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# Canadian Plastics

FEBRUARY 2017

## UP IN SMOKE

Will Canada's carbon tax  
plan hurt our industry's  
competitiveness?



**INJECTION MOLDING**  
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## FROM THE ARCHIVES

The January 1961 issue of *Canadian Plastics* reported on what was the largest injection molding order ever placed in Canada to that point: six million PVC ammunition pouches to be produced annually for the Canadian Army. Manufactured by Markham, Ont.-based Humphrey-Cosburn Plastics Ltd., the olive-coloured pouches, which would replace traditional cotton pouches, were made from materials supplied by Canadian Resins & Chemicals and had to meet rigorous strength, stiffness, and heat and water resistance standards. And this largest order had the potential to get even larger; as our story noted, since Canada was obligated to inform fellow NATO countries of the existence of the pouch, these nations now had the opportunity to order their own pouches from Humphrey-Cosburn.

## Number of the month: \$50\*

\* Price per tonne of carbon dioxide emissions by 2022, according to Liberal government policy. (See pg. 13)

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Cover Photo ©Getty Images/Thinkstock



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New carbon taxes in Ontario and Alberta, combined with existing fees in Quebec and B.C., could provide a model for other provinces that will soon be forced by the federal government to reduce greenhouse gas emissions. Environmentalists are thrilled. Businesses, however, worry that Canada's carbon pricing scheme threatens the manufacturing of fuels and petrochemicals — and puts industry jobs at risk — by creating a competitive disadvantage through increasing fuel and energy costs.

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Just because granulators and shredders operate differently doesn't mean processors and recyclers have to choose one or the other. Fact is, combining them into a two-stage system is the best way to get consistent, uniform feed material. But as in all successful partnerships, it takes planning and great communication.

#### 20 INJECTION MOLDING: The need for speed

There are basically two business directions available to today's plastics processors: growth or bankruptcy. If you prefer growth, you'd better be making quality parts as fast as possible. Which is why speed and more speed is a key theme of new injection molding machines aimed at packaging and medical markets.

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When this Toronto-based extruded film maker purchased a flexible packaging supplier four years ago, it didn't just change its name; it changed its business. And business is now booming.



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# Some upsides to Trump

With all the hand wringing and hair pulling from certain segments of American society — the professional classes, the media, Meryl Streep — you'd think the recent election of Donald Trump as the 45<sup>th</sup> President of the United States marked the effective end of that great nation.



And the orange-hued billionaire populist is even less beloved in Canada, with one recent poll finding that a whopping four out of five Canadians are fearful of a Trump presidency and believe it will be "bad" for Canada.

Economically, at least, our fears seem more justifiable than Meryl Streep's. Trump won the election in large part because of his promise to scrap NAFTA and the yet-to-be-ratified Trans-Pacific Partnership (TPP) trade deal, both of which are huge components of our economy. While campaigning for the presidency, Trump lambasted NAFTA for sending millions of manufacturing jobs to Mexico and China, and called the TPP "a potential disaster" for the U.S. Trump has promised to negotiate — in his words — "fair bilateral trade deals that bring jobs and industry back onto American shores."

And he's already suiting the action to the word. In early January — before he even took office — Trump arm-twisted Ford Motor Co. into cancelling a new US\$1.6 billion car assembly factory it was planning for Mexico, and instead allocating US\$700 million to a Michigan plant, adding more than 700 jobs there. The company was responding to Trump's threats to impose new barriers against imports, especially from Mexico and China. Ford's new factory — like the eight other auto plants built in Mexico since 2009 — was predicated on exporting finished product back to the U.S. But that entire business model has now come to a smoking, screeching halt.

The repercussions of Ford's deci-

sion and Trump's continuing hostility to NAFTA — and we can forget about the TPP, which he has already deep-sixed — are huge. Automotive products are Canada's most important export and our industry depends crucially on the U.S. market, which takes 85 per cent of our vehicle output and around two-thirds of parts production. Any significant disruption in U.S.-bound trade would have enormous repercussions for Canadian production, investment, and jobs.

That said, there's reason for cautious optimism among auto industry workers in Canada. As analyst Jim Stanford noted in a recent *Globe and Mail* editorial, there are huge and fundamental differences between Canada and Mexico, and their respective trade relationships with the U.S. "U.S. auto trade with Canada is balanced, unlike Mexico," Stanford wrote. "We sell more vehicles to the U.S. than we import from them, but we buy a lot more parts from the U.S. The resulting imbalance (in Canada's favour) is small, relative to a very large two-way flow. These factors make it unlikely that Trump's anti-Mexico strategy will be mirrored in similar hostility to Canadian products."

In short, any disruption in cross-border auto trade with Canada would hurt the U.S. as much as us. And it's also possible that, by stopping the migration of industrial capital toward Mexico, Trump will actually help Canada's auto industry.

He might also help us in a larger sense. Trump's fundamental economic message — that regulatory interference has stifled new and small businesses, the traditional engines of job growth in the U.S. — is equally valid in Canada. There's too much sand in the gears of economic life in our country, and working Canadians know it. If Trump can inspire his entrepreneurial counterparts in Canada to get involved in politics — hello, Kevin O'Leary — we'll owe him a sizeable debt. No matter what Meryl Streep thinks.

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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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Canada



# The amazing antibiotic SPIDER SILK

to the ancient Greeks and Romans, who treated wounded soldiers with spider webs to stop bleeding. The material is strong, biodegradable, and biocompatible, making it an attractive candidate even today for use in modern biomedical applications. Unfortunately, the availability of natural spider silk is limited as the territorial and cannibalistic nature of spiders prevents large-scale farming. Hence the need for a synthetic substitute.

“There is the possibility of using the silk in advanced dressings for the treatment of slow-healing wounds such as diabetic ulcers,” Thomas said. “Using

**W**e all know what happened when Peter Parker had a run-in with a radioactive spider. Less well known, but potentially even more transformative, is the chance meeting between a spider expert and a chemist that has now resulted in the development of an antibiotic polymer-based synthetic spider silk that can be tailored for use in drug delivery, regenerative medicine, and wound care.

The idea came together at a discipline bridging university meeting in the UK in 2012, when Professor Neil Thomas from the School of Chemistry connected with Dr. Sara Goodacre from the School of Life Sciences. Thomas was looking to create new drug delivery system and Goodacre, who heads up the School of Life Sciences’ so-called SpiderLab, realized that spider silk might provide the ideal material. Now, after five years of work, an interdisciplinary team of scientists at The University of Nottingham has developed a technique to produce chemically functionalised spider silk. In particular, they have demonstrated that the antibiotic levofloxacin can be incorporated in the silk and slowly released from the material. Moreover, antimicrobial activity can be maintained for at least five days.

The Nottingham research team has shown for the first time how “click-chemistry” can be used to attach molecules, such as antibiotics or fluorescent dyes, to artificially produced spider silk synthesized by *E. coli* bacteria. The chosen molecules can be “clicked” into place in soluble silk protein either before it has been turned into fibres or after the fibres have been formed. This means the process can be easily controlled and more than one type of molecule can be used to “decorate” individual silk strands.

According to the Nottingham research team, their technique can be used to create a biodegradable mesh that can do two jobs at once: replace the extra cellular matrix that our own cells generate to accelerate new tissue growth while gradually releasing antibiotics.

The use of spider silk in medicine actually dates back

our technique, infection could be prevented over weeks or months by the controlled release of antibiotics. At the same time, tissue regeneration is accelerated by silk fibres functioning as a temporary scaffold before being biodegraded.”

Top that, Spider-Man.

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## As FEPAC shuts down, Pierre Fillion discusses what's next

Being successful sometimes involves knowing when to call it a day. Which is why, after eight years in business, the Federation of Plastics and Alliances Composites (FEPAC) decided to cease operations at the end of 2016.

The Boucherville, Que.-based association was founded just before the beginning of the Great Recession, and having helped guide its member companies through the downturn and beyond, FEPAC president and CEO Pierre Fillion and the other members of the FEPAC board decided the organization had fulfilled its mandate. "In starting FEPAC, we wanted to create an association that would tackle the challenges facing Quebec's plastics processors, as opposed to other organizations that tended to focus on the needs of the material suppliers," Fillion said. "Our main goal was to help processors develop more sustainable operations." To that end,



Pierre Fillion

FEPAC created its two signature initiatives: the Plant-School program, which provided learning plans for new employees of member companies and skills enhancement plans for current employees; and the ECO-responsible certification program, which guided them through a process to develop more environmentally-friendly end products.

"Both programs have been successful, and we came to the conclusion that we had taken them as far as we could in Quebec; the concerns they represent are international issues now, which meant that FEPAC was no longer necessary," Fillion said. "The Plant-School program has grown beyond FEPAC and is being considered by most other provinces; and the ECO-responsible program is going to be carried on by the Vinyl Institute of Canada, which is licensed to deploy it on a national scale."

As it turns out, however, shutting

FEPAC down is really just the next step in the organization's evolution. "The board members of FEPAC and I plan to develop a new business model — a business-to-business web platform that we hope to have up and running by the end of 2017," Fillion said. "And whereas FEPAC was not-for-profit, this will be a for-profit venture. We see this as the new paradigm for industry associations."

In addition to Fillion's involvement in the new web platform venture, he has also started up his own private sector company. "My firm is the worldwide distributor for a carbon nanoparticle manufacturer," he said. "We'll be competing directly against the carbon nanotubes industry, with what we believe is a better performing, more affordable nanopolymer." Fillion is also serving as the president and CEO of the Saint-Martin, Que.-based Council of Sustainable Industries, which is working alongside the Vinyl Institute of Canada to nationalize the ECOresponsible program.

So the message from FEPAC's staff isn't goodbye, it's see you again soon.

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## Nova begins shipping LLDPE from new Alberta reactor

Nova Chemicals Corporation has started up its new world-scale LLDPE gas phase reactor at its site in Joffre, Alta., and is now shipping butene LLDPE produced on-site to its customers.

This is the first new LLDPE reactor in the Americas in over a decade, Calgary-based Nova said, and represents a billion-dollar investment.

"The new capacity allows us to meet the growing demand for flexible films used in food packaging, heavy-duty sack, and can liners," said Chris Bezaire, Nova's senior vice president, PE business. "The new supply of LLDPE from our PE1 expansion project will enhance our

position as a leading PE supplier in the Americas, helping our customers grow and succeed in their businesses."

The addition of the Joffre reactor

increases Nova's LLDPE production capacity by close to one billion lbs, giving the company a total PE production capacity of approximately five billion lbs.

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Photo Credit: Nova Chemicals Corporation

## Cavalier Tool & Manufacturing keeps growing

Having almost literally outgrown the available floor space at its plant, Windsor, Ont.-based moldmaker Cavalier Tool & Manufacturing is now nearing the end of a multimillion-dollar, 14,000-square-foot expansion.

“We’ve had phenomenal growth over the past five years, with annual sales increasing from \$10 million to \$30 million and employment from 85 workers to more than 120,” said Tim Galbraith, general sales manager at the company, which opened its doors in 1975. “But we grew without any bricks and mortar, and one of the sacrifices was that our assembly areas have gotten progressively smaller, to the point where we’ve had to use aisle space for final assembly of tools, which is not ideal.”

The new addition to the company’s existing 50,000 square feet of space will be dedicated to advanced assembly and final manufacturing, Galbraith said, and will link the firm’s two existing buildings. “We will set up stations that will be fully equipped, and every group will have a fully stocked area for final assembly,” he explained. “We are planning to officially open the addition in March 2017.”

Although Cavalier began as a company catering primarily to the auto industry, it shifted its focus about nine years ago under the direction of president Brian Bendig, the son of one of the three original partners. “We diversi-

fied our base to include recreational, agricultural, and commercial customers,” Galbraith said. “We are unique in being primarily non-automotive.”

The firm is also unique in the amount of time and



The construction at Cavalier Tool.

Photo Credit: Cavalier Tool & Manufacturing

resources it gives back to the Windsor community. “Brian Bendig is very involved with technical programs in the local high schools and apprenticeship programs in the local colleges; he volunteers his time and gives his input to help design the curriculums,” Galbraith said. “We also promote tours from high schools and community colleges, and had 500 students through our facility in 2016 on a

variety of tours. We are actively lobbying the community, showing young people that manufacturing is a good career choice that involves challenging work on multimillion-dollar machines.”

Cavalier expects to hire at least an additional 20 skilled trades workers once the expansion is complete, Galbraith said. “We are bursting at the seams, and would have even more work now if we had enough skilled trades,” he said. “We realized early on that the only way to achieve our goals was to embrace new technology. Brian Bendig and others from our firm have traveled the world to find the most innovative technologies available and incorporate them here, and it’s paying off.”

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## New North American thermoplastic distributor opens shop

A new thermoplastic distribution group has opened shop in North America, and appointed a Canadian partner.

Headquartered in Clarkston, Mich., General Polymer Thermoplastic Materials LLC opened its doors in October 2016 in response to what it calls “market demands from both prime thermoplastic suppliers and small and medium-sized users for improved supply, access, and support for engineering resin distribution.”

The firm is headed by industry veterans Greg Boston and Michael Kirtley. Boston is a former executive with General Polymers-Ashland Distribution, EMS-Grivory, and Asahi Kasei; and Kirtley is president of Spartan Polymers and formerly of Channel Prime Alliance, Ostermann, and Delta Polymers.

“The creation of supersized distributors through the consolidation of smaller distribution entities into larger multinational organizations has provided a space for a new entry in national distribution,” Boston said. “We are

honouring the lessons that Michael and I learned during the early days of authorized resin distribution, where relationships with resin producers and a focus on small and medium-sized processors were important to the industry.”

The initial plan was to start with commercial coverage in the Midwest U.S., Kirtley said, but the new firm has already expanded into other areas of the U.S. and Canada. “We planned our launch of General Polymers with a focus on the Detroit metro area, but we were quickly presented with new opportunities in other regions of North America. We now have over one-third of North America covered, from Ontario west to Illinois and Kansas, and south to Georgia,” Kirtley said.

Simcoe Plastics Ltd., of Shanty Bay, Ont., is General Polymers’ partner handling sales in Canada. The firm is headed by Kurt Stahle. “Having worked with Kurt and his organization in the past, Simcoe Plastics was a natural fit for a cooperative expansion in Canada,” Boston said.

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## PEOPLE



Dennis  
Darby



Peter  
Detmers



Joe  
Hruska



Maurice  
Janssen



Stacie  
Kordts



Rob  
Palmisano



Matthew  
Pékrl

- Toronto-based industry and trade association **Canadian Manufacturers & Exporters** has named **Dennis Darby** as its new president and CEO.
- Measuring and testing equipment supplier **Mitutoyo Canada Inc.**, headquartered in Mississauga, Ont., has named **Peter Detmers** as its new president.
- Toronto-based **Canadian Plastics Industry Association** has named **Joe Hruska** as vice president, sustainability.
- Minneapolis, Minn.-based testing equipment supplier **Mocon Inc.** has named **Maurice Janssen** as its senior vice president, global sales and marketing.
- Bolton, Ont.-based processing equipment maker **Husky**



Myron  
Petruch



Gary  
Phillips



Kirk  
Winstead

- Injection Molding Systems Ltd.** has named **Stacie Kordts** as its vice president, human resources.
- Parsippany, N.J.-based material supplier **Sun Plastech Inc.** has appointed **Rob Palmisano** as national sales manager for its Asaclean line of purging compounds.
- Material supplier **Teknor Apex Company**, headquartered in Pawtucket, R.I., has appointed **Matthew Pékrl** as OEM market development manager for its TPE division in North America.
- **Myron Petruch**, president of Parsippany, N.J.-based **Sun Chemical's** performance pigments division, has been named an executive officer of DIC Corporation, Sun Chemical's parent company based in Tokyo, Japan.
- Fairlawn, Ohio-based resin supplier **A. Schulman Inc.** has named **Gary Phillips** to the new position of chief commercial officer.
- Cranberry Township, Pa.-based **IPEG Industrial Group** has named **Kirk Winstead** as president. IPEG owns the Conair Group, Thermal Care, Republic Machine, and Pelletron Corporation plastics processing, waste recycling, and industrial heat transfer brands.

## In loving memory of Joseph "Joe" Peter Galea

March 7, 1944 – December 28, 2016



It is with great sadness that we inform you of the passing of our co-founder Joseph "Joe" Galea. Joe passed away on Wednesday, December 28th, 2016, after a battle with cancer. Joe was a true Visionary in our industry and the original Malpack believer. Malpack, the company, would not be here today without the vision and guidance he has provided since its inception in 1973. Over 43 years of dedication to his family, employees and customers will not be forgotten. His passion and humble nature will never be overlooked in our organization.

*'In loving memory .....We'll meet again someday'*

## SUPPLIER NEWS

Mississauga, Ont.-based **Rate Technology Systems** is the new representative for **Schenck Process LLC** in the provinces of New Brunswick, Newfoundland, Labrador, Nova Scotia, Ontario, Prince Edward Island, and Quebec. Headquartered in Kansas City, Mo., Schenck Process manufactures dry bulk solids pneumatic conveying, weighing, and feeding systems.



## Cyber Plastic Machinery adds equipment making to its portfolio

It always feels good to exceed expectations. Trudeau did it in the last election, and Cyber Plastic Machinery Inc. is doing it now. The firm was founded in July 2014 to fill a hole in Southern Ontario's blown film industry by servicing and upgrading all brands of existing equipment. And it has done it well enough to transition into manufacturing its own equipment in a new facility. "The evolution from refurbishing to machinery making happened primarily at the request of our customers, who began asking us to design and build new blown film equipment for them, although we still perform refurbishments," said Dawn Krycki-De Santis, the firm's head of sales and marketing.

Originally located in Brampton, Ont., Cyber Plastic moved to a 3,000-square-foot facility in nearby Mississauga in April 2016. "We needed to expand, and being in Mississauga puts us right in the middle of our supplier base," Krycki-De Santis said.

Cyber Plastic is a two-person company — Krycki-De Santis and operations manager Liviu Sas — and uses the

services of several local contractors when necessary. "We have a low overhead and can pass the savings on to our customers," Krycki-De Santis said.

To date, the firm has commercialized three new technologies. "We've developed an ABS air ring manifold that we can retrofit to any OEM air ring," Sas said. "It eliminates the clutter of hoses that usually surrounds the air ring by having only one air hose feeding the manifold installed on top of the air ring. It also protects the plastic bubble at its most vulnerable state, when it exits the die." The firm has also developed its own complete laboratory blown film line, intended mainly for testing by resin suppliers, laboratories, schools, and end users. "We've also developed our own dual lip air ring," Sas said.

In the end, the transition was an unexpected but welcome one for the firm. "Our original goal was to work with OEMs by refurbishing the small parts they didn't have time to do, and we've now expanded to become a preferred supplier to them," Sas said. "But this is a good thing, because it keeps the industry innovative."

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Liviu Sas and Dawn Krycki-De Santis.

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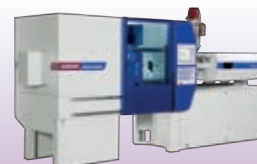
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# Donald Trump's 10 tips for business success



## 1 Find your art form

“I don’t do it for the money. I’ve got enough, much more than I’ll ever need. I do it to do it. Deals are my art form. Other people paint beautifully on canvas or write wonderful poetry. I like making deals, preferably big deals. That’s how I get my kicks.”

## 2 But forget business if you’re no natural

“Deal-making is an ability you’re born with. It’s in the genes. It’s not about being brilliant. It does take a certain intelligence, but mostly it’s about instincts. You can take the smartest kid... the one who gets straight A’s and has a 170 IQ, and if he doesn’t have the instincts, he’ll never be a successful entrepreneur.”

## 3 Be obsessive

“One of the keys to thinking big is total focus. I think of it almost as a controlled neurosis, a quality I’ve noticed in many highly successful entrepreneurs. They’re obsessive, driven, and almost maniacal, but it’s all channeled into their work. I don’t say this trait leads to a happier life, or a better life, but it’s great when it comes to getting what you want.”

## 4 Play it loose

“Most people are surprised by the way I work. I don’t carry a briefcase. I try not to schedule too many meetings. I leave my door open. You can’t be imaginative or entrepreneurial if you’ve got too much structure. I prefer to come to work each day and just see what develops. There is no typical week in my life.”

## 5 Ditch long meetings and get dialling

“I usually arrive at my office by nine, and I get on the phone. There’s rarely a day with fewer than fifty calls, and often it runs to over a hundred. In between, I have at least a dozen meetings, but the majority occur on the spur of the moment, and few of them last longer than fifteen minutes.”

## 6 If you gamble, be able to live with losing

“People think I’m a gambler. I’ve never gambled in my life. To me, a gambler is someone who plays slot machines. I prefer to own slot machines. I happen to be very conservative in business. I always go into the deal anticipat-

ing the worst. If you can live with the worst, the good will always take care of itself.”

## 7 Trust your instinct, not numbers

“I don’t hire a lot of number-crunchers, and I don’t trust fancy marketing surveys. I do my own surveys and draw my own conclusions. When I’m in another city and I take a cab, I’ll always make a point to ask the cabdriver questions. I ask and I ask and I ask, until I begin to get a gut feeling. The greatest of consulting firms charge you \$100,000 for a lengthy study and in the end it has no conclusion and takes so long to complete that if the deal you were considering was a good one, it will be long gone.”

## 8 Use your leverage

“The worst thing you can possibly do in a deal is seem desperate to make it. That makes the other person smell blood, and then you’re dead. The best thing you can do is deal from strength. Leverage is having something the other person wants. Or better yet, needs. Or best of all, simply can’t do without. Unfortunately, this isn’t always the case, which is why leverage often requires imagination and salesmanship.”

## 9 Don’t be bullied

“As much as it pays to emphasise the positive, there are times when the only choice is confrontation. I’m very good to people who are good to me. But when people treat me badly or try to take advantage of me, my general attitude has been to fight back very hard. The risk is you’ll make a bad situation worse, but my experience is that if you’re fighting for something you believe in — even if it means alienating some people along the way — things usually work out for the best.”

## 10 Get noticed

“You can have the most wonderful product in the world, but if people don’t know about it, it’s not going to be worth much. You need to generate interest and create excitement.”

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*These tips are excerpted from the 1987 bestseller “Trump: The Art of the Deal,” written by Donald Trump and Tony Schwartz.*

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# UP IN SMOKE

New carbon taxes in Ontario and Alberta, combined with existing fees in Quebec and B.C., could provide a model for other provinces that will soon be forced by the federal government to reduce greenhouse gas emissions. Environmentalists are thrilled. Businesses, however, worry that Canada's carbon pricing scheme threatens the manufacturing of fuels and petrochemicals — and puts thousands of industry jobs at risk — by creating a competitive disadvantage through increasing fuel and energy costs.

By Mark Stephen, editor

Where there's smoke, goes the adage, there's fire. But what happens when there's no smoke — or more specifically, no smoke from industrial smokestacks? The answer, generally speaking, is fewer jobs — a signal, all too often, of the shuttering of facilities that used to manufacture domestic products as contracts move to lower cost countries.

The shuttered manufacturing plant has become one of the most visible symbols of economic decline in both the U.S. and Canada — powerful enough that President Trump evoked the image of “rusted out factories scattered like tombstones across the landscape” in his Inaugural Address in January.

The Trump administration's prime directive is to bring manufacturing back to the U.S.; to reactivate these plants and — however ugly it looks — get them belching carbon dioxide back into the skies. In Canada, by contrast, the sight of smoke-free smokestacks and shuttered factories seems destined to become even more commonplace. On January 1, 2017, Ontario and Alberta adopted broad-based carbon pricing policies. Alberta opted for a carbon tax while Ontario chose a cap-and-trade system. Alberta's carbon tax is \$20 per tonne of carbon dioxide in 2017, while permits in Ontario's cap-and-trade system currently trade at about \$18 per tonne of carbon dioxide. Combine these with cap-and-trade programs already up and running in British Columbia and Quebec and roughly 85 per cent of Canadian businesses now live in a jurisdiction that has a price on greenhouse gas (GHG) emissions.

It's all part of the Canadian federal government's ambitious goal to set a national “floor price” on carbon that all provinces must levy on emissions, a move that will also force the nine provinces and territories that do not already have a pricing mechanism to act. In October 2016, Prime Minister Trudeau said pricing should start at a minimum of \$10 per tonne of carbon dioxide emissions in 2018, rising by \$10 each year to \$50 per tonne by 2022. Trudeau's ultimatum to the provinces is to adopt a carbon tax or cap-and-trade system by 2018 or have one imposed. The government's goal in adopting or expanding explicit carbon pricing is to drive down GHG emissions and shift the Canadian economy away from its dependence on fossil fuels.

## A LOSING PROPOSITION

Canada's huge service sector, which does not generate GHGs, won't be touched by carbon pricing. But the magnitude of those recommended increases in carbon taxes has stoked fears in the nation's business community, particularly if key trading partners such as the U.S. lag behind. For industry, carbon pricing will add significant costs to doing business in Canadian provinces by directly increasing the price of gasoline, natural gas, and similar goods that are themselves a direct source of emissions. The clear losers will be energy-intensive industries such as industrial and manufacturing companies that consume large amounts of energy throughout their entire value chain. These concerns

are summed up by Mitch Raymond, head of the Nova Scotia division of the Canadian Manufacturers and Exporters (CME). “It's equivalent to paying twice,” Raymond told CBC News in an interview late last year. CME members worry that new carbon prices will create a competitive edge for other jurisdictions that don't play by the same rules, Raymond added. “Members produce everything from steel to high-technology hardware,” he said. “While their emissions vary enormously, all are expected to pay more for the energy and supplies they use due to carbon prices.”

Major players in the Ontario chemical industry, based in Toronto and in Sarnia's so-called Chemical Valley, also worry that high carbon costs in Ontario will erode competitiveness, not only in the production process but in the

## TWO KEY DEFINITIONS

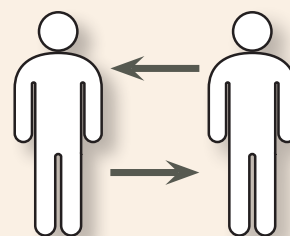
### Carbon tax:

A carbon tax is usually defined as a tax based on greenhouse gas (GHG) emissions generated from burning fuels. It puts a price on each tonne of GHG emitted, sending a price signal that's designed to, over time, elicit a powerful market response across the entire economy, resulting in reduced emissions.



### Cap-and-trade:

Cap-and-trade is a form of market regulation applied to GHG emissions. The “cap” puts a limit on the maximum amount of GHGs that can be emitted, which is then translated into a number of allowances. Allowances can be distributed free to some or all covered entities or auctioned to highest bidders within a competitive bidding process; each emission unit usually represents one tonne of GHGs. Companies must match their emissions to their allowances. Over time, the overall cap is lowered, leading to reductions in GHGs. After the cap has been determined, allowances for portions of the total limit are allocated. Such allocations, or permits, are either handed out to businesses that have relationships with the federal government, or else auctioned off to the highest bidder. Companies are taxed



if they produce a higher level of total emissions than their permits allow, but they can also sell off any unused allowance to other producers. This is the “trade.”

supply chain and transportation network. Nova Chemicals Corporation is a case in point. As with other firms in emissions-intensive and trade-exposed (EITE) industries, energy is a significant portion of Calgary-based Nova's petrochemical production costs, and competition for markets and capital is intense. Nova's petrochemical complex in Sarnia is a large emitter of GHGs, and the new provincial cap-and-trade plan will add to its operating costs. Nova has invested at that Corunna plant to process natural gas rather than crude, and is considering further expansion, but is assessing the impact of the province's carbon pricing, amongst other things, before proceeding.

Nova is also being pressured by increased operating costs in Alberta: the firm's billion-dollar expansion of its Joffre PE plant came online just as Alberta's NDP government introduced its carbon pricing plan. "Nova has taken real action to reduce its carbon footprint by investing in the use of lighter feedstocks such as ethane compared to places like Asia and Europe that make the same products from heavier feedstocks, and carbon policies must take this into account to avoid the unintended consequence of effectively supporting coal projects elsewhere in the world at the expense of a cleaner ethane-based project in Canada," said

Naushad Jamani, Nova's senior vice president, olefins and feedstock. "Regulatory certainty is extremely important because of the timelines in our decision-making process for large scale capital investments — without it, investments can be delayed or lost. At the same time, these regulations must be comparable with other jurisdictions to ensure we can effectively manage our costs and remain globally competitive. Competitiveness remains of critical interest to Nova and all EITE industry members."

## AUTO ANXIETY

Other plastics-related sectors in Canada are also concerned about the effect of carbon taxes. Truck and car plants don't generate a lot of emissions, but some of their suppliers do, and extra costs from a carbon tax would likely be passed along, hurting overall cost competitiveness with the U.S. and leading to new or expansion plants — and associated jobs — landing there instead of in Canada. Furthermore, about 98 per cent of Canada's car industry is in Ontario, which means it's now under a cap-and-trade system. "The auto industry is highly trade-exposed," said Mark Nantais, president of the Canadian Vehicle Manufacturers' Association (CMVA). "Ontario has recognized that transitional allowances for the first compliance period of the new cap-and-trade program and beyond are needed. The CVMA is committed to working with the Ontario government on the development of an appropriate regulatory framework suitable for the globally competitive environment in which we operate." The CME has also called on the Trudeau government to ensure carbon pricing is not only revenue neutral, but that revenue from industry be returned to industry in a way that ensures it can still be competitive. Other firms, meanwhile, are being individually proactive. "Resin and raw material supplying members of the Canadian Plastics Industry Association that are large final emitters in Ontario and therefore will be mandatory participants in the cap-and-trade program have been working with the government directly," said CPIA president and CEO Carol Hochu.

Given that carbon taxes will be a fact of life going forward, the key to shielding EITE industries and their suppliers is — in the words of a recent report by Canada's Ecofiscal Commission — "to get detailed information at the company level that proves exactly how they are impacted by carbon pricing, and then provide temporary relief to give the firm a limited period to find solutions." That, and adopt a wait-and-see approach. "For the plastics industry as a whole, there will be direct and indirect costs that may have an impact on business operations in a noticeable manner," Carol Hochu said. "How significant these will be is still to be determined, however."

In the end, Canada's carbon tax scheme has twin goals that are lofty and perhaps irreconcilable: no industrial smoke, but lots of economic fire.

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# TWO-STAGE *takes*

Just because granulators and shredders operate differently doesn't mean processors and recyclers have to choose one or the other. Fact is, combining them into a two-stage system is the best way to get consistent, uniform feed material. But as in all successful partnerships, it takes planning and great communication.

By Mark Stephen, editor

**Y**ou don't have to be a wrestling fanatic to see the value of a good tag team. The logic is irrefutable: doubling up allows you to double down on efficiency. It's a good way to forcibly eject a WWF wrestler from the ring, for sure, and it's also a good way for plastics processors and recyclers to reduce the size of rejected parts for use or reuse.

The size reduction of post-production waste by a two-stage process of shredding and granulating can significantly help to deal with high disposal costs, costly offsite recycling services, and high resin prices. In theory, it's simple: The shredder performs the coarse task of cutting large volumes of heavy plastic scrap into smaller, more manageable pieces, while the scrap is subsequently channelled into a granulator for final sizing to yield a consistent, uniform feed material.

So it's no surprise that more and more processors and recyclers are embracing the concept. But are they all embracing it correctly? Probably not, since there's a lot more to marrying a shredder and granulator than just lining them up and hitting the start button.

Which is why we asked some of the experts for their guidance on the right way to do two-stage size reduction.

## FORCE OR FINESSE?

The first thing to understand about combining size reduction technologies is when not to do it. A good understanding of shredders and granulators helps, since they operate differently. "Shredders tend to operate at lower speeds — 100 to 130 rpm — with high torque that allows them to chew through almost anything," said Greg Parent, the Canadian sales representative for Vecoplan LLC. "Granulators generally operate at high speeds with relatively low torque. Even low-speed granulators have rotors that turn at upwards of 190 rpm and standard-speed granulators operate at 400 to 500 rpm or more."

This distinction makes shredders and granulators suited to polar opposite size reduction applications. "If you need to process high volumes of heavy, dense scrap and don't care about having a wide variation in particle size and shape because the material is going to be sent to a recycler for resale, a shredder is ideal," said Mike Cyr, president of Rotogran International Inc. "Beside-the-press granulators, meanwhile, are good for grinding relatively small volumes of thin-wall material, sprues, runners, off-spec parts, and edge trim from film lines for immediate recycling back into the process." The lesson? Don't automatically fork over big bucks for a two-stage system. "Many customers assume they need a shredder and granulator combination, but when we examine their needs more closely, we often find that the right stand-alone granulator will suffice and be less costly," said Dave Miller, gen-



The Vecoplan VAZ 1100 U single-shaft rotary shredder with a Rotogran model 1442 granulator.

Photo Credit: Vecoplan LLC

# CENTRE STAGE

eral manager for size reduction with Conair Group.

As is the case with many processors, however, when the material is going to be returned to the molding machine or extruder in a blend with virgin pellets, shredded scrap will probably need to go through a secondary granulation process to develop optimal size and uniformity. Which is where it pays dividends to combine a shredder and granulator.

## STACK IT UP

The question then becomes, how do you marry the two pieces of equipment? The key to deciding with these two-stage systems is design, the experts agree, especially when it comes to maximizing floor space. Most of these machines have been built to fit into smaller spaces, which makes a stacked system a sensible solution. “Putting a shredder on top of a granulator is a compact way to increase the granulator’s throughput compared to using it alone,” Greg Parent said. “Pre-shredding transfers the hard work to the shredder and allows the granulator to run more efficiently to reduce material to its final particle size. It decreases the load on the granulator, and also extends the life of the blades and lessens the frequency of blade sharpening.”

Stacked systems have potential problems, however, beginning with the need to roll out the granulator from under the shredder to service the blades. “The most important part of a stacked system is having the ability to change blades through the access doors without having to move the equipment,” Mike Cyr said. “Rotogran uses a low-profile design that fits the granulator under the shredder and allows the user front access to the screens and blades of both pieces of equipment.”

A crucial bit of knowledge is that not every granulator will fit under a shredder. “Granulators sized to fit under shredders are different from those used in standard plastics processing,” Cyr said. “The granulator has to be long and wide, with a smaller diameter cutting circle and multiple rows of knives to maximize cuts per revolution.”

Safety can also be a concern with a stacked system. “If a system is too tall, it can be unsafe for an operator climb on top to carry out routine maintenance,” said John Farney, global sales manager for size reduction with ACS Group. “A solution is to put the granulator in a pit with the shredder on the ground floor, but this option can be expensive and isn’t realistic for every processor.”

But the biggest nemesis of a stacked system by far is metal contamination passing from the shredder down into the granulator. Metal-contaminated recyclables can easily damage the granulator blades, and a large enough piece of metal can cause damage to the rotor or shaft, which will cost

both time and money. “A stacked system doesn’t offer the same degree of control as a horizontal two-stage system for the obvious reason that gravity makes it more difficult to keep metal fragments from falling from the shredder, which can handle them, down into the granulator, which cannot,” said Dave Miller. “If the processor is committed to having a stacked system, they could put a magnet in the transition chute between the shredder and granulator, but it won’t be a guaranteed solution.”

## GOING HORIZONTAL

Which is why for materials that are likely to contain metal contamination, an in-line or horizontal setup is recommended. “Most often, we suggest using a horizontal layout, with the shredder output transferred to the granulator by a conveyor,” Miller said. “Even though it takes up more floor space, it provides more control over what goes into the granulator.” A horizontal design has the added advantage that virtually any shredder can be paired with any granulator. But that doesn’t mean there aren’t factors to consider, beginning with capacity. Which is where the problems usually start. “Big mistakes processors make is combining a small shredder with a big granulator, which means they won’t get the capacity they want; or using a granulator that’s too small for the shredder, resulting in the granulator becoming overfed,” said Madison Burt, vice president of sales with Weima America Inc. “They have to remember that, since it’s the last piece of the puzzle, the granulator’s capacity is going to drive the system.”

And there are two ways to match the granulator’s capacity to the shredder, the experts say. “Most modern shredders have a PLC within the main control that can be connected to a granulator,” said Jim Hoffmann, regional vice president of sales with Rapid Granulator Inc. “If the granulator becomes overloaded and amps up, it tells the control to stop the ram on the shredder from pushing, which stops the discharge conveyor. Once the granulator reaches a safe amp level, it automatically tells both the hydraulic ram and the conveyor to start up again. Communication is key here.” A second, simpler method is to use a smaller screen size on the shredder. “With a two-inch screen on a shredder, the material will pour out; with a one-inch screen, the material flow is significantly slower, which makes for a much better match with the granulator,” said Mike Cyr. “It also shifts a larger share of the workload to the shredder, which is better able to handle it.”

Metal detection — which is the main reason for selecting a horizontal layout in the first place, remember? — is not



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## size reduction

usually considered a serious problem for an in-line system. “Ideally, we recommend a metal detector/separator on a feed conveyor that feeds the shredder,” said Dave Miller. “We want to protect the shredder, even if it can tolerate the metal.” As a secondary line of defence, another metal detector can be placed between the shredder and granulator, Miller added.

A new option being offered by numerous equipment suppliers is a combo unit, which combines a shredder and granulator to perform both operations. The units are sometimes literally bolted together, or can stand side-by-side. Herbold Meckesheim USA offers the HB series granulator/shredder, which can reduce bulky items down to particle sizes of 0.16 to 0.31 inches in diameter without any secondary size reduction. The Combi-Shredder from Cumberland, meanwhile, has a shredder stacked onto the granulator so that shredded scrap is directly discharged to the granulator at throughputs of 1,100 to 1,540 lbs per hour. And Vecoplan recently unveiled the VAZ 1100U stack system, in which the shredder's discharge opening is bolted directly to the infeed opening of a Rotogran granulator.

In the end, the best two-stage size reduction system — whether a combi unit, an in-line system or a stacked design — is balanced in every stage and treated as a single process. “Processors and recyclers have to think of it as a system rather than as separate pieces of equipment,” said Mike Cyr. “The shredder and granulator have to be able to communicate, and every step — from feeding to grinding to conveying to evacuation — has to be tied together.”

It should all add up to one of the ultimate tag teams. Maybe even better than the WWF's Natural Disasters. **CPL**

## RESOURCE LIST

**ACS/Cumberland** (New Berlin, Wis.);  
[www.cumberland-plastics.com](http://www.cumberland-plastics.com); 262-641-8600

**Auxiplast Inc.** (Ste-Julie, Que.); [www.auxiplast.com](http://www.auxiplast.com); 450-922-0282

**New Tech Machinery Inc.** (Brampton, Ont.); 905-456-2968

**Precision Mold Supplies Ltd.** (Delta, B.C.); 604-943-7702

**Conair Group** (Cranberry Township, Pa.);  
[www.conairgroup.com](http://www.conairgroup.com); 724-584-5500

**Dier International Plastics Inc.** (Unionville, Ont.);  
[www.dierinternational.com](http://www.dierinternational.com); 416-219-0509

**Industries Laferriere** (Mascouche, Que.);  
[www.industrieslaferriere.ca](http://www.industrieslaferriere.ca); 450-477-8880

**Turner Group Inc.** (Seattle, Wash.);  
[www.turnergroup.net](http://www.turnergroup.net); 206-769-3707

**Herbold Meckesheim USA** (Slatersville, R.I.);  
[www.herboldusa.com](http://www.herboldusa.com); 401-597-5500

**Rapid Granulator Inc.** (Cranberry Township, Pa.);  
[www.rapidgranulator.com](http://www.rapidgranulator.com); 724-584-5220

**Dier International Plastics Inc.**  
**DCube** (Montreal); [www.dcube.ca](http://www.dcube.ca); 514-272-0500

**Rotogran International Inc.** (Toronto);  
[www.rotogran.com](http://www.rotogran.com); 905-738-0101

**Vecoplan LLC** (Archdale, N.C.);  
[www.vecoplanllc.com](http://www.vecoplanllc.com); 336-861-6070  
 Greg Parent; 416-678-0154

**Weima America Inc.** (Fort Mill, S.C.);  
[www.weimaamerica.com](http://www.weimaamerica.com); 888-440-7170

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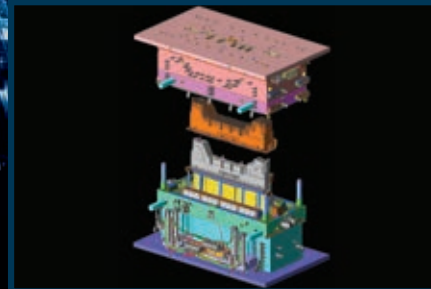
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Photo Credit: Sumitomo (SHI) Demag

# THE NEED FOR SPEED

By Mark Stephen, editor

There are basically two business directions available to today's injection molding shops: growth or bankruptcy. If you prefer growth, you'd better be making quality parts as fast as possible. Which is why speed and more speed is a key theme of new machines aimed at packaging and medical markets.

From prehistoric societies that domesticated the horse to chase down their prey to the cast of *The Fast and the Furious* film franchise outrunning fireballs in their Ford GT40s, speed has always been equated with survival. And it's no different for injection molders, for whom pumping out as many good parts as fast as possible can mean the difference between staying

afloat or going under. Which is why speed and more speed, while maximizing energy efficiency, is a key theme of new injection molding machine developments, aimed largely at packaging and medical markets.

If you're looking to shave a few precious seconds from your cycle times, here's what's new from some of the heavy-hitters.

## FAST TIMES

Engel has updated its line of e-speed fast-cycle hybrid machines, which are designed for high-performance packaging applications such as thin-wall containers. Beginning in the fall of 2016, the machine's hydraulic system has been optimised for greater dynamics and even faster and more precise injection, and the series now come standard with Engel's ecodrive servo-hydraulics. "The injection speed is 700 mm per second, and the opening stroke is 600 mm with a dry-cycle time of 1.8 seconds," Engel said. "To avoid peak loads while operating at high speeds even with high clamping forces, a system, which functions according to the



Engel's e-speed 500 fast-cycle hybrid machine.

Photo Credit: Engel



principle of a flywheel, stores the braking energy of the platen movements and transfers it back to the motor as needed — for example, for reaccelerating the platen. Thanks to this integrated energy storage, the Engel e-speed is able to run with a relatively low and constant connected load.”

Haitian International has two recent high-speed developments. First up is the new “p” (for packaging) version of the Venus II all-electric series (150 to 450 tonnes) aimed at high-speed, high-cavitation applications with cycle times above four seconds, such as caps and closures for cosmetics. It comes with a square platen, modified machine bed to handle heavy molds, and a 25:1 L/D injection unit with speeds up to 350 mm per second and a special ballscrew to avoid overheating during fast cycles. Second is the new Jupiter II plus series, an enhancement of the Jupiter II line unveiled in 2015. These two-platen models now have significantly faster clamp movements, Haitian said, along with new linear guides that eliminate lubricant and friction on the tiebars, optimized platen structure that reduces deformation, and a new Keba controller with 15-inch screen that offers a double-page view.

A recent introduction from Krauss-Maffei Corporation is the all-electric PX series of toggle presses from 50 to 200 tonnes. Servohydraulics are available for nozzle touch, ejectors, and extra-high-speed injection for thin-wall molding. The units are said by KraussMaffei to overcome what have

until now been relatively limited options in electric machines, and to be the first to offer the same degree of customization flexibility with standard options already available for hydraulic presses. For example, PX models offer 44 different configurations of injection and clamp units, three different injection speed ranges, and options for larger platens and greater ejector speed and force. This modularity also adds flexibility for retrofitting.

Milacron Holding Corporation’s K-TEC machine platform is designed to offer high speed, high accuracy, and high uptime. “The K-TEC’s precision and repeatability, fast cycle times, high injection rates and pressure, parallel functions, and easy maintenance are the hallmarks of the K-TEC, one of the most productive injection molding machines available on the market today,” the firm said. Available in full hydraulic or servo hydraulic configurations, the series is said to be well-suited for customized solutions for large production outputs. The K-TEC comes in 11 sizes from 60 to 450 tonnes, and is also available as a multi-component, monosandwich, or cube machine.

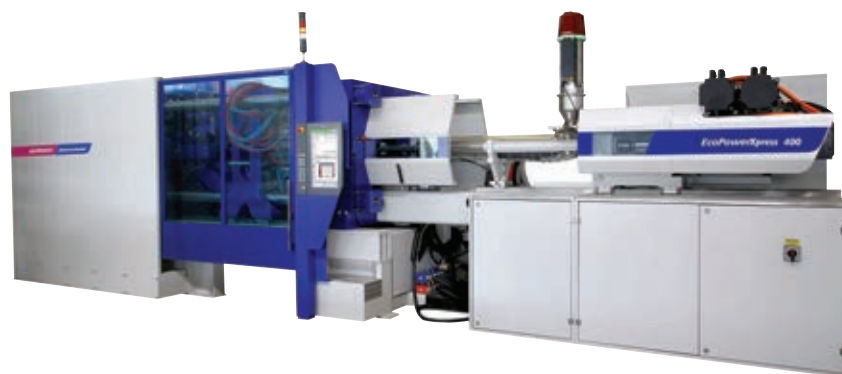
### SAVING MILLISECONDS

New from Negri Bossi is a high-performance electric machine called ELE. The standard version has high injection speed of 300 inches per second, while the packaging version will achieve 1,000 inches per second. At launch, the range goes from 50 to 350 tonnes, but

the company is targeting a wider range of 11 models from 50 to 650 tonnes, which will include multi-component versions. Improvements in specification and performance from the previous electric machine range have been made to create a wider appeal in areas such as packaging and medical. The ELE machine also features Smart Flex 2, a new locking unit with a different toggle geometry designed to be coupled specifically with electric closing and to have characteristics optimised to its target market. The company developed the technology specifically for electric machines.

Netstal recently introduced the Elios 7500, the first of a new series of hybrid presses said to feature a new “lighting-fast” electric toggle clamp that provides “the fastest dry cycle in its size class.” The five-point toggle is designed to provide force in the centre of the mold. “Extremely robust design effectively prevents any deformation of the mold plates,” said Markus Dal Pian, Netstal’s vice president of sales and marketing. The machine also offers “very large” tiebar spacing and “extremely ample opening stroke,” Dal Pian continued, making it suitable for stack molds and molds with large cavities. In addition to the clamp, screw drive is also electric, while injection is servo-hydraulically driven for speeds up to 2,200 mm per second, acceleration values up to 20 G, and a reaction time of 11 milliseconds. “The Elios 7500 can be equipped with hybrid injection units in the 2,900, 4,200 or 6,000 sizes,” Dal Pian said. Netstal plans to supplement the Elios 7500 with additional models with lower clamping forces, he added.

With a cycle time of less than two seconds, Sumitomo (SHI) Demag’s El-Exis SP 200 might just be the fastest machine for the production of decorated containers in the world, the firm said. “The El-Exis SP’s clamping unit with its decentralized electric drive provides high-speed, careful mold opening and closing to achieve a highly precise mold-stop position,” the company said. “This way, the



Wittmann Battenfeld's EcoPower Xpress 400 unit.

Photo Credit: Wittmann Battenfeld Inc.

labels are accurately placed and the cups are removed correctly.” An NC5-plus control system offers easy, uncluttered, and intuitive machine operation; and numerous software features and adjustment options specially developed for packaging producers facilitate process optimisation. At a recent demonstration, an El-Exis SP 200 produced decorated cups in a four-cavity mold. “A high-speed extraction robot intervened through side entry in the parting level, placed the labels in the stationary mold half, and removed the four completed cups on the moving side, where the cups were subsequently stacked,” the firm said. “The exhibit illustrated the maximum speed currently possible and the highest available system productivity for the production of IML-decorated plastic containers.”

Wittmann Battenfeld Inc. recently

introduced its EcoPower Xpress line, intended to fill the need for a high-speed electric machine that can compete in thin-wall packaging. The initial 400 ton model offers injection speeds up to 600 mm per second, and acceleration of 1.5 G, which is said to be 40 per cent faster than accumulator-assisted hydraulic injection. Wittmann Battenfeld developed the 400 ton model, which comes standard with the new UNILOG B8 control system, with input from a large European molder of IML packaging. The EcoPower Xpress 400/1100+ is the first size of this machine series, which will be available from late 2017 onwards with clamping forces ranging from 2,100 to 5,000 kN.

So if you're looking to make faster parts, not to mention faster profits, consider giving these suppliers a call. Maybe even put them on speed dial.

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### RESOURCE LIST

- Absolute Haitian Corporation** (Worcester, Mass.); [www.absolutehaitian.com](http://www.absolutehaitian.com); 508-459-5372
- Shadow Automation Inc.** (Uxbridge, Ont.); 416-464-2070
- Barway Plastics Equipment** (Vaudreuil-Dorion, Que.); [www.barway.ca](http://www.barway.ca); 450-455-1396
- Engel Canada Inc.** (Waterloo, Ont.); [www.engelglobal.com/na](http://www.engelglobal.com/na); 519-725-8488
- KraussMaffei Corporation** (Florence, Ky.); [www.kraussmaffei.com](http://www.kraussmaffei.com); 859-283-0200
- Dier International Plastics Inc.** (Unionville, Ont.); [www.dierinternational.com](http://www.dierinternational.com); 416-219-0509
- Milacron Canada Corporation** (Burlington, Ont.); [www.milacron.com](http://www.milacron.com); 888-254-1919
- Negri Bossi North America** (New Castle, Del.); [www.negribossi.com](http://www.negribossi.com); 302-328-8020
- Netstal** (Florence, Ky.); [www.kraussmaffei.com](http://www.kraussmaffei.com); 859-283-0200
- Sumitomo (SHI) Demag Plastics Machinery** (Norcross, Ga.); [www.sumitomo-shi-demag.us](http://www.sumitomo-shi-demag.us); 770-447-5430
- Wittmann Canada Inc.** (Richmond Hill, Ont.); [www.wittmann-canada.com](http://www.wittmann-canada.com); 905-887-5355

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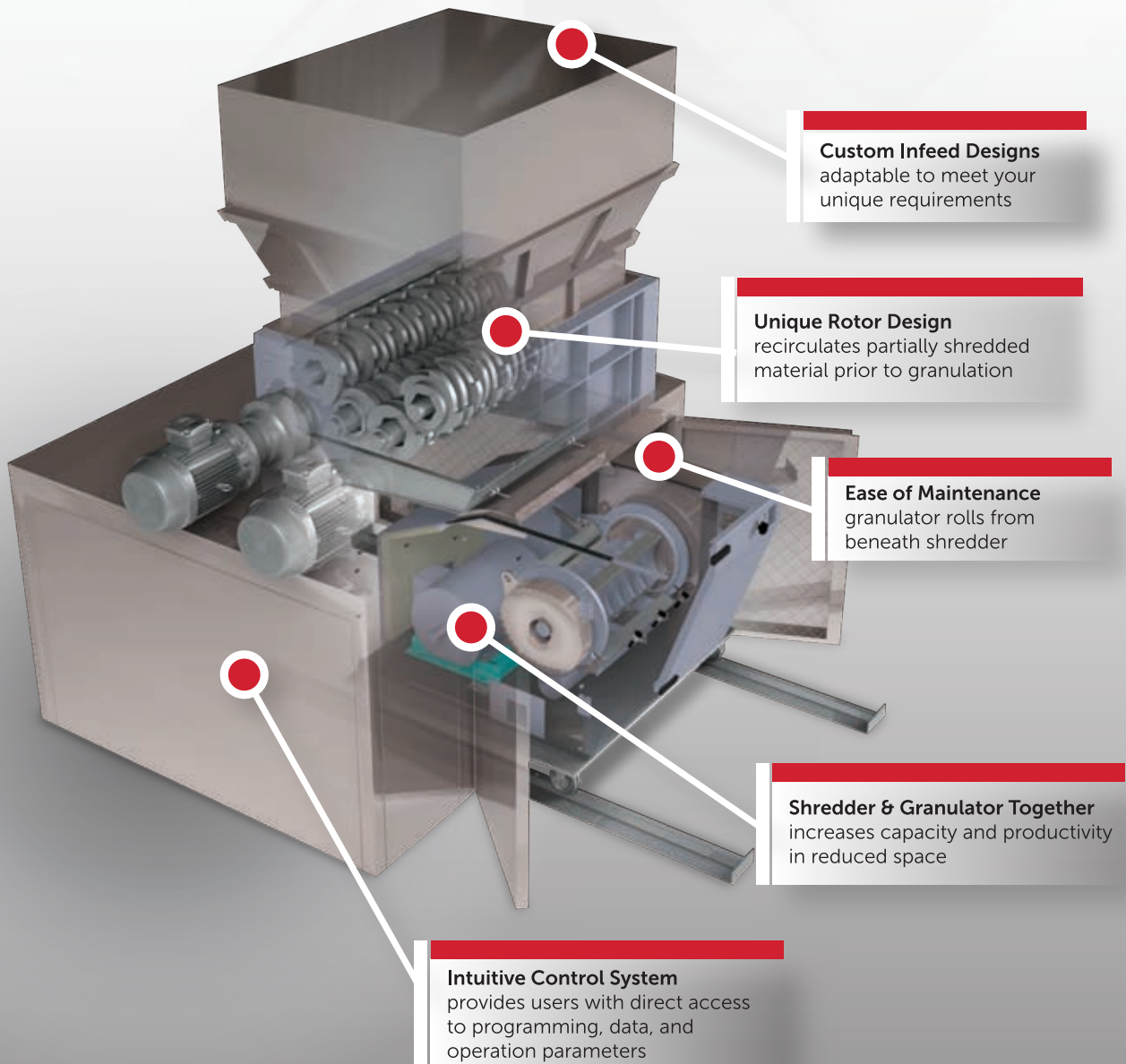
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Photo Credit: Sun Plastech Inc

If you think the trick to purging high-performance engineering resins and other challenging materials is to run conventional CPCs at high heats and for soak times long enough to get halfway through *War and Peace*, you'd better think again. These tips, combined with the right compounds, can help you optimize the most difficult purging experiences.

A classic *Saturday Night Live* TV skit called "The Thing That Wouldn't Leave" told the story of a host who couldn't get a stubborn guest out of his house after the party ended. There's an equivalent in the plastics manufacturing world, but it's not as funny: trying to remove challenging materials like additives, liquid colourants, and highly engineered resins such as PPA, PPS, PEEK, PPO, PEI, PSU, and PVDF from processing machines.

High-performance engineering resins, originally designed for aerospace, can now be found in electrical/electronic, telecommunications, chemical, and medical industries. Each market shares a growing need to utilize thermoplastics that offer higher temperature resistance, strength, dimensional stability, and chemical resistance. More

recently, the automotive industry has also started to use high-performance engineering resins due to pressing needs for more durability and lightweighting.

If there's a downside, it's this: High-performance, high-heat thermoplastics generally process at melt temperatures in the range of 520° to 800°F or 271° to 426°C, making them more prone to thermal degradation, in turn creating carbon build up leading to black specks. Which makes purging high-performance engineering resins, along with additives and liquid colorants, one of the fastest growing markets for commercial purging compounds (CPCs) — and also one of the most difficult, since both mechanical and chemical purging compounds are limited when it comes to residence times, flow restrictions, and heat stability above recommended

temperature ranges.

Which is why we talked with some of the experts about how to optimize your purging of high-temperature and other difficult materials.

### THE DO'S AND DON'TS

"First, when purging high-temperature engineering resins, use a CPC designed for the job," said Eric Proconier, product development manager with Sun Plastechn Inc., which carries the Asaclean line. "Most standard purge compounds have low-temperature carrier resins; these materials won't hold up at the temperatures required to remove high-heat engineering resins. The carrier resins utilized in CPCs designed for high-heat engineering resins are generally high-molecular-weight polymers with good thermal stability."

Second, be prepared to vary the purging procedure. "High temperature engineering resins such as PEEK, PPS, and PSU require special steps in the procedure to ensure operator safety," said Nancy Mitchell, technical product manager with Dyna-Purge. "The screw should be run in the forward position to promote positive conveyance, with the barrel kept full to minimize degradation; and be sure the melt temperature doesn't exceed the maximum temperature recommended by the CPC supplier." For heat- and/or moisture-sensitive resins such as PVC, nylon, and PCs — which degrade quickly and can therefore lead to carbon build-up and black specking — add the purge compound directly on top of the resin to begin purging, the experts say, so as to minimize exposure to oxygen during the purging process and prevent degradation. "Also, when shutting down the machine, it's imperative to remove any unstable resins, since they will tend to degrade," Mitchell said. "They should be replaced with a stable purging compound."

Molders that use hot runners might have to add yet another variation to the purging procedure. "They may have to close off certain valve gates and reroute the purge to more

difficult areas to achieve the best results," said Christie Giles, co-owner of World Class Technologies LLC, which carries the MagnaPurge line. "Also, processing machines have their own specific factors that can affect the procedure, such as dead spots where it's harder to remove material."

Third, purge at the lower end of the recommended resin melt temperature range by lowering barrel temperature and, in some cases, lowering screw rpm. "CPCs are most effective when processed within each supplier's recommended temperature range, and this is especially true when purging both low- and high-heat materials," said Kathleen Jarvis, national sales director at Neutrex Inc., which manufactures the Purgex line. "If a resin is a high-heat ABS or PPA processing at 600°F or 315°C, the mold should purge within the temperature range of the resin being processed. You don't want to push the purge beyond its maximum

heat because you'll risk burning the material inside the screw and barrel." This might just be the most common mistake processors make when purging engineering resins. "I see this error being committed all the time: customers leaving the CPC in the barrel at high temperatures for an extended time," said Juan Grino, factory sales representative with Slide Products Inc. "Time and temperature recommendations vary from product to product, but in most cases a maximum of 10 minutes is the longest the purge material should be left to sit in a high-temperature situation. The goal is to get the material in and out as quickly as possible to prevent burning."

Fourth, keep the feed throat cool to prevent "bridging" of the CPC in the throat. "The temperature of the feed throat coolant should be maintained at 80° to 120°F or 27° to 49°C," said Nancy Mitchell. "It's best to keep the feed throat temperature as



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## purging compounds

close to 100°F or 38°C as possible. In humid weather, the temperature should be slightly warmer than the dew point to avoid condensation.”

### UNCOLOUR YOUR WORLD

As with high-performance engineering

resins, additives and colourants are also increasing in use by today’s plastics processors. And they can be just as difficult to purge. “In almost 80 per cent of applications using additives, purging with a heavy-duty CPC should be sufficient,” Juan Grino said. “In the remaining

cases, CPC suppliers will usually have to create a specialized blend.”

Additives such as flame retardants break down endothermically when subjected to high temperatures, leaving residue behind. “If your purge product is not effective in removing these additives, you may end up with carbon build-up, which becomes more difficult to remove as time goes on,” said Nancy Mitchell. “Periodic purging to get rid of build-up will ultimately help eliminate contamination and may extend the life of the screw.”

Liquid colourants and organic pigments are also difficult to remove. “Some of these additives have an affinity to metal and require a more aggressive purge for cleaning,” Mitchell continued. “Processors that use colour concentrates should also be aware that some of the carrier resins, such as EVA, will thermally degrade if left in the barrel too long.”

In the end, the most valuable tip for removing high-performance engineering resins and other problematic materials from molding machines and extruders is this: talk to your CPC supplier. “Every CPC brand is different, with its own unique characteristics,” said Kathleen Jarvis. “Talking to the supplier, especially when purging difficult materials, ensures the molder uses the compound correctly, which might include adding another processing step. When molders improvise purging procedures on their own, bad things can happen.”

Even worse than a houseguest who won’t leave.

CPL



Photo Credit: Sun Plastech Inc.

## THE RIGHT STUFF

Here’s a quick look at some CPCs designed specifically to handle difficult materials.

### Asaclean

The company’s SX grade, which has an olefinic base, is said to be suitable for purging super-engineering resins above 570°F or 300°C, and is used exclusively for super-engineering resins such as PPS, PEEK, LCP, and Ultem.

### Dyna-Purge

The firm’s Dyna-Purge E2 is a mechanical, non-abrasive CPC designed to offer “the most advanced technology breakthrough in heat stability and enhanced cleaning,” Dyna-Purge said. “Its unique integrated polymer system was developed for purging high-temperature resins safely and efficiently in all areas of the machine, including tight channels.”

### MagnaPurge

For engineering resins, MagnaPurge PP 105 is a 95 per cent modified PP with a 5 per cent chemical compound, and is effective at temperatures up to 610°F or 320°C. For colourants and glass-filled materials, MagnaPurge PP 105 GLASS utilizes glass fibres for an additional mechanical action required for more difficult cleaning of products containing fillers and heavy colourant use.

### Purgex

Created for more challenging colour and/or material changes in engineering resins, plus efficient cleaning of hot runner systems, Purgex 3057 Plus is described as a ready-to-use mechanical CPC consisting of active ingredients with a PET carrier.

### Slide Products

The firm’s Klenz CPC operates at temperatures up to 610°F or 320°C, and is formulated with a polyolefin carrier. All ingredients are GRAS-rated, making it safe to use for food packaging applications. For use with injection molding, extrusion, and blow molding.

## RESOURCE LIST

### Dyna-Purge Div. Shuman Plastics Inc.

(Buffalo, N.Y.); [www.dynapurge.com](http://www.dynapurge.com); 866-607-8743

### Neutrex Inc.

(Houston, Tex.); [www.purgexonline.com](http://www.purgexonline.com); 281-807-9449

### Slide Products Inc.

(Wheeling, Ill.); [www.slideproducts.com](http://www.slideproducts.com); 800-323-6433

### AceTronic Industrial Controls Inc.

(Mississauga, Ont.); [www.acetronic.com](http://www.acetronic.com); 905-564-7227

### Sun Plastech Inc.

(Parsippany, N.J.); [www.asaclean.com](http://www.asaclean.com); 800-787-4348

### World Class Technologies LLC

(Midway, Ky.); [www.magnapurge.com](http://www.magnapurge.com); 859-226-0036





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# COVERTECH FLEXIBLE PACKAGING

## BACKWARD INTEGRATION INTO THE FUTURE

When this Toronto-based extruded film maker purchased a flexible packaging supplier four years ago, it didn't just change its name; it changed its business. And business is now booming.



By Mark Stephen, editor

Name changes don't always mean much. The Phoenix Coyotes rebranded themselves as the Arizona Coyotes last year, for example, and it hasn't amounted to a hill of beans — hardly anyone noticed and the team is still in the NHL cellar, standings-wise.

Once in a while, though, a name change actually does make a difference. Extruded film maker and packaging supplier Coverttech Flexible Packaging Inc. is a case in point. Back in the days when it manufactured pool coverings and reflective insulation material, the Toronto-based firm was known as Coverttech Fabricating. But when it bought the assets of Mississauga, Ont.-based flexible packaging converter Seville Packaging in 2013, a name change to Coverttech Flexible Packaging legitimately marked the beginning of a new direction for the company. Fast forward to today, and that trajectory continues with a \$10 million investment program spread out over 2017 to upgrade Coverttech's facility and purchase a wide range of new equipment.

## FROM POOL COVERINGS TO PACKAGING

Coverttech was co-founded in 1990 by entrepreneurs Furio Orologio, currently the company's president, and John Starr, the firm's current vice president/partner. "The company manufactured pool coverings at first, and then developed a reflective insulation material along with packaging material," said Coverttech vice president Don Habibullah. "We then introduced film extrusion in 2005. Manufacturing co-ex and monolayer extruded film, as well as reflective insulation, still makes up a large percentage of our business today."

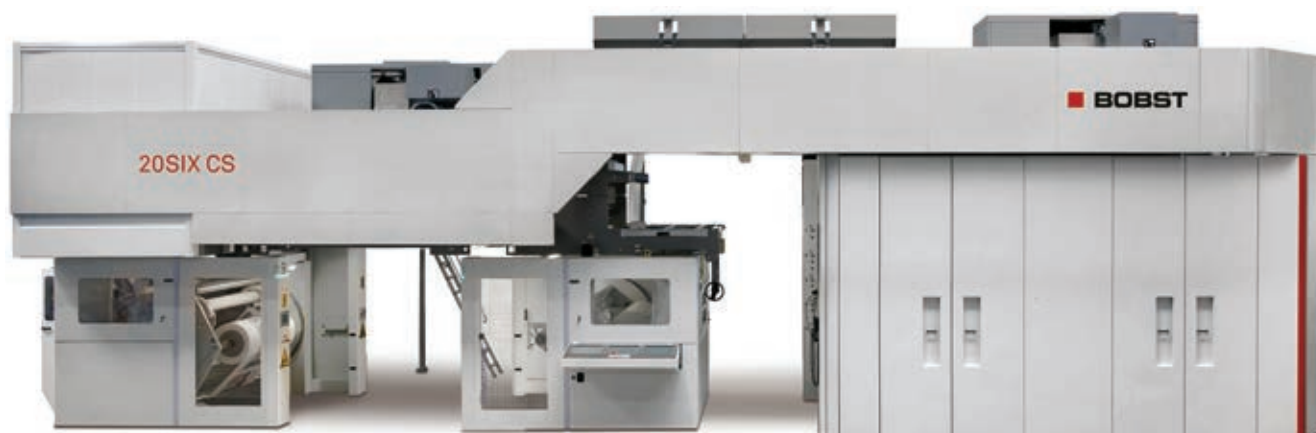
But the purchase of Seville Packaging four years ago was the definitive transition point for the firm, as well as a textbook example of synergy. "Seville manufactured specialty consumer and industrial packaging, including stand-up and re-sealable zipper pouches, laminated roll-stock, poly bags, poly woven bags, and solventless lamination materials," Habibullah said. "We were looking to get into the flexible packaging sector through backward integration, and the acquisition fit our strategy, while still complimenting our core business of film extrusion. With the two companies under one umbrella, the name change to Coverttech Flexible Packaging perfectly reflected our merger of film extrusion and flexible packaging manufacturing."

Coverttech currently provides film extrusion, narrow and wide web flexo-printing, laminating, and bag manufacturing to customers in both Canada and the U.S., but sees its greatest potential for growth south of the border. "We believe that our future success will come from our greater participation in the American marketplace, and this is what our \$10 million investment project is designed to facilitate," Habibullah said. The firm has purchased a new 10-colour, 65-inch BOBST 20SIX flexo-press, and is



Top and middle: Bag making and bag printing.  
Below: The firm's new BOBST 20SIX flexo-press.

Photo Credits: All photos courtesy of Coverttech Flexible Packaging Inc.







Above and right: Coverttech's horticultural and pet food packaging products.

also in the process of acquiring a new co-ex extruder line with pouch and bag making machinery. "The new equipment will give us more capacity, increased efficiencies, better lead times, and improve our overall competitiveness in the flexible packaging market, which is the sector we believe most of our growth will come from," Habibullah said. "The repeat length on the flexo-press goes from 14.2 to 47.2 inches, which will allow us to compete in 12 and 24 bottle overwraps. The co-ex extruder will allow us to do custom barrier blends according to customer specifica-

tions, which will complement our existing ability to supply intricate barrier films. Finally, the new bag lines will give us the ability to manufacture quad-seal bags and stand-up pouches, both of which are important markets we want to deepen our involvement in." The new equipment will be added to Coverttech's current machinery and equipment lineup of extruders, bag lines, bubble lines, slitters, eight-colour flexo-presses, solventless laminators, an envelope line, and a micro perforation machine.

## YOUTH MEETS EXPERIENCE

The firm, which employs approximately 100 workers, is also revamping the interior of its 107,000-square-foot facility. "Our plant currently has four divisions: extrusion, flexible packaging, insulation, and packaging," Habibullah said. "We're going to combine all of the manufacturing into one area, which will give us better flow on our production floor and allow us to gain efficiencies."

Notwithstanding Coverttech's wide product portfolio and extensive stock of machinery, the firm's real strength, Habibullah said, is its employees. "Our owners, including Furio Orologio and John Starr, all continue to work in specific areas within the facility, and each has at least 30 years of experience in the industry," he said. "On the other side, we actively go after the best and brightest young workers we can find; our new head of quality assurance has a PhD in polymer chemistry, for example. We have a young and dynamic production staff, and they're asking questions all the time. When we purchased Seville Packaging, we brought along all of its employees and added their expertise to ours. All of which gives us a good mix of experienced older workers and young, hungry newer workers."

The final piece of the puzzle? All of these skilled employees buy into the company's core business philosophy. "We're honest; we deliver on time and we don't compromise on our quality," Habibullah said. "Customers want innovation and also quality assurance, and we're trying to be at the forefront of that."

Which, come to think of it, wouldn't be a bad business model for the underachieving Arizona Coyotes. **CPL**



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## AUXILIARY EQUIPMENT

### Energy-efficient granulator with adjustable hopper

The new N35-60 granulator from **Piovan** features a 90° adjustable hopper with four loading positions to ensure that, if fed by conveyor belt, the direction of the belt can always suit the granulator hopper inlet.

The adjustable hopper also ensures simpler maintenance, faster access to the machine, and less operating space required.

The N35-60 unit is designed to process large pieces such as injection molded food containers; large blow molded bottles or cans; and rotationally molded tanks, bins, gardening products, and toys — objects that are normally large and light and can therefore bounce and be difficult to cut.

The N35-60 is also designed to offer energy savings of between 15 and 35 per cent, depending on the application.

**Piovan Canada (Mississauga, Ont.);**

**www.piovan.com; 905-629-8822**



The new gripper system also successfully reduces cycle times to a succinct 33 seconds, considerably increasing factory throughput.

FIPA components used to assemble the custom gripper system include GR04.103 sprue grippers, which feature a high-strength, anodized aluminum body and actuator jaws with both gap-free closing capabilities for small sprues and a 10-mm clamping diameter to accommodate larger parts; GR04.103-4 interchangeable sprue gripper jaws coated with extremely soft hydrogenated nitrile butadiene rubber (HNBR), which enable the mark-free gripping of delicate components; GR04.101A single-acting sprue grippers with direct part detection and large area sensor activation capabilities, regardless of sprue position; GR04.045 35° angle stroke gripper fingers with single-action, spring return design; LT10 compact reflective sensors, which enable the long-range optical monitoring of workpieces, can accommodate any mounting position, and feature a small footprint, adjustable sensitivity, an LED display, and lightweight body; and a variety of clamping elements, extrusions, and profiles.

**Fipa Inc. (Cary, N.C.);**

**www.fipa.com; 919-651-9888**



## INJECTION MOLDING

### Custom gripper system removes hot parts from I/M machines

**Fipa Inc.** has introduced a new *custom gripper system* for injection molding machines that are dedicated to making automotive lighting reflectors.

This latest custom gripper system can automate what had been a manual demolding process to protect employees from handling hot (120°C) plastic parts and improve quality by ensuring that parts are removed from their molds free of any marks or paint-wetting impairment substances that could potentially interfere with subsequent coating processes.

## EXTRUSION

### Barrel shroud increases energy efficiency

A new heater/cooler *barrel shroud* from **Davis-Standard LLC** is designed to increase the energy efficiency of single-screw extruders' temperature control systems by as much as 50 per cent.

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The shroud functions as a thermal blanket with top or side venting to reduce convective and radiant heat loss. The shroud fits right over the barrel to create a

thermal layer, preventing radiant heat losses, while a valve system that is pressure-activated prevents convective losses.

Insulating material is enclosed within steel.

The shroud is particularly well-suited for high-heat applications such as extrusion coating, cast film, and tubing processes. Less energy is required to maintain the barrel set-point, resulting in significant cost savings.

The shroud is available on new extruders as well as retrofits. Sections of the shroud fit over each barrel zone and are attached with a stainless steel adjustable fastener.

**Davis-Standard LLC (Pawcatuck, Conn.);**

**[www.davis-standard.com](http://www.davis-standard.com); 860-599-1010**

**Auxiplast Inc. (Ste-Julie, Que.);**

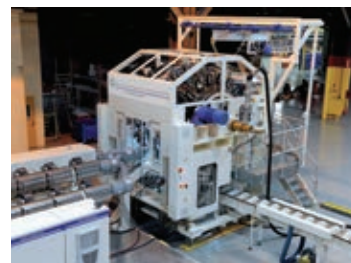
**[www.auxiplast.com](http://www.auxiplast.com); 866-922-2894**

## BLOW MOLDING

### Innovative system offers precision and flexibility

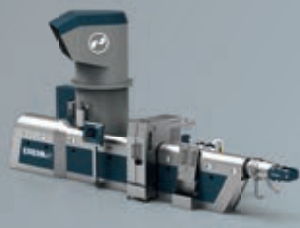
The new *Revolution MVP* wheel blow molding system from **Graham Engineering Corporation** comprises two proprietary innovations — a self-contained, modular clamp design; and a variable pitch feature — to offer the precision and output of a Graham wheel with the versatility of a shuttle.

Key features of the system include reconfigurability between 12 and 24 stations; the ability to produce bottles up to 16 inches tall; the capability of varying bottle height up to 28 per cent within a configuration, patented Quick-Change molds at about 5 minutes per station; and the capability of up to 8 rpm, with bottles per hour capacities of 11,520 for single-parison operation and 46,080 for dual-parison, neck-to-neck operation.



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A key innovation at the heart of the Revolution MVP is the modular clamp station. Each clamp station is independent of the others and all forces are self-contained within the clamp. Water manifolds through the platens and individual clamps can be removed for offline maintenance to reduce downtime. This modularity enables the user to vary the number of clamp stations from 12 to 24 on the same platform and configure the wheel based on the application and bottle height.

The system can comprise up to 10 extruders in sizes from 40 to 175 mm for monolayer, trilayer, multilayer co-ex, or view stripe applications. Easy to start up, the Revolution MVP produces good bottles in 4 or 5 revolutions, with a stabilized process in 10 or 15 minutes. IML is available at rates up to 120 bottles per minute, and bottle takeout options include rotary or star wheel.

**Graham Engineering Corporation (York, Pa.);**  
**www.grahamengineering.com; 717-505-4813**

## RAW MATERIAL HANDLING

### High-volume material mixing system

**National Bulk Equipment Inc. (NBE)** has introduced a new *high-volume material mixing system*

designed to supply 25,000 lbs per hour of homogeneously blended material.

This high-volume material mixing system is fully integrated with twin, high-speed, 2,500-

lbs capacity box dumpers; and two 8-inch diameter discharge spouts to completely process the material, from introduction to downstream supply.

Within the mixer, a 14-inch diameter auger mixes semi free-flowing material in a 15-inch diameter, 10-gauge mix tube. In-feed scoop blades at the base of the mixing auger and broad-throw dispersion paddles at the top of the mixing auger ensure a homogenous and consistent blend supply to downstream processes. A 30-hp TEFC motor ensures reliable, extended-duty performance.

NBE-integrated automation centralizes system control, communica-

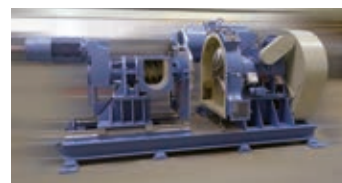
tion, monitoring, and reporting to a single, UL-listed HMI, designed and built by NBE. Rigorous NBE risk assessment procedures work to prevent hazards to those who operate and maintain the equipment, while identifying improvements in physical ergonomics and equipment access points. NBE expertise in application-appropriate codes, standards, and regulations ensures system compliance at start-up.

**National Bulk Equipment Inc. (Holland, Mich.);**

**www.nbe-inc.com; 616-399-2220**

### Optional force feed mechanism for low bulk density material

**Herbold Meckesheim USA** has introduced a new optional *force feed mechanism* for its popular line of HV plastcompactor densifiers used to agglomerate low bulk density material.



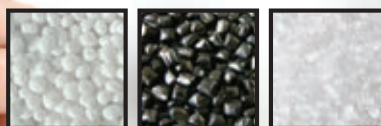
The resulting agglomerate has a higher bulk density than the source material with improved flow characteristics.

While traditional gravity feeding is appropriate in some



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cases, it's not ideal for materials like film or PS. The new force feeder mechanism uses an auger to convey material at a higher and more consistent feed rate to deliver increased throughput and reduced energy consumption.

Continuous material processing takes place between a rotating and a fixed compaction disc. Both discs are equipped with screw-mounted, replaceable kneading rails. Pre-granulated material moves through the centre of the fixed disc into the processing chamber, where it is rapidly heated by the two discs.

Three sizes of HV plastcompactors are available, offering throughputs as high as 2,600 to 3,000 lbs per hour.

**Herbold Meckesheim USA (Slatersville, R.I.);**  
[www.herboldusa.com](http://www.herboldusa.com); 401-597-5500

## PACKAGING

### Oxygen permeation technology for produce packaging

The new *Ox-Tran 2/12* oxygen permeation instrument from **Mocon Inc.** is designed to provide produce market-

ers and their material suppliers with oxygen permeation data quickly and more easily to assist in meeting shelf-life goals.

At the core of the new *Ox-Tran 2/12* is simplified setup. Typically, a significant number of labour hours are spent setting up tests or waiting for results, creating a bottleneck. The new instrument was specifically designed to produce results quickly, with minimal effort, to increase efficiency. A new user interface, coupled with increased automation, makes testing easier than ever before, with less skill required.

The *Ox-Tran 2/12* is well-suited for brand owners as well as film manufacturers and converters who either use or sell flexible materials for produce applications. Using the instrument across the supply chain ensures that quality standards are being met at every stage of the process.

**Mocon Inc. (Minneapolis, Minn.);** [www.mocon.com](http://www.mocon.com); 763-493-6370  
**Novatech (Mississauga, Ont.);** [www.novatech.ca](http://www.novatech.ca); 905-569-9814  
**Meyer Service & Supply Ltd. (Long Sault, Ont.);**  
[www.meyer.ca](http://www.meyer.ca); 877-312-2254



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## SOFTWARE

### Online heat load calculator

A new online tool available from Vortec, at [www.vortec.com](http://www.vortec.com), allows users to determine cooling requirements based on the actual parameters of their particular application.

Called the *Heat Load Calculator*, the system allows users to input enclosure height, width and depth, compressed air inlet temperature and pressure, current cabinet temperatures, worst-case ambient temperature, and whether the enclosure is in direct contact with sunlight (and enclosure colour). The Heat Load Calculator then calculates the total heat load in the enclosure and suggests a Vortec enclosure cooler suitable for the application. A print button allows users to easily print the completed form, heat load results, and the suggested cooler.

This new online tool is well-suited for a wide range of



industries and applications, including industrial/manufacturing, food, chemical, water, wastewater and other processing environments, oil refining and petrochemical processing, and others that have become dependent on microprocessors, PLCs, and VFDs.

Vortec (Cincinnati, Ohio);

[www.vortec.com](http://www.vortec.com); 800-441-7475

## CONTROLS

### Updated loss-in-weight feeder control platform

Schenck Process LLC has

recently added new features to its *Discount* loss-in-weight feeder control platform that customize, simplify, and enhance the user experience.

Some of the key additions include a "Favorites" folder,



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customizable calibration sequences, detailed event message text, and the use of HTML5 for online equipment monitoring.

Utilizing the Schenck Process EasyServe service tool, a "Favorites" folder can be created giving operators quick access to all the different parameters that are critical and unique to their individual process. Parameters that are rarely used can be hidden, eliminating the need to search through multiple parameters that are not relevant for the user's particular process.

A customizable calibration sequence easily leads operators through the required calibrations. Sequence check marks indicating that a calibration has been completed, progress bars, and detailed status and event messages are just a few of the enhanced operational features available with the Discount Tersus controller.

A change from Java to HTML5 for web page HMI provides a much wider range of access and compatibility through various web browsers and smart phones, including Apple products.

**Schenck Process LLC (Kansas City, Mo.);**

**[www.schenckprocess.com](http://www.schenckprocess.com); 816-891-9300**

**Rate Technology Systems (Mississauga, Ont.);**

**[www.ratetechnologysystems.com](http://www.ratetechnologysystems.com); 905-607-3240**

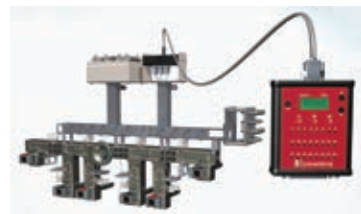
## HOT RUNNERS

### Sequential valve gate molding made easy

New from **Synventive Molding Solutions**, the SVG+ hot runner system is designed to offer superior performance, efficiency, and reliability for sequential molding of large parts.

The system has a simple design, with no cooling lines or plates required, to deliver increased reliability in the molding process. Ideal for family or modular molds, benefits of the SVG+ include higher quality part surface finishes, the ability to mold parts with complex geometries and high dimensional stability, higher production rates, and clamping force reduction.

The SVG+ actuated system is equipped with new modular actuators and patent pending SynCool3 technology. SynCool3 provides indirect cooling of the actuators without the need for separate cooling lines, as well as other benefits: it preheats without damage to actuator or seals, eliminates



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clogged or leaking cooling lines, prolongs actuator seal life with less servicing, improves manifold temperature uniformity by removing the cooling plate, facilitates quick mold changes by eliminating need to cool down the hot runners, and prevents overheating and degrading of hydraulic fluid.

**Synventive Molding Solutions Canada Inc. (Toronto);**

**www.synventive.com; 416-428-4693**

## PURGING COMPOUNDS

### Next-generation compound for processing machinery

**Sun Plastech Inc.**, the manufacturer of the Asaclean purging compound, has introduced its new UF2 grade material that enables very fast changeovers in injection molding, blow molding, and cast film extrusion applications.

The UF2 grade can be purged through a die without removing it, can effectively remove gels and contamination that is not carbonized, and has superior compatibility with PE resins.

Recommended for colour changes, material changes, hot runner cleaning, and shutdown/sealing, the UF2 grade compound requires less product than competing products and results in quicker cleanup. For blown film applications, the UF2 grade also helps manufacturers “hold the bubble,” minimizing downtime to increase productivity; in blow molding applications, UF2 helps hold the parison.

With a processing temperature range of 340° to 610°F or 170° to 320°C, the UF2 grade requires 0.0004-inch (0.01



mm) clearance for hot runner gates and extrusion dies. The material can also pass through as tight as 200-mesh extrusion screen packs when only one layer of mesh is used.

**Sun Plastech Inc. (Parsippany, N.J.);**

**www.asaclean.com; 800-787-4348**

## MATERIALS

### Blue-tone carbon black masterbatches for the automotive market

Modern Dispersions Inc. has introduced a new line of blue-tone carbon black masterbatches designed to satisfy the growing customer demand for blue-tone black colours in door panels, instrument panels, and other automotive interior applications.

Typical automotive applications require strong dispersion of pigments into various interior surfaces to match the overall colour scheme. Carbon black is used in auto interiors not only as a pigment but as functional filler due to its ability to increase UV stability. Colour levels are carefully controlled to ensure consistency since variables during processing can affect the colour performance of the masterbatch.

The new blue-tone carbon black masterbatch can be used in a wide range of resin systems including PE, PP, and TPOs. Typical usage levels range from five to eight per cent by weight depending on the total polymer system in the final product.

**Modern Dispersions Inc. (Leominster, Mass.);**

**www.moderndispersions.com; 978-534-3370**



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# Solving feed throat bridging/blocking in co-extrusion

By Ajay Beniwal, Extru-Tech Solutions Inc.



If an extruder is a musical band, the screw and barrel combination is the lead singer: they get most of the attention. The rest of the extruder — the feed throat, heaters, thermocouples, cooling blowers, temperature controllers, et cetera — can be compared to the back-up musicians: generally ignored until they go out of tune.

One way the feed throat can fall out of tune is through partial bridging, which occurs when melting of the polymer in the feeding area forms a

bridge around the screw that affects feeding. As a result, the output of the extruder will drop but it will still keep pumping. In a co-extrusion situation the operator probably won't even notice because the total output won't go down. That's why partial bridging is a more complicated problem than full bridging (in which the polymer can't move forward and there will be zero output).

The best way to troubleshoot bridging/blocking is to review the available historical logs and compare the data, like raw material, layer ratio, screw rpm, melt temperature, melt pressure, and torque/load of the extruder. If anything indicates a significant change in the output in a short period, we can predict partial blockage/bridging in the extruder. In case of full bridging/blocking, there will be zero output from that extruder: the screw will reach a maximum rpm but won't pump anything because it will stop taking the polymer granules. The load of the extruder will be minimal, and the melt pressure will show some reading because of the back pressure from the other layers.

Problems related to the bridging/blocking at the feed section can be resolved through the following steps:

- Stop the screw (if stopping the complete line) or keep rotating at 1 to 2 rpm to prevent the backflow from other layers.
- Remove the feed hopper for a clear view of the screw flights. (Do not put your fingers inside the moving screw!)
- Increase the screw rpm and watch if the screw takes any granules/pellets; if it doesn't, increase the barrel tem-

perature by 50°C in the first barrel heating zone. Vacuum all the granules from the throat opening for a clear view of screw flights. (Make sure the screw is not turning; follow proper lock-up procedure.)

- Once the temperature is reached, try running the screw at high speed, feeding manually, and watch if the pellets are conveyed in or not.
- Run the screw at a different rpm and observe if any conveying is taking place; if not, increase the first barrel zone temperature by a further 30°C.
- Find some polymer chunks or prefabricated round PE sticks and carefully feed them directly into the screw flight. (But do not use any metal rods or tools to feed these PE chunks.)
- Run the screw and make frequent changes in screw rpm while following the above step; once the polymer chunks start moving, feed some polymer granules. After a while the pellets will start moving freely, and at this time the barrel temperature can be brought down as per requirement.
- Check the feed zone cooling for any problems and observe if it maintains the required temperature while the extruder is in operation.

Usually the bridging/blocking problem does not occur in grooved feed extruders, but there are exceptions. If this happens, the problem can be resolved in the same manner as outlined above.

**CPL**

Ajay Beniwal is the chief consultant at Extru-Tech Solutions Inc., a Brampton, Ont.-based blown film and extrusion consultancy. For more information, call 647-687-0859 or visit [www.extru-techsolutions.com](http://www.extru-techsolutions.com).

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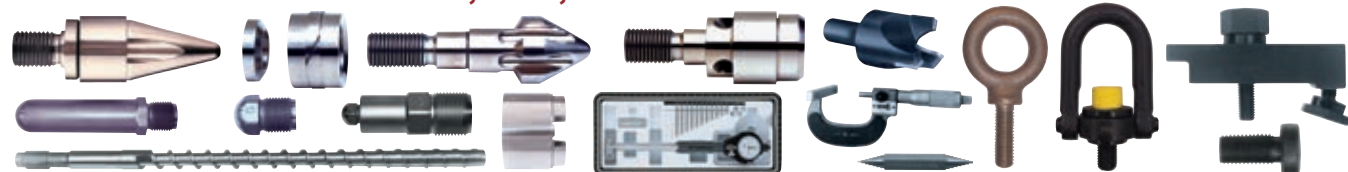
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