work, and the greatest flexibility for materials and converting inline. Customers need presses at the forefront of highest sales volumes, and continued development in flexo enhancements and new machines.

Also over the next decade, digital will continue to grow as we all see the cross-over point be-

tween digital and flexo continuing to rise. From a design standpoint, companies must still work on increasing production speeds and lowering per-unit costs to drive this trend further.

Variable data printing will continue to open new applications, and we will keep seeing improvements in the integration of digital engines to further gains in productivity, user friendliness and waste reduction.

Today and tomorrow, customers can benefit from companies that are not just flexo or just digital. An ability to develop digital engines and integrate digital engines do not have to be seen as separate press developments from flexo.

When a customer needs a machine, regardless of the printing

technology, processes can be the same, and companies providing that make them a total solution partner to the industry. Look for a company that excels when faced with the most challenging applications and needs, regardless of the customization required. ■

ABOUT THE AUTHOR

As VP Engineering, Scott Warhover participates in many aspects of Mark Andy, including the team that focuses on the development of new products, and the team designing each custom machine built for customers. Involvement in the design and technology decisions is a highlight of his job, along with managing the technology roadmap for future developments.

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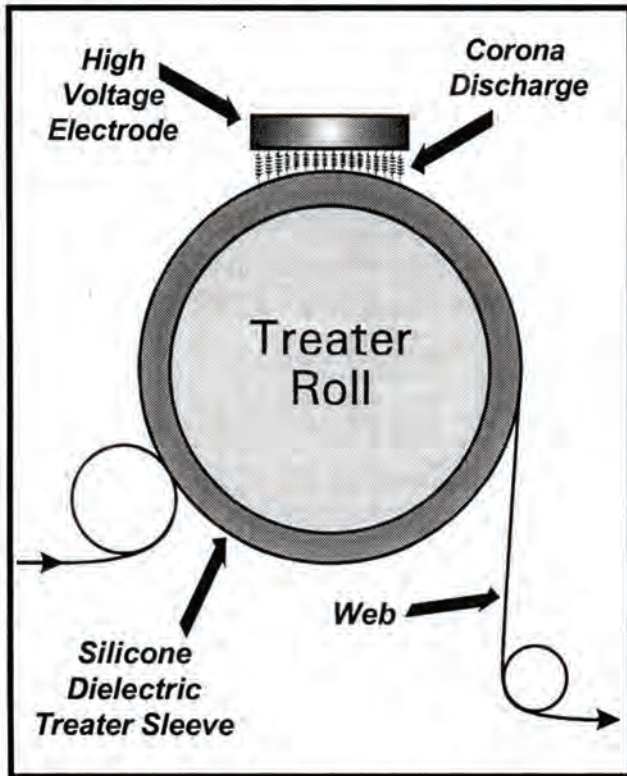
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96202	2.0"	51 mm	46 mm	Orange	.080" (2.0 mm)	\$1.35
96252	2.5"	64 mm	59 mm	Orange	.118" (3.0 mm)	\$1.85
96302	3.0"	76 mm	70 mm	Orange	.080" (2.0 mm)	\$1.85
96402	4.0"	102 mm	95 mm	Orange	.080" (2.0 mm)	\$2.25
96602	6.0"	152 mm	141 mm	Orange	.095" (2.4 mm)	\$3.15
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*These sleeves will fit any treater roll OD within +/- 0.125" (3 mm) of listed size.

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Paper Converting Machine Company (PCMC), Baldwin Technology Co., and Winkler + Dünnebier (W+D) will make their formal launch as BW Converting Solutions at PRINTING United

Expo in Atlanta October 18-20, 2023, at the Georgia World Conference Center, Booth B2219. PCMC will introduce the new ION, a hybrid flexo + inkjet packaging press that has the ability to produce larger digital runs cost competitively, meeting market needs for wider, faster printing with highest-quality. Baldwin Technology will feature the Guardian PQV 4.0 inspection system upgraded with advanced automation, micrometer inspection precision and its new Wizard-iQ Interface. W+D will showcase new product developments from the industry's fastest high-print quality envelope and direct mail inkjet overprint press to the award-winning all-in-one converter and inserter from digital pre-print.



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integration, is continuing its tradition of partnering with the printing industry's best OEMs, software companies and other suppliers. The latest collaboration is with Elitron America Inc., a global manufacturer of cutting, print-finishing and robotics systems for several industries – including digital printing, packaging, wide format, leather, composites and more – headquartered in Monte Urano, Italy.

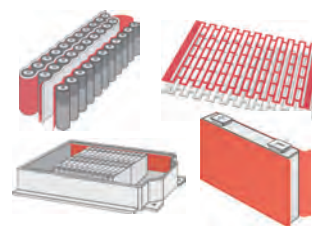
Significans Automation and Elitron America Inc. will showcase cost-saving and in-shop efficiency benefits of their recent partnership, at Printing United — North America's printing and graphic arts industry tradeshow — October 18-20 in Atlanta, Georgia.

Avery Dennison Launches Volt Tough™ Electrical Insulation Tapes

Avery Dennison Performance Tapes has announced the launch of the newly developed Volt Tough™ portfolio of electrical insulation tape solutions. This advanced offering of electrically insulative, single-sided filmic tapes is engineered to address the challenges of insufficient electrical insulation in EV battery packs.

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incorporate several critical features for OEMs and converters, including: Conformable options for curved geometries; high abrasion-resistant options; color options for vision inspection systems; flame-retardant options for UL® 94 and other flame requirements, high dielectric strength with thin, consistent profiles enabling higher energy density; and instant bonding to enable efficient production. ■



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New Elastomeric and Urethane Roller Coverings?

By William R. Bradley Jr., Vice President, Business Development, American Roller Company

In the converting industry there are many machine roller positions that rely on elastomeric or urethane coverings to produce high-quality products. For decades, there have been limitations with specific coverings used, often a trade-off with durability, temperature thresholds, and chemical resistance. Often, multiple performance values are required.

With the hundreds if not thousands of covering formulations available in the marketplace, the application dictates the family of polymers used. For example, if a web substrate is being laminated with a high-temperature coating (350-400F), a

product in the silicone family is usually selected. With this covering there is a trade-off where durability, compression set, and abrasion resistance can be a compromise.

In the last few years, there have been new developments in covering creation, blending the strengths of each formulation to produce next-level compounds. For instance, urethane coverings are used in high wear and abrasive applications, however, offer no release properties from adhesives or other chemicals. Today there are urethane formulations offering incredible release properties without giving up their abrasion resistance qualities.



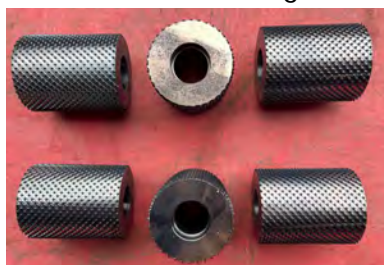
If you are battling an application using the same roller covering for years, there could be a better option. Ask your current supplier or contact a new one and ask, "What is the latest technology?" ■

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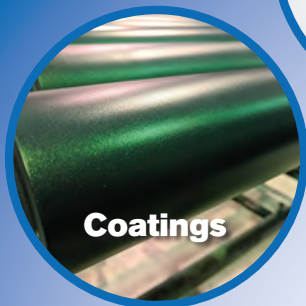


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