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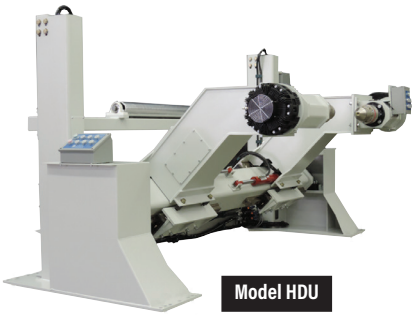

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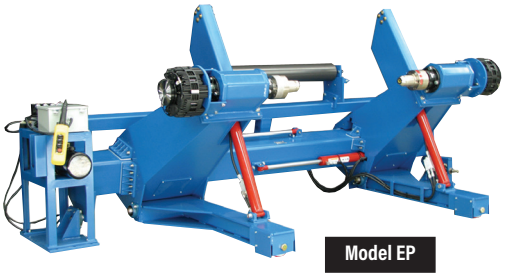

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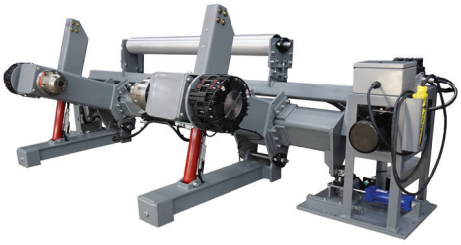

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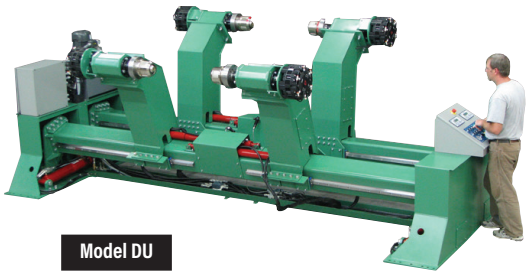

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Ending Toward a Beginning

Angel Morris
Editor

When pondering how to express what I wish for you as the year ends, I came across this quote from 20th-century poet T.S. Eliot: "For last year's words belong to last year's language, and next year's words await another voice. And to make an end is to make a beginning."

To me, Eliot's words exemplify December perfectly — that pocket in time between the months past and those ahead, when we begin to let go of this year, while not quite stepping into the next. These are the days we start closing one chapter in order to begin a new one.

Like many of us, I become reflective in December. I search for gifts I think will be meaningful to the recipient. I try to create experiences my family will treasure, and I focus on the blessings the year has given me. It can be bittersweet, however, remembering special things from our past that may never be again. And the opportunity to begin again in a new year can be both exciting and stressful.

This month's cover story shares how a new year is the perfect time for companies to focus on a "5R" framework – reuse, reduce, recycle, renew and redesign – and how it can help guide sustainable best practices. Sustainability within bags, pouches and emerging films is also a featured topic, plus important considerations in the selection of OEMs. Perhaps these are topics you are reviewing as the year ends, or know you must address in the coming year.

So, how do we embrace this unique in-between time, ending one year and beginning a new one? I challenge you to sit peacefully in December, letting this month be a gift to yourself. A time you worry about neither last year nor next, but instead appreciate each day as much as you can. After all, Eliot also said, "The end is where we start from."

Angel Morris
Editor-in-Chief
angelm@rdgmedia.net

P.S. The staff of *PFFC — Paper, Film and Foil Converter* magazine — wishes you the happiest of holiday seasons and a peaceful end to 2022.

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P.O. Box 529
Estero, FL 33929
586.227.9344
www.pffc-online.com

President/Group Publisher
Randy Green
randy@rdgmedia.net

Publisher
Lori Pisano
lori@rdgmedia.net
814.616.8380

Editor
Angel Morris
angelm@rdgmedia.net

Accounting Manager
Kristin Green

Systems Administrator
Angi Hiesterman

Operations/Customer Service
Jody Kirchoff

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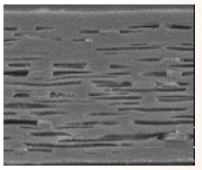

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The "5R" Framework

An Approach Designed to Reduce Packaging Waste

By **Nikola Juhasz**, Global Technical Director, Sustainability, Sun Chemical

Serious environmental issues and growing climate change concerns are resulting in an increased focus on sustainable packaging. According to the Environmental Protection Agency, 82.2 million tons of packaging waste was produced in 2018 with 30.4 million tons of that going to landfills. Of special concern is plastic waste which only has recycling rates in 2021 of 5 to 6 percent — or about 2 million tons, according to the World Economic Forum.

To address this issue, major brand owners have joined various regional plastics pacts around the world, including the US Plastics Pact, and made public commitments to, among other things, increase the rate of recycling and recycled material use in their packaging by 2025.

Achieving these packaging sustainability goals occurs when organizations across the entire value chain align their sustainability goals. Partnerships across the supply chain and with trade organizations that share similar sustainability values to deliver bio-renewability, compostability and recyclability, will help the packaging industry move towards

reducing waste and becoming a circular economy.

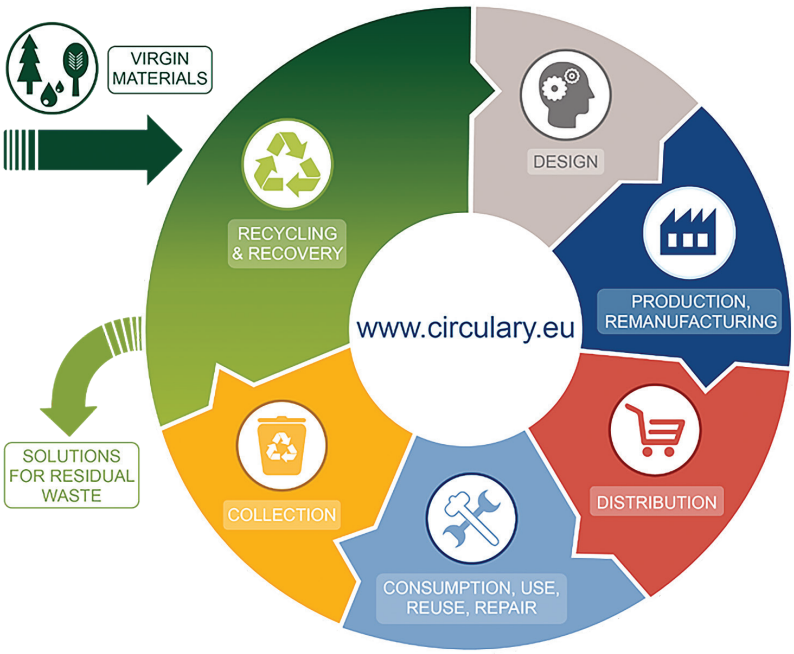
As organizations look for ways to reduce global carbon footprints, they should consider how to incorporate sustainable best practices throughout their operations, products and industry collaborations. Focus on a "5R" framework – reuse, reduce, recycle, renew and redesign – can help guide sustainable best practices and assist brands as they navigate the heightened environmental landscape.

Sustainable Growth with the "5R's"

As brands and their packaging converter partners take steps to reduce their carbon footprints, supplier partners are helping brands and converters achieve their sustainability goals through innovative product technologies, while at the same time advancing internal sustainability programs.

Suppliers are challenging themselves to look for ways to improve their internal processes by monitoring key metrics, such as energy and water usage — actions that are aligned with many of the United Nations' 2030 Agenda for Sustainable Development[1] goals.

In terms of innovation, certain inks, coatings and adhesives



Understanding a circular economy.

can be important enablers of a sustainable package that contributes to the overall design, functional integrity and performance of the package. These components can determine whether a package is recyclable, bio-renewable and/or compostable.

In a 5R framework, reuse refers to products designed to contain post-consumer recycled materials, or with protective coatings and resistant inks that offer the durability needed for reusable articles or packaging. Reduce is about enabling overall packaging lightweighting, through protective and barrier coatings, as well as barrier adhesives technologies. Reduce can also refer to minimizing or eliminating waste at converter

facilities with printing technologies that avoid press startups and shutdowns. Renew is about designing products with higher biorenewable content, which immediately translates into CO2 emissions reductions. Recycle is about products that enable enhanced recyclability, including repulpability and compostability, of a range of packaging structures. And redesign is about fundamental rethinking of packaging designs and printing processes.

Brand owners and converters can enable reuse by designing products that contain post-consumer recycled content or by using protective coatings and resistant inks that can withstand multiple wash cycles. Barrier adhesives technology and direct food contact inks can reduce packaging layers and weight, while inks with higher levels of renewable content translates into CO2 transmission reductions. Converters can redesign their printing processes by switching to a multi-purpose ink that can be used on different types of presses or even switch to extended color gamut printing to reduce waste.

Washable ink technologies are game-changing, allowing converters to address the demands of brand owners and delivering an immediate and measurable impact for the plastic packaging market. These inks are designed to be removed and separated from recoverable plastic substrates in today's mechanical recycling processes, which improves recyclability of packaging and enables industry certifications that are important for brand owners.

There are some considerations to keep in mind for sustainable product developments. First, new solutions must be designed in the context of properly validating assumptions and confirming that the carbon footprints of alternative package designs are actually achieved. This is done through lifecycle analysis. Additionally, costs must be managed because sustainable solutions generally don't carry a premium in the market.

New product developments must comply with current regu-

latory standards to ensure they're favorable not only for the planet but also for human health. Increasingly, safety and compliance may not be enough. When detection of certain substances is of concern, even at exceedingly low levels, a brand owner's reputation may be at risk. In a circular economy where such substances have to be managed through a full product lifecycle, from cradle to cradle at minimum, "beyond compliance" may become the new standard.

The Future of Sustainable Materials

Committing to sustainability means prioritizing and enabling increased materials circularity. To support this shift, brands and converters should focus on making packaging that is easier to recycle or otherwise recover. The 5R framework can be a guide to help identify areas of waste and determine the best route to commence sustainability initiatives.

Technological innovation is a result of the entire market and value chain, from retailers and brands to suppliers, converters, recyclers, nongovernmental organizations and legislators, all communicating openly, working together and being aligned towards the achievement of sustainability goals. ■

1 https://www.un.org/sustainabledevelopment/development-agenda/

ABOUT THE AUTHOR

Dr. Nikola Juhasz, Ph.D. is the global technical director for sustainability at Sun Chemical, where she engages with internal and external stakeholders to formulate sustainability-driven technical strategies and oversees the corresponding innovation and product development programs across all of Sun Chemical's product lines and technology platforms. To learn more about Sun Chemical's sustainability initiatives, including Sun Chemical's SunEco portfolio of solutions and the 5R framework, download Sun Chemical's Sustainable Growth guide at https://www.sunchemical.com/sustainable-growth-with-the-5rs/

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Winding: Part 2

Document Your Wound Roll Structure

By **Neal Michal**, Principal, Converting Expert, LLC

This is Part 2 in a five-part series regarding winding, with this month's focus on documenting your wound roll structure.

Last time we discussed the two types of wound roll structures that are possible. A "soft roll" will feature an S shaped interlayer pressure with a U-shaped MD strain profile. A "hard roll" will feature a peak interlayer pressure at the core that will decay toward the outside of the roll. The stored MD strain will look like a Nike swoosh.

You can characterize your wound roll structure by documenting either interlayer pressure or stored MD strain.

Document Interlayer Pressure

There are two proven ways to measure interlayer pressure:

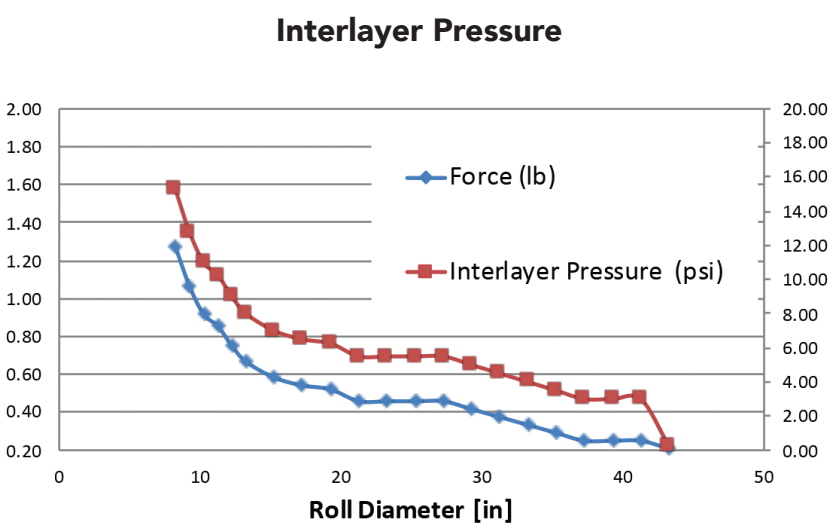
- Wind in pull tabs
- Reverse pull tabs

When possible, you can wind tabs into the building roll. This can be very dangerous so one must be careful when placing the tabs into the building roll. Once the tabs are wound into the roll use a handheld load cell to measure the force to remove the tab. This test is generally reserved for a slow speed pilot line application.

A much safer method is to use a "reverse pull tab" technique. The edge of the roll must have a clean slit edge. Insert a ruler (or a rod) into the side of the roll to a repeatable dimension. Use a hand held load cell to measure the force to remove the tab. A minimum of seven radial positions are recommended. It is recommended to use the same person to document interlayer pressure as this technique can be dependent on who takes

Diameter(in)	Force (lb)	Interlayer Pressure (psi)
8.25	1.27	15.25
9.25	1.06	12.75
10.25	0.92	11.00
11.25	0.85	10.25
12.25	0.75	9.00
13.25	0.67	8.00
15.25	0.58	7.00
17.25	0.54	6.50
19.25	0.52	6.25
21.25	0.46	5.50
23.25	0.46	5.50
25.25	0.46	5.50
27.25	0.46	5.50
29.25	0.42	5.00
31.25	0.38	4.50
33.25	0.33	4.00
35.25	0.29	3.50
37.25	0.25	3.00
39.25	0.25	3.00
41.25	0.25	3.00
43.25	0.21	0.25

Figure 1: Reverse Pull Tab Measurements



Pull Tab Force & Interlayer Pressure

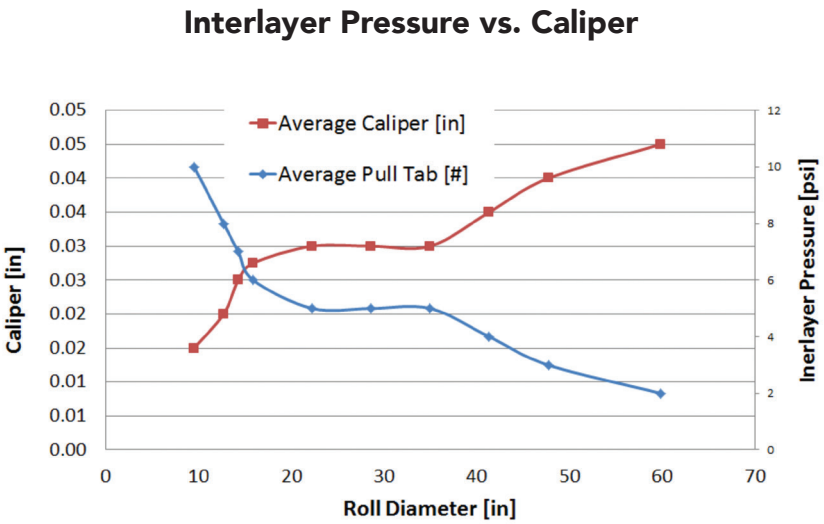


Figure 2: Inverse relationship between Interlayer Pressure and Measured Caliper

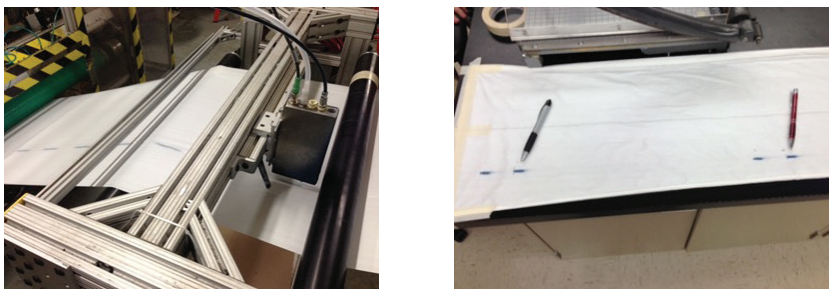


Figure 3: Print Registration Marks on the Web Before the Winder (left); Measurements off roll (Right)

the measurements.

In both cases, one can convert the pull tab force to pressure by conducting a calibration experiment. Cut a cube of material away from the wound roll you just tested. Cut coupons to a known dimension (eg: 4" x 4"). Place a pull tab into this stack of material at the same distance it was previously inserted into the roll. Place a known amount of force onto the stack using static weights or a tensile frame with a compression load cell. Calculate the pressure exerted onto the stack (EG 160# / 16 in^2 = 10 psi). Use the same hand held load cell to remove the pull tab. Repeat this exercise for three loads that represent three interlayer pressures. Calculate a calibration coefficient to convert pull tab force to interlayer pressure. The relationship should be linear.

See Figure 1 for an example of the data collected and the resulting graph. For this example the calibration coefficient is 12. Pressure [psi] = Pull Tab # x 12 psi/#

See Figure 2 for measurements that were taken from a sample 60" diameter roll of tissue. Note how the caliper is the inverse shape of the interlayer pressure. This is an example of a Soft roll structure. The S shape profile for interlayer pressure results in an inverse S shape relationship for caliper. See Figure 2.

Document Stored MD Strain

There are two proven ways to document your stored MD strain thru-roll:

- Measure repeating patterns on your web
- Print Registration marks before the Winder

If you have a repeating pattern (EG – registered graphics, embossing pattern) on your web you can often measure from one feature to the same repeating feature. Measure the roll circumference. Calculate roll diameter. Measure the repeat length on the roll. Strive to take the longest measurement possible. For example if your nominal repeat length is 12", it is better to measure the distance of three repeating cycles (→ 36" nominal). You may be looking for a difference of 1-2 percent stored strain difference. The longer repeat length will increase your resolution.

If your web does not have a repeating pattern, you can print one on the web before it enters the winding process. Figure 3 shows an installation of a printer and the subsequent registration marks.

It is important to use a nominal length that is as long as possible that will facilitate the length measurement on the roll. You should be able to measure to 1mm accuracy. Use a 250mm repeat pattern for 3" cores; 500mm for 6" cores and 1000mm for 20" cores. This will allow measurements all the way to the core.

Figure 4 documents the

Circumference (in)	Diameter (in)	Diameter (mm)	On Roll Repeat (mm)	Off Roll Repeat (mm)
188	59.8	1520.0	1055	1050
150	47.7	1212.8	1025	1020
130	41.4	1051.1	1005	1003
110	35.0	889.4	1002	1002
90	28.6	727.7	1002	1002
70	22.3	566.0	1002	1002
50	15.9	404.3	1003	1002
45	14.3	363.8	1005	1003
40	12.7	323.4	1007	1005
30	9.5	242.6	1010	1008

MD Strain On Roll (%)	MD Strain Off Roll (%)
5.5%	5.0%
2.5%	2.0%
0.5%	0.3%
0.2%	0.2%
0.2%	0.2%
0.2%	0.2%
0.3%	0.2%
0.5%	0.3%
0.7%	0.5%
1.0%	0.8%

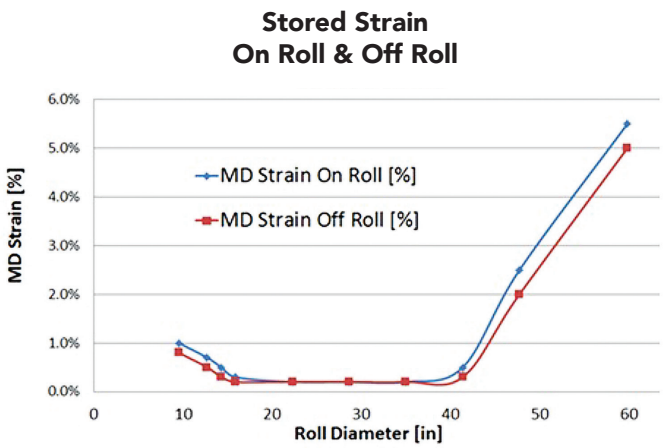


Figure 4: Stored MD Strain – On Roll & Off Roll

Roll Density Calculations (US Units)

BW: Basis Weight $\left(\frac{oz}{yd^2}\right)$

OD: Outer Roll Diameter (in)

W: Machine width or roll length (in)

L: Length on Roll (yd)

ID: Inner Roll Diameter/Core Diameter (in)

ρ: Roll Density $\left(\frac{lb}{ft^3}\right)$

$$\rho\left(\frac{lb}{ft^3}\right) = (3) * \frac{BW * L}{\left(\frac{OD^2}{4} - \frac{ID^2}{4}\right) * \pi}$$

Roll Density Calculations (SI Units)

BW: Basis Weight $\left(\frac{g}{m^2}\right)$

OD: Outer Roll Diameter (mm)

W: Machine width or roll length (mm)

L: Length on Roll (m)

ID: Inner Roll Diameter/Core Diameter (mm)

ρ: Roll Density $\left(\frac{kg}{m^3}\right)$

$$\rho\left(\frac{kg}{m^3}\right) = (1000) * \frac{BW * L}{\left(\frac{OD^2}{4} - \frac{ID^2}{4}\right) * \pi}$$

Figure 5: Average Roll Density Calculations

Stored MD strain on roll and off for another roll of tissue. Note that the "off roll" measurements were taken by removing the sample from the roll. Lay it out on a smooth table to allow a second measurement. Off roll strain will be less than the on roll strain. The amount of difference is due to plastic deformation.

Document Average Wound Roll Density

Average Wound Roll Density is a single metric that allows one to understand your wound roll structure. This is particularly true for compressible materials such as nonwovens, tissue and high loft webs. Although less sensitive, it is also a helpful metric for paper and film. You only need three parameters: Roll Diameter, Roll Length and Basis Weight. This information is typically on your roll ticket. If this data is stored in your PLC, you can begin to calculate this for every roll that you make. Figure 5 provides both US and SI units for calculating average roll density.

Next month we will discuss the important of tension, nip and torque for your winding process. ■

ABOUT THE AUTHOR

Neal Michal of Converting Expert is a well-known authority in web handling, process design and optimization. He worked with the Web Handling Research Center for 20 years. Currently serving as a technical advisor with AIMCAL, he can be reached at neal@convertingexpert.com or through www.convertingexpert.com.

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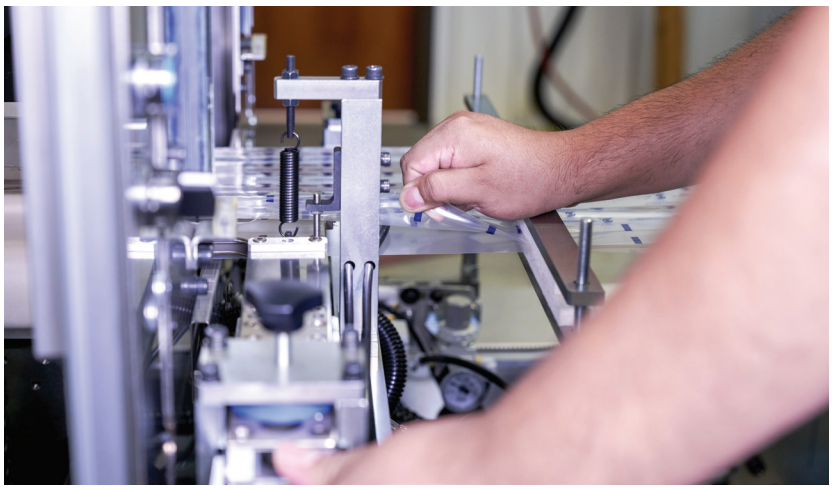
Sustainability

Within Bags, Pouches and Emerging Films

By **Mike Greely**, Senior Vice President Totani America

From production and functionality to sustainability attributes, bags and pouches need to provide an optimal experience for both the customer and consumer. As sustainability continues to be the most dominant topic within the flexible packaging industry, bag- and pouch-making machines continue to be optimized to handle and facilitate sustainable packaging materials.

As manufacturing partners support the transition to new, sustainable flexible films, there are a variety of opportunities for these bags and pouches to deliver excellent machinability with ever-emerging innovations in engineered films. In this article, we take a closer look into the current state of the packaging industry, as well as how collaborative partnerships will help transform the ongoing sustainability movement.



Springs support the zipper guide track to prevent film drag on the lower sealer.

Challenges with Sustainable Packaging

A common challenge in the packaging industry is determining the most effective way to incorporate sustainable films into existing packaging machines. For instance, when a packaging company needs to make a recyclable pouch, they need to identify how those materials will run and what impact the process will have on their operations. Although printers/convert-

The main unwind has an encoder for tension control and an edge guide to ensure proper film position.

ers want their packaging machines to run these sustainable films, they are more difficult to run than standard films due to their lack of heat resistance.

An important component to consider during the production process is making a quality seal. The amount of heat required to seal, and not stretch the film, is critical for making a successful pouch. In addition, bags and pouches for particular markets need barrier properties, such as those used for packaging pet food, lawn and garden products, and grocery store items. Creating sustainable packaging for these types of products is even more challenging due to their protection throughout the supply chain prior to consumer use.

How can we produce a sustainable package with the same seal integrity, low scrap rate and high production speed, as we can with traditional films?

Equipment manufacturers are actively engaged in finding solutions and opportunities for working with new film structures. They are going above and beyond to create strategic partnerships within the industry related to sustainable packaging, as well as learn about the films and how they interact with machines.

Sustainable Materials and Packaging Structures

Overall, while flexible packaging has a far smaller carbon footprint than other types of containers, sustainable solutions will help customers meet the market demand for more sustainable products.

Over the last several years, sustainable films and materials have improved drastically. For example, machine-directed orientation (MDO) films are used for their resistance to stretching in the film flow direction of the machine film. Utilizing various types of films and materials can help produce a better product, ultimately aiding in the consumer experience.

With sustainable packaging, converters and CPGs are tasked with determining if the structure needs to be adapted to a machine or if it's suitable as is. This decision is also dependent on how the customer is using the structure and if it's easier to process on a pouch machine. The question needs to be answered: How can we produce a sustainable package with the same seal integrity, low scrap rate and high production speed, as we can with traditional films?

There have also been adaptations to pouch machines to accommodate sustainable films. For instance, ultrasonic sealers have been used to help crush the zipper profile in the seal area, where in the past heat seals were normally used. In addition, improvements to the way film is drawn and registered in the machine has drastically helped counter the effects of

film stretching and print repeat variation.

The Future of Sustainable Flexible Packaging

The flexible packaging industry has a variety of sustainable opportunities, from the materials and films used to the machines' engineering. An important aspect of creating these opportunities is to evaluate what can be done with the materials we are working with now, such as enhancing efficiency and ease of operation, achieving faster runs and decreasing scrap levels. CPGs, printers and converters tend to lead these internal efforts, and they continuously push the industry to collaborate and develop solutions for a more sustainable future.

To achieve these sustainability goals, manufacturing partners can work together to create and apply sustainable solutions for their customers. For converters, it's important to find and implement a pouch machine — sooner rather than later — that accommodates both non-sustainable and sustainable materials to be ready at a moment's notice. Companies can be proactive by adapting their operations to be more sustainable, instead of reacting to the increasing consumer demand and potential future regulations.

Converting machines can be optimized for handling sustainable packaging materials, and manufacturing partners can support the transition to new, sustainable flexible films. Even with the present challenges, there are opportunities to be prepared for different packaging equipment and configurations. ■

ABOUT THE AUTHOR

Mike Greely, senior vice president for Totani America, a manufacturer of pouch making machines for flexible packaging. Founded in 1952 — celebrating its 70-year anniversary — Totani machines are being used in more than 60 countries. Visit the Totani website and contact pages to learn more about the company's products, services and expertise.

Maintaining Static Control

Three Ways to Lock in Good Performance

By **Dr. Kelly Robinson**, Founder, Electrostatic Answers

Static control is important for operator safety, manufacturing productivity and product quality. Maybe your customer is concerned about high static. Or, being proactive, static control is now much better with the invested time and effort. Great! Now that static problems are yesterday's news, other priorities demand your focus.

Before you move on, do three things to maintain good static control and lock-in the progress that you've made. This update to "Keep a Good Thing Going!" [1] adds a "big picture" perspective to the 11 specific suggestions for maintaining good static performance.

1. Install static dissipaters to form a fault-tolerant static control system.
2. Verify static performance regularly.
3. Include static control in Management of Change (MoC) procedures.

Fault-tolerant systems are robust because they maintain satisfactory performance even when a system component fails. For example, just upstream of the winding roll in Figure 1 is a tension control nip and a tacky roller web cleaner. In this section of the machine, there are four static-charging sources; two tacky rollers, a nip roller, and a winding lay-on roller.

Each source needs a static dissipater (see "Static Dissipater Locations" [2]). Two additional static dissipaters are needed to make the system fault tolerant. Static dissipater SBwind protects the winding roll in case SBnip fails. And, SBroll dissipates static charges on the winding roll in case SBlay-on fails. With these six dissipaters installed, static charges stored on the winding roll remain low even when any one dissipater fails.

Even with a fault-tolerant static control system, set up the machine to minimize static. For example, the pressures on the cleaning nip rollers and the pressure on the tension control nip should be set as low as possible

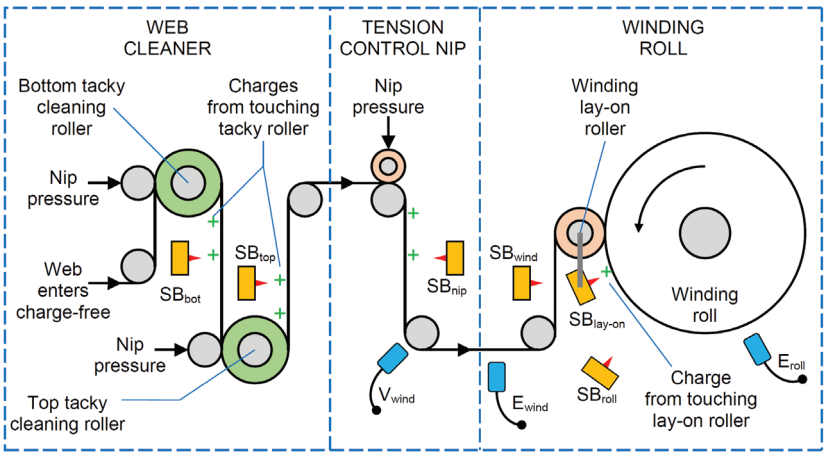


Figure 1: Fault-tolerant static control for a winding roll.

while still maintaining reliable operation. My experience has been that nip pressures are often adjusted upward a little bit just to make sure that the machine will run well. This well-intentioned adjustment is then repeated several times resulting in much higher than needed nip pressures and much higher than needed static levels.

To maintain good static control, our verification measures must detect a failed component and maintenance procedures must fix the failed component before two failures occur.

Verify static control performance by regularly measuring static at a couple of key locations (see "Assess Static Risks Using Electric Fields"[3]). Use a handheld electrostatic fieldmeter to measure the electric field Eroll near the winding roll to verify that the winding roll stores little static charge (see "'GeeZE' Rules for Static Readings"[4]. When SBlay-on and SBroll are operating properly, Eroll will be less than ±2 kV/cm (±5 kV/in).

Use a non-contact electrostatic voltmeter to measure Vwind, which is a sensitive verification measurement of all upstream static control devices. With good static control Vwind will be less than ±0.5 V/mm. For example, for a 50 mm thick web (0.002 inches or 2 mil), Vwind should not exceed ±25 V (see "Introduction to static control for roll-to-roll manufacturing"[5]).

Use a handheld electrostatic fieldmeter to measure Ewind, which verifies that SBnip is functioning properly.

Include static control in Management of Change (MoC) procedures (see, for example, J. Reynolds, "Management of Change for Fixed Equipment Mechanical Integrity"[6]). In a manufacturing operation, procedures, personnel and equipment are constantly changing. MoC is an administrative control to safeguard employees from the hazards inadvertently introduced by a change.

For example, when a new winder turret is to be installed, assess this change for possible impacts on operations including material handling, machine tension and speed controls, and operator training. A Process Safety Review might be held with a few knowledgeable people to step back and thing through the changes. If the changes are modest, perhaps no design changes or training updates are needed. If there are questions, perhaps a commissioning trial will be needed to verify speed and tension controls.

Include static control in these discussions. For example, we might establish baseline static performance by completing a static survey before the new winder is installed. Then, we can perform a second static survey to qualify the new winder for service.

Maintain static control by installing static dissipaters to form a fault-tolerant static control system. Fault-tolerant systems are robust and easier to maintain because they maintain satisfactory performance even when any one system component fails. Verify static performance by regularly making static measurements at a few, key locations.

These verification measurements should detect a failed component so that we can fix it before a second failure occurs. Finally, include static control in Management of Change (MoC) procedures so that we do not inadvertently introduce a new charging source into our system.

For more information, contact Kelly.Robinson@ElectrostaticAnswers.com. ■

1 https://www.pffc-online.com/static-beat/13415-static-beat-keep-a-good-thing-going
2 https://www.pffc-online.com/static-beat/12384-static-beat-static-dissipator-locations
3 https://www.pffc-online.com/static-beat/15664-assess-static-risks-using-electric-fields
4 https://www.pffc-online.com/static-beat/14478-static-beat-geeze-rules-for-static-readings
5 https://ieeexplore.ieee.org/abstract/document/9677304
6 https://inspectioneering.com/blog/2015-03-09/4447/management-of-change-for-fixed

The Midwest is the engine of manufacturing in the U.S., particularly manufacturing and converting roll goods.

Rust to Tech: Part 5

By **Susan Stansbury**, Industry Consultant

This is Part 5 of our series: Rust to Tech. While we know that converting and associated industries have made a leap from the old rust belt days into a world of technology and advancement, we need to consider how further innovation, even disruptive technologies, can propel — and challenge — new outcomes.

What are disruptive technologies?

One way to define the world of disruptive technology is to look at solutions that move beyond established technologies, ranging from significant displacement of current approaches and even creating entirely new advancements. Harvard Professor Clayton M. Christensen has also noted that disruptive technologies transform the competitive landscape.

What are factors affecting manufacturing?

1. Robotics, automation and machine learning
2. Smart technologies and digital recording
3. Big data, algorithms and cloud computing
4. Intelligent monitoring and sensors
5. Material innovations, renewables and sustainability
6. Energy storage, recovery and efficiency
7. The "internet of things" merge data streams.

Examples and expansion of these items follow. But first, a comment from Kevin M. Lee, Director of Solutions Engineering and SafetyChain Software, providing a view of the interconnectivity of all:

Manufacturing plants generate volumes of productivity, environmental and safety data daily. Harvesting and marrying machine collected data with human collected data empowers operators, supervisors and executives to visualize abnormalities and trends in real time. Real time data capture combined with immediate visualization allows plant management to action the data for production improvements.

It's the use of the above factors that results in improvements and disruptive changes described by Kevin Lee.

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The latest robotics offer higher levels of precision and hygienic

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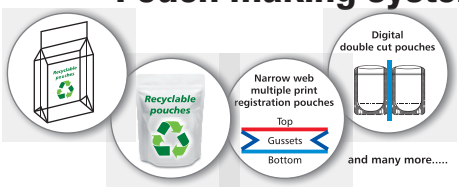
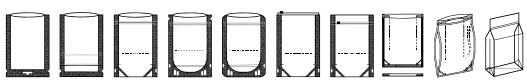


- Choice of 16”/24”/32”/40” machine width
- Quick and easy changeovers
- US based afer sales support & spares warehouse



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High speed Wicketers

- Available in 24”/30”/40” widths
- Vacuum arm options of 16” & 24”
- Fastest machine for string zippered wicketed bags at 250 cpm
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Universal Flat Bed Machines (Solid & Split roll)

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- Repeat seal capability for higher thickness films
- Bag sizes from 4” to 160”
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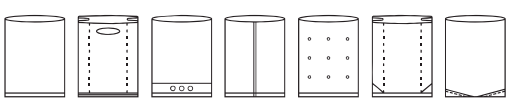

*Mechanical speed

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standards. When combined with automated production lines, results are transformative. Looking specifically at the converting industry where slitting-winding and related operations are common, Bryan Reilly, Technologies Sales Manager, brings home concrete examples:

The questions I've received from my customers over the past couple of years center on what automation options exist for the slitter/rewinder and what downstream automation is available. On the slitter/rewinder, options can include automatic knife positioning (AKP), laser core positioning, automatic core loading and positioning, automatic cross-cut of finished rolls, automatic tape-to-tail, automatic tape-to-core, automatic finished roll extraction (pushers) and choice of Left-hand or Right-hand drive. Currently, only a handful offer Left-hand or Right-hand options, but demand is increasing for machines that can be "mirrored."

Once finished rolls are pushed off the rewind shafts and onto the unload 'tree' – what additional automation can be used to improve quality and throughput of finished rolls? Some manufacturers either offer or partner with automation integrators to include robotic removal of rolls from the 'tree' and 90° rotation so that rolls are eye-to-the-sky then placed on a conveyor.

Reilly adds: *Next, there's the option for automatic core labeling and outer wrap label placement along with edge/profile inspection. Yet further sophistication can even incorporate automatic bagging and palletizing. A few larger converters are already at this stage of utmost automation while others are trying to focus on what level of automation they want to achieve and at what costs in the next few years. One thing is for sure, if the automation provides enhanced safety, reduced roll damage, increased throughput and higher quality finished rolls – it's only a matter of time before everyone will want higher levels of automation.*

The U.K.'s "Ecover" refill stations allow bottle reuse up to 50 times.

Smart technologies and digital recording, along with cloud computing, big data and other aspects of advancements all overlap and work together for the best efficiencies. Just looking at the stock market, CNBC Correspondent Bob Pisani notes that the market floor had some 4,000 traders when he began there, and now it's down to some 200 traders. This type of worker shrinkage has occurred almost everywhere. With manufacturing still looking for workers for well-paying jobs, technology is filling the gap with smart shop floor input.

Further regarding industry employment, according to David Manney (Manney's Manufacturing Minute):

Even though these technologies can ease some of the stress of working in a factory setting, they don't entirely eliminate the need for workers who understand what is going on in each process and can react if things break down or something doesn't go as planned. These new processes also allow manufacturers to rethink how they handle every step of production, from raw materials to finished shipping goods. [When] you're talking about factories where human hands are still the last step in production, [it] means manufacturers need to think about ways to integrate their machines seamlessly into their workflow.

The Midwest is the engine of manufacturing in the U.S., particularly manufacturing and converting roll goods. Indiana and Wisconsin vie for best areas in terms of the number of workers in manufacturing. In Wisconsin, with an industry labor force of nearly 500,000, the state is heavy on small-to-midsized manufacturers who are not prone to moving their business overseas, but sometimes challenged by lack of big business capital. Interestingly, LinkedIn listed Madison as first of the top 10 in "tech's most resilient hubs," where engineering talent is showing growth.

Among the factory floor

inputs are sensors that report everything from electric current data, to humidity, pressure, temperature, flow and various defect detections. In paper and printing, visual inspection and sensors report imperfections such as holes and imperfect print. Consider a flexographic 10-color, gearless press run at high speed with cutting-edge features like second pass in-register printing, automatic impression setting, automatic viscosity control and the ability to track performance 24/7.

It's a world away from the days when samples were taken to the lab to determine many of these factors. Companies who run roll goods had higher challenges in getting in-process samples. You could not stop a high-speed coating process, for example, to check quality every hour or so. It was a challenge when compared with products like pouches, canisters, pads and individual items that could automatically be kicked out of line at a specified point for inspection. Now, it's all done at smart tech levels.

In the current tech environment if "AI is designing perfect custom knee implants" (Healthcare Packaging) and 3D printing is increasingly making medical "parts," it's happening in manufacturing too. "From file to 3D object is also revolutionizing manufacturing," said GE Additive. At AdvancedTek of Waukesha, Wisconsin, production parts and tooling are major 3D activities.

Consequences of advancements also affect waste. Paper is already the most recycled material, being natural and renewable, with automated processes also reducing waste. And source reduction of waste is superior to trying to recycle, biodegrade or compost after sale. In addition, companies like Stora Enso and GP mills have had drastic reductions in process water usage. Plastics, too, are under major moves to reduce plastic. Manufacturers are finding disruptive avenues throughout their factories.

Materials and containers are changing rapidly. From the U.K.'s "Ecover" refill stations allowing bottle reuse up to 50 times, to sensors that indicate food shelf life — the ability to design new materials and packages is game changing. Who would have imagined, just a few years ago, that one of the older nonwovens web technologies, needlepunch fabrics, would be used in a new Nike Forward apparel line to reduce its carbon footprint.

"The Internet of Things," sums up a popular view. It is described as technology that allows addition of a device to objects such as electronic and other factory systems to connect and exchange data. ■

To read the first four in this series, visit:

https://www.pffc-online.com/converting-perspectives/16672-rust-to-tech-part-i
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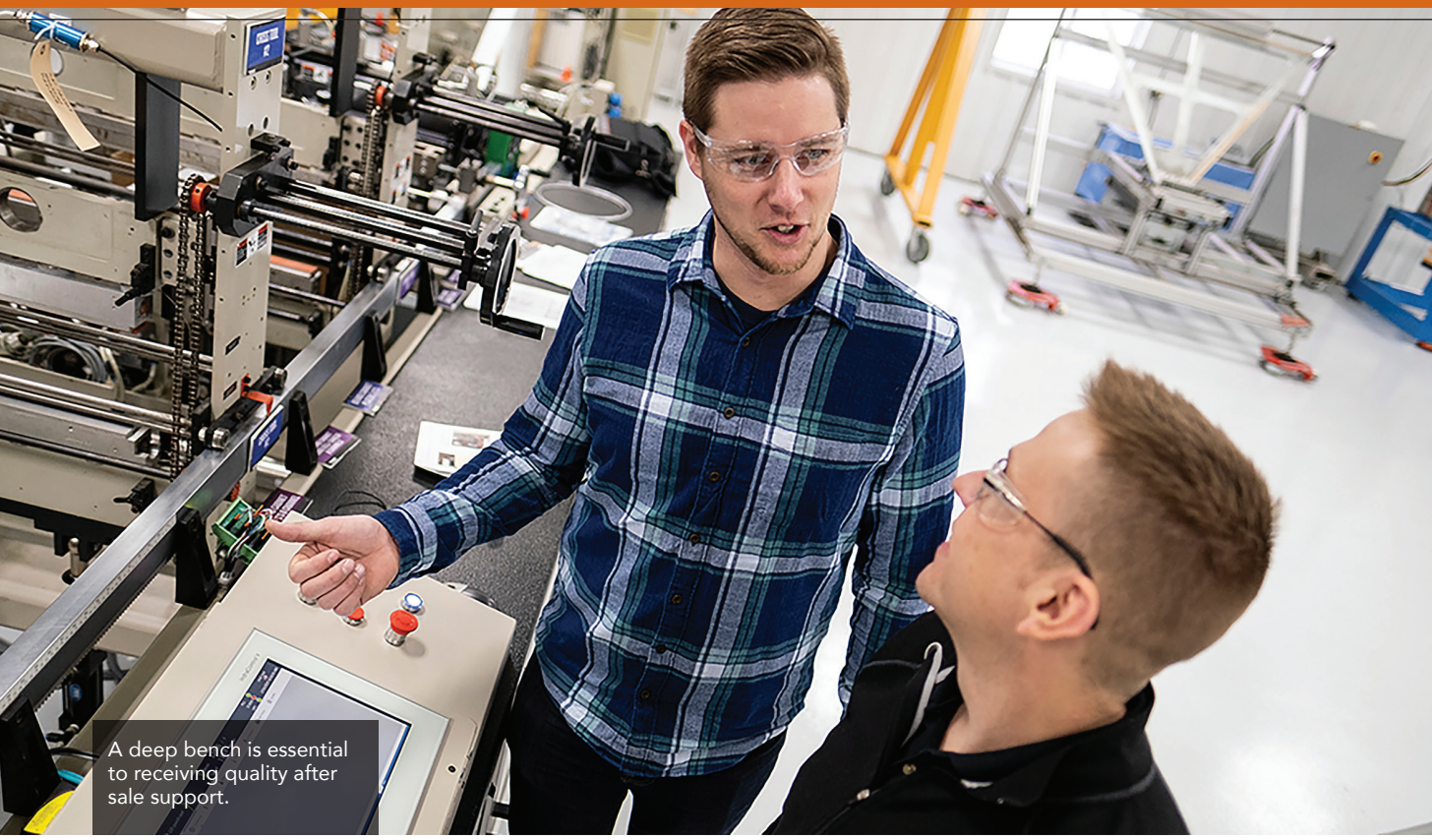
ABOUT THE AUTHOR

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



A deep bench is essential to receiving quality after sale support.

Important Considerations When Choosing an OEM

By **Scott Fuller**, Pouch Equipment Product Line Manager, CMD Corporation

After visiting industry trade shows like Pack Expo and seeing the impressive new technology demonstrated by Original Equipment Manufacturers (OEMS), many of us return to our positions and our companies with ambitious plans for incorporating those latest bells and whistles into our next capital equipment request.

We expect to utilize the latest technology to procure new business, new projects and, if we're honest, recognition for our well-researched and successful recommendation.

It is quite exhilarating, and daunting, to be responsible for recommending and specifying new equipment. It's an expensive, serious investment that, if done properly, ensures new growth and success, and if done poorly, could be a very costly mistake.

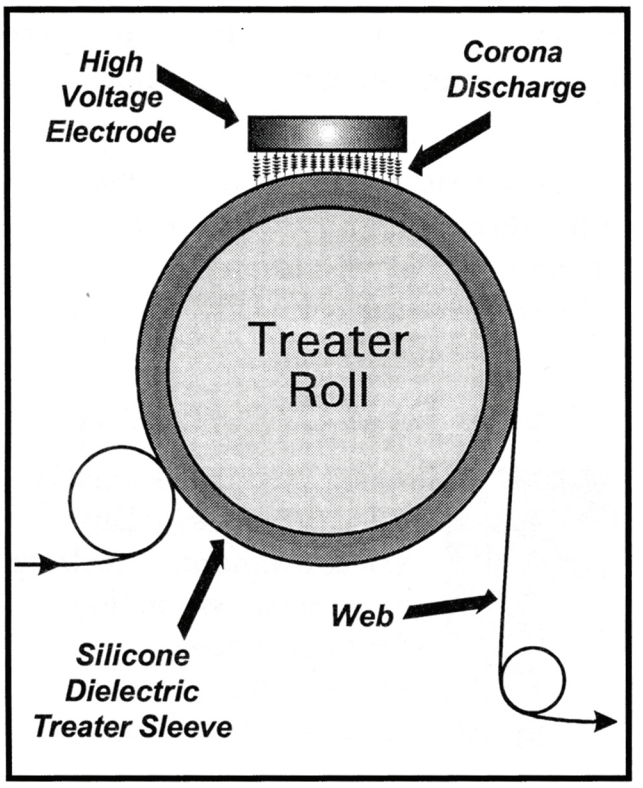
Companies have their specific methodologies for specifying and purchasing capital equipment. Depending on the cost and complexity, the process can take months, even years. But, whatever the process, the thought and planning that goes into it should include a thorough review of the tangible and less tangible benefits a specific piece of machinery, and the OEM, offer.

Along with the usual specifications required when soliciting an equipment proposal, consider the following when choosing your next OEM.

Experience and Reputation – It's advisable to select an OEM with substantial experience in the industry, as they bring with them the years of learning gained from commercializing technology. It's also of value to consider manufacturers newer to the industry who may have fresh ideas, different and better technology and can offer you first-to-market advantages. Of course, when doing so, extra due diligence, referrals and case studies may be warranted.

Examine the OEM Business Model – If standard, off-the-shelf equipment works for your firm,

SILICONE Treater Sleeves



Life inside a corona treater is hell.

Dielectrics must withstand high frequency, high voltage discharge, plasma-induced ion bombardment, elevated temperature, and concentrated ozone. Even the slightest defect can result in premature failure.

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"Our silicone sleeves are equal or superior to those supplied by the world's leading treater manufacturers."

We've been selling these treater sleeves for over 25 years now — in that long period of time, we have had only one or two sleeves fail on installation. 100% visual inspection is, indeed, very effective!

We guarantee these are the same high quality treater sleeves sold by OEMs worldwide — all at significant savings!

Product Code	Fits Roll OD* English	Fits Roll OD* Metric	Actual ID	Color	Wall Thickness	Price per Linear Inch
96152	1.5"	38 mm	35 mm	Orange	.080" (2.0 mm)	$1.15
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
96802	8.0"	203 mm	190 mm	Orange	.102" (2.6 mm)	$4.55

*These sleeves will fit any treater roll OD within +/- 0.125" (3 mm) of listed size.

Wall thickness variance: +/- .006"
Hardness (Shore A): 70-80

Dielectric Constant: 4-5
Dielectric Strength: 250 v/mil

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a company that builds banks of machinery with no chance for changes or customization may be the way to go. Often, this model allows for cost advantages that could result in a lower price for you. However, if you need something slightly different, or if your business changes and you require retrofits or adjustments down the line, this type of OEM will likely not be the kind of partner you will need.

Conduct an ROI analysis to analyze the value of your investment and payback period. The system should pay for itself within a prescribed length of time that works with your company's expectations. Be sure to include annual costs to operate, projected maintenance and wear parts expenses, etc.

Equipment Characteristics

- **Expect Reliability** – proof that the equipment performs to promised expectations; produces the product to specifications with acceptable scrap rates. Request data to back any claims made by the OEM.
- **Ensure the system is easy to operate** – this extends to training operators, time to onboard new people in the proficient operation of the system, simplicity of design to ensure easy and trouble-free operation. Does the firm offer training available virtually, to reduce costs and enhance availability for new operators?
- **Calculate downtime** – How long does it take to perform scheduled maintenance? Does the system offer alerts so maintenance can be scheduled, and unexpected downtime is avoided? Consider changeover times; maintenance accessibility, and the time it takes to set up and start up the machine at the start of shifts.
- **Iot Support Tools** – The technology is here to provide time- and money-saving tools in the way of real-time process monitoring and adjustments (even remotely.) These tools can enhance safety and productivity and reduce downtime.

Technical Skillset and After Sale Support

Carefully examine the terms of the warranty offered, and ensure that the OEM has a strong engineering and technical after sale support team at your disposal. A deep bench with mechanical and electrical engineers, programmers, experienced service technicians and an in-house parts department are essential to receiving the quality after sale support you will need to keep your system running at peak performance.

Ensure that service support includes:

- In the field
- In emergencies – is there an after-hours number that is answered?
- Installations and start ups
- Training in person and digital offerings.

Upgrades, retrofits, refurbishing services

- The OEM should have in-house specialists that are focused on the development and installation of upgrades and field retrofits.
- The OEM should offer a formal component obsolescence program designed to stay ahead of component obsolescence issues, with alerts to customers to keep them informed and ahead of the curve.

A Professional Specification Process

An experienced and knowledgeable OEM will have a clear process to ensure they understand the performance and production expectations and final product scope, specs and quality requirements of their customers. This process should include transparent, co-signed documentation from specifications through the sales contract. Agreement up front will ensure a beneficial relationship built on good communication and trust.

Terms and Financing – find out what is offered in terms of financing. Carefully review and understand the terms and conditions of sale, and the OEM's responsibilities to you, and vice versa.

Taking these important criteria into consideration regarding your next OEM will ensure a wise decision for successful projects, new business and perhaps even a feather in your cap. ■

ABOUT THE AUTHOR

Scott Fuller has more than 38-years in the Flexible Packaging industry, with much experience converting bags and pouches or troubleshooting bags and pouches in the field. "Not your typical machinery sales guy" is how customers and prospects frequently describe Scott's approach. By combining rare real-world experience with CMD's renowned engineering excellence, Scott helps clients take their pouch converting operation to the next level.

AD INDEX

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