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FROM THE ARCHIVES

The November 1949 issue of *Canadian Plastics* reported on the formation of the Ontario chapter of the Society of Plastics Engineers (SPE) – but the story didn't exactly overflow with national self-confidence. "The SPE's main objects are to promote in all lawful ways the arts, sciences, standards, and engineering practices connected with the use of plastics," our story explained. "One of the purposes of an Ontario section of SPE in Toronto will be to avail members of the opportunity of listening to informal talks given by outstanding American specialists in various phases of plastics."

**Number of the month:
620,000***

* Approximate number of recycled PET water bottles used to build JD Composites' prefab home in Meteghan River, N.S. (See pg. 10)

Cover photo and pg. 3 JD Composites photo courtesy of James Dwyer, Engel and Völkers



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Located near Barrie, Ont., this full-service engineering, product development, and injection molding specialist produces over 70 million high-precision plastic parts per year. And you could probably count the rejects on the fingers of one hand.

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New decade, new opportunities

In the spirit of full disclosure, I was originally going to call this issue's editorial "New decade, same old bushwa," but then I had second thoughts.



The bushwa part came from the fact that, although the 2010s are now in the ash heap of history, the news about plastics hasn't changed: in other words, bans and more bans. The 2020s were less than three days old when former U.S. Vice President and current presidential candidate Joe Biden called for a ban on all plastic bags in that country. If it was an off-the-cuff statement, it was ominous – a seasoned political pro intuiting where American public sentiment was heading; and if it was a carefully considered campaign platform, it was even worse – Biden's people had run the numbers and determined public sentiment was already there. Either way, the episode has more red flags than Bernie Sanders' honeymoon in the Soviet Union.

Two weeks later, China, the world's other largest economy and one of the biggest users of plastic, unveiled a major plan to crack down on single-use plastics across the country by the middle of the decade (see pg. 6).

On top of that, many actual bans came into effect during January 2020. In Canada alone, single-use plastic bans kicked in in municipalities in Alberta, Quebec, and Newfoundland and Labrador, and in all 255 locations of the Sobeys grocery stores.

But then I got optimistic. Because if the plastic manufacturing industry is facing unprecedented challenges – and it is – it's also true that there are enough new opportunities available to more than offset these, at least in potential. For one, overall industry growth is being fuelled by the expanding use of plastic in growing industries such as construction, automotive, aerospace, and electronics. Second, ever-more companies are finding innovative new

uses for existing plastic, or are producing newer plastics with novel physical properties that make them suitable for new uses, or as replacement materials for metals. And third, fears of environmental damage have led to an increased focus on biodegradable plastic manufactured from renewable materials; which is why demand for bioplastics is expected to eventually exceed the demand for traditional petroleum-based polymers.

And then there's recycling. While there's no silver-bullet solution to the toxic issue of plastic flowing into our oceans, recycling must form part of the answer. To date, plastic recycling has been an underperforming sector – with only 14 per cent of annual global plastic production being collected – but it's ripe for a remake. To cite just one example, waste management company Veolia and consumer goods giant Unilever have announced plans to work together to invest in new technologies to increase recycling and move towards a circular economy.

And every day, new approaches to reusing post-consumer plastic are being devised. As told in our cover story (beginning on pg. 10), Nova Scotia-based construction firm JD Composites recently completed its first concept home, made from about 620,000 recycled PET bottles. Dubbed the Beach House, the hurricane-resistant dwelling is a great example of how recycled plastic can be put to good use. And as a solution for housing in hurricane-prone regions – which often have poor to non-existent recycling programs, and therefore abundant waste plastic available for use – it's a storyline so perfect that no self-respecting novelist would dare invent it.

If a spacious, modern-looking, Canadian-built home made from recycled plastic isn't a cause for optimism as we head into a new decade, I don't know what is.

Mark Stephen, editor
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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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Converting coffee chaff into car parts

In the old adage about separating the wheat from the chaff, the chaff represents the stuff that's worthless. But in light of a new partnership between the Ford Motor Co. and McDonald's USA – based on Canadian research – it may be time to rethink that.

Every year, McDonald's produces more than 62 million pounds of coffee chaff – the unused dried skin that comes off of coffee beans during the roasting process – that has traditionally gone straight to landfills. Now, however, in what you might call a double shot of innovation, Ford is taking that chaff and converting it into a durable material to reinforce vehicle parts, including some of the most demanding ones. By heating the chaff to high temperatures under low oxygen, mixing it with plastic and other additives and

turning it into pellets, the material can be formed into various shapes that not only meet the quality specifications for headlamp housings, car battery covers, and other interior and under-hood components, but that will also be about 20 per cent lighter and require up to 25 per cent less energy during the molding process than the previous material combination of plastic and talc, a mineral that has to be mined.

The idea was developed, tested, and patented in Ontario, by researchers at the University of Guelph's Bio-products Discovery and Development Centre, who were looking for organic alternatives for polymers used in plastics and hit on coffee chaff as one of the most useful and scalable materials.

As used by Ford and McDonald's, the process begins in South America,

where the beans are collected and shipped to the roasters, where the skin comes off. It then moves to Ontario, when the chaff is shipped to Competitive Green Technologies, a biotechnology company in the town of Leamington and a technology licence partner with the University of Guelph; this is where the coffee chaff and plastic are mixed to produce resin. The headlight housings are then injection molded by Varroc Lighting Systems, which is located in Plymouth, Mich., near Ford's headquarters in Dearborn. The final step is to ship the headlights to Ford, where they get added to the cars.

The automaker began installing the headlights in its Lincoln Continental in December 2019, and other model cars are expected to follow, including the Mustang. **CPL**

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China announces ban on single-use plastics

China, one of the world's biggest users of plastic – and one of the biggest producers of plastic waste – has unveiled a major plan to restrict the production, sale, and use of single-use plastic products.

Issued by the National Development and Reform Commission and the Ministry of Ecology and Environment on Jan. 19, the directive will see non-degradable bags banned in major cities by the end of 2020 and in all cities and towns by 2022.

Fresh produce markets will be exempt from the ban until 2025.

In addition, items such as plastic straws or cutlery for foodservice as well as hotel disposables will be phased out under the ban. The policy explicitly prohibits the production and sale of products including ultra-thin plastic bags with a thickness of less than 0.025 mm and PE agricultural mulch with a thickness of less than 0.01 mm.

The announcement comes on the heels of heavy restrictions that China introduced in January 2018 on imports of mixed, highly polluted scrap plastic – the first major sign, analysts said at the time, that China was taking the issue of plastic waste seriously.

Some of these same analysts are now trying to understand what this new move will mean for China's – as well as the global – petrochemical industry. "China's polymers or plastics demand is, by volume, the biggest in the world, and its growth in demand is also the largest," said John Richardson, senior consultant, Asia, at the commodity market intelligence provider ICIS. "China is the biggest polymer import market in the world, especially for PE, around half of the demand for which is in single-use plastics. So, whatever happens in China is a big deal for the global polymers business. The implications both for virgin PE polymers demand in China and



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for the amount of that demand which is met by recycled production are likely to be very significant."

According to Wood Mackenzie senior consultant William Liu, the regulation will impact plastic consumption and consequently China's petrochemical industry. "PE consumption will be impacted as it is the main feed to produce bags and packaging films," he said. "But as plastic bags [and] straws are only one application of plastic, it won't have a major impact on the oil industry." According to Liu, as the ban rolls out to more cities and substitute materials gain traction, China's PE consumption will be further impacted.

The effectiveness of the directive will depend on many factors, Liu continued, in particular the development of substitute materials. "At present, compared with materials such as paper, glass, wood, and metal, plastic has many advantages in daily use, such as being lightweight, easy to process, convenient, and most of all cost-competitive," he said.

And the plan might just kick-start China's underperforming recycling sector. "It's a very reasonable scenario that China will lead the world in banning single-use plastics that have no real societal value, while also creating a modern, state-of-the-art recycling industry that competes with the very best in the world," John Richardson said. **CPL**

Borealis buys Nova's stake in joint venture

Calgary-based Nova Chemicals Corp. and joint venture partner Borealis AG have reached an agreement for Borealis to acquire the full ownership of Novealis Holdings LLC.

The financial terms of the deal, announced on Jan. 9, have not been disclosed.

Formed in 2018, Novealis is a 50/50 joint venture between affiliates of Nova and Austrian polyolefins manufacturer Borealis.

The move comes after Novealis entered into a 50/50 joint venture agreement with Total SA to launch Bayport Polymers LLC in Houston, Tex. The Baystar JV is building a PE unit in Bayport that will have a projected annual capacity of 625,000 metric tons.

The deal is expected close in the first half of 2020. **CPL**

Deacro Industries bought by Davis-Standard

Extrusion equipment maker Davis-Standard LLC has acquired Deacro Industries Ltd., a manufacturer of slitting, rewinding, and roll handling equipment headquartered in Mississauga, Ont., for an undisclosed amount.

In a statement, Deacro president Clarence Beishuizen said the company "will continue to operate and serve its customers as before."

Deacro was originally founded in 1979 as a precision machine shop for the plastics industry, but eventually transitioned to making slitting and rewinding equipment.

This is Davis-Standard's second purchase of a Canadian company in less than two years. In June 2018, the firm acquired Brampton, Ont.-based blown film machinery maker Brampton Engineering Inc.

Davis-Standard is based in Pawcatuck, Conn., and is represented in Canada by Auxiplast Inc., of Sainte-Julie, Que. **CPL**

CCL buys BOPP film maker Flexpol

Toronto-based specialty label and packaging supplier CCL Industries Inc. has signed a deal to buy Polish company Flexpol Sp. Z.o.o. for an estimated \$22 million.

Flexpol is a producer of BOPP film which is used in packaging, labelling, and lamination.

"Flexpol's plant is in very good condition with state-of-the-art equipment in a low-cost location," CCL president and CEO Geoffrey Martin said in a Jan. 3 statement. "We expect to significantly improve profitability by 2021 as product mix changes."

According to CCL, Flexpol had approximately \$70 million in sales in 2019, focused on flexible packaging customers.

CCL's statement said that Flexpol will operate as Innovia Poland. **CPL**

Omega Tool adds another KraussMaffei injection press

Canadian moldmaker Omega Tool Corp. recently installed a 2,000 metric ton KraussMaffei MX series injection molding machine at its Oldcastle, Ont. headquarters to increase its validation capabilities.

This is the third KraussMaffei press installed by the company, which was established in 1981 and serves OEMs and Tier 1 and Tier 2 automotive customers. The first machine, a 4,000 metric ton MX series unit, was installed in 2012, which is when Omega first began providing full validation capabilities; the second – the same style 4,000 metric ton machine – was added to Omega's facility in Querétaro, Mexico in 2017.

"The KraussMaffei machines



The new 2,000 metric ton KraussMaffei MX series injection molding machine on Omega Tool's shop floor in Oldcastle, Ont.

allow us to replicate the production environments of our clients – which saves time and development costs – and have footprints that were perfect for our facilities," said Delko Prebeg, Omega's chief operating officer.

KraussMaffei Corp. is headquartered in Florence, Ky. **CPL**

Photo Credit: KraussMaffei Corp.

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Ontario machinery sales firm Belpas relocates, grows

Machinery sales firm Belpas Inc. has staffed up, moved into a new and larger location in the Toronto area, and gained an important new account.

In December 2019, the company hired industry veteran Kevin Bell as its sales manager for Ontario, and announced the move to the new office located at 9131 Keele St. in Vaughan, Ont. And in January 2020, the firm became the new Canadian sales representative for injection press maker Niigata Machine Techno USA Inc. It will also represent Elk Grove Village, Ill.-based Niigata in the U.S. states of Michigan, Ohio, New York, and western Pennsylvania.

“With the addition of new product lines and new people, our growth in sales meant additional office space was



Belpas' new headquarter's; Kevin Bell.

required,” Belpas president Steve Bell said. “This modern new office space provides all the amenities we require to work efficiently with provision to accommodate our future growth.”

Bell also called Niigata “a world leader” in all-electric machine technology from 55 to 900 tons. “Repping Niigata fills a void we had in our product line of high-quality, smaller tonnage electric machines for our higher end customers,” he said.

Belpas supplies both new and used plastics machinery and equipment. In addition to Niigata, it's the Canadian representative for U-MHI Plastech Co. Ltd. (formerly Ube Machinery Corp. Ltd. and Mitsubishi Heavy Industries), IronJaw, Bulk Tech, and Concor Tool & Machine.

In addition to its Vaughan office, the company has sales offices in Montreal and Cleveland, Ohio.

CPL

Photo Credits: Belpas Inc.

KraussMaffei veteran Paul Caprio is the new president of Engel Machinery

Paul Caprio, a 30-year machinery sales veteran and the former head of KraussMaffei Corp., has been appointed as the new president of injection molding machine maker Engel Machinery Inc. in York, Pa.

In a Jan. 2 statement, Engel said that Caprio is managing the sales and service



Paul Caprio (left) and Mark Sankovitch.

subsidiary of the North American operation of Austria-based Engel Holding GmbH together with current CEO Mark Sankovitch. Sankovitch has been the president and CEO of Engel North America since 2009, and continues a leading role as CEO of North America with the plan to retire at the end of 2021.

Caprio left KraussMaffei in June 2019, after having served for 10 years as company president.

Engel's Canadian subsidiary, Engel Canada Inc., is located in Waterloo, Ont.

CPL

SUPPLIER NEWS

- Toronto-based machinery sales firm **Plastic Automation Engineering Inc.** (PAE) is the new sales representative for **Woojin Plaimm Co. Ltd.**'s injection molding machines in all of the Canadian provinces except Quebec. Korea-based Woorjin manufactures a wide range of hydraulic, all-electric, two-platen, and hybrid presses between 30 and 4,300 tons. PAE was founded in 1990, and is headed by general manager Nick Doiu. The firm also employs Mihai (Michael) Nicula.
- Thermoplastics resin distributor **Nexeo Plastics** has signed a new distribution agreement with material supplier **DSM Engineering Plastics**. Nexeo will now carry and distribute DSM products from its advanced material portfolio throughout Canada, the U.S., and Mexico, including Akulon PA6/PA66, Arnite PET, Arnitel TPC, EcoPaXX PA410, ForTii PA4T/PPA, Stanyl PA46, and Xytron PPS.
- Toronto-based specialty raw material distributor **Northspec Chemicals Corp.** has been appointed to distribute the **Stahl Polymers** portfolio in Canada. Northspec specializes in supplying high-performance, value-added resins, additives, and pigments in the construction, plastics, and rubber industries. Stahl is headquartered in Waalwijk, the Netherlands.

PEOPLE



Al Bailey

Tony Black

Michael Duff

David Fink

Chris Hergott

Rich Kanarski

Scott Lowe

Mark Skakun

Jeff Uhrig

- Lebanon, Ore.-based processing machinery maker **Entek Extruders** has named **Al Bailey** as its sales engineer.
- Bolton, Ont.-based **Husky Injection Molding Systems Ltd.** has named **Tony Black** as president of its Customer Success Management organization.
- York, Pa.-based wheel and industrial extrusion blow molding machine maker **Graham Engineering Corp.** has appointed **Michael Duff** as its vice president of sales and service.
- Industry association the **Plastics Pipe Institute Inc.**, headquartered in Irving, Tex., has named **David Fink** as its president and executive director.
- The Cambridge, Ont.-based **Canadian Tooling & Machining Association** has named **Chris Hergott** as its president.
- Extrusion machinery maker **Davis-Standard LLC**, headquartered in Pawcatuck, Conn., has named **Rich Kanarski** as its manager, technical product management.
- Tool manufacturer **Emuge Corp.**, of West Boylston, Mass., has named **Scott Lowe** as its national accounts manager for Canada and the U.S.
- Process additive supplier **Struktol Co. of America**, headquartered in Stow, Ohio, has appointed **Mark Skakun** as its president.
- **Novomer Inc.**, a sustainable chemicals company with locations in Rochester, N.Y. and Boston, has named **Jeff Uhrig** as its CEO.

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UNBOTTLED POTENTIAL

By building a three-bedroom home in Nova Scotia from 620,000 recycled plastic water bottles, construction company JD Composites has opened up a new way to turn plastic waste into eco-friendly housing.



By Mark Stephen, editor

Remember the fable about the three little pigs and the big, bad wolf? The wolf could blow down houses made of straw and wood, but not brick. There's a new prefab beach house overlooking the Meteghan River on Nova Scotia's South Shore that the wolf wouldn't be able to make a dent in either – and made from approximately 620,000 recycled plastic water bottles, it's a lot more environmentally friendly.

And far from being a bedtime story, it's history-making.

Built last year by Canadian construction firm JD Composites, the 2,000-square-foot, three-bedroom home is the first-ever made from 100 per cent recycled standard plastic bottles using PET core foam green technology. The house incorporates over 184 prefabricated PET wall panels, each of which was shaped and cut manually and according to the home's design. The 15-centimeter-thick plastic slabs provide both structural strength and insulation – the plastic panels will stand up to some of the highest wind speeds that Mother Nature can generate, and also allow the house to main-



The master bedroom.

Photo Credit: James Dwyer, Engel and Völkers

tain inside temperatures more than twice as effectively as conventionally built homes.

IDEA MEN

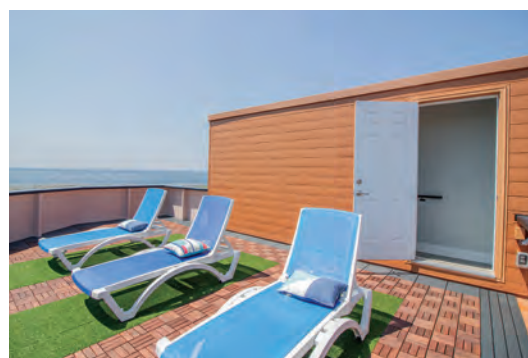
JD Composites is a start-up led by company president David Saulnier, a 15-year veteran of the marine construction sector, and vice president Joel German, a licensed heavy machinery operator who holds a degree in business administration from Université Sainte-Anne in southwestern Nova Scotia.

The two were looking for a disruptive technology to bring to market, and hit on the idea of building a home with recycled plastic bottles. Saulnier had experience working with composites, and decided that if he and German were going to start a new business, they had a responsibility to help the environment as well. "We wanted to utilize a plastic waste that would otherwise probably end up in a landfill or – even worse – in the ocean," Saulnier said. "We chose PET for a number of rea-



The house's exterior (left), rooftop terrace (below), and kitchen (bottom).

Photo Credits: James Dwyer, Engel and Völkers



sons: it's a versatile material, relatively inexpensive, and is also one of the plastics that causes the most litter." And building from other plastics could be problematic, he added. "PVC, for example, will off-gas volatile organic compounds for the duration of its lifetime unless it's totally encapsulated," Saulnier said.

After thinking about the project for three years – and with assistance from a \$109,000 repayable loan from the Atlantic Canada Opportunities Agency – JD Composites chose Brampton, Ont.-based foam producer Armacell to supply the PET. "I had known Armacell from my boat building days, and I knew they were a very reliable PET supplier," Saulnier said. The duo worked closely with Armacell's housing division, which created the panels by melting down the 620,000 recycled plastic bottles into small beads, before placing them through an extensive extruding process, during which the bottles were shredded and heated to

form plastic pellets and placed into a hopper, where they were treated with gases that melted them into foam. When cooled, the foam becomes incredibly durable and is both rot and mildew-resistant.

After obtaining raw product from Armacell, JD Composites' team sandwiched the foam core between fibreglass skins to create the lightweight composite panels at their Meteghan warehouse. Once the panels were complete, the entire house – dubbed the Beach House – was assembled on-site

in just two days in June 2019, on 1.46 acres of oceanfront property on nearby family land. The panels were bonded with chemicals instead of nails and shingles – which can come loose during a hurricane – to make the whole structure stronger. The JD Composites team then spent the winter finishing the interior. "All of the exterior walls and the roof – everything that gets hit by the elements – are made from recycled PET," Saulnier said. "Other companies have some recycled PET in wall panels – 30 per cent recycled content

with 70 per cent new material – but no one else is doing what we are. We’ve been told that only four major companies in the world are using this material, and we’re the only ones using it in this way.”

SAFE AND SOUND

In addition to utilizing plastic waste, the new material delivers when it comes to making the house warm and safe. The panel walls provide insulation at an estimated rating of R-30 throughout. “Typical Canadian homes use insulation with an R-20 rating, with wooden studs used 16 inches apart,” Saulnier said. “Higher rated insulation values are brought down by each stud – wood creates a thermal break in the insulation, reducing the R-value from R-20 down to R-13. Our home has been ASTM certified for North America/Europe for a continuous R-30 value with no thermal breaks. Because there’s nothing to transmit the cold air from the outside to the inside of the home, it’s over twice as efficient as a traditional house.” Over the life of a mortgage, Saulnier estimated, the homeowner could save up to \$80,000 in energy costs.

And as for structural strength, Saulnier and German – and everyone else involved in the project – were surprised by the results. Before construction began, a sam-



Joel German (third from left) and David Saulnier (second from right) cut the ribbon to officially open the Beach House.

Photo Credit: JD Composites

ple panel was sent to Exova Canada, a lab-based testing company in Mississauga, Ont., where it withstood 326-mile-an-hour wind speeds, twice as strong as a Category 5 hurricane. This was with a quarter-inch of wind deflection on an eight-foot-by-eight-foot square-foot panel. “We knew the material was strong, but we didn’t know how strong until the engineers at Exova maxed out their wind chamber,” Saulnier said. “They were also shocked that they could load the panel into the chamber by hand, because it’s such a lightweight material compared to concrete.” Since construction, the house’s strength has been tested again, although that wasn’t part of the plan. “During Hurricane Dorian, which hit Nova Scotia in September 2019, Joel and I went into the house and leaned against some of the walls to see if we could feel anything, and there was no movement at all,” Saulnier said.

FINISHING TOUCHES

Aesthetically, the Beach House doesn’t look anything like other made-from-bottle houses we’ve all seen in photos of shanty towns, either inside or out. JD Composites covered the core foam with an exterior finish of recycled aluminum siding laser-printed with a cedar print for looks, topped off with paint for UV protection. “We chose the siding to make the house stand out, but that’s only one possibility,” Saulnier said. “We could have made it look like a stucco finish and given it a rougher texture.”

The interior of the home features a large modern kitchen, open living room, three large bedrooms, two bathrooms, indoor barbecue room, and rooftop terrace. “The terrace gives a great view of St. Mary’s Bay,” Saulnier said. “It’s my favourite feature.” The Beach House also has large windows throughout, which capture other beautiful bay views while also letting in an



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One of the 15-centimeter-thick panels.

Photo Credit: JD Composites

abundance of natural light.

And while the house cost about \$400,000 to erect, it's expected to have fewer issues down the road because the material is so durable. That could appeal to some homebuyers who are already spending around \$400,000 for new construction, Saulnier said.

SCALING UP

Having garnered both praise and media attention from around the world, the house has put JD Composites on the metaphorical map. "We've received comments and questions about the house from all across Canada, the U.S., Britain, and Europe," Saulnier said. The next step is to get on

the map literally. "We're currently building a similar house about a half-hour away for private sale to a client, and our ultimate goal is to further develop the technology so it can be licensed globally. We see it as a solution for housing in hurricane-prone regions and for disaster relief. The scalability of our operation is phenomenal."

The Beach House, meanwhile, is currently for sale and also listed on Airbnb, where it's become a hot vacation rental property. "If the house doesn't sell, that's fine," Saulnier said. "It's a Cadillac house in a small Acadian village in Nova Scotia, and we've grown attached to it."

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size reduction

ON THE CUTTING EDGE

No plastics processor actually wants to generate waste, but they all do. Efficiently reducing bad parts and other plastic waste into quality regrind for reuse is what separates the pros from the pretenders. These latest size reduction technologies can help.

By Mark Stephen, editor

You can go a long way doing imitations. Jim Carrey got his start that way, and Rich Little made it his whole career.

In a weird way, the makers of size reduction equipment for plastics can probably relate. When you get right down to it, the overall goal of most plastic recycling programs is to turn scrap and non-conforming parts into material that imitates virgin resin by being a similar size and form, and with the proper material characteristics to be blended with original resin.

But if size reduction involves going small, it's not a small thing: Day in and day out, hundreds of plastics processors use size reduction equipment alongside injection molding, blow molding, extrusion, and thermoforming machines. They're also used for general recycling purposes.

So when new technologies come out – either in granulators, which handle runners and small to medium-sized parts; or shredders, for large or very dense parts – virtually everyone has an interest in knowing.

So here's a look at some of the latest offerings.

SLOW IT DOWN

Slow-speed granulation technology has been around for two decades, and 25 rpm has always been the worldwide standard for slow-speed operation. But that may change with Rapid Granulator's new

OneCut Pro granulator, a beside-the-press unit that allows injection molders to adjust the rpm range when granulating at a slow speed from the standard 25 rpm to a bandwidth of 15 to 35 rpm (plus/minus 40 per cent rotor speed), for optimal quality regrind. Running at 15 rpm, the OneCut Pro improves the quality of ground brittle materials and minimizes dust and – very importantly – noise. Speed can easily be increased to 35 rpm – increasing the capacity of the granulator by 30 to 40 per cent – to accommodate larger amounts of material. “The OneCut Pro comes equipped with

EnergySmart, a new system that lets the operator stop the machine as material is fed into it for an energy consumption reduction of up to 80 per cent,” said Bengt Rimark, Rapid's CEO. “It also uses our Stop & Go technology, which lets the machine granulate in intervals to further save energy, with zero energy consumption and no noise during the pause mode.”

Another offering in the low-speed category is from Wittmann Group. Replacing its former Junior and Minor models, the company's new S-Max screenless granulator models – the S-Max 2, S-Max 2 Plus, and S-Max 3 – are low-speed granulators designed for the inline recycling of sprues made of hard and brittle engineering resins, and generate material throughputs of 27, 44, and 66 lbs per hour, respectively. Mounted on casters for mobility, the three granulator models have



Wittmann's S-Max screenless granulator models are low-speed granulators designed for the inline recycling of sprues.

an interface that enables full communication with the injection molding machine and, as an option, a shutdown function is available. When the injection molding machine is “off,” the granulator stops automatically, helping to save energy. They also have ARS auto-reversing control, which clears jams by automatically stopping and reversing the rotor. In a nutshell, Wittmann said, the granulators produce less noise, save more energy, have a more compact footprint, need less maintenance, are equipped with hardened cutting tools, provide for easy cleaning, and also have excellent safety features.

RECYCLERS REJOICE

Granulator maker Rotogran International Inc. moved from its original headquarters in Vaughan, Ont. into a much larger manufacturing plant in the nearby town of Bolton in the fall of 2018 – a relocation made necessary in large part by growing its business as it gets more involved in recycling. “We’re definitely moving into recycling as that industry expands,” said Rotogran president Mike Cyr. Which, ironically, also benefits its plastics processing customers. “Production is the name of the game in recycling – recyclers want heavy-duty granulators that can run at maximum capacity around the clock,” Cyr said. “Processors don’t usually run granulators at full capacity, but when they do – if they’re shock-loading to get rid of a big collection of bad parts – they reap the benefits from this heavy-duty construction as well.” For both recyclers and processors, Cyr said, Rotogran has been equipping its granulators with more and more innovative components of late. One example is wear-resistant plates that can be changed rapidly – in less than half the time it takes to change blades, Cyr said. “The plates are optional on our granulators,” he said. “Wear-resistant plates aren’t new per se, but we’ve improved ours by making them from the same tool steel as the rotor blades are made from.” Rotogran can also put a pathway deflector in the cutting chamber itself, deflecting the material back directly into the cutting circle after the first cut. “The removable, replaceable deflector is an optional upgrade that greatly improves throughput,” Cyr said.

Another size reduction machinery specialist zeroing in on the recycling market is Piovan. The company’s newest cutting innovation is the U&G disposable knives system, which promises longer knife life for recyclers – as well as processors – thanks to the application of CPM10V tool steel. “U&G disposable knives are a clamped knife design allowing for a significantly smaller knife to be used,” the company said. “After a conventional knife is sharpened to its minimal level, 95 per cent of the knife is rendered useless and scrapped.

Since the U&G disposable knives are so much smaller, a more exotic, more expensive tool steel can be used for longer life and still cost less than conventional knives utilizing expensive D2 tool steel.” And for recyclers – for whom, even more than processors, downtime equals money lost – these disposable knives mean less time wasted for knife changes. “U&G knives take about half as much time to change as conventional knives,” Piovan said. “The difference is even greater with older technology granulators with fixed knives and no knife gap pre-adjustment fixture – it’s the difference between changing a 300 gram knife instead of a 15 kg knife.”

Also built for plastics recycling, Vecoplan LLC’s new VIZ series – which stands for Vecoplan Infinity Shredders – are designed so that, depending on the requirements, the user can choose between the HiTorc drive with its powerful start-up phase and high torque; or the ESC, Vecoplan’s frequency controlled, belt-driven direct drive. “Vecoplan also came up with a new rotor design that features bolted tool holder plates with variable cutting tip sizes, making rotor changes unnecessary,” said Greg Parent, the company’s Canadian sales representative. “Users only have to exchange the plates to quickly adapt the cutting geometry to different output grain sizes –

the rotor remains in the machine.” Compared to earlier shredders, the VIZ also has an improved ram height to handle entire bales. The working chamber of the machine was also enlarged, permitting reliable shredding of bales with models 1300 and higher. “In a comparable Vecoplan model range this is possible only with sizes 1700 and higher, although the smaller version would have the necessary throughput,” Parent said. “Users can also equip the machine with a second counter knife.”



Vecoplan’s VIZ shredder can be equipped with either with a high-torque, quick-start drive or a frequency controlled, belt-type direct drive.

NEW AND IMPROVED

Other size reduction machines are just plain new and/or improved. The WLK 1500 shredder from Weima features new safety features for universal operation. The modified Weima WAP gearbox has a safety clutch located in the sensor monitored belt pulley, protecting the shredder from impurities and major damage. And it makes automatic stopping possible at any time. For opera-

tions that shred thin film or fibres, meanwhile, clogging is prevented by the segmented floor guide and the precise guidance of the ram that presses the material to be shredded against the rotating rotor. The standard hydraulically lowered swivel screen basket is designed to improve accessibility and simplify maintenance. Additionally, all WLK shredders have a Pipespacer hopper that prevents material bridging, which is important when shredding objects such as large purgings. The WLK series shredders can be fitted with either the universal

size reduction

V-rotor or the F-rotor developed especially for film and fibres.

In 2018, Conair Group launched its portfolio of Viper granulators, consisting of 14 different models with standard features that include improved sound insulation, hardened and water-cooled cutting chambers on most models, as well as bigger screens for increased throughput. From small press-side units to large, central granulators, the Viper product line includes models with rotor diameters of 6, 8, 12, 17, and 23 inches, or 140, 200, 300, 420, and 570 mm; and maximum throughputs from 80 to 3,800 lbs per hour, or 36 to 1,724 kg per hour. Tangential-feed cutting chambers are standard on smaller grinders, while large units come in a super-tangential configuration to facilitate feeding of large and bulky scrap. Eighteen months later, Conair is still surfing the Viper wave, but – to keep the metaphor going – carving when required. “We’re customizing various Viper models to suit the specific needs of individual customers,” said Dave Miller, Conair’s general manager, size reduction. “Processors want to be able to tie the granulator controls into other plant systems as part of a smart factory approach. And our customers in the packaging and film sectors want to be able to monitor as much as of the granulator as possible – amperage, cutting chamber temperature, vibrations, how long it’s been running, and more – because, for them, a granulator is a key production compo-

nent, and if it goes down there’s a tremendous amount of scrap that gets generated that can shut down the line. We can accommodate all of these requests.”

The end goal may be to imitate virgin resin, but there’s nothing phoney about any of these size reduction technologies. **CPL**

RESOURCE LIST

Conair Group (Cranberry Township, Pa.); www.conairgroup.com; 724-584-5500

Dier International Plastics Inc. (Unionville, Ont.);

www.dierinternational.com; 416-219-0509

Industries Laferriere (Mascouche, Que.);

www.industrieslaferriere.ca; 450-477-8880

Turner Group Inc. (Seattle, Wash.); www.turnergroup.net; 206-769-3707

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

Rapid Granulator Inc. (Leetsdale, Pa.); www.rapidgranulator.com; 724-584-5220

DCube (Montreal); www.dcube.ca; 514-272-0500

JL Plastics Machinery Inc. (Thornhill, Ont.);

www.jlplastics.ca; 647-554 3679

Equipment Resources NW (Ridgefield, Wash.); www.ernw.com; 360-892-6005

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

Vecoplan LLC (Archdale, N.C.); www.vecoplanllc.com; 336-447-3573

Greg Parent; 416-678-0154

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

Wittmann Battenfeld Canada Inc. (Richmond Hill, Ont.);

www.wittmann-group.com; 905-887-5355

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An on-the-fly colour change from black PP to light grey PP, completed in seven parts using Asaclean's UP grade CPC.



UNCOLOUR YOUR WORLD

As important as it is to put colour into plastic, it's just as important to remove it when the time is right, since any streaking in a new production schedule can render thousands of parts worthless. Commercial purging compounds were made for this.

By Mark Stephen, editor

Colour change is a fact in many areas of life, and most of the time it happens without any help from us: leaves turning different hues as summer gives way to fall, for example, or our hair greying as we inch our way into middle age.

Other colour changes definitely don't just happen by themselves – won't happen at all, in fact, without direct human action. Molding coloured plastic parts is definitely on this second list. Since resin is nearly colourless, most plastic products are not originally coloured – it takes the careful addition of colourants such as masterbatches, coloured pellets, or coloured compounds to achieve that. But the real work might be in getting those colours out of molding machines and extruders when necessary so they don't linger for

prolonged periods and contaminate new colour production runs. Which is where purging comes in.

For molders, purging is the process of removing traces of old material and contaminants – including old colours – from molding equipment. But with a plethora of commercial purging compounds (CPCs) to work with, which compound is the most efficient when it comes to colour changeovers? And what are the benefits of using a CPC at all as opposed to relying on process resin or regrind? The answer, almost invariably, depends on the particular job or situation.

DECISIONS, DECISIONS

One thing is clear at the outset: When it comes to removing colour, it's better to purge than not to purge. And by and

large, processors understand this. Market research studies conducted by manufacturers of CPCs during the past decade reveal that, while processors have mixed feelings about using CPCs for maintenance or resin changeovers, fully two-thirds prefer to use a CPC for colour changes.

And it's not hard to see why: Switching a molding machine or extruder directly from one colour to another without purging will see colours from previous run caught up in the machine's dead spots; the new production resins will, without warning, push the old colours into new parts. The result? Contaminated products that will end up in the scrap bin.

Now that we know why it's necessary, the first step to get the most out of a colour changeover is to identify which

purging

purging compound, of the many on the market, is the best for a particular job. Funny enough, this decision isn't determined by the colour change itself. "The type of processing machine and the processing temperature usually determine which specific CPC to use, regardless of whether you're doing a colour changeover or purging for any other reason, such as a resin changeover or scheduled maintenance," said Jarred Packard, project engineer with Asaclean-Sun Plastech Inc. "You wouldn't want to use a standard PP purge on a high-heat application in any situation, for example."

And when it comes to blow molding, cleaning the accumulators on these units typically requires the use of a CPC volume of two or three times the accumulator capacity, regardless of whether the purge is to remove colour or resin.

Not only are there mechanical, chemical, and chemical-mechanical hybrid types of purging compounds, but each CPC manufacturer has its own proprietary compositions, different from the others. Since the CPC must be removed by the next processing resin, material compatibility between the CPC and the resin – as opposed to the

to advise processors on which of their grades are safe for hot runners and the proper purging procedure to be used. For example, some of Chem-Trend L.P.'s CPCs have been designed specifically for use through hot runners, and have been shown to extract residues from previous production runs even weeks after a colour change.

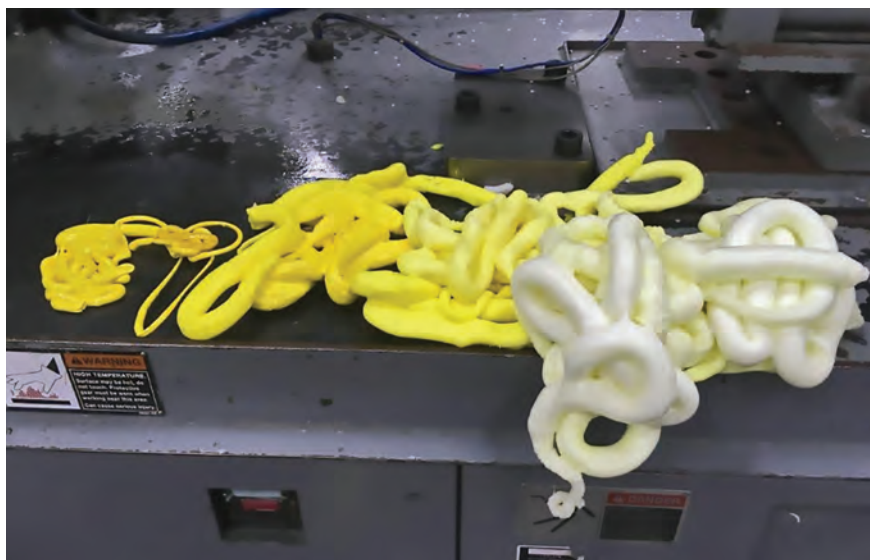
Sometimes purging hot runners requires hands-on attention. "We worked with a processor that had unsuccessfully tried to clean its hot runners with a combination of liquid-type purging compound blended with PP production resin," Jarred Packard said. "This liquid purge didn't even touch the black colourant they wanted removed, so we recommended our Asaclean NCR grade – since it was an ideal viscosity match – and then developed a customized four-point cleaning program for them."

USE AS INTENDED

The most important thing, then, is to use a CPC the way it was meant to be used, since purges aren't interchangeable. And when it comes to colour changeovers, processors have lots of product options to choose from. Shuman Plastics Inc.'s Dyna-Purge A is designed for PP, and lends itself to on-the-fly colour changes. "It's a uniquely engineered CPC that combines the key features found in both mechanical and chemical products," said company president Ken Shuman. "This new hybrid technology is ideal for eliminating colour streaks."

And Asaclean E by Sun Plastech is a styrenic-based CPC that can be used for colour changes in both injection molders and extruders, and is said to be well-suited for residue-sensitive applications due to its low-residue formulation. It also ensures fast and clean machine start-up, Jarred Packard said.

A recent trial of Chem-Trend's Ultra Purge PO compound at an overseas bucket manufacturing plant showed the product went beyond extracting deposits left by the immediately prior production run; according to Graziano Pestarino, Chem-Trend's European



A colour change purge from yellow to natural.

Photo Credit: Shuman Plastics Inc.

In other words, standard purging rules usually apply when it comes to colour changeovers. Generally, mechanical purging compounds – which tend to work based on material affinity and viscosity differences, using the machine to perform the work – are the best choice for injection molding; chemical purges – which tend to have foaming agents in them, allowing the purge to expand into low-flow or poorly designed areas that a mechanical purge can't reach – are better for extrusion. The caveat is that, since extruders often process the same colour for extended runs, colour changeovers are probably performed less frequently on extruders than on injection presses.

colour – must be understood. For example, the screw slippage that can occur when the screw has difficulty picking up material from the feed throat – causing increased cycle time and other issues – can be caused by changing from a high-temperature material to a lower temperature material. If the temperature is lowered too soon during the purging process, the previous material will not be removed completely, resulting in buildup – both colour and other contamination – on the screw.

Also, different components of the molding machine can require specialized care when purging for colour. Take hot runners. CPC suppliers need

Switching a molding machine or extruder directly from one colour to another without purging can result in new production resins pushing old colours into the new parts, causing contaminated products.

sales manager for Ultra Purge, it also extracted old colours that had built up over several previous runs.

THE TROUBLE WITH REGRIND

The contrast between using CPCs for colour changeovers and using in-house methods couldn't be clearer, CPC makers and suppliers say. "Putting regrind, natural resin, or a homemade product through an injection molding machine simply layers new material residue on top of the buildup that was already there," Ken Shuman said. "Those old colours can linger for long periods before breaking loose and appearing as streaks in new colour production runs. Real CPCs flush the colours out right away so they don't reappear later on."

Processors that don't use CPCs for colour changeovers often use their own regrind instead. And it almost never works. "While the cost of regrind is on the cheaper side, it's just a production resin designed to make parts, not to attack and remove colourant," Jarred Packard said. "Regrind may displace some of the previous colourant from a machine, but nowhere even close to all of it. It generally flows right through the middle of the barrel/screw and pushes the previous colourant and resin to the side barrel walls and trailing edges of the screw flights. It layers over and masks everything, leading to contamination issues down the line that can make a bad situation even worse."

Using a high-quality CPC for colour changes is part of a good overall cleaning regime that will maintain machine cleanliness and reduce or eliminate downtime for unplanned stoppages. For example, a recent self-published report by

Neutrex Inc. – the supplier of the PurgeX brand of CPCs – compared the use of five different resins (PP, HDPE, PS, ABS, and nylon) to PurgeX for changing from black to natural or yellow. On average, the report said, using the CPC decreased downtime by 75 per cent, lowered the scrap rate by 90 per cent, and required 94 per cent less material to purge.

TOUGH TRANSITIONS

In a perfect world, processors could move through the so-called colour wheel in an orderly fashion, transitioning from light parts to dark. But ours

isn't a perfect world. "It makes sense from a scheduling standpoint to run from light to dark, but the molder doesn't always have control over that," Jarred Packard said. "For molders that *can* control it – like automotive suppliers making door panels that only come in two or three colours: beige, black or grey – we do recommend going from lightest to darkest. By using a little forethought, and deciding which colours to do in what order, and using the right CPC, the molder can save hours of downtime per day."

That said, the classic purging transition from dark to light will always present a challenge if not done with the right purging material. The Econo-Purge CPC from Slide Products Inc. is designed to quickly, economically, and effectively remove old colour residue for hard colour changes such as black to white in injection molding, extru-



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sion, and blow molding operations. “Econo-Purge can effectively be used in the areas where colour always wants to accumulate – such as manifolds and hot runners – even when orifices are extremely small,” said Jeff Lewis, Slide’s technical sales manager. “It’s also very good at removing buildup in the check rings, and is one of the lowest odour CPCs you may ever use.”

Other resins can be difficult to remove because they have an affinity for metal, including some highly filled materials, powdered metallic pigments, and EMI shielding compounds. “Some blue materials tend to have affinity for metals, as well,” Ken Shuman said. “What often saves these situations is that the processors using these niche materials recognize the difficulties, and will work with their CPC suppliers to come up with solutions.”

Sometimes these solutions are rela-

tively straightforward. “If you’re experiencing a difficult colour change or contamination, try repeatedly increasing and then decreasing the screw speed,” Shuman said. “Short bursts of agitation at a higher screw speed loosens the carbon or pigment. Subsequently slowing the screw speed down allows the purge to expand and push the loosened contamination out.”

Problems involving the exotic materials mentioned above can require more drastic remedies. “In extrusion, if you’re experiencing difficulty purging out highly pigmented colours such as blue or red, raise the barrel temperature approximately 50°F – or 28°C – above the normal operating temperature, so that the pigmented resin will dissolve better in the purging compound,” a Shuman Plastics technical paper said. “And always work within the resident resin tem-

perature profile to minimize possible degradation of the resin.”

In the end, colour changeovers shouldn’t be in-house jobs done with in-house materials. Bringing your CPC representative into the equation can save time, money – and, speaking of colours, maybe some premature grey hairs on your part. **CPL**

RESOURCE LIST

Asaclean-Sun Plastech Inc. (Parsippany, N.J.); www.asaclean.com; 800-787-4348

Chem-Trend L.P. (Howell, Mich.); www.chemtrend.com; 517-545-7980

Neutrex Inc. (Houston, Tex.); www.purgexonline.com; 281-807-9449

Shuman Plastics Inc./Dyna-Purge (Depew, N.Y.); www.dynapurge.com; 866-607-8743

Slide Products Inc. (Wheeling, Ill.); www.slideproducts.com; 800-323-6433

AceTronic Industrial Controls Inc. (Mississauga, Ont.); www.acetronic.com; 905-564-7227

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HOT NEWS

Hot runners revolutionized the molding process, and the revolution isn't over yet. Performance requirements are becoming more demanding, leading to new enhancements in quality, control, leak protection, and troubleshooting. Here's what we mean.

By Mark Stephen, editor

Most revolutions can't be understood in real time. When Chinese premier Zhou Enlai was asked in the 1960s about the influence of the French Revolution – which had happened almost 200 years earlier – he famously said that it was “too soon to tell.”

Widely introduced in the late 1970s, hot runners revolutionized the molding process – but this time, the results were apparent right away. Until then, molders believed that generating a large percentage of

scrap on every shot – in the form of sprues and runners that, in an era before recycling, had to be thrown out – was inevitable. What hot runners accomplished was to make part cooling the chief element dictating cycle time, and not the sprue. Because they dramatically reduce scrap, hot runners have now benefitted two generations of molders during times of rising resin prices – which is almost always. And the technology has also opened the door to co-injection and

multicomponent molding within the same machine.

But that doesn't mean the revolution is over. Performance requirements for hot runners are becoming more demanding as technology advances and applications grow in complexity. Superior quality, improved performance and control, leak protection, and enhanced troubleshooting are all major factors driving today's hot runner market. And these latest product offerings deliver in spades.

HOT RUNNER NOZZLES WORK WITH DME MANIFOLDS

Designed to work with DME Co. manifolds, DME's Stellar 7000 hot runner nozzles offer a Stellar manifold and components alternative for customers who want to do their own



hot half plate machining.

With this offering, customers can purchase the manifold and nozzles, including installation specifications and a set of draw-

ings and CAD data – this is the first time DME has offered individual components for its Stellar product line, which is designed for molding small parts.

Compared to DME's 5000 series nozzles, the Stellar 7000s are stronger, employing a stainless steel seal ring. They're also self-keying, requiring no additional dowel pins or clips. By bringing the nozzle body heater closer to the manifold surface, they provide a more uniform thermal profile. And the unique dual-key head design allows easier machining of the nozzle plate and installation.

DME Co. (Madison Heights, Mich.);
www.dme.net; 248-398-6000

UPGRADED MULTI-TIP NOZZLE FOR VERTICAL GATING

Ewikon Molding Technologies Inc.'s HPS III-MV multi-tip nozzle for the vertical gating of parts is now available in a new, more powerful version.

With an improved installation geometry and a coil heater that's integrated into the pressure tube, the nozzle now features state-of-the-art hot runner technology with a stable heating and an even temperature profile. It's designed to be suitable for the processing of technical resins with narrow processing windows or fibre-reinforced plastics.

The nozzles are available in two body diameters that can be paired with several tip insert sizes for simultaneous gating of a maximum of six parts, with pitch diameters from 10.5 to 25 mm.

A front installation option facilitates easy maintenance. Nozzles can be replaced or tip inserts exchanged once the cavity plate has been



removed. An optional hot sprue version is also available.
Ewikon Molding Technologies Inc. (Rockford, Ill.);
www.ewikon.com; 815-874-7270

CONTROLLER OFFERS INTUITIVE TOUCH INTERFACE

Hasco America Inc.'s new H1280 hot runner control series has an intuitive, touch user interface that supports the user's inputs at all navigation levels.



The rapid-start wizard guides users through all the key settings, enabling even untrained personnel to safely operate the controller within a short time.

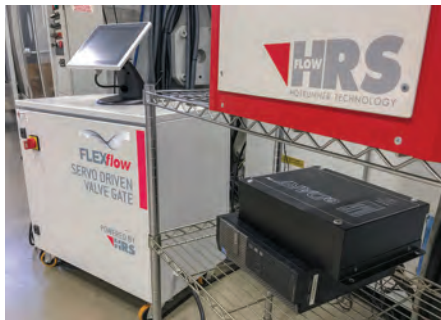
The hot runner controller also includes compre-

hensive monitoring to protect the controller, hot runner system, and mold. Its troubleshooting feature enables malfunctions to be rapidly located and contains illustrated repair instructions. Cooling elements on the outside ensure ideal heat elimination for greater reliability and a longer service life for the electronic components, and sensor inputs are equipped with voltage protection.

In addition, a special start-up routine can detect a short circuit in a fraction of a second, well before a fuse could blow. The individual zones' fuses are accessible from the outside so they can be replaced without having to open the controller housing.

Hasco Canada Inc. (Toronto);
www.hasco.com; 800-387-9609

PARTNERSHIP ADVANCES PROCESS CONTROL USING IN-MOLD SENSORS



hensive monitoring to protect the controller, hot runner system, and mold. Its troubleshooting feature enables malfunctions to be rapidly located and contains illustrated repair instructions. Cooling elements on the outside ensure ideal heat elimination for greater reliability and a longer service life for the electronic components, and sensor inputs are equipped with voltage protection.

The companies conducted a recent demonstration that included placing sensors in three different-sized cavities of a family mold, as well as strategically placing temperature sensors, to test the capability of the whole system to withstand difficult process conditions while still ensuring optimal part production. Sensors were instrumented to monitor

cavity pressure, mold temperature, and mold deflection and their response to the Flexflow system controlling the process parameters of both the mold filling (flow rate and pressure control at each gate independently) and the valve gate sequencing.

"Results showed that systematic engineering and simulation efforts, integrated intelligent molding systems, and flexible servo-driven hot runner technology greatly minimized the risks associated with a new tool launch," said Robert Harvey, HRSflow's North American sales director. "In addition, it facilitated process development, assured consistent part quality in various molding conditions, and allowed new design possibilities that would traditionally be excluded."

HRSflow-Inglass USA (Byron Center, Mich.);
www.hrsflow.com; 616-228-6900

CAP AND CLOSURE SYSTEM NOW WITH ENHANCED LEAK PROTECTION

Mold-Masters has added the patented MasterShield technology – Milacron's name for a pre-loaded nozzle spring that seals the nozzle against the manifold – as a standard feature to its Sprint hot runner systems.

Designed to offer protection against leaks, even on cold start-ups, and a wider processing window, MasterShield applies a sealing force that protects the steel – with the spring absorbing excess loads – in case of overheating, preventing costly damage to the mold.

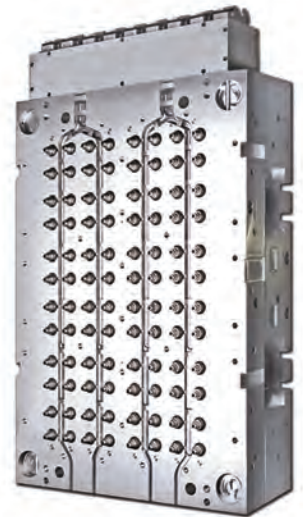
Built for making lightweight caps and closures, Sprint hot runners are capable of cycle times ranging from two to six seconds. A 96-cavity mold with the technology (shown) can produce 26-mm caps at sub-two-second cycle times, churning out more than one billion parts a year; molds with the hot runner systems can also be designed to produce 38- or 48-mm caps.

Mold-Masters Americas (Georgetown, Ont.);
www.milacron.com/sprint; 905-877-0185

CONTROLLER ADDS SETUP ASSISTANT

The latest iteration of Meusburger's profiTEMP+ hot runner controller features a setup wizard that can help determine optimum parameters so that a new hot runner can be installed in the shortest possible time.

In addition to identifying and analyzing the hot runner's zones, the setup wizard helps operators define the heating method and provide zone names, setpoint values,





and limit values. Setup parameters are saved on the device, and during the MoldCheck a complete test of the hot runner's wiring is performed and documented.

The setup wizard is pre-installed on new controllers; and for devices

running an older software version, the update can be downloaded free of charge from the web and installed via a USB drive on the device.

Meusburger U.S. Inc. (Charlotte, N.C.);
www.meusburger.com; 704-526-0330

CONTROL TECHNOLOGY FOR LARGE PART SEQUENTIAL VALVE GATED APPLICATIONS

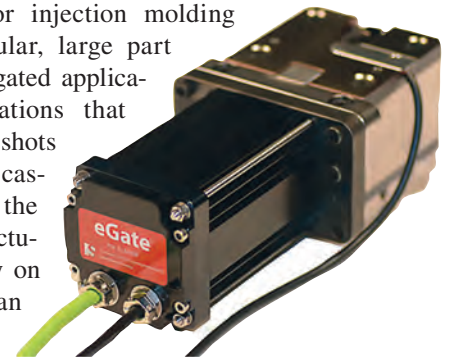
Synventive Molding Solutions recently released Gate 2.0, the latest addition to its activeGate control technologies.

Well-suited for injection molding jobs – in particular, large part sequential valve gated applications, or applications that require multiple shots or materials, or cascade molding – the eGate's electric actuator bolts directly on the manifold for an easy install, offering both a compact footprint and small stack height.

eGate's new easy-to-use intuitive interface includes a simple drag-and-drop editor for easy setup, recipe storage, and mold overview, as well as offering varying levels of user control.

Other benefits include better control of melt packing and balance; reduced warpage, part weight, and clamping forces; and the ability to achieve parts with optimal aesthetic qualities, including Class A surfaces.

Synventive Molding Solutions (Peabody, Mass.);
www.synventive.com; 978-750-8065



CPL

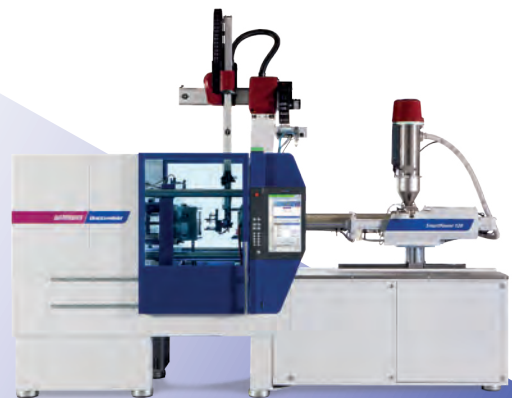
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MOLDED PRECISION COMPONENTS

is pursuing perfection

Located near Barrie, Ont., this full-service engineering, product development, and injection molding specialist produces over 70 million high-precision plastic parts each year. And you could probably count the rejects on the fingers of one hand.

By Mark Stephen, editor

The quest for perfection is probably as old as humankind, and is almost never attained. Romanian gymnast Nadia Comaneci famously got a perfect score of 10.0 at the 1976 Olympic Games, and math whizzes might ace high school tests from time to time, but other examples are few and far between.

But while the pursuit of perfection might seem like a fool's errand to the average person – akin to chasing a carrot on a stick that's been duct-taped to your forehead – to Molded Precision Components (MPC) it's all in a day's work.

Utilizing a team of multidisciplinary engineers and in-house resources, MPC is a full-service injection molding specialist located in rural Oro-Medonte, Ont. – about 15 km north of Barrie – that boasts beyond world-class quality stats with a defective parts rating of less than one part per million delivered from an annual total of over 70 million parts. The company specializes in scientific molding and manufacturing

high-precision functional plastic components – including gears, bearings, cable end fittings, multicomponent housings, covers, and seals, made through overmolding and insert molding, multimaterial molding, and micro-molding for parts as small as 0.3 grams. MPC serves multiple industries but focuses primarily on the automotive and medical parts sectors, and was one of the first organizations in Canada to adopt and be certified to IATF 16949 (ISO), which puts it at the head of the list for automotive clients who increasingly require this qualification. As a prerequisite to the IATF certification, MPC also carries ISO 9001: 2008 certification, and ships products throughout Canada, and to the U.S., Mexico, China, Brazil, Poland, and more.

DRAMATIC REINVENTION

But such wide ranging, high-caliber work hasn't always been the company's calling card. Originally founded in 1980 under the name Molded Plas-



David Yeaman (left) and Thomas Woegerer.

tic Consultants, the firm was run for the next 25 years as a simple prototype molding shop with just a few machines. The reinvention began in 2006, when young, experienced plastics industry veterans David Yeaman and Thomas Woegerer purchased MPC's assets with the goal of turning it into a multidisciplinary engineering, toolmaking, product development, and precision injection molding service. Both qualified professional engineers, the two men wanted to create the type of company they hadn't been able to find previously. "We had both found it frustrating working for others, knowing there's a better way of doing things and not being able to do it," said Yeaman, MPC's president and co-owner. "We wanted the flexibility to make decisions we couldn't have made at a

larger organization, because you couldn't prove through an appropriation request or ROI that doing it really pays for itself."

And although the timing turned out to be a bit off, the idea definitely wasn't. "We started with three people – unfortunately right before the recession hit – but still managed to double our workforce during the recession," Yeaman said. "We succeeded because we were filling a niche market in precision plastics, implementing lights-out manufacturing from day one and using highly efficient methods to offer customers quality and delivery levels that no one else was achieving."

MPC's success under its new ownership can be tracked in several ways. First is its dramatic physical growth: from 8,000 square feet of manufacturing space in a single plant in 2006 to 26,000 square feet between two co-located facilities today. "We've added a new hall every year for the past five years," Yeaman said. Second, MPC's revenues have soared, from \$300,000 in 2006 to approximately \$10,800,000 in 2018. And third, the company's workforce has now swelled from the original three to almost 60.

MPC's growing association with precision molding was made official, so to speak, in March 2019, with a name change and rebranding that was kicked off with an invitation-only event

at the Five Points Theatre in downtown Barrie. "We relaunched the company as Molded Precision Components to reflect the fact that we are very precise in our work, so much so that incorporating it into our name made sense," Yeaman said. "Now the market knows exactly what we do."

VERY EARLY ADOPTER

MPC has invested heavily over the years to become a full-service shop. "We have extensive tooling capabilities, including 15 tool makers; CAD design and 3D printing for validation of product design and development; in-house SigmaSoft virtual molding software; optical scanning that can measure to five microns or less; and our own vertically integrated automation and part packaging by cavity," Yeaman said.

In essence, MPC was running a connected plant long before being connected was a thing. "We adopted a smart factory approach before anyone knew what Industry 4.0 was," Yeaman said. "In the early days, we implemented RJG Co.'s in-cavity pressure sensing technology in every cavity and every tool; that way, we knew if a part was good or not before the mold even opened. By adding sensing and automation to everything possible, we can predict the behaviour of the plant as a working organism. Our goal has always

been to measure the process and control it completely, automatically, and with minimal human involvement."

File that comment about "minimal human involvement," because it explains a lot about MPC. One of the company's key goals under its new ownership was to become lights-out – not simply to save money but also as a way of achieving a perfect manufacturing process. "Our belief is that having workers on shift 24/7 can actually mask problems," Yeaman said. "Because a person overseeing production will step in to correct a failure in the line, you'll never strive to make that production line run perfectly on its own. Running lights-out forces us to reach for perfection in our product runs. Our mentality is perfection in everything we do. Good enough isn't good enough – we expect more of ourselves and so do our customers, especially in the automotive and medical markets, where there's no tolerance for rejects."

GOING ALL-IN

The key to getting the biggest benefits from connected technology, Yeaman and Woegerer believe, is to install it plant-wide – which MPC has done, machine by machine. "We built the company by investing in one connected machine at a time, until eventually all of our units were connected and able to run lights-out, so we never had to go back and redo or retrofit anything," Yeaman said. "It was a big investment, but smart technology works best when it's plant-wide; you can't limit it to a single manufacturing cell and expect to get full payback."

And it's an investment that never truly ends. MPC continues to add new technology to its arsenal, including the recent acquisition – for a cool quarter of a million dollars – of an ATOS optical precision coordinate measuring system. Made by technology supplier GOM, the ATOS allows 3D, non-contact measurements of complete surfaces of prototypes, tools, and injection molded parts regardless of the object's size; the advanced blue light technol-



Gears molded by MPC (left), and the company's Industry 4.0 mainframe.

injection molding

ogy captures complex freeform contours quickly and completely, overlaying that data directly in the design environment. “This is an incredible piece of equipment that improves the accuracy of parts more quickly to deliver reduced time to market for time-sensitive projects,” Yeaman said.

MPC’s total commitment to perfection manifests itself in other ways too. Take water chilling, for example. “We wanted to have a cooling system that was as environmentally responsible as possible, so we eliminated towers and chillers and adopted geothermal technology early on,” Yeaman said. “Thomas and I designed and developed our own geothermal cooling system; it allows us to recapture the heat that we put into the machines and reuse it to heat our offices. It was a significantly larger financial investment than buying a chiller would have been, but we wanted to put our money where our mouths were when it came to the environment.”

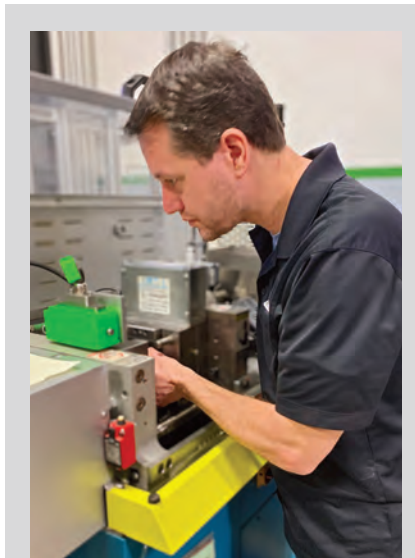
YOUTH MOVEMENT

And the company has the same level of commitment when it comes to scouting young new talent. “Compared to other molders, we have a relatively young workforce, and cultivate candidates from the universities and colleges, specifically Georgian College, which is local,” Yeaman said. “We work closely with Georgian College’s Co-operative Education program, and hire many of its students over the summers for wide-ranging roles – engineering, project management, moldmaking, quality management, accounting, logistics, and more – and a lot of them have taken full-time jobs with us after graduation.”

MPC’s commitment to attracting the best young employees doesn’t end there. The company is also an active participant of the Barrie Inno-

vators Alliance; a sponsor of The Sandbox, a gathering place in Barrie where budding entrepreneurs can meet and network about starting new businesses; and a lead sponsor of the CyberGnomes, a team of Stayner, Ont. high school students who compete annually in the “First Robotics League” competition. And in 2018 MPC launched Tabacon, a venture developed to provide youth with the opportunity to learn and gain practical, transferable skills such as leadership and social abilities through outdoor adventures and mentorship experiences.

At the core of its business operations is MPC’s people, and Yeaman and Woegerer consider them – and not the company’s enviably low defective parts rating – to be its biggest advantage.



Thomas Woegerer on the shop floor (top), and a row of Arburg injection molding machines.

“Our quality and reliability are second to none, but we couldn’t do any of this without our people,” Yeaman said. “Anyone can buy and implement a new technology, but implementing a culture of kindness and compassion – doing what’s right for your fellow co-workers – is more difficult. We have some of the best people in the industry here, and we want them to be in the right positions – whether they’re quality inspectors, engineers, tool makers, or machine operators – so that they all add equal value and everyone knows their opinion matters. And I think we’ve done that.”

The flip side of that equation is the work given back by MPC’s employees – not just supporting the business, but through employee-led teams such as MPC Cares, which raises funds to support local causes; and the MPC Green Team, which implements sustainable working and operation practices across the business and beyond.

THE ROAD AHEAD

Heading into a new decade, MPC’s plans will get even bigger. The company will break ground shortly on the construction of approximately 20,000 square feet of extended space at the second of its two co-located sites. This will provide floorspace for an estimated 15 to 20 new hires; for the relocation of MPC’s in-house tool building and engineering capabilities; and for the next generation of molding

technology, with the first machine starting up in October 2020. And beyond that, MPC has just secured a new 10-acre property for the development of a 150,000-square-foot state-of-the-art facility, with the objective of achieving net zero energy operation. “There’s never a dull moment at MPC, and 2020 is just the beginning of our next chapter,” Yeaman said.

Sounds like the plan to attain perfection is unfolding perfectly.

CPL

AUXILIARY EQUIPMENT

TCUs now offer non-ferrous cast-bronze construction

The latest *Thermolator* temperature control units (TCUs) from **Conair Group** now offer optional non-ferrous construction, with wetted components made of cast bronze, for improved durability and performance for processors whose process water is of low quality.



Available as an option in all Thermolator TCUs that use water as coolant, the units are highly resistant to corrosion and other problems associated with process water supplies that are untreated, unfiltered, or of limited quality.

The new product feature includes a cast-bronze pump volute, heater tube, mixing tube, and impeller, and is designed to deliver longer working life than previous corrosion-resistant Thermolator TCU products.

The new TCUs are well-suited for processors who are using distilled or RO (reverse osmosis) water, both of which can be aggressive to iron components.

Conair Group (Cranberry Township, Pa.);
www.conairgroup.com; 724-584-5500

Dier International Plastics Inc. (Unionville, Ont.);
www.dierinternational.com; 416-219-0509

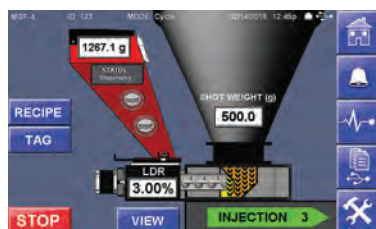
Industries Laferriere (Mascouche, Que.);
www.industrieslaferriere.ca; 450-477-8880

Turner Group Inc. (Seattle, Wash.);
www.turnergroup.net; 206-769-3707

INJECTION MOLDING

Control system ensures uniform colour

Maguire Products Inc. recently introduced *100% Injection Coloring*, a control system for feeding masterbatch to the injection molding process that ensures colour uniformity and saves costs by dosing colourant during the injection phase, when conventional feeders are inactive.



During the injection molding cycle, about 75 per cent of virgin resin enters the screw during the recovery phase and 25 per cent during injection. Because conventional feeders add colour only during recovery, insufficient mixing can occur.

With the 100% Injection Coloring system – which is

available as an option for the MGF gravimetric feeder – a special controller on the feeder receives signals from the processing machine in both phases, ensuring that colour is added throughout the cycle. This means processors no longer have to use either an upstream pre-mixer or expensive over-colouring to compensate for insufficient mixing.

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

EXTRUSION

Crosshead helps reduce scrap and achieve faster start-up times

New from **Davis-Standard LLC**, the *Model 3000A* crosshead is designed to enable tube and hose makers to reduce scrap and attain faster start-up times for smaller lots.

The Model 3000A incorporates an automatic, servo-driven concentricity adjustment system that allows for adjustment of the core tube/tip assembly with a simple joystick control, allowing operators to minimize eccentricity, maximize concentricity, and reduce downtime during product changeovers. Additionally, the servo drives enable monitoring and adjustments throughout the run to account for lot-to-lot variations.



The crosshead features a tapered mandrel and highly engineered flow paths to ensure consistent flow through all speed ranges. Also, the thrust-bearing-supported core tube/pin assembly enables wall thickness modification under pressure without interruption.

Davis-Standard LLC (Pawcatuck, Conn.);
www.davis-standard.com; 860-599-1010

Auxiplast Inc. (Sainte-Julie, Que.);
www.auxiplast.com; 866-922-2894

ROTATIONAL MOLDING

Compact, lightweight cooling fan

Available in three types of operation – without starting device (wall plug), direct starting drive (wall plug and button), and variable frequency drive (VFD) – **Roto-line USA's** new *cooling fan* is



designed to meet the cooling needs of industrial processes, including rotational molding and other types of plastics manufacturing.

The fan is available in two versions – three phases with direct start, and single-phase with VFD – and is robust, compact, lightweight, practical to be moved around, and easy to install in tight spaces.

The fan's housing is rotomolded from PE, and the pedestal is made from steel coated with corrosion-resistant paint. The fan can be set up to start automatically when other equipment runs, and can also be mounted on walls or columns.

Benefits include efficient and even cooling of products, molds, and production lines.

Rotoline USA (Kent, Ohio);
www.rotoline.com; 330-677-3223

CONVEYING

Conveyor modularity increased with new motors

The new *quick disconnect motor* offered on **Dynamic Con-**

veyor Corp.'s products is designed to give users an array of benefits that increase conveyor modularity, application options, ease of use, and maintenance.



The connector enables a quick direct connection between the brushless DC motor and controller with an easy-to-use lock lever that doesn't require tools or additional hardware, making it easy to perform motor replacements or modify control options while in the field.

With cable length options ranging from 20 inches to 65 feet long, the control package can be mounted anywhere along the conveyor's sidewall, leg supports, or remotely mounted away from the conveyor.

Additionally, the new motor has achieved an IP66 rating for protection against water, allowing it to be used in high-moisture applications.

Dynamic Conveyor Corp. (Norton Shores, Mich.);
www.dynamicconveyor.com; 231-798-1483
Plastics Machinery Inc. (Newmarket, Ont.);
www.pmiplastics.com; 905-895-5054



Size Reduction E-news

Every plastics processing facility produces scrap, but not every facility has an efficient way to reduce it to manageable, uniform size for reuse. And because reclaiming scrap material can make the difference between profit and loss, you've got a real incentive to get it right.

Our daily themed e-newsletter from March 16-20 will cover some of the latest size reduction technologies and best practices to help you go big when it comes to making scrap plastic small.

Sign up for this free e-newsletter here!

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www.canplastics.com/subscribe/

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ROBOTS & AUTOMATION

Ultra-high-speed robots in three models

Based on its well-known UHS appliances, the new *Sonic* robot series from **Wittmann Battenfeld** can be used for



parts removals down to four seconds robot cycle time; and gripping times faster than one second also improve productivity for tasks other than parts removal.

The first three models are the Sonic 131, Sonic 142, and Sonic 143, for use with injection molding machines with clamping forces from 165 to 550 tons.

The robots have a standard stroke of 500 to 900 mm for the X-axis, 800 to 1,600 mm for the Y-axis, and 1,500 to 4,000 mm for the Z-axis.

The series offers safer parts removal with a feature that only allows the mold to close if all parts remain in the gripper. The robots can also count and stack parts in containers.

And as is customary in other Wittmann robots, the gripper valves and inlets are seated directly on the vertical axis to ensure short response times.

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

MATERIALS

Melt flow modifiers for polypropylene

New from **Struktol Co. of America**, the *VMO* line of products for modifying the melt flow index (MFI) of PP are designed to very easily raise the MFI of a PP to meet their processing and compound requirements.

Each product is in a Struktol lubricant/process aid, making a pellet masterbatch form that can be easily incorporated into the polymer or compound. These products also offer the ability to be introduced not only during extrusion/compounding but can also be used directly in injection molding.

Another unique feature is the ability to use blended PP with PE and still allow for MFI increase.

The product line includes VMO 058, VMO 108, VMO 208, VMO 308, and VMO 408, all of which are distinguished by their activity, ranging from low to high.

Struktol Co. of America (Stow, Ohio);
www.struktol.com; 330-928-5188

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SALES MANAGER POSITION

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- Knowledge of the Process Cooling Industry (some training will be provided).
- Knowledge of refrigeration pertaining to chillers and pumping systems.
- A highly motivated team player with a strong focus on customer satisfaction.
- Strong communication skills to work with staff and client groups as required.

Temperature Corporation offers a comprehensive benefits package including, dental, medical and life insurance.

We look forward to hearing from you and interested candidates should forward their resume to
linda.tandemchillers@gmail.com

We thank all candidates for their interest in Temperature Corporation. Only candidates selected for an interview will be contacted.





Extrusion: The Shining

By Allan Griff, consulting engineer

From shiny shoes to polished apples to gleaming cars, we have a fascination with gloss, and we want no less from plastics products. Luckily, plastics give us a variety of gloss options. The injection molder relies on the mold surface, but in extrusion we must deal with the natural gloss of the material.

Glossy isn't the same as smooth. For example, leather-grain surfaces can be embossed into otherwise glossy extruded sheet. Remember that, like most embossing, the pattern can be reduced or even washed out when the product is reheated above the embossing temperature, as is necessary for thermoforming. Gloss is also dependent on angle of testing, and isn't the same as haze or transmission.

We can change gloss with additives. Fillers like calcium carbonate will do it, and mica will give a sparkly opacity which is not quite gloss, but which has its own appeal. With fillers, particle size and shape are very important, so they must be selected and specified with some care and pretesting.

Some polymers aren't simple homopolymers but have

components that affect gloss; one of the most important of these is high-impact polystyrene (HIPS), made by including rubber chains either in the actual polystyrene chain or as an additive during or after polymerization. For these, there's a balance between impact strength and gloss: more rubber is duller but tougher.

In the extrusion process, melt temperature is the most important controller of gloss. The hotter, the better, but beware the visible discoloration and invisible brittleness that may appear if the surface gets too hot. Measuring melt temperature isn't simple, and its value and accuracy depend on how and where it's measured (at the screw tip is the least reliable).

One way around this overheating is to laminate or co-extrude a surface layer of a glossy polymer over a tougher but less glossy core. Most refrigerator door liners used to be made that way, until the makers realized that the glossy surface was more brittle and showed scratches more easily. It may also be preferred for some picture frames or other wood-like surfaces, or insulation that's pulled through a conduit, where too slick a surface increases friction.

The lamination process is still useful for applying special surfaces, and is thus competitive with co-extrusion. Making the laminating film separately costs more, but thickness is better controlled, so material savings may make it cheaper.

External glazing is another technique, where the extruded surface is passed under radiant heat (a bar or lamps) or even a flame for some profiles (flame polishing). If it's a gas flame, connect the gas source to a switch that shuts off the gas if the profile stops moving, thus avoiding fires or escaping gas.

Yet another way to get the same effect is to increase the distance from die to cooling surface. The surface stays molten longer and has more time to level out, just as a painted wall doesn't show brush strokes as they level out before it's completely dry.

The downside is that all these glazing methods may embrittle the surface, just like running a hotter melt temperature. Many years ago, I saw a line that flowed carbon dioxide or nitrogen over the surface in the glazing area, thus reducing the oxidation and making the surface less brittle and less likely to crack in service. It worked, and maybe someone out there is still using it, but the result has to be worth the cost.

GPI

Allan Griff has been working in plastics extrusion since 1955, and since 1961 has worked independently as a consultant, expert witness in law cases, and as an educator via webinars and seminars, both public and in-house. Find out more on his website, www.griffex.com, or email him at algriff@griffex.com.



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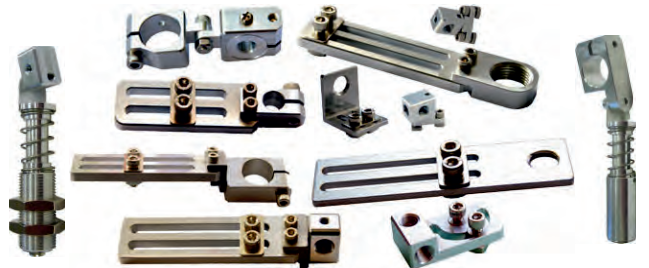
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