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Canadian Plastics

FEBRUARY 2019
VOLUME 78 • NUMBER 1

FROM THE ARCHIVES

The July 1994 issue of *Canadian Plastics* reported on a memorable annual conference recently held in Toronto by SPI Canada, the forerunner of the Canadian Plastics Industry Association. SPI Canada used the occasion to elect Mike Schmidt, the founder and president of ABC Group, as its new chairman. Next, SPI president Ron Evason – then battling cancer – gave a talk about a cancer research fund that he had just started, followed by a speech on economic policy from Ontario's Economic Development and Trade Minister Frances Lankin. The event culminated with a keynote speech on what it takes to be a winner by Toronto Maple Leaf legend Darryl Sittler.

Number of the month:
$1.9 billion*

* The estimated amount of capital spending on industrial chemical industry projects in Canada in 2019. (See pg. 6)

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Remembering Bill Carteaux

North America's plastics industry suffered a devastating loss in December when Bill Carteaux, the longtime head of the Washington, D.C.-based Plastics Industry Association, died of leukemia at age 59.

Carteaux came to the association in 2005 after a long career in the plastics machinery sector, which included being the co-managing director at Demag Plastics Group, and before that head of Autojectors Inc.

Carteaux's 13-year tenure as CEO of the Plastics Industry Association came during a time of transformative change to our industry, including the great recession in 2008, the shale gas resurgence, and public challenges over bag bans and plastic waste in general. Through all of these difficulties, he not only kept the organization relevant but greatly expanded its membership.

Early in his tenure at the Plastics Industry Association, Carteaux took the big step of rebranding the institution because he knew that it's then-current name — Society of the Plastics Industry — was confusing to those both inside and outside the industry. So he renamed it the Plastics Industry Association, and the group refers to itself now as PLASTICS, in all capital letters.

One of Carteaux's finest hours came in 2009, when he was a key figure in preventing that year's NPE show from melting down as big exhibitors like Nissei and others threatened to pull out during the economic tumult. Fearing a ripple effect that would doom the whole show, Carteaux flew to Japan and Europe — home to some of the major machinery companies that were planning to leave NPE — to convince them to remain by giving them steep discounts for exhibiting at the show. It worked. NPE2009 was a success and Carteaux's reputation as the man who saved NPE was affixed.

Three years later, Carteaux oversaw the move of NPE from Chicago to Orlando, Fla. for the 2012 edition. The move saved exhibitors millions of dollars in lower costs for exhibiting, utilities, and travel, and maybe that much again by freeing them from being gouged by the unions at Chicago's McCormick Place.

Carteaux also headed the Council of Manufacturing Associations, and he played a key role in forming global and regional plastics association groups like the North American Plastics Alliance, an umbrella group of the industry from Canada, Mexico, and the U.S. And as head of PLASTICS, he worked with plastics associations in Canada and Mexico on crafting a common position on the replacement for NAFTA.

For all of which he was deservedly named as the youngest-ever inductee into the Plastics Hall of Fame in 2015.

Canadian plastics industry members with long memories might see parallels between Carteaux and the late Ron Evason. Evason was the energetic president of the Society of the Plastics Industry of Canada, the forerunner of today's Canadian Plastics Industry Association. Like Carteaux, Evason transformed his association, putting SPI Canada — formerly just a Canadian branch of the American organization — on the map in the 1970s and 1980s by forging good relations between it and the federal government, in the process showing that the plastics industry was a much more important factor in our national economy than the feds realized. Also like Carteaux, Evason was a cheerleader for plastics, and "saved" a plastics trade show — he wrested control of Toronto's Plast-Ex show from Maclean Hunter and put it under SPI Canada's control, where it flourished. And like Carteaux again, Evason died too young from cancer, in 1995.

So history repeats itself, not — as Karl Marx once said — first as tragedy and then as farce, but as tragedy for our industry both times.

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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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PRINTED IN CANADA
ISSN 008-4778 (Print) ISSN 1923-3671 (Online)

Publication Mail Agreement #40065710

2018 SUBSCRIPTION RATES

5 issues Canadian Plastics, plus Dec. 2020 Buyers' Guide:
CANADA: 1 Year $77.50 plus applicable taxes;
2 Years $123.50+ taxes
USA: US$135.50/year
FOREIGN: US$154.50/year

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Bendable, conductive polymer film for consumer electronics also has healthcare potential

An expression in the comedy world says that if it bends it's funny, if it breaks it's not. To modify it slightly, a glass-like, conductive polymer under development at Purdue University that can make smartphones and other electronics more bendable is a fun innovation, but its potential use in healthcare applications that could help save lives is very serious indeed.

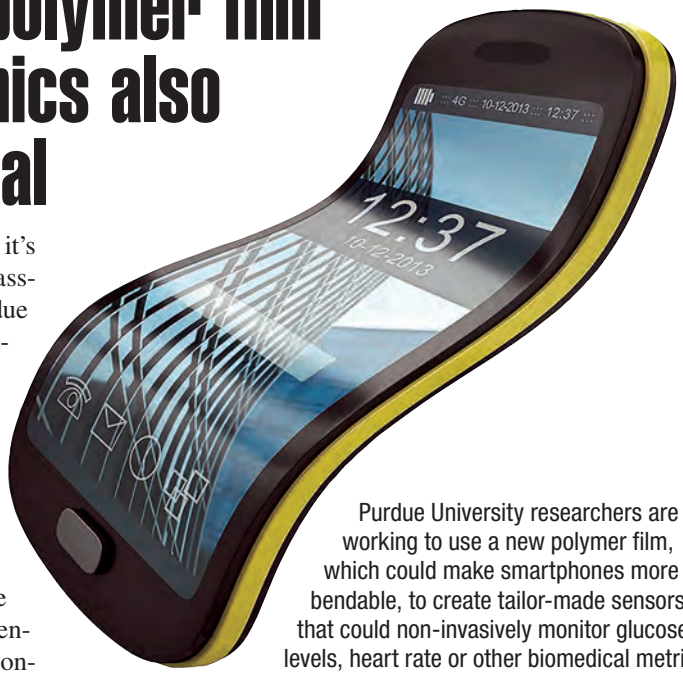
Researchers at Purdue, which is located in West Lafayette, Ind., have designed the polymer to conduct electricity for transparent and flexible electronics. Purdue's polymer is made from long chains that contain radical groups, which are molecules that have at least one unpaired electron. "The radical polymer has a fundamentally different chemistry and mechanism for creating conductive plastics," said Brett Savoie, an assistant professor of chemical engineering at Purdue who served as a senior member of the research team. "We are able to coat the film, which stays transparent at relatively large thicknesses, and make uniform films without defects."

The polymer film, which is said to have the look and feel of glass, can be inexpensively and sustainably produced on a large scale because it comes from "earth-abundant materials," Savoie said. "Now, you have something you can sell, especially for high-end electronics," he continued. "We have made a giant leap in polymer production by better matching the mechanical properties of organic materials used to create them and helping to avoid catastrophic failures with electronic display screens."

The material is cost-effective compared with currently used polymers in electronics that rely on expensive chemistry and chemical doping to achieve high conductivity, Savoie said, and much less expensive than indium tin oxide, which is the current standard material in displays. "And it's competitive with other organic plastics and is orders of magnitude better than the next-best radical polymer," he added.

The new polymer is also central to a research project currently underway at the Purdue-based Materials Innovation for Bioelectronics from Intrinsically-stretchable Organics centre. Researchers there are using the polymer film to create custom sensors that could non-invasively monitor glucose levels, heart rates, and other biomedical metrics. The film could be modified, using specific molecules or ions, to target and selectively interact with various biological components inside the body, Savoie said, and could be worn as a nearly invisible patch on the skin.

And there's nothing funny about this potential breakthrough. **CPL**



Purdue University researchers are working to use a new polymer film, which could make smartphones more bendable, to create tailor-made sensors that could non-invasively monitor glucose levels, heart rate or other biomedical metrics.
Photo Credit: Perdue University

Petrochemical growth spurt is good news for Canada's plastics industry

Getty

Canada's petrochemical industry is headed for its biggest surge of expansion spending in five years in 2019, analysts predict, thanks in large part to incentive programs by the federal and provincial governments.

Capital spending on industrial chemical industry projects in Canada this year is expected to jump by 65 per cent to $1.9 billion, the highest since $2.2 billion in 2014 and third-highest in a decade, according to a 2018 membership survey by the Chemistry Industry Association of Canada (CIAC), which represents producers of 75 per cent of the country's chemical products by value.

Also, employment is expected to rise by about four per cent or 640 jobs to 17,670.

Capital spending in Canada this year will come mainly from construction already underway on two projects to turn petrochemicals produced with natural gas into plastic pellets: Inter Pipeline Ltd.'s $3.5 billion PP project in central Alberta and the $2 billion expansion of Nova Chemicals Corp.'s PE plant at Sarnia, Ont. The former is to receive $200 million in royalty credits under a 2016 Alberta NDP government program, while the latter is backed by $100 million through Ontario's Jobs and Prosperity Fund and $35 million from Ottawa's Strategic Investment Fund.

Last year, Alberta announced two programs worth $2.1 billion in royalty credits, grants, and loans to encourage investments in petrochemical feedstock and manufacturing facilities. Winning bids for these projects are expected to be announced soon.

Meanwhile, a final investment decision is expected soon on a $4 billion PP project by a joint venture of Calgary-based Pembina Pipeline Corp. and a subsidiary of Kuwait Petroleum Corp., eligible for $300 million in royalty credits under the 2016 Alberta program. In early January, Pembina said that it plans to spend $110 million in 2019 to advance development of the project, including progressing engineering to secure lump sum construction contracts.

As important as they are, Canadian petrochemical expansions are still dwarfed by the activity south of the border. A total of 333 new U.S. chemical industry projects using shale gas had been announced as of September 2018, according to the American Chemistry Council. Those projects account for US$202 billion in new capital investment and are expected to create 431,000 direct and indirect jobs by 2025.

Historically, Canada has attracted approximately 10 per cent of the total chemistry investments in North America, but recently this share has plummeted to just two per cent. CIAC's numbers look promising in reversing that trend. Some of the elements working in Canada's favour include feedstock costs for petrochemical production, the federal government's recent announcement for enhancements to the Accelerated Capital Cost Allowance, and the Alberta government's announcement in mid-January of an additional $600 million for the province's Petrochemical Diversification Program and an additional $500 million to its Feedstock Infrastructure Program.

And in Ontario, meanwhile, the provincial government's Restoring Ontario's Competitiveness Act, 2018 should streamline duplicate regulations that currently strangle the competitiveness of the chemical manufacturing sector by saddling it with extra time, effort, complexity, and costs. Among other initiatives, the Act will repeal the Toxics Reduction Act by 2021 and rely on the science-based Federal Chemicals Management Plan, as other provinces do; revoke nine regulations related to the Municipal Industrial Strategy for Abatement and insert these requirements into Environmental Compliance Approvals; and simplify and update rules for operating engineers. **CPL**

Former Wittmann Battenfeld executive Matt McCabe passes

Matt McCabe, most recently a principal of plastics representative firm Great Lakes Machinery & Automation LLC (GLMA) and a former Wittmann Battenfeld Inc. executive, died on Jan. 20 in an all-terrain vehicle accident in Fremont, Ohio.

McCabe, an 18-year veteran of the plastics industry, was 43. He was killed when the ATV in which he was a passenger crashed through the ice on a frozen pond. The driver of the ATV escaped unhurt.

After earning a degree in industrial technology from Ohio University, McCabe started his career as a sales agent for The Turner Group in Seattle, Wash. In 2003 he joined Wittmann Battenfeld as their regional sales manager in California, and he moved to Connecticut in 2004 and was promoted to national sales manager. He later served as the company's first international key account manager. In 2015 he moved back to Ohio and started GLMA, located in Fremont, with his business partner Mike Paeth. GLMA represents Wittmann Battenfeld, Fanuc Robotics, and several other machinery makers. **CPL**

Alpha Poly keeps growing by adding 10-colour press

Brampton, Ont.-based flexible packaging manufacturer Alpha Poly Corp. has completed the installation of a new Windmoeller & Hoelscher Miraflex II 10-colour press.

The family-owned firm held a ribbon cutting ceremony on Dec. 21 to officially launch the new machine.

Photo Credit: Alpha Poly Corp.

From left: Carole Kerrigan, Patrick Kerrigan, and Paul Kerrigan at the ribbon-cutting ceremony.

"This is our second W&H press," said Patrick Kerrigan, Alpha Poly's president. "Our first is a Miraflex AM eight-colour flexographic press with insetter capabilities, and the new Miraflex II complements it and also increases our flexibility, allowing us to bring in new business." The new Miraflex II also brings the number of the company's printing presses to three: the two W&H lines and a six-colour Uteco flexo printing press from Italy. Alpha Poly also has a Nordmeccanica Super Simplex SL laminator and two Deacro 610 slitters, as well as other equipment for lamination, slitting, and pouch/bag conversion.

Founded in 1989 by the Kerrigan family as Alpha Polybag Corp. to manufacture PE bags for industrial sectors, the company started with two employees and a 3,000-square-foot space and has been expanding its size and scope ever since. In 2000 it acquired KCL Promotional Packaging from a U.S. firm, which gave it access to the flexographic printing market; and in 2016 it bought flexo printer/converter Miki Printing of Acton, Ont.

Five years before that, in 2010, Alpha Poly underwent a rebrand and name change. "After many years of our customers knowing us as Alpha Polybag, we realized that if we wanted to branch into printed laminated roll stock and bags, we needed to change the perception that we were only a polybag supplier," Kerrigan said. "It worked, and we've seen nothing but growth."

As a result, Kerrigan continued, the company plans to double its manufacturing footprint — currently at 50,000 square feet — to over 100,000 square feet during 2019.

The company, which currently has 60 employees, now makes flexible packaging for a wide range of industries, including food manufacturers and pet care; offers flexographic printing and in-house design capabilities along with converting and laminating; and produces printed roll stock and stand-up pouches. It has customers in Canada, the U.S., and international markets, and recently became GMI-certified for CVS Pharmacy, Walgreens, and Target. **CPL**

Canadian Plastics Pioneers merges with CPIA

The Canadian Plastics Pioneers (CPP), an organization made up of plastic industry veterans with at least 25 years of experience, has merged with the Canadian Plastics Industry Association (CPIA).

CPP has approximately 160 members, and is dedicated to preserving the history of plastics manufacturing in Canada. In 2017, CPP published a book entitled *Plastics Pioneers 1950-2000*, which documents the people, places, and plastic products that helped shape Canada's plastics manufacturing industry over 50 years.

"We're pleased that a path to continue CPP's mission to ensure Canadian plastics history is in place has been achieved," said CPP chairman Ralph Zarboni. "As part of CPIA, our future is now clear with additional benefits for members as part of the much larger plastics industry association."

According to the terms of the merger, a new "Canadian Plastics Pioneers" membership category has been created in CPIA. Additionally, CPIA will set up their own qualifications and scan their membership for potential pioneers to add to the group, and CPIA will also hold an annual Pioneers category meeting in June to which all members will be invited. CPP members will also be invited to attend other CPIA functions such as golf outings, and CPIA has also agreed to take on the mandate of compiling and maintaining historic records for a projected book that will cover plastics in Canada from 2000 to 2050. **CPL**

CPP chairman Ralph Zarboni poses with a copy of *Plastics Pioneers 1950-2000* in 2017.

StackTeck adds operations in South Korea

Canadian moldmaker StackTeck Systems Ltd. has opened its first mold-making plant outside of North America, a 139,000-square-foot facility located in Hwaseong, South Korea.

The facility first opened as a subsidiary of StackTeck's parent company in 2010, with a focus on building molds for PET preforms, medical, and packaging applications.

This business will now be called StackTeck Asia.

"The product range and technical abilities of StackTeck Asia are well-suited to support StackTeck's business in the region," John Yu, StackTeck's senior board director, said in a statement. "Combining efforts of these two businesses will bring many synergies, as there is significant overlap in market applications. StackTeck Asia is particularly strong in molds for PET preforms, packaging, and medical."

Photo Credit: StackTeck Systems Ltd.

StackTeck Asia's headquarters in Hwaseong, South Korea.

Brampton, Ont.-based StackTeck has also announced that it has appointed Rick Unterlander as its new general manager, where he will focus on PET preform projects in the Americas and act as a liaison to StackTeck Asia.

Over 100 PET preform molds have been built to date, Yu said, including a significant number of high-cavitation molds running in Japan.

Founded more than 35 years ago, StackTeck makes injection molds for caps and closures, medical, PET preforms, and thin-wall packaging; as well as complete system integrations including in-mold labelling. **CPL**

PEOPLE

Robert (Bob) Bessemer | Tobias Daniel | Chuck Gorman | Declan McCarthy | Rich Oles | Joe Piccini | George Radcliff | Mike Pisch | Walter Ripple

– Baltimore, Md.-based auxiliary equipment maker **Novatec Inc.** has named **Robert (Bob) Bessemer** as its vice president of extrusion technology.

– Munich Germany-based plastics processing machinery maker **KraussMaffei Group** has named **Tobias Daniel** as vice president of global sales for its injection molding division, responsible for both KraussMaffei and Netstal brand injection molding machines.

– **Toshiba Machine America**, headquartered in Elk Grove, Ill., has named **Chuck Gorman** as national sales manager for its injection molding division.

– St. Louis, Mo.-based global packaging supplier **TricorBraun** has appointed **Declan McCarthy** as its chief financial officer.

– Torrence, Calif.-based injection molding machine supplier and mold component maker **Alba Enterprises LLC** has named **Rich Oles** as its president and CEO.

– Maize, Kansas-based screw and barrel manufacturer **Reiloy USA Corp.** has named **Joe Piccini** as president and **George Radcliff** as vice president of sales and marketing.

– Specialty colour and additive maker **Chroma Color Corp.**, headquartered in McHenry, Ill., has appointed **Mike Pisch** as its chief financial officer.

– Polymer supplier **PolyOne Corp.**, headquartered in Avon Lake, Ohio, has appointed **Walter Ripple** as vice president, sustainability.

SUPPLIER NEWS

– Auxiliary equipment maker **Conair Group**, headquartered in Cranberry Township, Pa., has contracted **FinCap Electrical and Mechanical Inc.**, of Newmarket, Ont., to handle installation, automation, control, and repair services for its equipment in Canada. FinCap is headed by Andrew Finlay, president, and Evan Cappuccitti, vice president.

– Clarkson, Mich.-based resin distributor **Chase Plastic Services Inc.** is now representing **Sabic**'s complete line of specialty resins — including Noryl brand PPO/PPE, Ultem brand polyetherimide, and LNP brand compounds and copolymers — in North America. Nexeo Solutions also distributes Sabic's specialty materials in the same region.

– Material distributor **Foster Corp.**, headquartered in Putnam, Conn., has been appointed as a North American distributor of **Solvay**'s KetaSpire PEEK and AvaSpire PAEK polyketone-based polymers for the North American medical market. This will include unmodified polymers and standard colour formulations currently offered by Solvay.

– Fairlawn, Ohio-based international plastics distributor **General Polymers Thermoplastic Materials** is the new North American distributor of **A. Schulman Inc.** compounds. Schulman's portfolio of high-performance plastic compounds and resins range from engineered polymers and alloys and soft-touch TPEs, to polyolefin compounds and flame-retardant concentrates.

– Austria-based **ACH Solution GmbH**, a supplier of technology for processing of liquid silicone rubber, solid silicone rubber, and multi-component machine tooling, has appointed **ACH Solution USA Inc.** , headquartered in Sarasota, Fla., as its technical partner and exclusive representative for North America.

YOU'VE BEEN FRIENDED

By Mark Stephen, editor

With the cost of materials going up and maintenance budgets going down, it's critical that shredders and granulators be as user-friendly as possible. New designs that offer easy cleaning and knife maintenance, quick and safe access to the heart of the machines, and improved wear protection can help transform your size reduction process from headache to hassle-free.

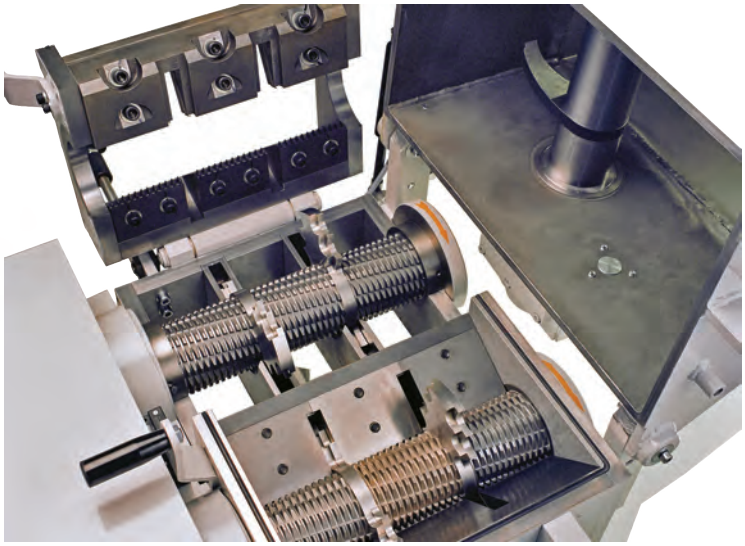


Photo Credit: Wittmann Battenfeld

The cutting chamber of Wittmann Battenfeld's Junior Double 4 screenless granulator.

With the possible exception of ride-hailing apps like Uber, no product ever got worse by being made more user-friendly. And that probably goes double for something as inescapable as size reduction in plastics processing. Now more than ever, granulation is a vital step in the total production process. With the higher cost of materials combined with increased demands from end-users to include reground and/or recycled materials in the product, using regrind is no longer merely an option. So it's good to know that new shredders and granulators boast more user-friendly features than ever, including easy access, removable parts, less blade wear, and more.

ACCESS GRANTED

With the increasing cost of materials and shrinking maintenance budgets, it's important that size reduction machines be designed for easy cleaning and knife maintenance. Which means that quick, safe access to the heart of the unit is critical. Now available in North America, Rapid Granulator Inc.'s Raptor series of single-shaft shredders has a unique, patented "open-hearted" design that makes the machines particularly easy to operate, service, and clean. According to Jim Hoffman, Rapid's vice president, sales and marketing, a Raptor shredder can be in a completely open position in less than one minute after it has stopped running. "The front door is hinged on the side, and provides unrestricted access to the rotor and to the screen, which is mounted in the door," Hoffman said. "Once the front door is open, the shredder hopper mounted on a rear hinge can be tilted back." Once the machine is open, Hoffman continued, all fasteners are accessible from the outside using air-driven tools. "The tilting hopper opens with an electrically operated jack, while the screen and granule bin can be handled by a single operator," Hoffman said. "The screen cradle design doesn't need bolts to be removed when removing the screen, and the granule bin slides out easily. The same tool is used to unlock the front door and to rotate the rotor." As an option, Hoffman said, a light can be fitted to provide extra illumination. Rapid offers a total of 36 base configurations for the Raptor to handle various customer applications. "The Raptors can also be configured in the Rapid DUO concept, with a floor-standing granulator located directly beneath the output of the shredder," Hoffman said.

Newly available for the North American market, Weima's WKS series of general purpose, single-shaft shredders is designed to shred voluminous objects, tear-resistant fibres, and film. Depending on the application, the machines — the WKS 1400, WKS 1800, and WKS 2200 — are available with either hydraulic or power-belt drive. Various screen sizes are available in the material discharge area, and screen segments can be changed individually. The shredders come with Siemens PLC control panels, and are suitable to

Right: Rapid Granulator's "open-hearted" Raptor shredder.

run stand-alone or as part of a recycling line. On the user-friendly side, a swing ram on rolls is positioned inside the cutting chamber, providing for consistent infeed of materials; and an inspection flap inside the chamber allows for easy access for maintenance to clear any foreign objects that may have been introduced during the shredding process. Also, the shredders come equipped with hydraulic or power-belt drives, depending on the application. The rotor type also depends on the application: a V-rotor for lumps and large objects, or an F-rotor for fibres and film. The screen size can be chosen to fine-tune the final shredded product to the ideal size, including for reintroduction into a production line or for recycling.

It's been exactly two years since Universal Dynamics Inc., the U.S. arm of Italy-based Piovan SpA, introduced a comprehensive line of granulators to the North America market, which are sold under the Piovan brand. The line encompasses small, beside-the press granulators through mid-sized and large granulators, with rotor diameters from seven to 24 inches, and machines designed for specialty applications such as thermoforming and post-consumer recycling. The range of granulators includes both in-line and front-of-press granulators for capturing thermoforming web scrap, as well as granulators designed to handle edge trim from extrusion. For blow molded parts, granulators are available with optional scooped rotors, which allow more area in the cutting chamber for handling large, bulky parts. The granulators come standard with a host of user-friendly, wear-resistant features, including disposable blades that allow knife inserts to be changed easily; and tangential cutting chambers, in which the geometry of the cutting chamber can be tailored to specific applications — instead of being cast, the cutting chambers are machined and fastened with dowels, so they can be easily disassembled to replace worn parts. In addition, the granulators for post-consumer recycling have a special finish to make them more resistant to wear; this anti-wear treatment is also an option for the rest of the line.

Photo Credit: Rapid Granulator Inc.

Vecoplan LLC has added a new hydraulically lifting shredder floor as a standard feature on two of the models in its workhorse V-ECO series of shredders. Designed to offer safe and easy access to the rotor, customers can remove extraneous material, adjust or exchange counter knives, or rotate and change the cutters. "Instead of having to open the door and take the screen out, the operator simply presses a button and the floor lifts hydraulically right at the rotor," said Greg Parent, the company's Canadian sales representative. "The operator can then walk under the machine from the rear to gain full access to the rotor, cutters, and counter knives to perform maintenance or remove tramp metal without emptying the hopper or having to enter the shredder." The cutting chamber floor is an option on the two smaller V-ECO shredders — the 900 and 1300 — and is standard on the larger 1700 and 2100 models, Parent added. Another new user-friendly feature from Vecoplan is the ESC drive, a gearless drive with motor power of 50 to 200 hp."The ESC drive is a special variable speed torque motor coupled to a synchronized drive flange for instant torque and speed adjustments based on process feedback," Parent said. "A digital encoder constantly evaluates the current drive conditions and automatically boosts efficiency in all operational conditions. This system eliminates the need for moving parts like gear reducers, clutch assemblies, or torque arms, which all require careful maintenance and provide opportunities for parts failure."

NO WEAR, NO TEAR

The extremely abrasive nature of today's glass-filled polymers and other tough materials is no laughing matter in the size reduction world: they represent a major cost factor in the machinery and, by dulling knives and causing other alignment problems, are responsible for the vast majority of granulate quality problems. As a solution, Rotogran International Inc. now offers removable, replaceable inserts for the wear areas of its granulator chambers. "The inserts are located at both sides of the rotor and at the wear points of the backplate leading into the bottom stationary blade area," said Rotogran president Mike Cyr. "Inserts can be provided without any protective coating for use as a consumable product, or they can be tungsten carbide coated for extended life." For this second option, Cyr said, the inserts are coated with a layer of tungsten carbide applied with a high-velocity oxygen fuel process that's superior to the more common plasma process — it fuses the tungsten carbide particles to the steel insert with extremely high-density and negligible porosity, giving a typical hardness of 65 Rockwell C. "These inserts can be replaced without disassembling the entire granulator chamber and in half the time it takes for a typical blade change," Cyr said. "Zero speed sensors, rotor locks, high-level bin sensors, amp meter overload relays, and smart conveyor feed systems are other user-friendly options our customers request, and we can supply all of these."

Screenless granulators have always provided a number of user-friendly benefits: less noise; clean and uniform

regrind for hard, brittle plastics such as styrenes, acrylics, and glass fibre-reinforced, mineral- and talc-filled engineering grade resins; and low-speed operation — typically between 27 and 32 rpm — which reduces wear of cutting tools and maintenance demands, enabling up to twice the maintenance interval of conventional blade granulators. Equipped with two rotors in the cutting chamber for large sprues and parts, Wittmann Battenfeld's Junior Double series screenless granulators are typically used offline, located away from the process. "The Junior Double series has an optional automatic reversing system that helps minimize blockages in the cutting chamber and aids the granulation of thicker walled or tougher plastics," said Christian Weiss, Wittmann Battenfeld Canada's national sales manager. "The reversing system enables the machine to determine if resistance to the cutting blade is too high. If so, it reverses the rotor and repositions the part to allow cutting from a different angle. The Junior Double granulators also offer quick cleaning since there's no screen to unplug — the customer has easy and complete access through the double-top opening, which exposes the whole cutting chamber."

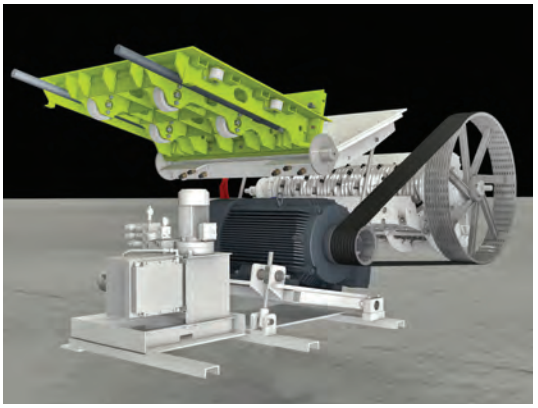


Photo Credit: Vecoplan LLC

Graphic showing the hydraulically lifting shredder floor that comes as a standard feature on two of the models of Vecoplan's V-ECO series of shredders.

Herbold Meckesheim GmbH has also developed new possibilities to reduce wear costs: The company's SMS series granulators can all be supplied with wear plates in the grinding chamber. The options range from basic replaceable wear plates in the top of the granulator and — depending on wear and tear — replaceable stator knife supports all the way to screwed, replaceable rotor knife support plates.

SAFETY FIRST

A common maintenance problem, especially with older granulator designs, is that knife removal, replacement, and adjustment can be difficult and dangerous — for example, relying on a block of wood for safety while the operator is installing, adjusting or torquing down a newly sharpened set of knives on a movable rotor. Viper granulators from Conair Group, which replace a variety of granulators the company offered under various product names, simplify the knife maintenance process with safety switches and interlocks that make removal easy and safe — most importantly, safeties that reliably disable operation and prevent the rotor movement when the granulator is open for cleaning, screen access, knife/rotor adjustment or other lubrication or maintenance. "All Viper granulators offer tool-free access to the rotor chassis, with drop-down screen cradles that allow the operator to lower the granulator screen for inspection, adjustment or cleaning of the rotor assembly," said Dave Miller, Conair's general manager for size reduction. "Cutting chamber access is simplified thanks to hinged, tilting hopper designs and power-assist features to ensure that one person can safely open and handle even the largest Viper granulator hopper." Also, Miller said, the bearings and rotor shafts of Viper granulators are protected by rotor-end disks that isolate them from exposure to granulate, dust, and fibres that might otherwise find their way into rotating machinery or interfere with proper lubrication.

Cumberland's new line of beside-the-press granulators — the 7, 10 and 16 series — can be integrated with extruders and injection molding machines to process scrap directly inline. According to Tyler Check, Cumberland's product manager for size reduction, benefits of the new granulators include safety, user-friendliness, application flexibility, durability, and performance. "The machines are compliant with ISO 12100 safety standards, and the cutting chambers can't be accessed until the rotor stops," he said. The new granulators have a viewing window that lets operators monitor the material in the cutting chamber, Check continued, and the cutting chamber has wide-open access for easy cleaning and knife changes. Also, an improved discharge seal minimizes dust and potential regrind leakage, and a larger discharge bin doesn't have to be emptied as often.

In the end, contract drivers for Uber might not make customers' lives any easier; these new user-friendly size reduction features definitely will. **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

Cumberland (New Berlin, Wis.); www.cumberland-plastics.com; 262-641-3885
- **New Tech Machinery Inc.** (Brampton, Ont.); www.newtechmachinery.com; 905-456-2968
- **Auxiplast Inc.** (Sainte-Julie, Que.); www.auxiplast.com; 450-922-0282

Herbold Meckesheim USA (Slatersville, R.I.); www.herboldusa.com; 401-597-5500

Piovan Canada (Mississauga, Ont.); ww.piovan.com; 905-629-8822

Rapid Granulator Inc. (Leetsdale, Pa.); www.rapidgranulator.com; 724-584-5220
- **JL Plastics Machinery Inc.** (Thornhill, Ont.); www.jlplastics.ca; 647-554 3679
- **DCube** (Montreal); www.dcube.ca; 514-272-0500
- **Equipment Resources NW** (Ridgefield, Wash.); www.ernw.com; 360-892-6005

Rotogran International Inc. (Toronto); www.rotogran.com; 905-738-0101

Vecoplan LLC (Archdale, N.C.); www.vecoplanllc.com; 336-447-3573
- **Greg Parent**; 416-678-0154

Weima America Inc. (Fort Mill, S.C.); www.weimaamerica.com; 888-440-7170

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

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AIDING AUTOMOTIVE APPLICATIONS

Injection molders have been making automotive parts since injection molding first got started. But it never gets old, especially since automakers are always demanding components that are tougher, lighter, more corrosion- and chemical-resistant, easier to fabricate, and less expensive than alternative materials like metal. Which is why some of the latest resins and additives will come in handy.

Photo Credit: PolyOne Corp.

PolyOne's Maxxam LO is a low odour, talc-filled PP that's designed to help OEMs meet vehicle interior air quality standards in underhood automotive HVAC applications.

By Mark Stephen, editor

From Elvis's pink Cadillac in the 1950s to Prince's little red Corvette in the 1980s to 50 Cent's recent "Get in My Car", popular music has had a thing for automobiles. Plastics have been into the automotive sector — literally — for almost as long. For both functional and structural vehicle parts, plastics innovations bring design and lightweighting possibilities without sacrificing performance, the second of which is critical as automakers struggle to comply with tough new government fuel emissions standards in North America and Europe, knowing that traditional metalworking approaches to weight reduction don't always cut it.

So it's no surprise that vehicles represent one of the fastest growing markets for the chemicals industry. For decades, specialty chemicals have helped support the automotive industry through a range of products designed not only to reduce vehicle weight for better mileage, but also to enhance performance, increase energy efficiency, and improve manufacturing quality. And since the automotive industry clearly understands that less is more when it comes to weight, don't expect the material makers to ease up now. Here's a look at some of the latest injection molding resins and additives for vehicle parts.

IN THE HOOD

The strength and corrosion resistance of modern plastics makes them an ideal raw material for parts under car hoods, where the requirements for long-term resistance to cyclic mechanical loads, also known as fatigue strength, are increasing.

Lanxess AG has just launched a new PA6 product range called Durethan Performance for periodically stressed components. According to Lanxess, the different grades are several times more resistant to fatigue under pulsating loads than standard products with the same glass fibre content. The first products in the product range are the thermally stabilized Durethan BKV30PH2.0, BKV35PH2.0, and BKV40PH2.0 compounds with glass fibre contents of 30, 35, and 40 per cent respectively, as well as the impact-resis-

tant modified Durethan BKV130P compound which is reinforced with 30 per cent glass fibre. "These materials target applications such as air intake systems and oil filter modules or parking brakes," said Dr. Thomas Linder, a materials development scientist at Lanxess. "Its mechanical properties make the PA6-based Durethan Performance a good alternative material for PA66 compounds, which have become much more expensive in recent years. This substitution can often be carried out without increasing the glass fibre content, meaning that it doesn't add a higher component weight to the part."

Solvay Performance Polyamides recently introduced Technyl Red J, a PA-based material specially designed for turbocharger systems running at continuous temperatures up to 220°C or 430°F. "Automakers are starting to realize that traditional high-heat polymers can be too brittle to maintain required thermal, pressure, and chemical performance over time," said Didier Chomier, automotive global marketing manager for Solvay's Performance Polyamides global business unit. "Red J is the top-of-the-range building block of our Technyl Red offering for thermal management systems, and targets applications such as air intake manifolds, charge air coolers, turbo air ducts, resonators, cylinder head and engine covers." Technyl Red J offers superior long-term heat ageing performance of up to 220°C (at 2,000 hours) or 210°C or 410°F (at 3,000 hours), Chomier said, and flows like PA66, ensuring high chemical resistance and good surface aspect. "Recommended melt and mold temperatures are significantly lower than competitive PA4.6 or PPA resins, which saves energy during processing and minimizes part cooling time," he added.

INTERIOR DECORATING

The interior of the modern vehicle is one place where plastics are reigning — where trim, window encapsulation, and the dashboard of a modern vehicle are more likely to be made from plastic than any other material.

The new Apex 1523-LG series of flexible PVC injection molding compounds from Teknor Apex Co. has been used successfully in automotive window encapsulation, and exhibits substantially lower levels of surface gloss, providing a rubber-like finish that matches that of adjacent ethylene propylene diene monomer rubber (EPDM) components while retaining the cost-performance advantages of PVC. According to Steve McCormack, industry manager of the Teknor Apex Automotive Group, the Apex 1523-LG materials exhibit gloss levels similar to those of EPDM rubber beltline seals or glass run channels, enabling manufacturers of PVC-encapsulated windows to meet OEM demand for a closer match in the surface finish of these critical appearance parts. "The lowest gloss levels of standard PVC compounds for window encapsulation are in the 9 to 12 range as defined by SPI gloss finish standards, and these are achieved through etching or sandblasting of the tooling surface," McCormack said. "In contrast, Apex 1523-LG compounds achieve a gloss level in the 3 to 4 range without need for surface treatment of the tooling, which eliminates the costs associated with the tooling maintenance and repair required to keep a consistent surface appearance from part-to-part."

Photo Credit: Teknor Apex Co.

Teknor Apex's new Apex 1523-LG series of flexible PVC injection molding compounds are well-suited for automotive window encapsulation.

BODY SHOTS

Ascend Performance Materials recently introduced a new grade of its Vydyne PA66, designed to reinforce downgauged steel and aluminum used in vehicle body in white (BIW) structures, helping reduce weight. Called Vydyne R433H, the material has improved energy absorption over traditional glass-filled PA66, reducing noise, vibration, and harshness (NVH), and absorbing impact energy from crashes. "Using the new grade in the BIW structure reinforces sheet metal, helping manufacturers shave substantial weight and improve efficiency," said Vikram Gopal, Ascend's senior vice president of technology. "And in electric vehicles, where lightweighting and NVH reduction are especially important, R433H also works well in battery frame and housing applications."

The new Duranex 532AR grade from Polyplastics Group is a PBT material that's said to deliver good alkali stress crack resistance for a range of automotive applications by preventing alkali from penetrating the inside of the resin, causing cracks. This alkaline can arise from rust formation in metal parts. Duranex 532AR is treated with a hydrolysis-resistant formula, and has greater durability than standard materials. According to Polyplastics, recent test evaluations show that when specimens are immersed in alkali, cracking occurs within two hours in standard materials, whereas no stress cracking occurs in Duranex 532AR even when immersed for up to 200 hours. Duranex 532AR also has good heat shock resistance, Polyplastics said, and can help electrical components and sensors installed near the engine withstand this harsh environment; and is also well-suited for use in parts installed in the chassis section and lower areas of vehicles which can be splashed by water and mud, and come into contact with harmful chemicals such as snow melting agents.

SMELLS LIKE ODOUR CONTROL

There was a time when automakers considered the famous "new car" smell to be a bonus, since it signalled to the consumer that the car was, in fact, new. But that was then. Today's car buyers tend to associate the odour with harmful emissions, including volatile organic compounds (VOCs), so the goal is to get the new car smell out of the new car. To this end, PolyOne Corp. recently introduced Maxxam LO, a low odour, talc-filled PP that's designed specifically to help OEMs meet vehicle interior air quality standards in underhood automotive HVAC applications. According to Jim Mattey, the global marketing director for PolyOne's performance products and solutions division, a key benefit of Maxxam LO is that it reduces noxious odours — including the new car smell — while still maintaining its performance and aesthetic. "This material enables reduced VOC emissions and consistently achieves odour testing results of 3.0 per VDA 270, which translates into a neutral-smelling interior," he said. "The grades can also be customized to achieve a wide range of physical and mechanical properties to meet the specifications of any OEM."

Struktol Company of America has just expanded its line of products targeting odour and VOC control with the new Struktol RP 53 additive. A blend of odour-neutralizing chemistries, the additive is designed for difficult, high-odour compounds containing problematic species such as mercaptans, amines, and phosphites. The product can be used in a variety of polymer resins but is primarily targeted at polyolefins, the company said, and is a good fit for automotive interior compounds. Struktol RP 53 works at a low loading level and can be easily added into the injection molding process, as well as compounding and direct extrusion.

Musicians aren't going to give up on automobiles anytime soon; and neither, from the looks of things, are chemical makers. **CPL**

RESOURCE LIST

Ascend Performance Materials (Houston, Tex.); www.ascendmaterials.com; 713-315-5700
Lanxess Canada (Elmira, Ont.); www.lanxess.ca; 519-669-1671
PolyOne Canada Inc. Distribution (Mississauga, Ont.); ww.polyone.com; 905-405-0003
Polyplastics USA Inc. (Farmington Hills, Mich.); ww.polyplastics-global.com; 248-479-8928
Solvay Canada Inc./Cytec Canada Inc. (Toronto); www.solvay.com; 905-356-9000
Struktol Canada Ltd. (Newmarket, Ont.); www.struktol.com; 416-286-4040
Teknor Apex Co. (Pawtucket, R.I.);www.teknorapex.com; 800-556-3864

Left: Mold-Masters has made enhancements its Fusion Series G2 drop-in system, including an expanded nozzle range and waterless actuator technology.

Photo Credit: Mold-Masters

WHAT'S HOT IN HOT RUNNERS

By Mark Stephen, editor

With the need for very accurate, flash-free plastic parts on the rise, the demand for hot runner systems is on the rise too. Which is why improving hot runner technology is especially important. Some of the latest innovations are designed to minimize residence time, increase shot capacity, and generally promote more efficient molding.

Some changes are obvious, like when Mike Tyson got a face tattoo. Others are harder to spot. Take hot runners. Because they're a great way to maintain uniform wall thickness, eliminate knit and flow lines, and offer advantages like locating the gate at a wide variety of points on the part — ensuring the gate can be placed at the most favourable location for optimum filling and/or part aesthetics — hot runner systems are increasingly seen in plastic injection molds, in applications from automotive to electronics to medical sectors and more.

Despite their growing popularity, however, hot runners are also closed systems — unlike molds and even screws, it's difficult to know what exactly is going on inside a hot runner. Which means it's not always easy spot innovations. But innovations are definitely happening, and hot runner technology is increasingly being tailored to the very specific requirements of the end markets the systems will be serving, not to mention conquer tough materials and increase throughputs and uptime. Here are some of the latest developments.

MAKING CONNECTIONS

The new, fully assembled and wired hot runner system H4016 from Hasco is designed to supplement the company's range of ready-to-install systems

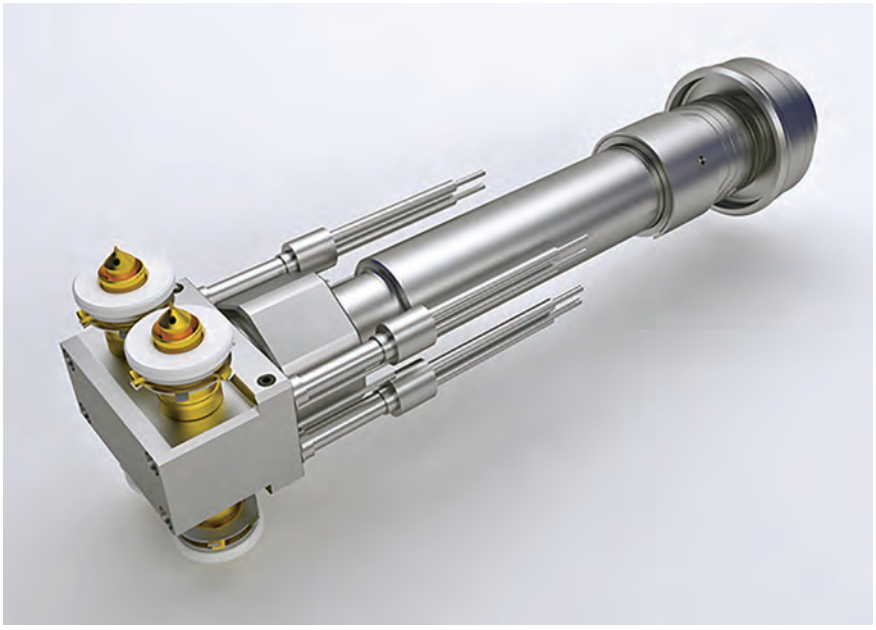


Photo Credit: Husky Injection Molding Systems Ltd.

Husky's Ultra SideGate Inline nozzle can produce a gate with a vestige as small as 0.05 mm.

and hot halves. According to Hasco, the robust, form-fit connection between the hot runner manifold and the screw-in nozzle guarantees leak-free operation and significantly facilitates the mounting and removal of the system as a whole in the injection mold. Connector cables for the individual nozzles and the hot runner pass through individually configured cable ducts to the connection box, where they're wired according to customer specifications, which saves the moldmaker or injection molder from having to connect up the system and ensures a smooth start to production. Hasco's assembly guarantees tight connections between the hot runner manifold and screw-in nozzle, eliminating the risk of leaks. Attachment points on the manifold mean that it can be readily lifted out of the cavity, avoiding any distortion of the system when it's tilted during installation or removal.

Mold-Masters has rolled out a number of additions and enhancements to its Fusion Series G2, the drop-in system suitable for the automotive industry, including an expanded nozzle range and waterless actuator technology. New for the G2 Series are the F3000 and F8000 nozzles, which expand the capabilities and applications of this system to include shot sizes from less than 15 to over 5,000 grams. The F3000 has a shot capacity of less than 15 grams, making it well-suited for smaller under-hood components, technical automotive components, and price-sensitive packaging and consumer goods applications. The F8000 increases shot capacity of the system further to 5,000 grams by utilizing runner diameters up to 28 mm, and nozzle lengths are also available that exceed one meter. Both the F3000 and F8000 are delivered completely pre-assembled and pre-plumbed, which saves significant set-up time. And by incorporating popular features like field replaceable heater bands, any maintenance is quick and easy.

Husky Injection Molding Systems Ltd. recently introduced its Ultra SideGate Inline nozzle, which the company said allows for direct sidewall gating of high-quality parts that would otherwise require gating with a cold runner. Available in angled or straight tips with variable tip distances from 55 to 63 mm, the nozzle is ideal for part spacing as small as 18 mm, Husky said, and can produce a gate with a vestige as small as 0.05 mm, depending on the resin. The patented design features a replaceable tip that's separate from the nozzle. It improves cooling and eliminates the need for split melt flow cavities in favor of a single cavity. Like Husky's conventional Ultra SideGate, the new Inline nozzle provides easy access to the nozzle tip and allows for in-machine maintenance. Ultra SideGate Inline handles a wide variety of resins, including difficult-to-mold materials such as PC, Husky said, and is suited for molding deep-draw parts such as pipettes and syringe barrels, or hinged closures or smaller parts where gate quality is critical and only side gating is possible.

COMING TO NORTH AMERICA

Incoe's Slim-Flo nozzle, which incorporates its Seal-Fit leakproof technology, is now available in North America. The nozzles, which thread into the manifold, are designed to save energy compared to compression-style nozzles because they don't touch the mold at the nozzle/manifold transition, business development manager Jim Bott said. In addition, Bott said, the positive threaded connection between nozzle and manifold minimizes the risk of leakage between the two components. The Slim-Flo nozzles, which have a five mm-diameter flow bore, are part of Incoe's Direct-Flo line of modular hot runner systems. The nozzles are screwed into the manifold, creating an all-in-one system that minimizes cavity distances to promote more efficient molding with a multi-cavity tool.

The L2X-Mikro, Ewikon's drop-in hot runner system for direct gating of parts as small as 0.05 grams, is also now available in North America. Inspired by an earlier high-cavitation system, the L2X-Mikro has a more compact manifold with fewer drops to handle small shot sizes, Ewikon president David Boxall said. "Thanks to its short flow paths, which are designed to handle a small volume of flow, it can process thermally sensitive engineering and commodity resins," he said. "The system features a 61 by 48 mm manifold in three standard, compact layouts with two, four or six pre-installed nozzles that fit the most commonly used mold sizes for small presses. The system is also offered as a hot half in two standard sizes." Each nozzle has a leakproof, screw-in con-

nection that reduces space requirements in the mold, Boxall added.

REJECTING CONVENTION

HRSflow recently launched its HPgate, a new hardened metal valve gate that's screwed into the mold and can be replaced easily. The insert allows the user to manufacture parts with a high-quality finish at the gate without flash. The HPgate addresses the difficulties molders face when using conventional gates: Having to adjust for narrow gate dimensions and flow variations that impact the symmetry between the gate and needle valve pin. With a conventional gate configuration, a plastic layer can form at the gating point. This layer is torn off from the part when the mold opens and could lead to flash, a problem that the HPgate minimizes. Incorporating a cylindrical needle closure reduces the time required to optimize the process and attain high-quality parts. But due to the hardness of the insert, the HPgate allows moldmakers the option of possibly choosing softer, less expensive steel for the mold plates. Another advantage is that the needle has a conical contact surface that better controls its temperature, the company said.

Osco has added sizes to its lineup of Multiple Gate Nozzles (MGN), which are designed to minimize residence time and deliver balanced melt flow while controlling temperature at each gate. The new MGN-G 50 is ideal for molding small parts from commodity resins, Osco vice president of sales Peter Rebholz said. It comes with a choice of two or three gates and nozzle diameters ranging from 0.343 to 0.406 inches, he added, and centreline spacing is 0.3 inches, smaller than the one-inch centre spacing required by some competing nozzles. The MGN-T 50, meanwhile, uses externally heated drops to achieve longer length parts, Rebholz said. It handles up to four gates and has nozzle diameters of between 1 and 1.812 inches. Users have a choice of three tip styles for a wide range of applications.

They may not be as attention-grabbing as a face tattoo, but these latest hot runner innovations make a lot more sense. **CPL**

RESOURCE LIST

Ewikon Molding Technologies (Rockford, Ill.); www.ewikon.com; 815-874-7270
Hasco Canada Inc. (Toronto); www.hasco.com; 416-293-5044
HRSflow Hot Runner Systems NA Inc. (Windsor, Ont.); www.hrsflow.com; 519-973-0212
Husky Injection Molding Systems Ltd. (Bolton, Ont.); www.husky.co; 905-951-5000
Incoe Corp. (Auburn Hills, Mich.); www.incoe.com; 248-616-0220
Mold-Masters (Georgetown, Ont.); www.moldmasters.com; 905-877-0185
Osco Inc. (Rochester Hills, Mich.); www.oscosystems.com; 248-852-7310

Turning up the HEAT

Expensive, high-temperature resins are almost the norm these days for some molders. But what shouldn't be the norm is using standard commercial purging compounds to try to remove them from your processing machines. Here's the right way to purge super-engineering resins.

By Mark Stephen, editor

A purging transition from colour to clean.
Photo Credit: Shuman Plastics Inc.

The Purge movie series has rapidly grown into one of the most popular and profitable horror franchises in Hollywood. For plastics processors using high-performance, high-heat engineering resins, the purge can be a horror show of a different kind.

So-called "super-engineering" resins such as liquid-crystal polymers, PEEK, polyamide-imide, polyetherimide, polyphenylsulfone, and polysulfone generally process at melt temperatures in the range of 270° to 426°C, or 520° to 800°F. Originally designed for aerospace, these increasingly popular materials can now be found in parts for the electrical/electronic, telecommunications, chemical, and medical industries. And they all share a common problem when it comes to purging: Traditional commercial purging compounds (CPCs) don't have the necessary thermal stability to purge resins at these elevated temperatures, and will lose integrity and cleaning power, leaving behind residue — and maybe even catching fire.

And because high-performance materials aren't cheap — often costing four or five times as much as traditional resins — minimizing scrap is critical. Which means that, like it or not, if you're processing high-heat engineering resins, you can't afford not to purge your injection molding machines, extruders, blow molding equipment, and hot runner systems. So since you have to do it, you might as well do it right, by using specialized CPCs that are designed for the job — that maintain thermal stability at very high processing temperatures — and by following the instructions that come with them.

The good news is, most CPC makers and suppliers have at least one killer grade — and sometimes more — designed specifically for high-heat engineering resins, and depending on their preference, processors can choose between mechanical and chemical purge products.

MECHANICAL ENGINEERING

Available through Sun Plastech Inc., Asaclean PF grade mechanical CPC is designed for super-engineering resins at processing temperatures of up to 420°C, or 790°F. "The PF grade is also suitable for hot runner cleaning and may be used as a sealing material during machine shutdowns within temperature ranges of 280° to 420°C, or 535° to 790°F, because of its superior thermal stability," said Jarred Packard, project engineer with Sun Plastech. "For difficult changeovers with high-heat engineering resins — going from black to white or black to natural — we recommend Asaclean PX2; it's a glass-filled mechanical purge with superior scrubbing power and can purge resins at processing temperatures of up to 420°C, or 790°F."

Another mechanical CPC is Chem-Trend L.P.'s Lusin Clean G410, which is formulated to operate from 300° to 415°C, or 570° to 780°F, and is compatible with PPO, PEEK, PPS, PSU, and LCP materials. "Lusin Clean G410 facilitates quick colour change using a minimal amount of material, reducing colour changeover time by up to 90 per cent and reducing scrap from 50 to 90 per cent," said Corey Henley, Chem-Trend's senior technical service specialist.

Neutrex Inc., which has been manufacturing Purgex brand CPCs since 1992, offers Purgex 3057 Plus, a mechanical purge which includes a modified PE for higher temperature resins. "This CPC can be used for rapid turnaround on colour and material changes with challenging resins such as LCP, PBT, and PPO, on alloys such as PC/ABS, and is recommended for glass- or mineral-filled applications," the company said. "This blend operates up to 315°C, or 600°F, with a five-minute soak or higher temperatures without a soak."

From Shuman Plastics Inc./Dyna-Purge, Dyna-Purge E2 is a mechanical CPC that's effective through the broad temperature range of 300° to 380°C, or 575° to 715°F. "The E2 compound is engineered for colour changes, resin changes, and preventative machine maintenance," said Shuman Plastics president Ken Shuman. "It's non-abrasive and thoroughly loosens carbonized and degraded resin, allowing it to be flushed away."

On the chemical side, meanwhile, Slide Products Inc. offers Purge-Atory HT, which contains a PET resin carrier. "It's especially well-suited for processors running PEEK or Ultem, and can be used to 370°C, or 700°F, and higher," said Juan Grino, the company's factory sales representative. "We've had customers use Purge-Atory HT to remove PEEK that processes at 480°C, or 900°F, which is blow torch temperature."

OPERATING INSTRUCTIONS

Now that you know some of what's available, the issue of how to use these specialized CPCs can be complex. We can start by getting rid of a common misperception: the assumption that processing at very high temperatures causes super-engineering resins to degrade more quickly. "That isn't true," said Ken Shuman. "Thermal stability is a key feature of high-performance plastics, so there isn't any more degradation than with traditional resins operated at more traditional temperatures."

> **Traditional CPCs don't have the necessary thermal stability to purge at the temperatures needed to remove high-heat engineering resins, and will lose integrity and cleaning power, leaving behind residue — and maybe even catching fire.**

Which means that you don't have to purge high-heat engineering resins more often than other applications, but there may be differences in *how* you purge these materials. And these operating procedures can vary. "It often comes down to a partnership between the customer and the CPC supplier to figure out how to get the purging compound through the machine as quickly and efficiently as possible," Shuman said. "The goal is to purge without degrading the purge itself, which would just compound the problem. It's a more nuanced procedure, and a good CPC supplier will work closely with the customer the first time to reach the right process, if possible by being there in-person to supervise."

As Shuman and other experts agree, speed is definitely of the essence. "High-temperature CPCs shouldn't reside in the machine for any longer than necessary due to the risk of decomposition," Jarred Packard said. And when transitioning from high-heat to lower heat resins, the experts say, it's helpful to bridge the temperature range by starting with purging compounds developed for high temperatures. "While the machine components are cooling, you may also need to flush and add a new barrel capacity, depending on the temperature and the time it takes to reduce heat for the next resin," Packard said."

Other things can help to lower the risks. "Have adequate ventilation, adequate air movement, and purge into a bucket of water, which quickly encapsulates the purge, reducing the amount of smoke or off-gassing," Ken Shuman said.

Beyond these points, probably no two procedures will be exactly alike. Which just goes with the territory when purging high-temperature resins. "A difficulty in determining the right purging procedure with some of the newest high-temp materials is that the processors themselves sometimes don't know what the chemical properties are," Juan Grino said. "Many times it's a unique, proprietary blend that's been developed specifically for that processor, so we won't have encountered it before and the customer might not be able to tell us exactly what's in it. The only way we

can figure out the right purging procedure in this situation is to experiment: go into the customer's plant and burn some material until we get it right."

NOT A DO-IT-YOURSELF PROJECT

But in today's hyper-competitive thermoplastics molding market, taking the time to find the right purge procedure is a luxury not all can afford. "The tension in this equation is that most customers want to have a one-size-fits-all purging solution that works for every machinery line on their shop floor, and we can't give that to them if even one of those lines is running a high-temperature material," Ken Shuman said. "These are exotic materials and by definition require more exotic CPCs and very unique procedures."

Which might lead to the worst-case scenario: processors trying to remove high-heat resins with their own in-house compounds like soap and surfactants. CPC suppliers are united in saying that this purging method — questionable at best even against softer materials — is a guaranteed fail against super-engineering resins like PEEK, which can be like cement once they cool. "The do-it-yourself approach puts your machines at risk for resin build-up, which can cause encapsulated materials to degrade and, eventually, may cause your machine to fail, which can lead to downtime," Juan Grino said. "Using regrind is also a bad direction to go with high-temp resins because, since the melt temperature has been altered, you won't know what temperature to run the regrind at."

Like so much else in plastics processing, in the end it all comes down to economics. "Having to scrap components molded with very expensive high-temperature resins is obviously detrimental to your profitability," said Jarred Packard. "And although CPCs made for high-temperature resins are more expensive than standard CPC grades, they're actually much cheaper per kilogram than the high-temp materials themselves, whereas standard CPCs cost more per kilogram than the softer, more traditional resins they're being used to remove."

Done the right way with the right CPCs, purging super-engineering resins from your processing machines won't be a terrifying experience. **CPL**

RESOURCE LIST

Chem-Trend L.P. (Howell, Mich.); www.chemtrend.com; 517-545-7980
Neutrex Inc. (Houston, Tex.); www.purgexonline.com; 281-807-9449
Shuman Plastics Inc./Dyna-Purge (Depew, N.Y.); www.dynapurge.com; 866-607-8743
Slide Products Inc. (Wheeling, Ill.); www.slideproducts.com; 800-323-6433
AceTronic Industrial Controls Inc. (Mississauga, Ont.); www.acetronic.com; 905-564-7227
Sun Plastech Inc. (Parsippany, N.J.); www.asaclean.com; 800-787-4348

Moving on UP

Ricardo Rodriguez (left) and Michael Bucko on the shop floor of Techflow's new and larger headquarters.

Ontario-based blown film machinery and plastic extrusion equipment maker Techflow Design & Manufacturing Inc. has a good reason for expanding into a new, larger facility in Mississauga: its business is booming.

By Mark Stephen, editor

In everything from combining your loans into a single payment to getting married, a well-planned consolidation can work wonders.

And when it comes to a manufacturing plant, consolidation can offer some of the biggest benefits of all: Having everything under one roof saves money, improves operational efficiency, and consolidates systems and processes. Which is one reason why blown film machinery and plastic extrusion equipment maker Techflow Design & Manufacturing Inc. recently moved into a new, larger facility in Mississauga, Ont. The other reason? The company had simply outgrown its old location because its business is booming.

Techflow offers complete turnkey blown film extrusion systems as well as line components such as single-layer and co-ex dies, single- and dual-lip air rings, bubble cages, extruder barrier screws, internal bubble cooling systems, screen changers, haul-offs, and winders. "After 15 years in our first plant in Mississauga followed by six years in a second plant in Mississauga, we moved into our third plant in November 2018," said Michael Bucko, Techflow's vice president and CEO. "We need the larger facility to allow for continued expansion and to meet customer demand, in particular for our co-extrusion blown film lines in three-, five-, seven-, nine-, and 11-layers."

IMPECCABLE CREDENTIALS

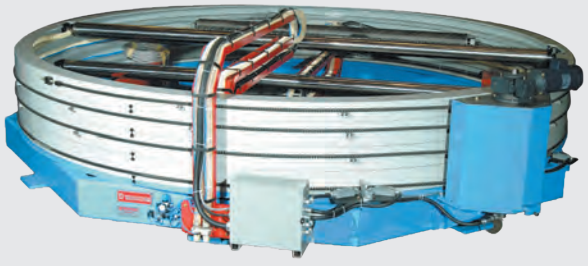
Techflow was founded in 1997 by Bucko and Ricardo Rodriguez, who is the company's president and also a Canadian blown film industry veteran and innovator. Rodriguez began his career in the 1970s as an original partner in Brampton, Ont.-based blown film powerhouse Brampton Engineering. He then went on to co-found Polysystem Machinery Mfg. Inc., a Missis-

sauga-based blown film systems supplier; and then, in 1989, he founded blown film equipment manufacturer Addex Inc. in Brampton.

Techflow started operations in classic start-up style, operating in space rented from a local machine shop. From the beginning, Rodriguez and Bucko had a specific vision for the company. "We started with a good customer base, and we've been determined to keep them all and to expand it by always being available," Bucko said.

Rodriguez's industry bona fides notwithstanding, he and Bucko still had to prove Techflow's worth in the early days by doing repairs on other company's equipment or — at best — supplying small equipment of their own. "We built the business up slowly over the years, so that the repair orders became orders for die packages and air rings, which have always been our areas or expertise," Bucko said. The company's dual-lip air rings incorporate a special laminar flow plenum that results in a minimal amount of air turbulence and maximizes distribution of air flow, providing greater bubble stability and subsequently reducing heat generation. "And our dual air ring design allows blow-up ratios that range from 1.2:1 to 4.0:1 while still maintaining optimal cooling rates and achieving high bubble stability," Bucko said.

A Techflow Design & Manufacturing product gallery:



Top to bottom: A dual-lip air ring, multiple twin co-ex lines, and a GBR oscillating haul-off.

Photo Credits: Techflow Design & Manufacturing Inc.

GROWTH SPURT

As Techflow's reputation grew, so did the size and scale of its projects. "Now we're supplying complete turnkey lines for food packaging, industrial packaging, sanitary packaging, and agricultural film by combining our core strengths of die technology and air ring technology with other vendors that supply equipment that complements ours," Bucko said.

And Techflow's business is now booming. "We sold a record number of turnkey lines in 2018, and we've been growing our sales consistently year-over-year," Bucko said. Techflow's largest client base is the U.S., followed by Mexico, and the company has sales representation throughout North America — Stephen Mudgett is its Canadian sales representative — and it has strategic alliances with firms in Europe and Latin America. "Equally important to our success is our close and valuable relationships with key ancillary component and system suppliers, who are all recognized industry leaders in the segments they serve," Bucko said.

Increased sales was why finding a headquarters to hold new equipment was a priority for Techflow as 2018 drew to a close. "The plant we've just moved into is double the size of our previous location, and it's in a brand new building in a brand new industrial park; all of the infrastructure is cutting-edge, and our new plant gives us enough extra space to expand in the future," Bucko said. "The smaller size

of our previous location created logistical problems since we had to integrate various machinery and equipment in other rented locations. We've now consolidated everything under one roof, which is going to make us a lot more efficient."

biggest challenges," Bucko said. "We're constantly looking to find technicians and investing time and training into developing our skilled workforce."

Which isn't the worst problem to have, since manpower shortages only plague companies that are thriving. As to why Techflow is thriving, Bucko has a pretty good idea. "We believe in addressing a problem before a film line is shipped," he said. "It can be tempting to deliver a line ahead of schedule to try and impress the customer, but if it's not up to spec it's just going to create problems down the road and you'll lose any goodwill you've created. We check, double-check, and measure everything before we ship any equipment. As a result we have very few maintenance issues."

We sold a record number of turnkey lines in 2018, and we've been growing our sales consistently year-over-year.

EMPLOYEES WANTED

The larger space also means that Techflow can hire more personnel, which it needs to do to handle its increasing business. This might be easier said than done, however. "Like every other manufacturing company, finding skilled workers is one of our

So from the 30,000-foot view, Techflow is where it wants to be at the moment. But Rodriguez and Bucko still aren't completely satisfied. "We're happy with our growth, and we've taken steps to ensure that we can still keep the high level of satisfaction that our clients expect from us, but we'd like to have more things under our own control," Bucko said. "We sometimes have to arrange for several contractors to be present at the same time for a start-up, for example, and the scheduling logistics of that can be tricky. In the future, we'd like to bring more of these technicians into our company."

Techflow's consolidation isn't over yet, then. **CPL**

AUXILIARY EQUIPMENT

Pellet dryer for abrasives

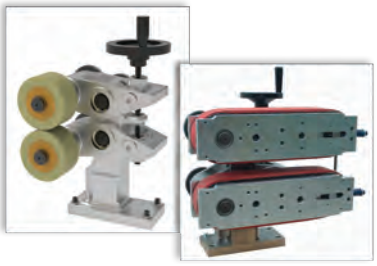
A new *pellet dryer* for use with **Nordson Corp.**'s BKG pelletizing systems is designed to meet the challenge posed by the steady growth in use of glass-filled and other abrasive materials by substantially reducing the time and cost associated with replacing "wear" parts.

The design reduces the number, complexity, and cost of the dryer components that are subject to abrasion and makes them more accessible to maintenance or replacement. While the new dryer has much the same overall appearance and footprint as a standard BKG dryer and provides the same throughput, there are substantial differences in the configuration of components subject to wear. The new design reduces production downtime by simplifying maintenance, making it possible for one person to carry out maintenance tasks.

Due to the optimized pellet inlet, the rotor has been simplified, especially in the lower area, and wear is minimized by the reduced impact of abrasive pellets. Other measures taken to reduce or eliminate wear from pellet flow include a new cover plate design and countersinking of screw heads.

Nordson Canada Ltd. (Markham, Ont.); www.nordson.com; 800-463-3200

Non-motorized puller assemblies for downstream handling



Versa Machinery has introduced a new series of *non-motorized puller assemblies*, in pinch roll and caterpillar puller designs, for a wide variety of downstream handling requirements at speeds from 0 to 900 feet per minute.

"P" series pinch wheel feeds are available with roller widths from two to 5.5 inches (50 to 127 mm) with roll materials offering different traction and wear characteristics, and are well-suited for the manufacturing of 3D printer filament, moving and punching rigid profiles, and for capturing materials trimmed from the edges of various profile and film extrusions.

"C" series caterpillar feeds come with belt configurations ranging from two to nine inches (50 to 230 mm) length and four to 18 inches (100 to 460 mm) width, and are

well-suited for pulling extruded vinyl siding.

Standard non-motorized puller assemblies are equipped with a hand wheel to adjust the belt gap, which opens and closes around a constant centreline. Optional pneumatic operation of the belt booms along a constant centreline allows control of the pressure applied to the product being pulled, and makes repeatable set-up almost instantaneous.

Versa Machinery (Elkhart, Ind.);
www.versamachinery.com; 574-266-0780

INJECTION MOLDING

Control complex processes easily

Based on customer requests, **Engel** has upgraded the *CC300 controller* for its injection molding machines, which include hydraulic, electric, horizontal, and vertical models for applications ranging from precision micro parts to large automotive components.

New features include an overview of all components and machine tasks that's located on the home screen.

Components like the injection unit and tasks like mold set-up are used particularly frequently as a starting point with the control unit. Thanks to the new arrangement on a shared page, the machine operator can now switch between tasks and components even faster. In the style of the CC200, the production and system settings pages can be opened from any page by swiping from the left or right edge of the screen, helping to smooth users' transition from CC200 to CC300.

In addition, "breadcrumb" navigation ensures even better orientation. Breadcrumb trails map out the entire navigation path, enabling the user to see at any time which level they have reached and to move in a targeted way to any other level.

The improved controller will be standard on all new Engel presses worldwide, with shipments beginning in early summer of 2019.

Engel Canada (Waterloo, Ont.);
www.engelglobal.com/na; 519-725-8488

New all-electric press for packaging applications

Wittmann Battenfeld has extended its EcoPower Xpress series of all-electric, high-speed injection molding machines into the lower clamping force range with the addition of the new *EcoPower Xpress 160/1100+* press, which delivers 1,600 kN clamping force.

Specially designed for thin-wall applications with high volumes, as required in the packaging industry, the new unit is equipped with a highly dynamic injection unit. The screw infeed movement for injection and retraction of the screw during plasticizing is driven by twin herringbone gear racks with symmetrical force transmission.

The clamping unit of the EcoPower Xpress 160/1100+ is a three-platen/four-tie-bar system with a five-point toggle lever, self-locking in the end position, with a drive system consisting of a servo motor and rack-and-pinion gears. The highly rigid moving platen travels on a moving carriage on the machine frame, supported by linear guides and rotating roller bearings, without contact to the tie-bars.

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

AUTOMATION

Custom-made for pick-and-place

The new *LRX EasyControl* linear robots from **Krauss-Maffei Corp.** are designed to offer an efficient solution for simple pick-and-place applications.

The basic components of the new LRX EasyControl series are fundamentally based on the new LRX small robot series that was launched in 2017 and includes firmly defined, standardized equipment. This standard covers all requirements for simple pick-and-place applications.

The primary focus of the new LRX series is on the control system of the linear unit. The concept of the new EasyControl is based on three different programming stages that are mutually interchangeable. Its advantage is that the system enables different production operators to work flexibly in their preferred system, depending on their level of experience and the application at hand. Compared to conventional control systems, the new EasyControl enables users to get started with the automation process up to 30 per cent faster. This quick introduction process also lessens the risk of faulty programming and therefore faulty operation, which in turn helps to avoid failures and collision-caused shutdowns.

KraussMaffei Corp. (Florence, Ky.); www.kraussmaffei.com; 859-283-0200

RAW MATERIALS HANDLING

System monitors railcar unloading

Novatec Inc.'s new *RailSense* system monitors the condition of the major components in railcar unloading systems, diagnoses problems, and recommends corrective actions.

RailSense monitors pressure, vibration, vacuum, and temperature; checks the condition of filters, oil, and bearings; and ascertains the overall operating health of the systems, which are used to transfer resin and other bulk materials into silos. RailSense sensor data is transmitted via Internet connection to a PC, smart phone or tablet using easily understandable icons that describe the condition of major components and recommend necessary corrective actions via text messages and email.

Based on Novatec's MachineSense technology, which employs machine-wearable sensors to facilitate predictive maintenance, RailSense users receive equipment data in real-time.

With RailSense, the operator of the railcar unloading system can avoid multiple trips between the railcar, the silo pad, and the unloader to check fill levels and unloading conditions. The easy-to-use system allows workers to perform maintenance based on actual equipment conditions, and alerts users to problems before equipment fails.

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

CLEANROOMS

Flexible-design cleanrooms certified to ISO 14644

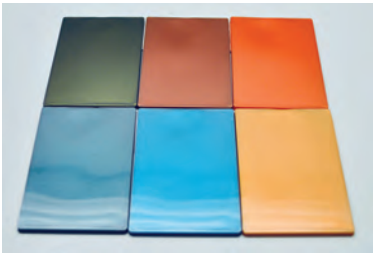
Softwall cleanrooms from **Hemco Corp.** have been certified to international standard ISO 14644 (Class 5/ Class 8), and feature a flexible design that allows them to locate over and around equipment, with the option of being mobile with casters.

The structural framework is of aircraft anodized aluminum with clear vinyl curtains around the unit. Configurable with entry airlocks, the curtains can be strips or solid depending on restriction of access in clear or opaque white vinyl. Fan-powered HEPA filter and fluorescent lighting modules along with blank ceiling tiles are positioned into a ceiling grid system, and optional entry airlocks can be incorporated into the design. The HEPA filter modules have power cords and speed controls and can operate on 115v or 220v power.

Hemco Corp. (Independence, Mo.); www.hemcocorp.com; 800-779-4362

COLOURANTS

Special effects at low addition levels



New special effect liquid colours from **Riverdale Global** are designed to help manufacturers of packaging and consumer products enhance shelf appeal and add value while using lower let-downs of colourant compared to pellet masterbatch.

The new specialty colours include *Deep Pearl*, which uses particles that provide a standard pearlescent effect at lower let-downs; *Transparent Pear*, which is used at 0.5 per cent loadings in clear resins and exhibits a glitter effect; *Blast*, which provides super-bright pearlescent effects while minimizing flow lines; *Splash*, which combines bright specialty pigments and pearlescent particles to yield super-bright effects; *Metal* (pictured), which provides a smooth, flat surface with a metallic sheen; *Metal Expression*, which has larger particle sizes that create a glittery metallic effect; *Transparent*, which can be used at loadings of only 0.1 per cent to tint clear resins; and *Natural*, which are dispersions of FDA-approved colours in natural carriers, whereas the carrier resins in masterbatch are synthetic substances.

The new special effect colours are each supplied in a container that stays sealed from the moment it arrives at the processor's loading dock, through storage, handling, and metering into the process, and during return to Riverdale Global for replenishment.

Riverdale Global (Aston, Pa.); www.riverdaleglobal.com; 610-358-2900

Putting a price on a used extrusion line

By Allan Griff, consulting engineer

Some things aren't easy to quantify. Love is one of them, and the value of a used extrusion line is another. But unlike love, determining the value of a used extruder is definitely doable, provided you ask the right questions.

Sometimes I get asked to estimate value or capacity, or both, perhaps for legal purposes or by someone wanting to sell or buy a used line. My easy answer to a buyer is to invoke the rule of thirds. First, find out the cost of a new line of equal size (diameter and L/D) and power (kW or hp), if possible from the same company that made the used one. Then plan to pay one-third of that price to buy the used line. If it's selling for less, it may be very old or in poor condition, or both. If the price is more than one third, find out why. There may be a good reason: The machine may be relatively new and is being sold because the company has folded or decided to move far away, or it lost some business and the machine is now redundant.

Then, allow another third to fix what's broken, often electricals, and shipment costs.

The final third is the savings achieved by buying used.

But it's not always that easy. A line may be more valuable depending on how soon it can be put into operation. In some cases, where the line is still at its owner's plant, it might even be leased and run there to get seasonally-needed production right away, and then sent to its new location in the off-season. If you do this, consider the possibility of leaving the line in place and having the owner continue to make your product under lease or some other creative financing. This is particularly attractive if you don't do extrusion yet, as it saves you the hassle and cost of buying and storing resins and additives, finding employees, and running 24 hours a day.

WORTHWHILE QUESTIONS

Another way to estimate value is to go online and look for similar equipment on websites of used-extrusion-line dealers. In evaluating prices, make sure they include location, options to inspect and test, packing costs, availability, and payment terms — Right now? On receipt? After successful operation? I ask for age, but I also try to see the machine nameplates, which may show the year of manufacture or at least a serial number that will allow me to check with the OEM.

As for capacity, there are many limits, and they often depend on the product to be made as well as the equipment, so a combination of experience and data is needed. If I have to make an educated guess, I use my table of limits for different resins: four lbs per hour per hp for HDPE; five for PP; six for LDPE; eight for PS; and 10 for PVC. But we may not always be able to get full power from the motor because of the speed reduction ratio. Also, higher viscosity (lower melt index) may need more power, but that may be countered by preheated feed and more barrel/die heat.

Downstream equipment (line speed) may control the production rate, and this usually is limited by cooling. This may depend on roll size in a flat film/sheet line, or tower height in blown film, but limits can often be raised by modifications such as internal bubble cooling in blown film, added surface agitation in water-cooled profiles, and sometimes just by cleaning the water passages in the rolls.

Cooling is also affected by melt temperature, so controlling that temperature by conditions or screw design will affect maximum saleable output. I include the word "saleable" as product value depends on control of thickness and physical properties, which may deteriorate at high production speeds. In short, 70 lbs saleable is worth more than 100 lbs of scrap. **CPL**

Allan Griff is a veteran extrusion engineer, starting out in tech service for a major resin supplier, and working on his own now for many years, as a consultant, expert witness in law cases, and especially as an educator via webinars and seminars, both public and in-house. Find out more on his website, www.griffex.com, or email him at algriff@griffex.com.

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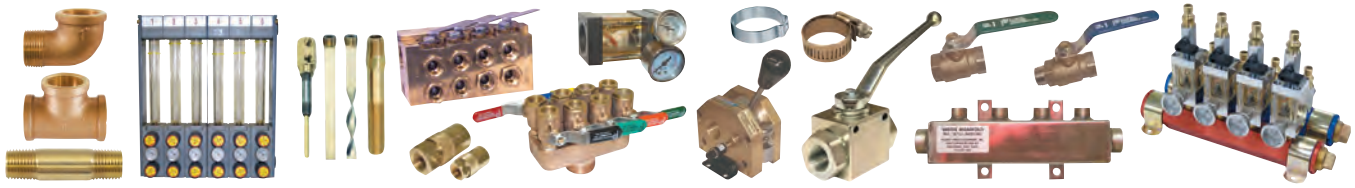

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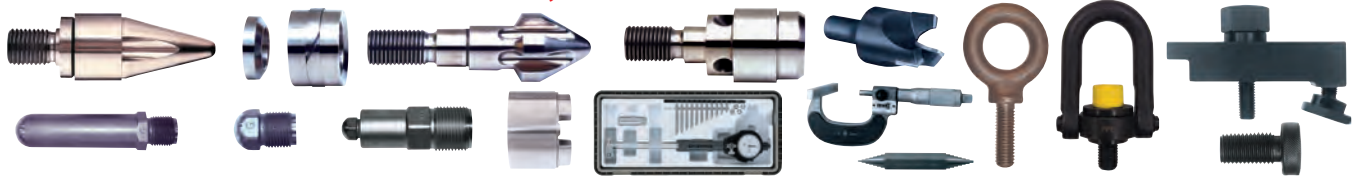

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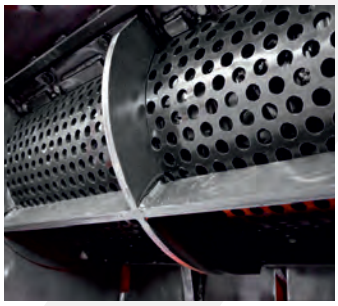

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