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Number of the month:
22*

*The number of exhibiting companies at the AceConnex tabletop show.
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CORRECTION:

An April 15, 2019 news story that appeared on our website wrongly reported that Alpha Marathon Film Extrusion Technologies Inc. was involved in a recently dismissed lawsuit with Dual Spiral Systems. Alpha Marathon Film Extrusion Technologies Inc. was not involved in the lawsuit.

Canadian Plastics regrets the error.



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Twenty years after they became commonplace in Europe, interest in all-electric blow molding machines is building in North America. Here's a look at some of the latest fully electric and hybrid models, and why you should care.

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By transforming post-consumer plastics into value-added polymers and waxes, this Brantford, Ont.-based clean technology company is offering processors a whole new world of specialty materials.

Picking on paper straws

When it comes to plastic straw bans, the plastics industry could be forgiven for indulging in a we-told-you-so moment.



The anti-straw movement has been around for years, gaining much traction beginning in 2015 after a video of a marine biologist extracting a plastic straw from a sea turtle's nose went viral.

Beginning in 2018, major companies including Starbucks, McDonald's, A&W Canada, and Alaska Airlines started to phase out plastic straws. Regionally, Vancouver has instituted a plastic straw ban, Scotland plans to eliminate them by the end of this year, and New York City, Hawaii, and California all have pending straw ban legislation.

The problem is, the alternatives aren't any better — and in the case of paper, are demonstrably worse. The bottom line is, paper straws taste horrible. If you've haven't yet had the pleasure, reach for the closest piece of paper at hand — one of my editorials ripped from an old issue of *Canadian Plastics* will do nicely — and roll it into a thin tube. Then, sip any carbonated or non-carbonated beverage you choose through it, and enjoy the exquisite feel of cellulose dissolving on your tongue and the taste of glue and wet paper in your mouth.

More seriously, non-plastic straws are drawing fire from the disabled and their advocates, who say they make life more complicated for people with disabilities who rely on straws because they're unable to go through the physical motion of putting a drink to a mouth. These people — who literally need straws — are now pointing out that materials other than plastic just don't do the job. Paper, they note, dissolves and can be bitten through; and metal gets either too hot or too cold depending on the temperature of the drink, and can even be painful for those with symptoms like jitters. "Other

types of straws simply do not offer the combination of strength, flexibility, and safety that plastic straws do," Disability Rights Washington, a non-profit group based in Seattle, said in a letter it recently coauthored to the city in response to a proposed plastic straw ban in Washington state. The group has tried to educate others on why plastic is the most efficient material for straws, the letter continued, but they often get told they're wrong.

Superior non-plastic alternatives exist from a performance standpoint — glass, copper, even bamboo — but their high cost and impracticality means they pose no real challenge plastics' cheap disposability.

All of which should remind those who want to ban them that plastic straws exist in the first place as a solution to paper's glaring flaws. The plastics industry has known this since day one, but it probably doesn't matter anymore because, in the Western world at least, the straw debate isn't really about straws — it's about the broader effects of a throwaway culture where thoughtless disposal is the rule. Developing nations and some Asian countries, meanwhile, can't even have this debate because, since they don't have recycling facilities, there's no alternative to simply dumping plastic waste. Which is why, for example, China's Yangtze River contributes 55 per cent of the estimated 2.75 million metric tonnes of plastic waste — which definitely includes straws — going into oceans each year.

So until we change our ways — and until more recycling facilities here at home are persuaded to accept straws made from PP, which they don't all do — we can expect more and more candy cane striped paper straws and fewer plastic straws — which remain, stubbornly, the most efficient straws.

And in the meantime, we'd better get used to the taste of glue.

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Canadian Plastics magazine reports on and interprets developments in plastics markets and technologies worldwide for plastics processors, moldmakers and end-users based in Canada.

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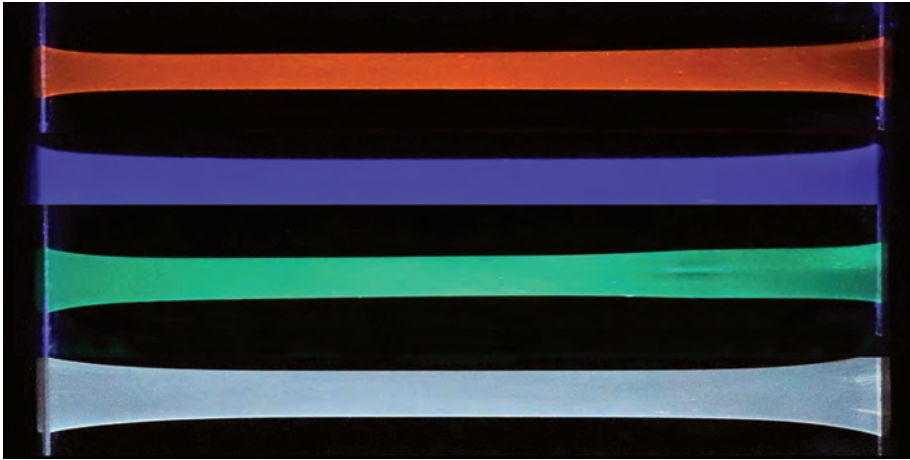
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Polymers give early warning signs of stress



Swiss and Japanese researchers achieved the white fluorescence (bottom) by combining sensor molecules that emit orange, blue, and green fluorescence respectively.

If your significant other has ever blown up at you suddenly because they're stressed out and you didn't know it and said the wrong thing, you appreciate the value of being warned in advance when something is under too much pressure.

Getting advance warning when material in a plastic part is under stress has always been hit-or-miss: scientists have previously developed polymers that change their optical properties in response to mechanical stress, but the change is generally triggered by the breaking of molecular bonds within the material, so it can only happen once. Additionally, those bonds can also be broken by stimuli such as heat and light, resulting in false alarms.

With these limitations in mind, researchers from Switzerland's University of Fribourg and Japan's Hokkaido University have devised a polymer with a new type of sensor molecule that can only be activated by mechanical force — it glows when it's stretched, signalling that mechanical stress is building towards a catastrophic part failure.

To do this, they built upon their previous work, published last year, in which they developed a type of PU resin that contains stress-sensing rotaxane consisting of ring-shaped fluorescent molecules threaded on dumbbell-shaped molecules featuring so-called "quencher groups" — which decrease the fluorescence intensity of a given substance — at their centre. In the relaxed polymer, the quenchers are near the fluorescent rings and prevent them from glowing under ultraviolet light. Stretching the polymer moves the quenchers and fluorescent rings apart, causing the material to glow green. The more the material is stretched, the brighter it glows, and it goes dark again once the stretch is released. The process can be repeated indefinitely.

In the current study, the researchers developed three new PU resins that glowed blue, green or orange when

stretched, demonstrating that the colour can be tailored simply by using different cyclic fluorescent rings in the rotaxanes. Again, the materials emit light of greater or lesser intensity, depending on how much they're stretched. By combining the three polymers, the researchers said, they created the first white light-emitting polymer that can instantly be switched on and off mechanically. And because no chemical bonds are broken, the process is fully reversible.

Potential applications for these materials include built-in monitors that send visual warning signs

before a part fails or that enable engineers to map stresses in parts under load and help them design these better. **CP**

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AceConnex tabletop show was a hit



A one-day industry tabletop show held at the Doubletree by Hilton hotel in Mississauga, Ont. on May 9 got two thumbs up from exhibitors and attendees.

Organized by Mississauga-based AceTronic Industrial Controls Inc., the AceConnex show featured 22 exhibiting companies plus 11 different technical presentations put on by some of the exhibitors. “The goal of AceConnex was to bring customers in the plastics industry together with key suppliers in a smaller, more intimate setting than a traditional trade show,” said AceTronic president Kim Thiara. “This was the first time we’ve done this show, and the turnout was higher than anticipated. The exhib-



itors were thrilled to be able to connect with potential new customers, and part of the value for the attendees was in hearing the technical presentations and then being able to follow up directly with the presenters with any questions. Based on the responses to this show, we’re already planning a second show for next year.”

CPL

Colour innovator Robert Swain dies at 90

Robert Swain, the founder of custom colour compounder Chroma Corp. and a member of the Plastics Pioneers and the Plastics Hall of Fame, passed away on April 21 in East China, Mich. at the age of 90.

Born in Cape May, N.J., Swain worked for Union Carbide and then Exxon Chemical Co. While at Exxon, he developed and patented several new PP compounds, including the first PP used in automotive steering wheels for Ford Motor Co., and PP agitators for Maytag Corp. washing machines.

Swain left Exxon in 1967 to start Chroma Corp. in McHenry, Ill., and the company began developing highly concentrated colourants for a wide range of applications. Chroma was also the first colour compounding company to offer custom formulated colourants to the pharmaceutical industry. Swain sold Chroma in 2016. Today, Chroma, Breen Color Concentrates, Carolina Color, and Hudson Color are owned by private equity firm Arsenal Capital Partners, operating under the name Chroma Color Corp.

Swain was elected to the Plastics Hall of Fame in 2009. At the time of his induction, he was just the second person in the colour compounding industry to be admitted to the Hall of Fame. He joined the Plastics Pioneers Association in 1978, and served as treasurer then and later as managing director.



CPL

Made-in-Quebec deal between Roda Packaging and Industries Rada

Quebec-based rigid plastic container maker Roda Packaging has acquired Industries Rada Ltd., an injection molder and blow molder of custom packaging products that’s also headquartered in Quebec.

The terms of the deal have not been disclosed.

In a statement, Roda Packaging said that it has been sourcing materials from Industries Rada — which was founded in 1999 — for more than 10 years. “Under the new designation Industries Rada (2019) Inc., the new entity will help respond positively to a specific shortage in market supply,” Roda Packaging said.

Joining the organization will be Stéphan Berthiaume as president and Isabelle Lehoux as CFO and human resources officer.

“With this transaction, we gain the combined strengths of production capacity, a proven sales force, and a cross-Canada distribution network,” Berthiaume said in the statement. “We believe in the intrinsic value of the made-in-Quebec business model we offer our clients, and now look to reap the benefits of enhanced production capacity and of technology investments to be made in the months to come. Furthermore, we are firmly committed to becoming a collaborative lab and high-performance centre for recycled resin reintegration.”

Headquartered in Laval, Que., Roda Packaging also has manufacturing plants in Toronto and Vancouver. The company was founded more than 30 years ago, and manufactures rigid plastic containers, bottles, and caps and closures for the North American market.

Industries Rada makes HDPE and PET containers, customized products, and has a machine shop for mold fabrication. The company is headquartered in Delson, Que.

CPL

Milacron selling Uniloy to investment firms

Milacron Holdings Corp. is selling its Uniloy blow molding business to U.S.-based investment firms Osgood Capital Group LLC and Cyprum Investment Partners LLC.

The terms of the deal have not been disclosed.

The Cincinnati, Ohio-based plastics processing machinery maker announced the news on May 14, just two weeks after it disclosed in its first quarter financial report that it was exiting the Uniloy business and putting it up for sale.

Milacron bought Uniloy, which is headquartered in Tecumseh, Mich., in 1998 from Johnson Controls Inc. Milacron plans to keep the structural foam business that it bought from Johnson Controls at the same time.

Brian Marston, currently the president of Milacron's blow molding and

extrusion division, will lead the Uniloy organization as president and CEO. He has held leadership positions within the plastics and blow molding industry for 35 years, Milacron said in the statement.

"Uniloy has operated as a Milacron product brand since 1998, and we are confident it will continue to thrive under its new ownership in the years ahead," Milacron CEO Tom Goeke said. "[The sale] is consistent with our decision to concentrate on our core...technologies, including Milacron injection molding machines, Milacron extrusion equipment, Mold-Masters hot runner and control systems, DME mold components, and our Cimcool fluid technologies."

The Uniloy transaction is expected to close within 90 days, Milacron said.

CPL

Polyethylene sales veteran Geoffrey Perkins passes away

Geoffrey Perkins, a longtime sales professional in Canada's plastics industry, passed away on April 11 at the age of 87 in Belleville, Ont.



Perkins started at CIL in the 1960s and then transitioned into PE resin sales by joining Dow Chemical Canada as a sales manager in 1972. He stayed with Dow until 1992, when he joined PE film maker PolyExperts Inc., which was headquartered in Laval, Que., as its sales manager for Ontario. Perkins retired from the plastics industry in 2016.

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CCC buys Canadian container maker Plastique Micron

Altium Packaging Canada, a subsidiary of U.S.-based blow molder Consolidated Container Co. (CCC), has acquired Canadian firms Plastique Micron Inc. (PMI) and its affiliates IMBC Blow-molding 2014 and Action Plastic Products for an undisclosed amount.

Founded in 1970, PMI manufactures plastic containers for food and cosmetics applications, and has three plants: in Anjou and Orangeville, Ont., and in Sainte-Claire, Bellechasse, Que. The company employs approximately 200 workers.

In a statement, Atlanta, Ga.-based CCC said that all three locations will be integrated with the existing Altium Packaging Canada plants. Altium makes the Semopac, Deltapac, Humberline Packaging, and Polybottle brands.

“This acquisition is the next step in executing our vision of becoming a differentiated packaging solutions provider,” Sean Fallmann, president and CEO of CCC, said in the statement. “The acquisition of PMI allows us to further broaden our portfolio in the specialized pharmaceutical, health, and nutraceuticals markets while expanding our footprint in Canada.”

PMI CEO Bernard Poitras said the acquisition “comes at the perfect time and will result in a new phase of expansion for Plastique Micron.”

CCC also operates a leading post-consumer resin business, Envision Plastics, giving it a total force of 60 rigid plastic packaging manufacturing facilities, two recycled resins manufacturing facilities, and 2,600 employees.

CPL

SUPPLIER NEWS

– Newmarket, Ont.-based sales firm **Plastics Machinery Inc.** is now the Canadian representative for **Nanoplas Inc.**'s line of mold cleaners and degreasers. Products include Mold Brite mold cleaner and degreaser, Defender rust preventative, and Tuff-Kote mold release spray.

– **NCI Building Systems Inc.** and **Ply Gem Parent LLC**, which merged last year to become the largest manufacturer of exterior building products in North America, is now operating as **Cornerstone Building Brands**. Cornerstone is headquartered in Cary, N.C.

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- Colourant supplier **Chroma Color Corp.**, headquartered in McHenry, Ill., has appointed **Bishop Beall** as vice president of sales and business development.
- Germany-based extrusion blow molding machinery maker **Kautex Maschinenbau** has named **Alain Cappelle** as director of its packaging division.
- **Elix Polymers**, a Tarragona, Spain-based manufacturer of ABS resins and derivatives, has appointed **David Castañeda** as its new CEO. He takes over for Wolfgang Doering, who stepped down in March.
- Williamston, Mich.-based blow molding machine maker **Bekum America Corp.** has named **Chuck Flammer** as its business development manager.
- Houston, Tex.-based polymer reseller and distributor **Vinmar Polymers America** has named **Cole McGuffin** as its national account manager for Canada. He is based out of the company's office in Mississauga, Ont.
- **L.S. Starrett Co.**, an Athol, Mass.-based manufacturer of precision measuring tools and gages and metrology systems, has appointed **Jon-Michael Raymond** as director of sales, North America, industrial products.
- Cobourg, Ont.-based **Lorenz Conveying Products** has named **Chris Robinson** as its new U.S. sales manager. Robinson is based out of Illinois.
- **CCC Plastics**, a Mississauga, Ont.-based supplier of resins and colourants, has appointed **Harinder Tamber** as its new technical specialist.

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ELECTRICAL STORM

Twenty years after they became commonplace in Europe, interest in all-electric blow molding machines is building in North America. Here's a look at some of the latest fully electric and hybrid models, and why you should care.

By Mark Stephen, editor

Fossil fuels like gas and oil aren't going to win any popularity contests these days, which makes going all-electric, in any product category, seem like a slam dunk. But it's not. Once touted as the next big thing in urban mobility, sales of Smart vehicles have tanked since the car went fully electric, for example, with the result that automaker Daimler AG's Mercedes-Benz business is discontinuing sales of the brand in both Canada and the U.S.

On the flip side, not every all-electric product offering ends with a whimper either. In blow molding, the development of all-electric and hybrid models — which combine hydraulics with electric motors — continues to gain momentum. Advocates of all-electric and hybrid machines point to several advantages over traditional hydraulics, including energy savings, oil-free cleanliness, faster cycle times, reduced downtime and labour, fewer and smaller mold temperature controllers, and smaller footprint of the molding cell.

Digging a little deeper, all-electric machines are also said to excel in precision. "All movements executed by an electric drive are very accurate and

almost 100 per cent repeatable, exceeding what you can do even with closed-loop hydraulics," said Heidi Amsler, marketing manager at W. Amsler Equipment Inc. In fact, machinery suppliers say, electric-machine control is so precise that set-up requires more exact plotting of positioning points than with hydraulic units. By contrast, suppliers say, the accuracy of even the best-maintained hydraulically driven machines can drift over time as fluids heat and degrade, causing varnish to deposit on valves. The oil also can amass dirt that clogs lines, leading to a slower, less accurate response.

All-electric machines are quieter, too, with suppliers reporting that operating noise levels are at least 10 dB lower than for similarly sized hydraulic units. And on the maintenance side, all-electrics have fewer wear parts and require less labour to maintain.

Finally, while electric-driven machines with two and four cavities are still more expensive than conventional hydraulically driven units of the same size, suppliers say the price premium on all-electric models has dropped from about 30 per cent five years ago to



between 5 and 20 per cent today because of the falling prices of servo motors due to their rapidly growing popularity.

All of which explains why some of the biggest names in blow molding machinery are now firmly on board.

ELECTRIC COMPANIES

Some machinery builders favour all-electrics above all else, including two Italian companies that make only all-electrics: Magic MP SpA and Plastiblow srl. In January 2019, Magic opened a U.S. headquarters in Canton, Mich. to showcase its all-electric continuous extrusion blow molding machines, which the company started making 20 years ago. The Plastiblow range of machines, meanwhile, includes single- and double-station machines for production of stackable containers up to 30 litres in size. They can be equipped with single extruder or mul-



R&B Plastics has entered the all-electric blow molding machine segment with its new RBS series shuttle line.

tiple extruders for co-extrusion applications, with standard design for HDPE or with grooved barrel design for high molecular weight PE (in granule or powder form). All the Plastiblow machines are suitable for a high level of customization, the company said, and use up to 70 per cent less energy than comparable hydraulic units.

Hesta Blasformtechnik GmbH & Co. KG of Germany introduced its newest and largest all-electric shuttle last year, the double-station Hesta 900. It has a 900-mm mold stroke, opening stroke of 240 mm, and 44-ton clamp. The dry cycle time is 3.3 seconds, the company said, and the machine can handle up to 16 cavities per side and makes containers up to five litres, with an option for 10 litres. Compared to hydraulic machines, the Hesta 900 uses less than half as much energy, the company said, and the machine's smooth

movements also minimize wear on parts such as molds, motors, blow pins, and cutting rings. Also, because it automatically adjusts clamping force, the machine produces quality parts with little flash. Additional user-friendly features include a design that allows for molds to be swapped out in just 20 minutes.

Another German company, Kautex Maschinenbau, built its first all-electric machine way back in the 1990s, when it was part of Krupp Group, but decided the technology wasn't yet robust enough for full-time production. But that was then. The firm launched its first all-electric KBB60D machine on the North America market three years ago, and demand for this series has grown at a considerable rate, according to company president Bill Farrant.

"Extremely short dry cycle times and low energy costs give the KBB series an edge in terms of saving resources and maximizing efficiency," he said. "In addition, quick-change systems enable by far the fastest product changeover in the extrusion blow molding machines segment." And in a marriage between all-electrics and Industry 4.0, Kautex recently introduced the second generation of its virtual KBB machine — comprising a compact workstation unit, two monitors, a projector, and a real control panel, this training tool is designed to allow simulation of exact production processes with KBB series machines in real-time.

Closer to home, Canadian firms are also getting into the all-electric act. Markham, Ont.-based Pet All Manufacturing Inc. recently introduced its new all-electric IBM 300/700, one of its range of CanMold injection blow

machines. Besides offering significant energy savings, the machine is said to be faster than hydraulic models, and is suited to cleanrooms. This 88-ton, three-station machine is aimed at small containers — typically two ounces to one litre — for pharmaceuticals and cosmetics with very high neck tolerances. Pet All Manufacturing also recently opened a new technical centre in Paynesville, Minn. to help its expansion into the U.S. market.

And W. Amsler Equipment Inc., which moved into a new 34,000-square-foot headquarters and factory last year in Bolton, Ont., introduced its next-generation four-cavity all-electric reheat stretch blow molder at NPE2018. "The L42X all-electric reheat machine offers several new features including preferential heating, neck orientation, and hot-fill capabilities," said Heidi Amsler. "It provides versatility to enable PET bottle production in sizes up to two litres in four cavities, and can make up to 6,500 bottles per hour for a 500-ml package; it can also be used to run two- or three-cavity molds for production of larger containers up to five litres. Neck finishes range from 18 to 70 mm."

According to Amsler, customers don't crave all-electric machines per se; what they want is energy efficiency — an area in which all-electrics deliver. "Energy savings with all-electrics comes mainly from the fact that electric motors are inherently more energy efficient, plus the electric motors operate only when needed, whereas hydraulic motors pump continuously and usually at a fixed speed," she said. "Also, hydraulic oil requires cooling, which consumes more energy."

South of the border, meanwhile, Bekum America Corp. recently introduced an all-electric version of an extrusion blow molder built with a focus on speed and price for the consumer packaging industry. Called the Eblow 407DL, the double-shuttle, long-stroke machine has a newly developed integrated quick mold change system based on magnetic clamping plates as well as updated three-layer spiral flow head technology, which the company says optimizes the use of recycled

blow molding

material. The model also includes Bekum's patented C-clamp design, which separates clamping actions from alignment control to achieve platen parallelism of less than 0.1 mm over the full stroke. The clamping force was limited to 22.4 tons on the Eblow 407DL to offer a competitive cost-output ratio and to improve cycle time and energy savings, the company said.

And in a partnership that spans three continents, Saline, Mich.-based R&B Plastics Machinery LLC is working with blow molding equipment companies in Taiwan and South Africa to offer all-electric R&B-branded machines. Taiwan-based Sika Machinery Co. Ltd. is manufacturing systems and components that are shipped to R&B's manufacturing facility for final assembly and customer trials. South Africa-based Seecor Blow Molding Solutions, meanwhile, is providing technology support. The results are the RBS series shuttle line and RBA series accumulator machines, which consist of shuttle platforms ranging from 350 to 1,250 mm-long strokes, offered in both single- and double-sided machine configurations. Target applications include consumer packaging, automotive, and industrial parts. The new machines mark R&B's entry into the all-electric segment, R&B president and general manager Fred Piercy said. "Our customers have begun asking us for all-electrics," he said, "On a large scale, there are still very few blow molding machinery makers offering all-electrics, so there's room for smaller companies to get involved. Most of the older generation of blow molders are well-versed in hydraulics, less so with all-electrics, so there's a learning curve involved, but it's not too steep."

HYBRID HOPEFULS

Other blow molding machinery makers offer a range of hybrid units. Jomar Corp. considered going the all-electric route but then picked servo-driven



Jomar Corp.'s servo-hydraulic IntelliDrive injection blow molding machine.

hydraulics for its IntelliDrive injection blow molding machine, first introduced with 85 tons of clamping force at K 2016. Two years later the company expanded the line at NPE2018 to 135 and 175 tons of clamping force. "The units feature precise servo-driven hydraulics that reduce energy consumption by up to 50 per cent compared with standard hydraulic machines, depending on container specification and material process," said Ron Gabriele, Jomar's sales manager. "Also, both the model 135 and 175 boast a dry cycle time of 2.5 seconds, compared to three seconds for competitive injection blow molding machines. They use 40 per cent less hydraulic oil and tower water, and emit substantially less ambient heat compared with standard hydraulic machines, which reduces overall operating costs." The IntelliDrive launch has been so successful, Gabriele continued, that it resulted in the discontinuation of the company's standard hydraulic Model 175. "The IntelliDrives have become our largest selling machine line — so much so that I see us discontinuing all of our larger hydraulic machines in the near future," he said. "The energy savings are too compelling to ignore."

The NPE2018 show also saw Rocheleau Tool & Die Co. Inc. unveil its RS-90, a hybrid model that's powered by both variable frequency drive electric technology and hydraulics. Two

high-torque, high-force rotary actuators generate the clamping force. The RS-90 is Rocheleau's largest reciprocating-screw machine, and is especially suited for making containers for industrial and consumer products. Various die head configurations are available to accommodate molds with one to 16 cavities. With its 90-mm-diameter extruder, the machine is capable of throughputs of more than 750 lbs of resin per hour, the company said.

Makers of both fully electric and hybrid machines are confident that, given time, they'll win over even their most stubborn customers. "Old-school processors are familiar with the cheap, robust power of hydraulic machines," Ron Gabriele said. "But as servo components prove themselves over time and continue to get less expensive, OEMs and processors will both have to move towards all-electric and servo units to stay competitive."

The Smart car turned out to be a flash in the pan. Bet on all-electric and hybrid blow molding machines to stick around.

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RESOURCE LIST

- Bekum America Corp.** (Williamston, Mich.); www.bekumamerica.com; 517-655-4331
- Hesta Blasformtechnik GmbH & Co. KG/Jackson Machinery Inc.** (Port Washington, Wis.); www.jacksonmachinery.com; 262-284-1066
- Jomar Corp.** (Egg Harbor Township, N.J.); www.jomarcorp.com; 609-646-8000
- Kautex Machines Inc.** (North Branch, N.J.); www.kautex-group.com; 908-252-9350
- Magic MP SpA/Magic North America** (Canton, Mich.); www.magicnorthamerica.com; 313-209-9107
- Pet All Manufacturing Inc.** (Markham, Ont.); www.petallmfg.com; 905-305-1797
- Plastiblow srl/Hamilton Plastic Systems Ltd.** (Mississauga, Ont.); www.hamiltonplasticsystems.com; 800-590-5546
- R&B Plastics Machinery LLC** (Saline, Mich.); www.rbplasticsmachinery.com; 734-429-9421
- Rocheleau Tool & Die Co. Inc.** (Fitchburg, Mass.); www.rocheleautool.com; 978-345-1723
- W. Amsler Equipment Inc.** (Bolton, Ont.); www.amslerequipment.com; 905-951-9559

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RESONATING RESINS

By Mark Stephen, editor

When it comes to food packaging, plastic is almost always a better material to choose than the alternatives. And speaking of better, here are some of the newest plastic resins and additives designed for both rigid and flexible applications.



The new grade Styropor P 24 Speed rounds off BASF's EPS range for the food packaging industry.

Photo Credit: BASF

Charles Dickens coined the phrase “it was the best of times, it was the worst of times” to describe life during the French Revolution. Fast forward to today and it’s not a bad way to sum things up for the plastics packaging industry. On the one hand, there’s a global battle against single-use plastics, particularly when it comes to the once-ubiquitous plastic bag, with at least 127 countries across the globe now having adopted some form of legislation to regulate plastic bags. But on the other, plastic has still managed to become one of the most popular packaging options, and plastic containers and bottles are in

greater demand in the food and beverage industry than any other material.

Which is why, depending on the region, packaging applications account for between 35 to 45 per cent of polymers produced in total.

And since this trend shows no signs of slowing down, material suppliers both big and small are introducing new resins and additives designed to enable the most cutting-edge rigid and flexible food and beverage packaging applications.

STAND-UP IS ON THE RISE

The market for stand-up pouches is growing at approximately three times

the rate of that of flat packaging, depending on the region. With that in mind, A. Schulman Inc. has introduced Polybatch-brand EasyPour additive masterbatch concentrates, designed to optimize packaging’s inner surfaces. Adding the masterbatch to the inner layer of a multilayer structure ensures the contents flow smoothly, making it easier to empty the package. “It’s a struggle to empty stand-up pouches, tubes or bottles,” said Ralf Küsters, the company’s product and market development manager. “There’s always something left inside, and no one likes that.” The new masterbatch technology

is designed for use in both flexible and rigid multilayer constructions. Formulas are customized using specialized test methods in order to optimize performance for a given packaged substance. To back up the innovation with numbers, A. Schulman developed a test to measure the speed and distance of the product on a tilted surface, as well as the amount of residue on that surface afterward. It showed a pouring improvement of up to 25 per cent. The testing system in place allows brand owners to appraise products themselves to see how well they work and adapt them to their particular needs.

PS is a versatile plastic that can be rigid or foamed. General purpose PS is clear and hard, with a relatively low melting point. Typical food packaging applications include bottles and food containers. Rounding off BASF's EPS range for the food packaging industry, the company has developed a new plastic grade which has approximately 4.8 per cent lower pentane content, reducing the molding cycle and intermediate conditioning times. The new grade Styropor P 24 Speed has a density of 25 grams per litre, the company said, resulting in up to 50 per cent shorter mold cycle times when compared with BASF's established Styropor P 326. The new type of Styropor has a high mechanical resistance, superior flexural and compressive strength similar to the classic Styropor P 26, and good fusion properties and a smooth surface finish. Styropor P 24 Speed, similar to all Styropor packaging grades, is without flame retardant, and is available in three bead sizes ranging from 0.4 to 1.3 mm.

LDPE is used predominately in film applications due to its toughness, flexibility, and relative transparency, making it popular for use in applications where heat-sealing is necessary. A new silicone-based slip additive masterbatch for LDPE film that reportedly optimizes form-fill-seal (FFS) flexible packaging production has been launched by Dow Performance Silicones, a global business unit of DowDuPont Specialties Products division. According to Christophe Paulo, Dow Performance Silicones industrial and

consumer strategic marketer, the company's MB25-235 masterbatch significantly reduces the coefficient of friction for LDPE film and also addresses the traditional drawbacks of organic additives by delivering stable, long-lasting slip performance and avoiding migration to the film surface. "MB25-235 is based on advanced silicone slip technology that helps to boost production speed, maintain uninterrupted throughput, and ensure uniform film quality," Paulo said. "Unlike organics, it will not migrate to the film surface, and is also cost-effective as it only needs to be incorporated into the outer layer of multilayer films, which reduces the amount required." MB25-235 is approved for food contact under FDA, EU, and Chinese regulations, Paulo added.

GETTING EU COMPLIANT

A new line of ABS compounds under the brand Chemical Compliance (CC) for food packaging applications has been launched by Spain's Elix Polymers. All components in Elix's ABS CC compounds are said to be compliant with health-related regulations such as EU10/2011 (Plastic Materials for Food Contact Applications), which already set the maximum limits of substances that are considered safe. Grades have been formulated for individual applications, enabling customers to select the materials based on their specific needs. Two injection molding grades — P2H-CC and P3H-CC — are said to be easy to process, and have high levels of brightness as well as intense colours. Elix also supplies extra services like migration testing, development of compliant colours, additional quality controls for these compounds, and technical support during processing as an added guarantee that customers are following best practices and to ensure that there's no contamination or degradation of the compounds.

An innovative new TPE technology from Kraiburg TPE that features superior adhesion to nylons also complies with EU10/2011. The compounds that comprise the company's new FC/AD/PA Thermoset K series are said to provide very good processability and supe-

rior surfaces that don't require any finishing after leaving the mold. "The materials can be injection molded directly onto nylon 6 and nylon 6/6 without any additional adhesive primer," said Dirk Butschkay, Kraiburg's product marketing manager. With hardness degrees ranging between 40 and 80 Shore A, they combine tactile properties such as soft-touch and non-slip grip even at low wall thicknesses, Butschkay continued, and they also provide superior tensile strength, elongation at break, and abrasion resistance.

IMPACTFUL COPOLYMERS

PP has good chemical resistance, is strong, and has a high melting point, which makes it a good choice for hot-fill liquids. Sabic recently extended its Flowpact series of impact copolymers with the new PP FPC70 grade for rigid packaging. Rigid packaging made with this high-flow (MFR 70) resin, including applications that can be hot-filled, is said to have much higher top-load strength than identical products made with benchmark materials, resulting in better stackability for better transport and storage economics. "FPC70 boasts polymer chemistry advances that yield a material with a balance of high stiffness, impact strength, and high heat distortion temperature, unlike a standard PP impact copolymer," said Lada Kurelec, global business director, PP, for petrochemicals at Sabic. "We believe that PP FPC70 answers the continuing trends in thin-wall packaging by enabling up to 10 per cent thinner walls and fast injection, which reduces energy consumption and increases productivity."

PET is clear, tough, and has good gas and moisture barrier properties, which is why it's commonly used in beverage bottles and many injection molded and blow molded consumer product containers. Sukano Polymers has introduced a mobility aid additive masterbatch for injection stretch blow molded (ISBM) PET bottles that's designed to enable bottle makers and brand owners to run their conveyor belt systems and production robots without the need for a spray coating. The Sukano Mobility Aid solution, believed

packaging

to be the first commercially available for this application, is provided as a solid PET masterbatch and can be used for virgin PET or RPET material during molding or processing. The product is said to produce a silicone-like mobility aid effect in PET, yet is engineered to preserve material clarity with minimal impact on haze. According to Sukano research and development global head Michael Kirch, the new masterbatch is well-suited to clear, translucent, and coloured bottles produced for food and beverage applications, as well as personal care, household and cleaning, and cosmetics products. "It's also widely applicable, as PET material containing the new masterbatch can be run on existing ISBM bottle production equipment without modification," Kirch said. "Bottle makers and brand owners can now run their conveyor belts without interruption and minimize the mispicks by production robots, which improves

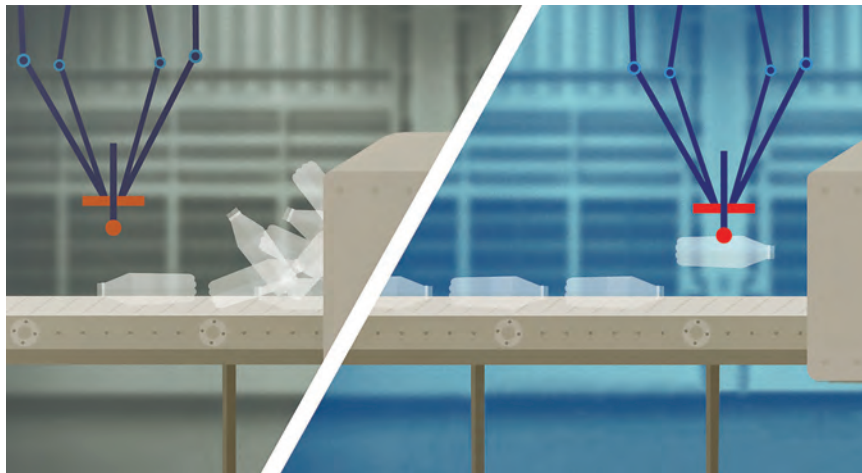


Photo Credit: Sukano Polymers

Sukano's Mobility Aid additive masterbatch enables PET bottle makers and brand owners to run their conveyor belt systems and production robots without the need for a spray coating.

productivity and maximizes yields."

When it comes to materials innovations for food and beverage packaging applications, this might indeed be the best of times.

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RESOURCE LIST

A Schulman Inc. (Fairlawn, Ohio);
www.aschulman.com; 330-666-3751
BASF Canada Inc. (Mississauga, Ont.);

www.basf.ca; 289-360-1300

Dow Performance Silicones (Midland, Mich.);
www.dowcorning.com; 800-248-2481

Elix Polymers Americas LLC (Weston, Fla.);
www.elix-polymers.com; 305-699-3130

Kraiburg TPE Corp. (Buford, Ga.);
www.kraiburg-tpe.com; 678-584-5020

Sabic Innovative Plastics Canada (Cobourg, Ont.);
www.sabic.com; 905-372-6801

Sukano Polymers (Duncan, S.C.);
www.sukano.com; 864-486-1478

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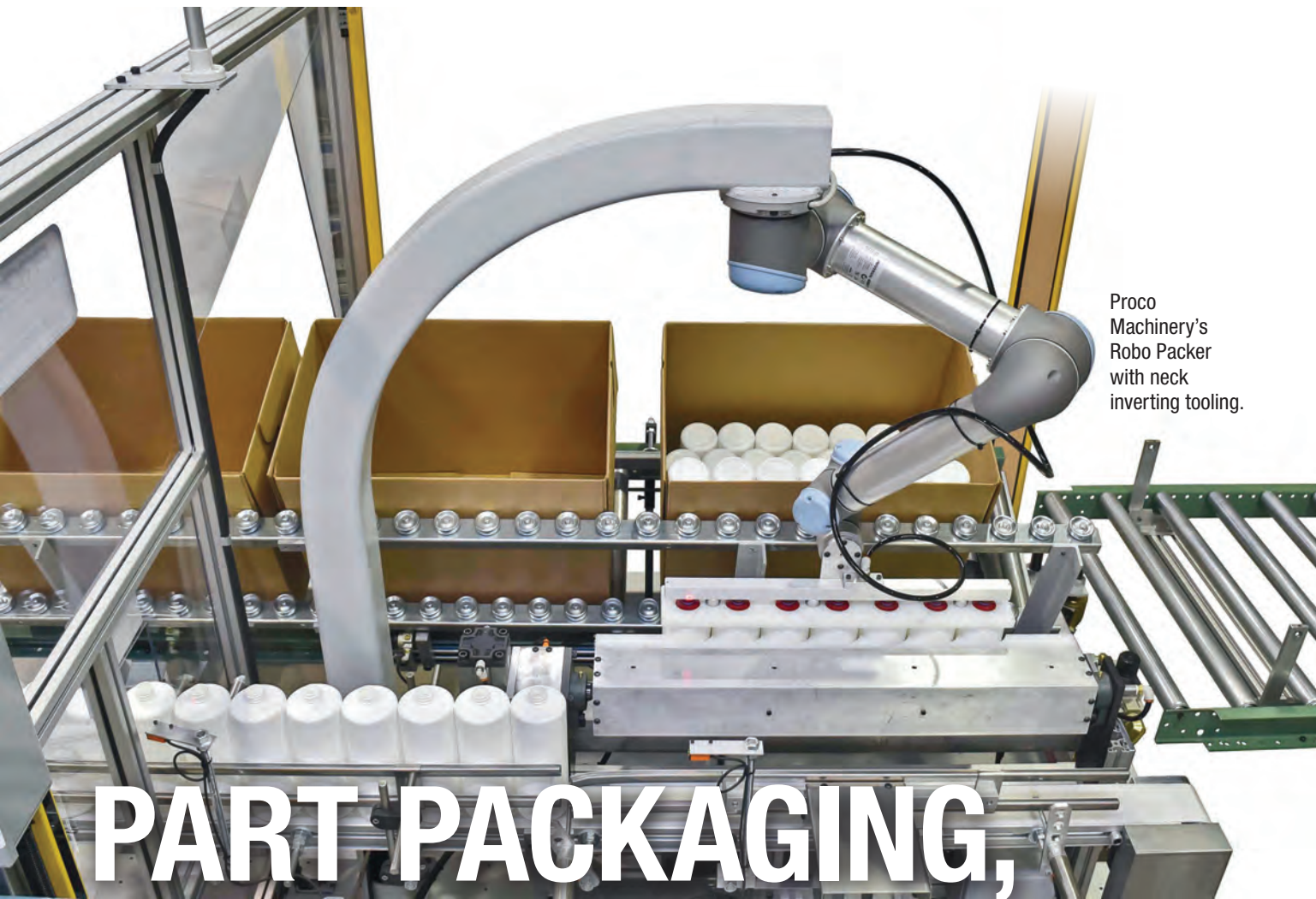
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PART PACKAGING, ROBOT STYLE

So you've finally decided to automate your end-of-the-line part packaging process? Great. Now here's how to do it.

By Mark Stephen, editor

A staple of sci-fi films is out-of-control robots doing bad things to good people. And a staple of real world manufacturing today is the fear that robots have too much control, and are doing bad things to good factory workers by taking their jobs. But here's another way to look at it: By automating the repetitive, tedious jobs, people can be redeployed to areas where they'll be safer and more engaged in their work.

And few jobs are more repetitive and tedious than part packaging, which can involve lifting, bending, labelling, inspecting, and orienting parts for vir-

tually an entire work shift. Which is why more and more plastics processors are automating their end-of-the-line part packaging processes. Robots can pack less expensively than people, can work around work-force shortages, are capable of complex picks and motions that would not be possible or safe for a person, and run an average of 80,000 hours before requiring maintenance.

But savvy processors with plans to switch from manual to automated part packaging still have to take a number of factors into account to ensure they get the best, most competitive robotic system for their needs.

TO AUTOMATE OR NOT TO AUTOMATE

The biggest decision to make at the outset is whether automating an end-of-the-line packaging system is actually a better option than manual packaging. Sometimes the answer is no. "People are efficient at packaging small, short, one-of-a-kind runs, so robotics may not be the best choice for a product that will only run once, or if different products run every day," said Dale Arndt, director of engineering with Fanuc Canada Ltd. Since repeatable runs are a key factor in robotic efficiency, begin by analyzing run times and product

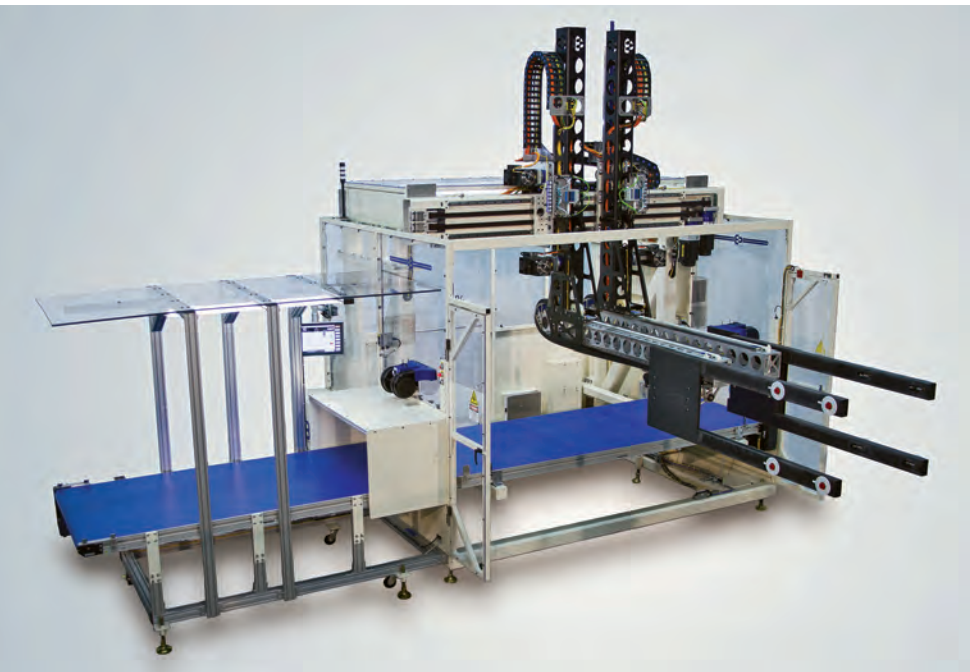


Photo Credit: CBW Automation

CBW Automation's new B2X side-entry robot on a part production line.

quantities. And you don't have to make this analysis on your own — automation systems suppliers can help. "Fanuc uses a charting method that assesses ease of automation and value of the automation task," Arndt said. "If something is hard to automate and low-value, we recommend leaving the part to be packaged manually; if it's a high-value task and easy to automate, we recommend automating it."

Another important point is whether or not the processor has ever used robotic automation before. If not, robot systems suppliers recommend against automating every part packaging line in one go. Beyond that, there are different schools of thought for dealing with first-time customers. "When working with a company that hasn't had automation before, we look for the heaviest hitting application that will give it the best return on investment, which tends to be the highest volume run," said Taras Konowal, North America director of sales for CBW Automation. "Automating this production line will give the customer the experience it needs to handle automating other lines later on." Other automation suppliers prefer to tackle the easiest production line first. "Some customers that are

automating for the first time want to start with the toughest packaging application as a test," said Joe Campbell, senior manager, strategic marketing and applications development with Universal Robots USA Inc., which makes collaborative robots. "We suggest they begin by automating a simpler application instead, where they can see immediate results and gain experience for other, more complex applications."

JUST THE FACTS

Once the decision to automate a particular packaging line is made, the packaging system provider needs to know some key points before it can recommend the right solution. "The fundamentals for any robot application are, what's the part being made, what's the payload, and what's the cycle time?" Campbell continued. "From there, we want to know how the parts are being presented out of the mold, and also the box size. This is an advantage of collaborative robots, which are versatile enough to handle different box sizes, different stack heights, and different volumes of parts going into a box."

Another key consideration represents a genuine fork in the road that can take you in one of two different directions:

are the parts being packaged after degating for direct shipment to a customer, or do they require either immediate post-mold assembly or simple box filling to be sent somewhere else in the facility for post-mold work? "If the parts require additional work downline, installing two robots might be the best solution — a top-entry robot to degate the part and a six-axis robot to manipulate it for assembly or secondary operations," said Tim Lavigne, business unit manager with Absolute Robot Inc. "Sometimes one six-axis robot will have the reach to perform both degating and post-mold work by itself, but not often."

If the parts are being packaged for in-house work later on, the robotic automation might not have to be quite as precise. "In these situations, the processor usually only needs to bulk-fill the box, which means that the orientation of the parts within the box probably doesn't matter quite as much — we only need to know the count number of parts that will go in each box; when that count is reached, a new box is delivered," said Jim Healy, vice president, sales and marketing, for Sepro America LLC. "Most of the inquiries we get from customers are for situations like this, where parts are going to be stored for secondary assembly later on. But if the parts are being packaged for direct shipment to customers, we need to know as much as possible about the part dimension: its size, shape, orientation in the box — the entire packaging array." For either situation, Sepro's Speed-Entry is a range of side-entry robots specially designed for high-speed picking and placing of packaging parts, with a modular design that makes it suitable for any type of layout. And Proco Machinery Inc. recently introduced its new Robo Packer case packer, which can be supplied with any one of three different robotic arm payloads depending on the application, the task to be performed, and the level of productivity that's required. "The Robo Packer can be configured to pack all necks up or all necks down either using row-by-row or full-layer packing methods," said Siva Krish, the company's vice

president of sales. “In situations where a standard configuration doesn’t work, we can develop custom tooling to pack bottles lay-flat inside the box.”

MATERIAL CONSIDERATIONS

Especially for parts that will be packaged and shipped out directly, product behaviour can be an issue, since differences in the physical characteristics of plastic containers — such as round, square, or tacky — can affect the performance of a packaging system. “This is why we always want to see part drawings and part samples before recommending custom automation,” said Tim Lavigne.

PET bottles, meanwhile, can develop static “cling” that causes them to bunch up and move unpredictably as they’re fed down a conveying line and onto a palletizing/collating table or stack. “Static cling in PET bottles can be a huge problem, since they repel each

For processors that have never used robots before, systems suppliers recommend against automating all part packaging lines in one go; start by automating one line instead.

other and push off the collating table, causing shorted bottle counts; or they cling together, making it difficult pick them up or palletize them without operator intervention,” said Siva Krish. “A good way to solve it is by putting an antistatic blower on the infeed conveyor to remove the static charge from each bottle.” In addition to antistatic spray systems that blow charged air onto the bottles, grounding strips or plates on the machine can help dissipate static buildup, as can changes in conveyor belt material that lessen the friction.

Sometimes FDA requirements for handling of food containers dictate which areas of the containers can come in contact with the tool, which can impact end-of-arm tooling design. “In

these situations, the robotic arm must have a food-grade design,” said Olivier Cremoux, business development manager at Stäubli North America. “The integration of the arm must respect the sanitary requirements of the production area, most of the time avoiding having the robot or retention areas on top of the products. Then the tooling must be compatible to touch the product, avoiding contamination and damage to the product.” This is a rare instance in the entire robot installation process where the customer will know more than the automation system supplier. “Customers will give us boundaries as to how we can handle a part — generally with medical or food packaging applications — and we’ll use that information when designing the solution,” said Jim Healy. “This isn’t an area where we can instruct them.”

HEIGHT REQUIREMENT

With these issues decided, the next step is making sure the robotic components will actually fit into the available floor and ceiling space. Consulting with a packaging system provider to think through the layout design phase comprehensively can save both time and money, especially on big projects. “This is a great place to use simulation software to discover what the options are, and to pick the lowest cost/highest functionality solution that matches the available space,” said Dale Arndt. “There are three solutions to floor and ceiling height limitations: stationary platen-mount robots, which take up very little space; product lines that move sideways along the platen; and floor-mount and rollaway floor-mount automation, which are side-entry but can be pushed out of the way when the processor has to change the tool.” For part packaging in tight areas, the new B2X side-entry robot from CBW Automation has been designed with a particularly small footprint, as well as 50 per cent greater production output, quicker changeovers, and cost savings compared to the company’s previous high-speed retrieval system.

An end step in plastics production is quality control, which on a manually

packaged line is almost invariably performed by an employee on that line. But if the line gets switched over to an automated packaging process, something new will be required. What, exactly, depends on the application — it can be as simple as a leak checker or as high-tech as a vision system or other sensor, and both automation system suppliers and systems integrators can supply the technology. “Vision-guided robotics can now check each part before it’s put in the box,” said Jim Healy. “The robot can also be programmed to inspect a single part at a predetermined part count — one in every 100 shots, for example, or one in every 200 shots — so that if parts begin to go bad, the customer has a window into when the failure began.”

In case you’re tempted, trying to automate only the QC while leaving the part packaging to be done manually is probably not a great idea. “When this happens, there’s no repeatability in the process, and you’re not using the full advantages of automation,” said Olivier Cremoux. “With Stäubli’s TX2 collaborative solution, the robot and operator can work together, combining efforts as a team.”

In the end, once you’ve decided that a production line meets the criteria for automated part packaging, the benefits can be substantial: repeatability, consistency, and letting people work where they’re most needed. The automation supplier’s job is to get you there by determining the best robotic system for your needs and making sure the installation process goes smoothly.

And that’s not science fiction. **CPL**

RESOURCE LIST

Absolute Robot Inc. (Worcester, Mass.); www.absoluterobot.com; 508-792-4305
CBW Automation (Fort Collins, Col.); www.cbwautomation.com; 970-229-9500
Fanuc Canada Ltd. (Mississauga, Ont.); www.fanuc.com; 905-812-2300
Proco Machinery Inc. (Mississauga, Ont.); www.procomachinery.com; 905-602-6066
Seapro Canada (Montreal); www.sepro-group.ca; 514-515-9349
Stäubli North America (Duncan, S.C.); www.staubli.com; 864-433-1980
Universal Robots USA Inc. (Ann Arbor, Mich.); www.universal-robots.com; 844-462-6268

New developments in **PLASTICS DRYING**

Keeping moisture out of resin may seem like a small aspect of plastics processing, but it's actually huge. Without properly dried resin it's almost impossible to produce quality plastic parts. The good news is that suppliers of auxiliary equipment spend a lot of time thinking about drying so that you don't have to. Here's some of the latest developments.

By Mark Stephen, editor

The idea of a necessary evil goes all the way back to the ancient Greeks, and has been used ever since to describe everything from government to marriage. For most plastics processors, a classic example of a necessary evil is resin drying: they don't want to do it, but it has to be done.

Why? The moisture contained within the plastic may seem like a small aspect of processing, but if it isn't controlled it can lead to lowered physical properties such as reduced tensile and impact strengths, making it almost impossible to produce quality plastic parts. The bad news is, there's no shortage of ways for resin to pick up moisture: Hygroscopic polymers such as nylon, ABS, acrylic, PET, PBT, PU, and PC absorb moisture internally and release moisture through the air; even non-hygroscopic resins such as PVC, PP, PS, PE, and many more can collect moisture on their surfaces. And if you don't get rid of that moisture you'll be at a major competitive disadvantage.

Fortunately for processors that have to dehumidify their resins but don't want to have to think about it, suppliers of auxiliary equipment spend a lot of time thinking about it for you. Here's some of the latest results.

OLD FAVOURITES REDESIGNED

A new generation of Carousel Plus desiccant dryers from Conair Group use an innovative new air-to-air aftercooling option. The company's D series portable dryers and dX series mobile drying/conveying systems are the product of a complete redesign of Conair's small and mid-size Carousel Plus desiccant dryer architecture, affecting portable dryers and mobile drying/conveying systems sized from 15 to 400 lbs per hour of throughput. "The new aftercooling option is important because aftercooling is required to reduce the temperature of the return air from the drying hopper, which improves the moisture-absorption efficiency of the desiccant," said A.J. Zambanini, Conair's dryer product manager. "Processors now have the ability to specify dryers equipped with either an optional air-to-water aftercooler or the new air-to-air aftercooler." The air-to-air unit can sustain drying efficiency while handling return-air temperatures of up to 190°C or 375°F and dewpoints of -40°C or -40°F, he added. "At the same time, it saves water, maximizes dryer portability, and makes installation and set-up faster and easier," he said. A key component of the new D and dX series



Photo Credit: Novatec Inc.

Novatec's NitroDry dryer generates its own nitrogen, using standard factory compressed air, to dry resins that are highly susceptible to oxygen degradation from prolonged exposure to heat in the presence of oxygen.

dryers is the DC-C programmable electronic controller, which was developed by Conair specifically for drying applications. "The control uses our own software to maximize flexibility in adapting to current and future customer application needs, and is available on both dryers in two configurations: the DC-C Plus package features a four-inch touchscreen user interface, while the DC-C Premium offers a seven-inch screen," Zambanini said.

Dri-Air Industries Inc. also has a new dryer revamped from a familiar favourite. The company's new 3000 FM unit expands Dri-Air's line of large desiccant dryers, and is modeled on its established 1500 FM design while using larger towers and blowers for use with central drying systems and extruders that have outputs of up to 3,000 lbs

per hour. It also has a compact footprint of 30 square feet, Dri-Air president Jason Sears said, and a new regeneration airflow design that significantly reduces the previous energy usage level — which, Sears added, was already among the industry's lowest. "Dry air is used for regeneration or cool-down of desiccant towers, allowing for -25°C or -80°F or lower dewpoints," Sears said. All external panels are hinged for quick access to internal components, he continued, and the panels can be slipped off their hinges to conserve space. Additionally, a high-pressure fan reduces the ambient noise level to less than 70 dB and allows the dryer to operate at very low process temperatures to accommodate resins such as PLA. "The 3000 FM also has Dri-Touch controls that display the important operating parameters on a highly visible seven-inch touchscreen," Sears said. "The menu screen provides imme-

diante access to all settings and other parameters needed for set-up and troubleshooting."

DRY HARD

Maguire Products recently launched its new VBD-600 mid-range vacuum resin dryer, which offers throughputs of up to 600 lbs per hour, which the company said is ideal for customers that manufacture sheet and large automotive parts, as well as for other injection molding and extrusion applications. According to Maguire, the VBD-600 uses only four-fifths of the energy compared to a similarly sized desiccant dryer and dries resin in about one-sixth of the time. It accomplishes this by using three vertically arranged components: first, the heating hopper warms the resin to a customer-defined temperature; the high-speed slide-gate valves then dispense material to the next level, the vacuum vessel, with an

accuracy of plus or minus four grams — and by creating a vacuum, the vessel reduces the boiling point of water, forcing moisture out of the pellets; finally, the heavily insulated retention hopper has a transparent shroud to protect dry materials from moisture. The VBD-600 has the same features as other dryers in the VBD line, the company said, including a five-year warranty and software that constantly monitors drying conditions and makes adjustments to save energy. It also has as standard the capability to display and log energy consumption, showing both real-time and averaged values.

If you've ever noticed a drying-related discoloration in nylon, PBT, PLA, and TPU resins, you're not alone. This colour shift from pure white to yellow is caused by prolonged exposure to heat in the presence of oxygen and doesn't just spell trouble for appearance parts — it also signals degradation that

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can impact strength, ductility, viscosity, chemical resistance, stiffness, and stability. Novatec Inc.'s new NitroDry dryer provides processors with a new, oxygen-free tool to avoid this degradation. The dryer generates its own nitrogen, using a factory's normal compressed air, to dry resins that are highly susceptible to oxygen degradation, and then vents air to the drying room, avoiding the hazards of venting pure nitrogen in a closed area. "The NitroDry resin dryer is an oxygen-free system that's a good fit for press-side drying of newly designed polymers with unique properties," said Mark Haynie, Novatec's dryer product manager. "The process is totally self-contained, so the hassle of handling and the cost of purchasing tanks of nitrogen are eliminated." In

Piovan's AIPC resin drying system connects drying to injection and preform production.



Photo Credit: Piovan

in 7, 25, and 50 lbs per hour models," Haynie said.

PROBLEM SOLVERS

Piovan has a new patent-pending technology called AIPC — short for automatic control of injection pressure — which is designed to enable an injection molding machine to "guide" Piovan's Genesys PET drying system

so that it operates with a constant injection pressure around a customer-defined set-point. The problem being solved is that in a conventional PET preform production system, the resin drying phase isn't connected to injection and preform production, which means that pressure doesn't always fall within a predetermined range of values — and can actually fluctuate continually, causing possible variations in the characteristics of the PET products. Prior to AIPC, a

addition, Haynie said, there's no danger of pure nitrogen release because the nitrogen is only produced at the rate at which it's needed and is released in a slightly oxygen-rich vent stream. Nitrogen at -24°C or -75°F dewpoint displaces oxygen and circulates through the drying hopper, he explained, which means temperatures can be raised by as much as 10°C or 50°F to reduce exposure time. "The NitroDry dryer is safe for all resins, and is currently available

so that it operates with a constant injection pressure around a customer-defined set-point. The problem being solved is that in a conventional PET preform production system, the resin drying phase isn't connected to injection and preform production, which means that pressure doesn't always fall within a predetermined range of values — and can actually fluctuate continually, causing possible variations in the characteristics of the PET products. Prior to AIPC, a

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Genesys dryer's performance was optimized using the AECS algorithm, based on measurement of the weight loss of the dried material. "With AIPC, the injection molding machine itself supplies the data necessary for process management, ensuring that the degree of drying is really suitable for the type of preform to be produced," Piovan said. "With the aid of a signal transducer, the injection pressure is continually measured and sent to the Genesys dryer. The dryer continually adapts its operation even more effectively in order to keep it within a working range suitable for the type of production, with variations not exceeding ± 2 bar throughout the cycle."

Wittmann Battenfeld is offering a new generation of its Aton segmented wheel dryers: the Aton H, a compact, portable dryer that can process up to 200 lbs of resin per hour. It comes in three sizes, with airflows of 1,059,

2,472, and 4,237 cubic feet per hour. A USB interface enables users to import up to eight material data sets. If a processor is using a Battenfeld injection molding machine, the dryer can connect to it via a router, allowing control of the dryer from the primary machine's control. Aton H series dryers are available with the Basic, Plus, and VS options. Aton Basic H dryers feature the material saver function to prevent over-drying, as well as dewpoint management that automatically adjusts the temperature for desiccant regeneration to save energy; Aton Plus H dryers have additional energy-saving features, including a standard, thermal function called 3-Save that heats the air for regeneration of the desiccant inside a special heating tube and then uses a heating element to raise the temperature of the air further before it's blown onto the desiccant; and Aton VS H dryers integrate a vacuum blower for mate-

rial conveying in the frame under the drying unit, allowing the dryer to be connected to multiple conveying units.

So if you have to dry your resins — and odds are you do — these new technologies can at least take the evil out of the necessity. **CPL**

RESOURCE LIST

- Conair Group** (Cranberry Township, Pa.); www.conairgroup.com; 724-584-5500
- Dier International Plastics Inc.** (Unionville, Ont.); www.dierinternational.com; 416-219-0509
- Industries Laferriere** (Mascouche, Que.); www.industrieslaferriere.ca; 450-477-8880
- Turner Group Inc.** (Seattle, Wash.); www.turnergroup.net; 206-769-3707
- Dri-Air Industries Inc./Maguire Products Canada Inc.** (East Windsor, Conn.); www.dri-air.com; 860-627-5110
- Maguire Products Canada Inc./Novatec Inc.** (Vaughan, Ont.); www.maguireproducts.com; 905-879-1100
- Piovan Canada** (Mississauga, Ont.); www.piovan.com; 905-629-8822
- Wittmann Battenfeld Canada Inc.** (Richmond Hill, Ont.); www.wittmann-group.ca; 905-887-5355

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WASTE NOT, WANT NOT

By transforming post-consumer plastics into value-added polymers and waxes, Brantford, Ont.-based clean technology company GreenMantra Technologies is offering processors a whole new world of specialty materials.

By Mark Stephen, editor

Alchemy was an ancient practice that sought to turn lead into gold. Its practitioners never could get it to work, but the idea of taking something that's basically worthless and making it valuable is universal — and GreenMantra Technologies Inc. is actually achieving it today.

The Brantford, Ont.-based clean technology company uses a patented process that transforms low-value waste plastics destined for landfill sites into value-creating specialty chemicals such as synthetic waxes and polymer additives. GreenMantra's end products, which are sold under the Ceranovus brand name, are PE and PP additives that can be custom formulated to meet specific performance requirements, and which can be used in rubber compounding and asphalt modification for roofing and paving, plastics processing and composites, polymer and rubber compounding, coatings and inks, and other applications.

"Our goal is to up-cycle recycled plastics into unique specialty materials that deliver value in industrial applications, creating a more circular economy for plastics where they're beneficially reused rather than landfilled," said GreenMantra CEO Jodie Morgan.

A QUICK START

Founded in 2010 with an initial investment from the MaRS Accelerator Fund, GreenMantra built its first demonstration facility in Brantford; and at the end of 2014, a series of investments by venture capital, combined with both provincial and federal funding, allowed the company to complete construction of a commercial-scale facility, also located in Brantford. From the start, GreenMantra found eager customers, including the City of Vancouver, which incorporated the

firm's waxes into its mix for asphalt paving. With that door opened, the company saw more interest and adoption from other Canadian and U.S. customers.

At the heart of GreenMantra's production process is a set of proprietary heterogeneous catalysts that enables selective thermal catalytic depolymerization reactions to occur. The catalysts deliver higher yields and control factors such as molecular weight and structural and thermal properties of the final product, which also allows GreenMantra's process to operate at a much lower temperature than other chemical recycling processes while avoiding the randomness of depolymerizations experienced in processes based on pyrolysis or gasification. "This allows us to deliver conversion yields as high as 95 per cent," said Domenic Di Mondo, GreenMantra's vice president of technology and business development.



Above and right: The shop floor at GreenMantra Technologies.

Small wonder, then, that GreenMantra's uniqueness was recognized early on. In the fall of 2010, the Canadian Innovation Exchange named it one of Canada's 25 most innovative companies. Since then, more accolades have followed: In 2016, GreenMantra received the R&D100 Gold Award for Green Technol-



Photos courtesy of GreenMantra Technologies Inc.

ogy; in 2017, it was recognized as one of the top 100 clean technology companies by Global Cleantech, was honoured by the Canadian Plastics Industry Association with its Sustainability Award for clean technology, and won the Ontario Export Awards' Clean Technology Award; and in 2018, it was named one of Canada's 500 fastest growing manufacturing companies.

GreenMantra is also not shy about partnering with established players in the chemicals world. In September 2017, the company announced a partnership with Sun Chemical, the world's largest producer of printing inks, to jointly develop polymers from recycled PS waste for use in ink formulations. And in May 2019, it entered into a joint partnership with Ineos Styrolution to convert post-consumer PS into chemical monomer building blocks that can be used to replace a portion of virgin monomer feed in Ineos' polymerization process.

Another plus for the company is being located in Brantford, Di Mondo said, an area in southwest Ontario that has been hungry for manufacturing capacity since the auto sector's exit during the economic downturn of 2009. "There's a robust pool of qualified manufacturing workers here, and our proximity to university towns such as Guelph and Waterloo supplies a steady stream of qualified candidates for hire," he said.

ANOTHER STEP FORWARD

GreenMantra made another advancement recently when it announced the development of an allied technology that converts post-consumer PS into unique styrenic polymers with applications in inks, coatings, and insulation. GreenMantra began construction of a demonstration plant for this technology in 2018, being built at its existing manufacturing complex in Brantford. The new plant is scheduled to be operational by the end of this year. "PS in foam and solid form is commonly used in consumer products, food and product packaging, and many other applications," Di Mondo said. "It's one of the world's fastest growing solid wastes, but it has one of the worst recycling rates of all plastics, with an estimated 95 per cent either disposed of in landfills or incinerated. We want to help reverse this trend."

Using a proprietary catalyst and unique conversion process, GreenMantra has converted waste PS foam into unique short-chain styrenic polymers on a laboratory scale. "Our new demonstration plant will provide an initial supply of converted modified styrenic polymers to enable customer qualifications in a variety of end-use applications and to seed commercial sales," Di Mondo said.

GreenMantra's approach to post-consumer plastics bucks a trend followed by other clean technology companies of turning the discarded material back into its building blocks or other low-value applications such as lawn furniture.

"Plastic in general is a fairly low-value product, so it doesn't make sense to spend a lot of money collecting it, sorting it, and processing it just so that it can go back into another relatively low-value end product," Morgan said. "In order to boost plastic recycling rates around the world, recycling has to be more worthwhile, which means that waste plastic needs to be up-cycled into higher value applications." For example, GreenMantra's technology turns discarded Styrofoam into something completely different — instead of breaking the Styrofoam chains into their individual links, it only cuts them into smaller pieces, thereby generating a new material. "By using this molecule, we can create products that can have much more value than the original plastic," Di Mondo said.

By making valuable new polymers from old polymers, GreenMantra is successfully keeping the molecules in play — the definition of a circular economy. "And because we combine technology with sustainability to create differentiated specialty polymers and waxes, we're giving our customers a wide range of benefits, including improved product performance, reduced formulation and manufacturing costs, and increased use of post-consumer recycled materials," Di Mondo said.

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AUXILIARY EQUIPMENT

New blender features high-speed choppers



Munson Machinery Co. Inc.'s latest paddle blender, the *HD-510-MS*, has four high-speed choppers to break up lumps and disperse dry bulk solids, pastes, slurries, and emulsions containing agglomerates, and

can be used for custom compounding applications, as well as other applications within the plastics industry.

The heavy-duty machine has a U-shaped vessel made of heavy-gauge carbon steel. Its paddles project radially from the main shaft, which is flange-mounted for easy maintenance, and is powered by a 75 hp (56 kW) motor with foot-mounted gear reducer to a chain and sprocket drive. Each high-speed tulip-style chopper features air purge seals for long life, and is driven by a 7.5 hp (5.6 kW) motor.

A high-strength agitator with paddle blades pushes the material into the choppers, which add shear and intensify the blending process. The paddle blades and choppers act together to rapidly break down lumpy or otherwise difficult-to-blend materials into particles that are distributed uniformly throughout the batch for more thorough blending.

Munson Machinery Co. Inc. (Utica, N.Y.);
www.munsonmachinery.com; 315-797-0090

INJECTION MOLDING

Advanced manufacturing execution system

Wittmann Battenfeld is partnering with ICE-flex, an Italy-based developer of manufacturing execution system (MES) software, to offer software specifically designed for Wittmann Battenfeld injection molding work cells.



Called *TEMI+*, the software takes advantage of new communications standards available on Wittmann Battenfeld equipment enabled with Wittmann 4.0, automatically detecting when auxiliary equipment is added or removed in the work cell via Wittmann Battenfeld's "plug-and-produce" technology. Information collected from the injection molding machine and connected peripherals can be transmitted to a display screen for monitoring.

TEMI+ consists of two packages. The basic *TEMI+* package includes production planner, production monitor, data manager, and OEE (overall equipment effectiveness)

and KPI (key performance indicator) functions. The basic package controls the production cell, and can adjust settings to ensure operations remain within specification and to optimize equipment effectiveness and performance.

The *TEMI+* advanced package includes all the basic functions and adds features such as an alarm manager, a quality management system module, and a maintenance manager module. These additional features improve both productivity and product quality while reducing machine downtime.

Wittmann Battenfeld Canada Inc. (Richmond Hill, Ont.);
www.wittmann-group.ca; 905-887-5355

Hybrid vertical unit with low machine height

Nissei Plastic Industrial Co. Ltd. is introducing its new *TWX220RIII25V* hybrid type vertical injection molding machine, designed to offer one of the industry's lowest machine heights with a 2,110 kN (220 ton) clamping force.



Developed from Nissei's TNX-RIII series hybrid-type vertical machine, the new *TWX220RIII25V* is equipped with a new compound-type clamping mechanism and offers low profile structures throughout the machine.

The most notable feature of this machine is the compound-type clamping mechanism that materializes smaller machine size. It consists of a high-speed cylinder, high-pressure clamping cylinder, and half-nut mechanism, which replace a conventional-type cylinder that controls both high-speed clamping and high-pressure clamping with one clamping cylinder. Because of this new mechanism, the mold-mounting height is lowered to 1,000 mm — about 30 per cent lower than the conventional machines — making mold installation/set-up, insert, and product takeout easier than ever before. The overall machine height is about 10 per cent lower, offering good flexibility for available installation space.

Nissei America Inc. (Anaheim, Calif.);
www.nisseiamerica.com; 714-693-3000

En-Plas Inc. (Toronto); www.en-plasinc.com; 416-286-3030

EXTRUSION

Downstream equipment for medical tubing

Novatec Inc. has entered the medical tubing machinery market with the introduction of its *Bessemer Rx-SmartMED* series of downstream extrusion equipment, designed to help

medical extruders that need to meet stringent cleanroom standards and tight tolerance requirements for producing medical tubing.



The Rx-SmartMED line includes vacuum sizing and water cooling tanks, and a line of puller/cutters. The MVT series medical vacuum tanks — available in three-, five-, and eight-foot lengths — are designed to meet the critical ovality and concentricity requirements of single- and multi-lumen microbore tubing, and are easy to clean.

Built from 304 stainless steel, the tanks include a digital closed-loop vacuum control that lets operators enter fine vacuum settings (to within 0.01-inch of water) for increased dimensional control. They also have the ability to operate at water levels under 0.10 inches to control water drool.

The puller/cutter series, meanwhile, is equipped with flat belts with triangular belt wrap that precisely feed microbore tubing. Three sets of belts include sponge, white nitrile, and dual-layer with sponge and silicone combination. Precision linear slide bearings have been incorporated into the belt boom system to assure the belts are parallel in both axes to offer precise tube tracking through the belt contact area.

Maguire Products Canada Inc./Novatec Inc. (Vaughan, Ont.); www.maguireproducts.com; 905-879-1100

PACKAGING

Digital plate for flexible packaging printing offers cost savings

New from **Flint Group**, the nyloflex *FTH Digital Plate* is a flat top dot plate designed to provide greater versatility for meeting the highest standards in flexible packaging printing.

A solvent-processed plate with a smooth surface designed for use with surface screening, the new flexo plate provides high solid ink density and superior highlight performance for ultimate overall print results.

The inherent flat top dot surface of the nyloflex *FTH Digital Plate* is achieved without additional processing steps or consumable items. Exposure with either standard tube or LED UV-A light results in a flat top dot surface on the plate, which can be texturized with the latest surface screening technology to create a customized surface pattern to meet the specific requirements of the printer. The resultant micro-textured surface of the plate provides superior



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ink laydown and improved solid ink density on flexible foil substrates.

Plates are commercially available in standard thicknesses of 0.045 inches (1.14 mm) and 0.067 inches (1.70 mm), and sizes of 35 x 47

inches (900 x 1,200 mm), 42 x 60 inches (1,067 x 1,524 mm), and 50 x 80 inches (1,270 x 2,032 mm).

Flint Group (Montreal);

www.flintgrp.com; 514-731-9405

MOLD TECHNOLOGY

Accelerated mold deliveries

StackTeck Systems Ltd.'s new *FastTrack* system is designed to accelerate mold deliveries by using automated design capabilities that work with a pre-set, optimized set of mold design rules to compress up-front processes.

Design automation leads to the use of best practices in mold design, which enables the use of many standardized components that are normally considered custom in a cus-

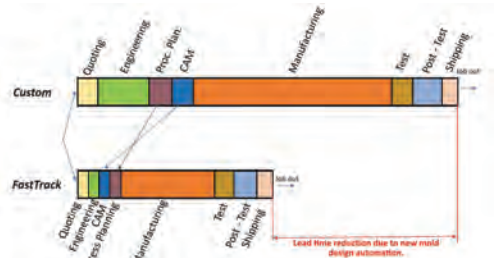
tom designed mold. *FastTrack* shortens the quoting, engineering, process planning, and manufacturing stages by using automated design and product standardization to reduce typical lead times of four weeks down to a few days.

The first phase that *StackTeck* is now offering will cover single-face molds for round lids and round air-eject containers with two, four, six, and eight cavities. Future development of this technology will cover a broader range of part types, as well as higher cavitations and stack molds.

And as *StackTeck* is introducing the *FastTrack* approach, it's also putting a new mold proposal app in the hands of its sales team so that the standardized products can be priced and mold concept diagrams can be provided on the spot; formal proposals are sent within one business day. Delivery timelines for lid molds are nine weeks, and containers are 11 weeks, depending on size.

StackTeck Systems Ltd. (Brampton, Ont.);

www.stackteck.com; 888-700-8555



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MATERIALS

First sparkle colourants formulated for rotomolding

A new series of colour concentrates from **Teknor Apex Co.** is designed to help manufacturers strengthen brand identity, enhance shelf appeal, and add aesthetic value to otherwise utilitarian objects by supplying a sparkling effect produced by glinting flakes within the colour itself.



The company's *StarDust* concentrates are available in all standard colours, and are supplied in pellet form for

injection molding and as powdered dry colour for rotational molding. The powder form is the first sparkle-effect rotomolding colourant.

Teknor Apex recommends *StarDust* concentrates for consumer products such as toys, housewares, dust bins, waste bins, storage bins, and other items where shelf appeal or visual enjoyment are key values. Rotomolding applications include kayaks, outdoor furniture, coolers, and sporting equipment.

Teknor Apex Co. (Pawtucket, R.I.);
www.teknorapex.com; 800-556-3864

HOT RUNNERS

Temperature management system boosts efficiency, lowers costs

New from **HRSflow Hot Runner Technology**, *HRScool* is an innovative solution for hot runner injection molding in which the otherwise necessary water cooling of the corresponding actuator can be dispensed with.

The key to *HRScool* is the twice-optimized temperature management system, in which insulating supporting columns

with a minimal contact surface reduce the input of heat from the hot runner to the cylinder housing. This, in turn, is provided with a cover with a large, flat surface made of thermally conductive material. The integrated telescopic design enables maximum heat dissipation from the cylinder to the cold platen.



Because there's no longer any need for elements such as cooling lines, channels, and connections that are otherwise necessary for active cooling, advantages of the system include reduced assembly and handling costs, and — because problems with clogged cooling circuits and the degradation of hydraulic fluids can no longer occur — increased machine availability and lower operating costs.

Additionally, the compact design of systems with *HRScool* takes up less space in the molding tool, resulting in an optimum uniform temperature distribution along the entire hot runner system for higher molding quality.

HRS Hot Runner Systems NA Inc. (Windsor, Ont.);
www.hrsflow.com; 519-973-0212

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When to use a freelance product designer

By Greg Stout, Blue-Reed LLC



Regardless of whether you're in injection molding, blow molding, extrusion or rotational molding, if you're a plastics processor and you have an idea for a new plastic part or an assembly of parts, you might want to think twice before trying to design it on your own.

Despite what people may think, developing a new part is not a quick endeavour, and chances are you aren't a designer and don't have one working for you. If this is the case, then hiring a freelance product designer might be the right decision.

Most times, before actually having the part designed, you have to deter-

mine if there's a market for the part; other times, the part has to be designed so that it can be test marketed to determine its appeal. A freelance product designer can handle both tasks for you. You may also know how you want the part to look and what you want it to do, but you probably don't know the ins and outs of the different processes, where the parting lines should go, where you might need a feature to reinforce the strength of the plastic, or even what properties you need the plastic to have. And do you know which process will make your part in the amounts per year that your market survey says you should expect to sell within a year? Again, a plastic product designer can tell you.

Getting into the nitty-gritty of what the part does and how it works, you need to know if your part will be strong enough to do the job you want it to do, and also what material will be strong enough to do it in. A product designer will be able to recommend the right material and then run finite element analysis (FEA) on it to determine if the resin will be able to take the loads that the part is going to see. The designer will also be able to recommend tweaks — a rib here or a hole there — that will allow the part to actually exceed strength requirements. If, for example, you need a hollow plastic tank designed to hold a liquid with a high specific gravity for a year, he/she will be able to tell you that the creep expected from the properties of the plastic, as determined from FEA, will have this much deflection at these spots and the stresses will be beyond the rating of the resin. All of this can be figured out well before you invest in the high expense of the mold.

I was once contacted by a client who had already designed a 330-gal-

lon IBC tank that mounted to a plastic skid and that also doubled as a 30-gallon water tank. A friend of his who knew SolidWorks had modeled the part for him. My client knew the part could be made by rotomolding, but he also knew there were some problems with the part and wanted me to take a look at it. I saw right away that there was no draft at all on any of the walls and no ribs for large flat areas and other major areas of concern. I told him that I would have to redesign it for the process. He told me more about how the tank/skid assembly would be transferred from spot to spot by truck. I then had to tell him that the assembly would have to pass DOT testing requirements. This meant that the IBC and skid would have to be designed to withstand more than just the weight of the product contained in them — they would have to be able to withstand a fall from a height of eight feet onto the weakest corner of the skid after the plastic has been frozen. This involves FEA to a high degree.

The upshot is that, rather than costing you money, a good part designer can probably save you a bundle of cash in the long run by designing a part — in the first try — that's strong enough to do the job it's meant to do, with an estimate upfront of what their design fees should be so you can budget accordingly. They can also concentrate exclusively on your project and not be distracted by day-to-day production problems that an internal staff member at your company may have. In the end, it may just be the simplest and fastest way to turn your idea into reality. **CPL**

Greg Stout is the president of Blue-Reed LLC, a rotomolding design consultancy located in Stow, Ohio. For more information, visit www.plastic-productdesign.com or call 330-322-8707.

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Model EMF-72M**



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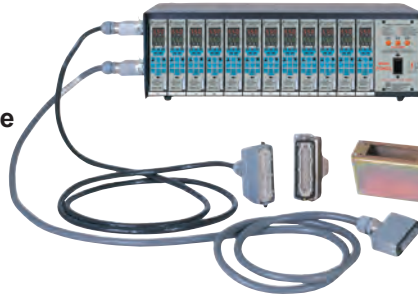


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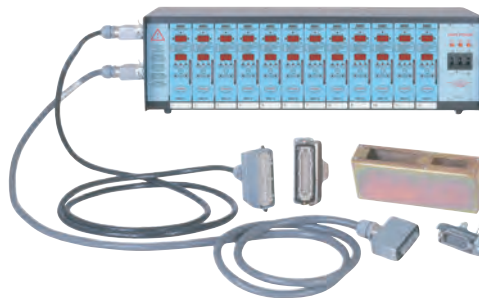
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