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June 2010

INJECTION MOLDING

LEADERS at the ROUNDTABLE

The plastics industry's future

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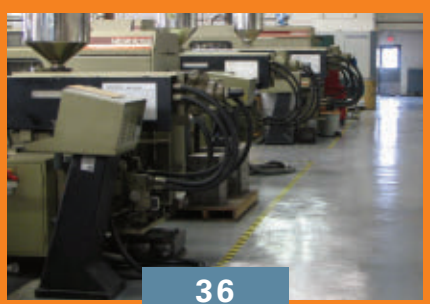
Will buying a new collapsible core mold save you money?



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How Matsui dryers helped EuroPlast give costs a much needed trim

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Harald Zacharias, President, EuroPlast
Endeavor, WI

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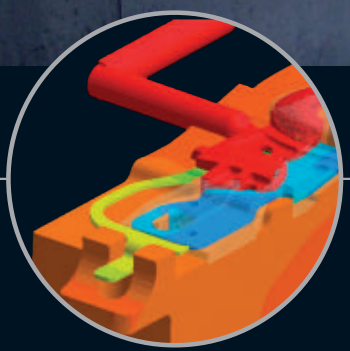

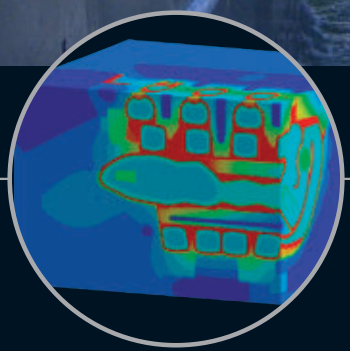

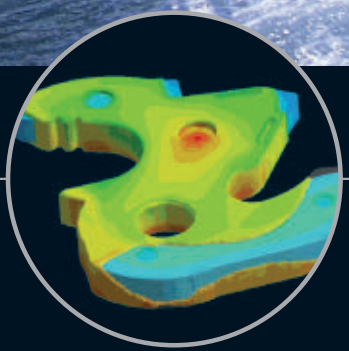

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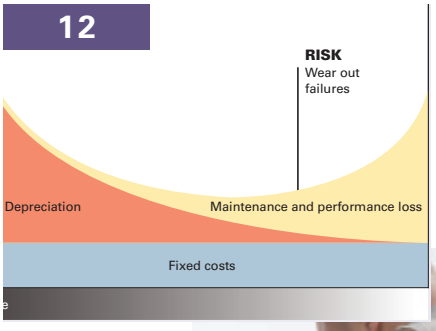

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"If your whole model said, 'I got it figured out,' it may be good for today, but it isn't going to last as you move forward."

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Napkin sketches into commercial success

Blackwell Plastics has been the consummate enabler for inventors over the years, and cofounder 85-year-old L.D. Blackwell has seen enough slumps and peaks to know diversification weathers all storms. Check out its energetic marketing video for a glimpse inside.

plasticstoday.com/imm/articles/tour-0610

How do you leave what you built?

Many mold shop owners are getting ready to retire or are even well past retirement age, so the question of what to do with the business—especially a thriving, growing business—becomes particularly vexing. One company found an answer.
plasticstoday.com/articles/management-employee-stock-ownership-plans-and-plastics

Preparing employees to help create your future

If you aren't doing all you can to train the next generation of skilled workers, within a decade you may find yourself without the knowledge you need. One speaker at AMBA's annual convention in Florida provided some tips to get you started.
plasticstoday.com/imm/articles/plastics-employee-training-necessity

[On the blog]

Can China become a global player in medical devices?

Molders Economic Index data: April 2010

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[IMM poll]

Which of these do you lose the most sleep over?
- **Higher business taxes due to Congressional legislation/reforms**
- **Higher costs of raw materials (plastics and steel)**
- **Higher costs of energy**

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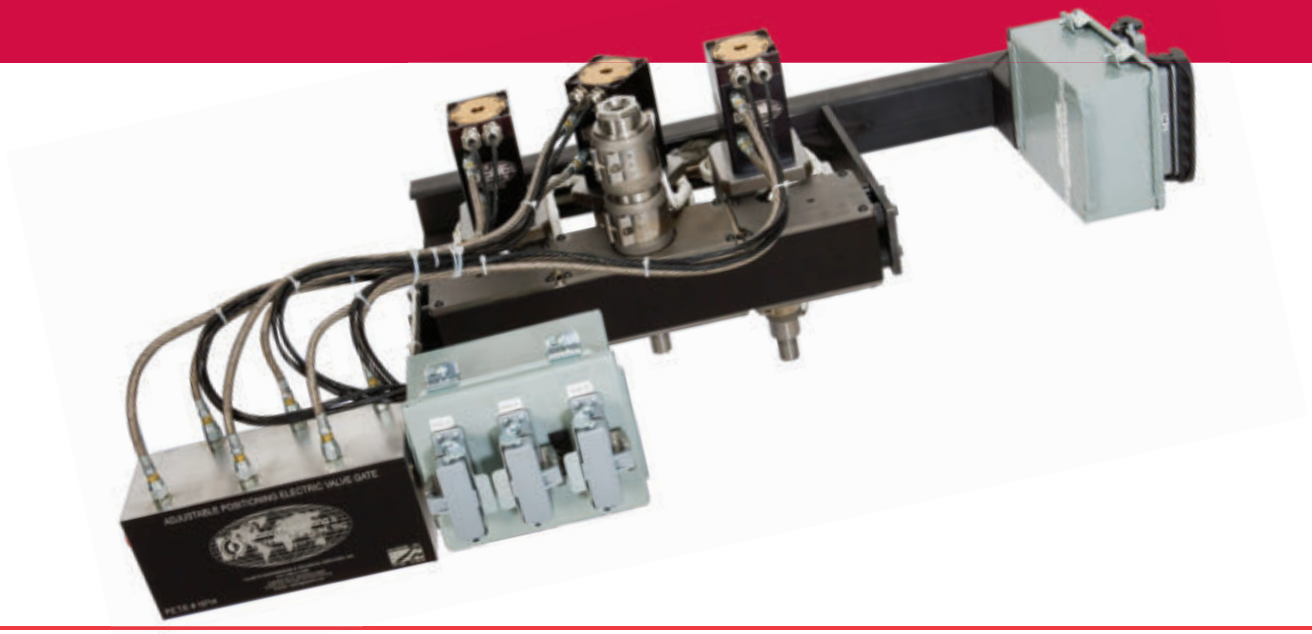

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Those of us in the plastics industry have come a long way in the past 12-18 months, from a gloomy lowdown place all the way up to where we can see the dawn starting to break. We also know that we still have much farther to travel before we stand in the warm afternoon sun.

We at **IMM** know this to be the case because, along with our sister magazine *Modern Plastics Worldwide*, we invited 15 top managers of leading plastics supply-side companies to an executive roundtable in Chicago at the end of March, essentially to hear their responses to two questions.

First: Is the plastics industry in true recovery mode following the Great Recession? Second: What actions can and should processors and moldmakers be doing to succeed going forward?

On the first question there was virtually unanimous agreement that our business had indeed turned upward again—certainly not dramatically, but the execs said the bottom had been reached during the latter third of 2009, give or take a few months, and the plastics business was stabilizing and starting to grow.

It needs to be pointed out that they were talking not just about their businesses, but also about the business activity of their moldmaker and molder clients—your business. The connection is patently obvious.

OUR GLASS IS A BIT OVER HALF FULL

Cautious it may be, but optimism is on the prowl.

> "There was virtually unanimous agreement that . . . the plastics business was stabilizing and starting to grow."

As for the second question, the roundtable was split into two sessions of 90 minutes each, and the pace of the discussion was, to say the least, lively and continuous. There were a number of excellent recommendations on what to do, and no need to choose a winner. The full collection forms a solid best-practices list.

Starting on p. 20, online editor John Clark's article, "Executive Roundtable: Goodbye, 'Good enough'; Hello, world class," offers a distillation of many participants' recommendations—though by no means all of them. Mark June 22 on your calendar, when **IMM** and **MPW** will conduct a webinar of the event—an edited 45-minute video recording of the roundtable sessions, plus some Q&A time. There's no cost; sign up at plasticstoday.com. Don't miss it.

Hard statistical data that is very up-to-date on our industry is hard to find, but stories heard at recent conferences and shows support the idea that the industry is recovering. I heard such stories at the Molding 2010 conference in San Antonio April 12-13, and again at the PDx/Amerimold show in Cincinnati May 11-13.

There is reason to be optimistic, but also reason to be careful—that cautious optimism everyone is expressing. The U.S.-initiated financial crisis spread around the world quickly, and many are nervous that ripple effects from Greece's financial troubles could also go around. We've never before had a world so connected.

But that's no reason to wait and hope things will get better on their own. They definitely won't. So it's time to get busy.

Note: If you haven't already noticed, there is a new classified ad resource for the plastics industry at plasticstoday.com. Check it out.

Rob Neilley, Editor in Chief
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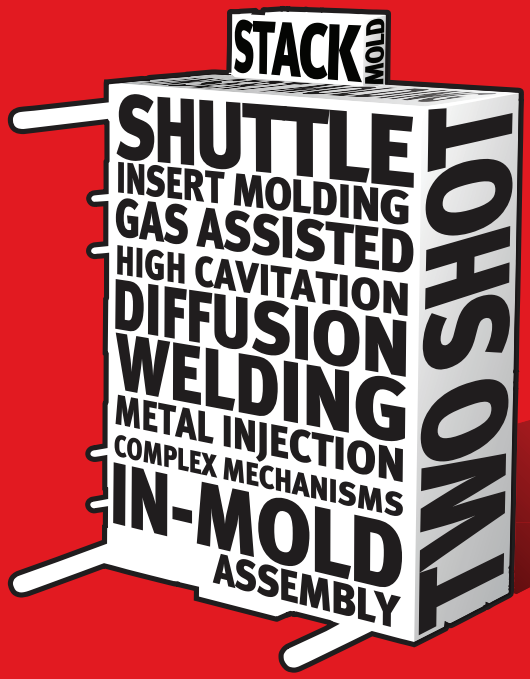

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MICRO SHOTS

Mack stacks its management deck

The retirement of Bruce Bixler, a 36-year employee of Mack Molding who headed up purchasing, started a reorganization of the company's senior management. Marc Colety, who has been manager of Mack's Cavendish, VT plant, has taken over from Bixler as director of procurement, and Gene Birmingham has moved into the plant manager spot vacated by Colety. Bryan Campbell has been promoted to PM, headquarters facility, and Carl Bickford has taken on the new position of quality manager–contract manufacturing.

Novatec suit dismissed

In a brief press release, the Conair Group (Cranberry Twp., PA) announced that Novatec Inc. (Baltimore, MD) dismissed its lawsuit against Conair. Originally filed in June 2009, the suit claimed that Conair had infringed Novatec's patented dual-flow drying technology. Both companies, says Conair, have agreed to dismiss any claims against the other related to the patent. Novatec will continue marketing it dual- and single-flow IntelliPET and PowerGuard dryers, and Conair will continue to market its dual- and single-flow EnergySmart dryers.

imm **Find more news at plasticstoday.com/imm.**

Eastman opens expanded Tritan plant as copolyester's rapid rise continues

Eastman's expanded Tritan copolyester line pushes its total capacity to more than 30,000 tonnes/year.

Only six years removed from its decision to pursue an abandoned monomer as the key to the high-heat material it had sought at different intervals for decades, Eastman Chemical Co. (Kingsport, TN) marked another important milestone in the whirlwind development of its Tritan copolyester material with the May 13 opening of a dedicated Tritan production plant at its Tennessee HQ.

"I've been in R&D most of my career, and taking something from lab scale to commercial scale when you have to simultaneously develop a new monomer, a new polymer, and the market . . . we had no right to believe we could actually do that, but we did," explained Dante Rutstrom, VP and general manager, specialty plastics business.

Eastman officials hosted trade and area press, as well as local and regional government officials to mark the occasion. Including the original developmental line, Eastman now has just over 30,000 tonnes/year of capacity for Tritan copolyester, all in Kingsport, with plans in place to double that by 2011 to 60,000 tonnes/year should demand continue to expand at its current pace.

The company said that Tritan business in the past 12 months has quadrupled in dollar and volume terms, with applications expanding beyond the initial markets of reusable sports water bottles, housewares, and small appliances to include medical, infant care, bulk water, and signage.

Company officials said that technology development began in earnest in 2004, and after presenting a plan at the corporate level to pursue the new monomer and polymer, a team led by Rutstrom pushed forward starting in 2005 with the simultaneous creation of the monomer and polymer production technologies, as well as market development. Eastman launched the product commercially at the October 2007 K show in Düsseldorf, Germany.

Supply, purchasing execs: Manufacturing growth to continue in 2010

The Institute of Supply Management (ISM; Tempe, AZ) announced that, based on its semiannual survey of purchasing and supply executives, its spring 2010 Semiannual Economic Forecast shows that manufacturers' net revenues are expected to rise 6.3% this year.

When surveyed in December 2009, the panel of supply managers predicted a 5.7% increase in 2010 manufacturing revenues compared to 2009. "Manufacturing is emerging from a period in which many companies lost significant volumes of business due to reduced demand," said Norbert J. Ore, chair of the ISM Manufacturing Business Survey Committee. "While excess capacity and meager capital investment are concerns, the forecast of revenue growth and improved employment will drive the continuation of the recovery."

Plastics and rubber products were one of 15 industry sectors reporting expectations of revenue growth greater than 3%. According to 66% of survey respondents from the manufacturing industries, revenue in 2010 will increase by an average of 12% over 2009. Only 13% said they expected lower revenue in 2010 than in 2009. Respondents said that operating rates were 72.8% of normal capacity, and that production capacity was expected to increase 6.4% in 2010. Capital spending was due to expand by 2%. Overall, the report concluded that manufacturing is expected to grow significantly in 2010.

Siloxane lubricant solves friction issue for locking plug

Processor Koby Environmental (Clarence Center, NY) has adopted a siloxane lubricant in its nylon-based Torquer locking plugs. The plugs attach to the access pipes in groundwater monitoring wells to reduce friction and thereby enable hand-tightening. The devices, which incorporate elastomeric gaskets, are molded from glass-filled nylon to provide sufficient stiffness in operation, particularly for the larger sizes. "There is nylon-to-nylon contact and without lubrication, friction at these points would make it next to impossible to turn the wingnut by hand," says Tom Koby, president of Koby Environmental.

After unsuccessfully trying a lubricated nylon grade, Koby turned to a siloxane masterbatch from Multibase Inc. (Copley, OH). Adding 2% by weight of the Dow Corning Siloxane Masterbatch reduces the coefficient of friction at the surface of the parts. The additive is either tumbled with the other components at the start of batch preparation, or introduced at the press. "It's as easy to add to our process as any of the colors we use," according to Tom Koby.

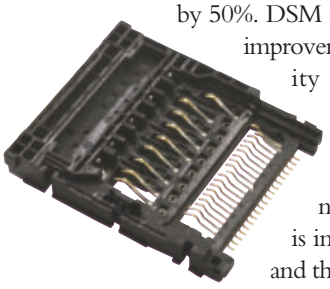
According to Multibase, the ultrahigh-molecular-weight lubricant is present at the surface, but does not migrate to the surface and cover it, like lower-molecular-weight oils or waxes. "There is a high concentration of the nylon resin at the surface," says Ted Hays, Americas development manager for material and application engineering at Multibase, "so Koby can use pad printing to put its company logo on the plugs, along with operational instructions." As an added bonus, the lubricant brings processing benefits. "We are seeing a significant increase in the lifespan of our equipment—tooling, screws, tips, barrels, everything—compared to hardware we use to mold other parts in glass-filled nylon," says Koby.

A siloxane lubricant from Multibase enables hand-tightening of this locking plug, while offering processing benefits as well.

High-end PA gains connector application

Taisol Electronics, the second-largest memory card maker in Taiwan, was looking for a material that would reduce warpage in its 5-in-1 memory card connectors, but liked how DSM's Stanyl ForTii included halogen-free flame retardance, and stiffness even at high temps, while reducing cost to customers.

Taisol's card readers provide the interface for Memory Sticks, SD Cards, MMCs, Smart Media, and xD-Picture Cards in notebook and desktop computers, stand-alone card readers, LCD projectors, monitors, and more. The company says that even though the previous material, a GFR PA9T, was developed specifically for low warpage, Stanyl ForTii F31 polyamide could further reduce warpage by 50%. DSM says the dramatic improvement in coplanarity compared with other materials is significant since component integration is increasing density, and thus warpage.



Increasing profitability through equipment upgrades and replacement

Managing the operating costs of injection molding equipment throughout its life cycle is vital to profitability. Appropriate upgrades or replacing older equipment can significantly lower part costs and raise the competitive profile. **—Greg Cooke**

Typically, a processor's goal is to manufacture products at minimum cost without compromising part quality, functionality, reliability, or delivery. Injection molding requires the use of capital-intensive equipment. With new systems, resin cost is usually the largest part cost contributor, followed by depreciation that is largely dependent on equipment utilization. Selecting new equipment that is optimized for specific parts and production volumes is vital to minimizing part costs.

As equipment ages, depreciation costs decline while maintenance- and performance-related costs increase. Minimizing part cost requires maintaining optimal use of equipment while keeping energy, maintenance, and scrap costs low. But all equipment eventually reaches a point at which components come to the end of their design life and begin to fail. At this point, equipment can become increasingly unreliable. This can raise maintenance- and performance-related operating costs, leading to increased part costs (Figure 1).

As products evolve and new technology becomes available, older equipment gradually becomes increasingly less viable to operate. Once manufacturing requirements can no longer be met, or when a more cost-effective solution becomes available, equipment becomes economically obsolete, which can occur before it becomes functionally unusable.

Reinvestment to improve or replace existing equipment is typically triggered by one or more of a variety of factors:

- Products evolve and changes are needed to meet market requirements (i.e., lightweighting parts to reduce manufacturing costs and environmental impact).
- Existing tooling or equipment is worn and no longer meets quality requirements.
- More manufacturing capacity is needed, creating demand for more equipment.
- Parts and service are no longer available, making equipment expensive and difficult to maintain.
- A competitive threat demands equipment modernization.

What strategy to consider

Determining the best strategy—whether to refurbish, upgrade, or replace existing equipment—can be a challenge, but it's vital to remaining competitive. Refurbishing only to address immediate issues may prove more costly if soon after, the equipment must be replaced due to failure of other more critical components.

Upgrading or replacing existing systems is an opportunity to maximize future profitability. Suitable upgrades generally maximize short-term profitability, effectively extending the life of existing equipment. New systems offer a long-

How can your supplier help? The article continues at plasticstoday.com/imm.

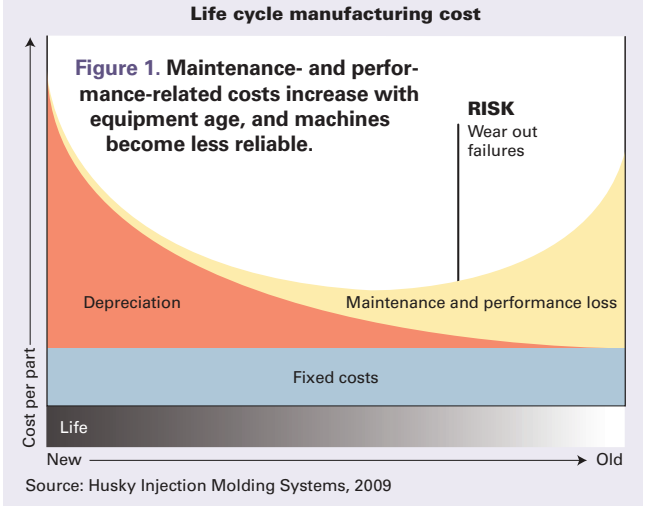


Figure 1. Maintenance- and performance-related costs increase with equipment age, and machines become less reliable.

Source: Husky Injection Molding Systems, 2009

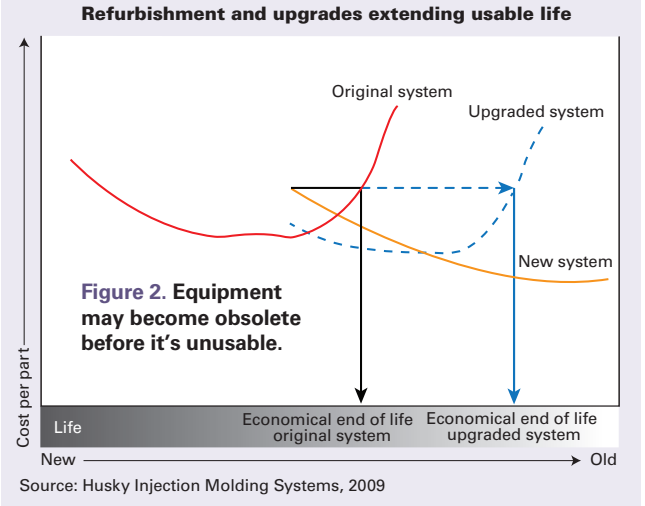


Figure 2. Equipment may become obsolete before it's unusable.

Source: Husky Injection Molding Systems, 2009

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term competitive advantage. Decisions must consider all available information and must be tested against future business objectives, financial status, and market trends (Figure 2).

Financial benefits and considerations need to be evaluated carefully as depreciation costs with new capital expenditures help reduce taxes and improve profitability—specifically, earnings before interest, taxes, depreciation, and amortization (EBITDA). This applies not only to new equipment, but also to major refurbishments and upgrades, provided they meet one or more of the following criteria:

- Extends the useful life of equipment beyond 12 months.
- Is not a part of routine maintenance nor typically listed in a maintenance manual.
- Increases performance by at least 25%.
- Is a major integral part of equipment.

Alternatively, all or a portion of refurbishment and upgrade expenditures can be expensed in the current financial year.

In the current economic climate, there are many incentives available to promote new technology and modernization like environmental rebates (from governments and utilities providers, for instance) for improving energy efficiency and implementing green technologies. Apart from the financial benefits, these can yield a competitive advantage in positioning manufacturers to implement leading-edge technology and environmentally friendly solutions.

Significant gains can be achieved by lightweighting a part through conversion of existing tooling combined with upgrading a machine to be more energy efficient. In PET preform molding, a 10% weight savings through lightweighting a 28g part with a 15% machine energy utilization improvement yields a 24% energy reduction per part (considering molding only). An annual volume of 150 million parts per year for approximately one system translates into roughly 370 tons less CO_2 emissions. Based on U.S. averages, this is equivalent to about 70 fewer vehicles on the road. Including emissions for resin savings, this increases to around 1500 fewer tons of CO_2 emissions per year, which is equivalent to about 290 vehicles.

Determining the right solution

Each situation, part design, equipment, and production requirement is unique and requires in-depth evaluation of multiple options to determine the best solution (Table 1). To help facilitate such initiatives, manufacturers can enlist the help of suppliers to manage injection molding equipment over its entire life cycle, as well as assist in optimizing operations to improve profitability.

Consider the case of a Husky customer with a fully depreciated 15-year-old preform molding system. The system runs satisfactorily, but spare parts are often hard to obtain and have a long lead time, resulting in many hours of lost production. This manufacturer has several options: to keep running as is, to replace existing equipment with a completely new system, or to have the existing system refurbished and upgraded.

Table 2 considers the relative economic drivers that exist when looking at this customer's capital, finance, and overhead costs, plus amortization, maintenance, and energy. Resin cost savings have been excluded to isolate the benefits of improved equipment performance. Still, resin savings through lightweighting should be included, as it is often the largest cost driver in total part cost and can significantly improve the economic advantages with new or upgraded systems.

An upgraded system yields a faster payback than a new replacement system. However, new systems offer the potential for a much greater return for capital invested. Over the course of an

Table 1. How should you address your equipment needs?

	Equipment impact	Capital cost	Performance improvement	Warranty	Changes to infrastructure and auxiliaries	Tooling compatibility	Personnel training	Environmental impact
Refurbishment	Restores original performance and wear life	Lowest	None (minor)	Limited only for refurbished components	None	May not be compatible with new tooling	None	Minor improvement mainly to correct known issues
Upgrades	Improve existing performance capability and/or reduce future costs	Middle	Minor to significant	Limited performance guarantee and warranty possible	None or minor changes to existing	May improve compatibility with legacy and new tooling	None or minor	Can be significant improvement
Replace with new	Complete new system with latest technology	Highest	State-of-the-art performance capability	New equipment performance guarantee and warranty	Typically requires new auxiliaries	May not be compatible with legacy tooling	May be significant	Largest improvement opportunity

Consider part design, equipment, and production requirements when deciding to refurbish, upgrade, or replace.

Table 2. Case study: Upgrade or buy new?

	Existing system	Refurbished and upgraded system	New system
Total new investments	-	$600,000	$1,500,000
Cycle time, seconds	18	16	12
Cavitation	96	96	72
Equipment uptime	90%	94%	97%
Annual output, millions/year	138	162	168
Relative part cost (avg. next four years)			
Material, $/1000	40	40	40
Processing $/1000 (amortization, energy, labor, maintenance, infrastructure, finance)	7.30	6.77	7.07
Part cost, $/1000	47.30	46.77	47.07
Avg. savings/year	base	$86,750	$39,480
Simple payback, years	base	2.4	4.3
Estimated remaining years of life	4	6	15
Profit opportunity over life cycle @ $50/1000	base	$2,605,920	$8,913,115
Total return on investment		434%	594%

A Husky customer with a 15-year-old system explored upgrade or buy-new options. The most cost-effective choice depends on the life of the program: fewer than five years, upgrade; more than five years, buy new. (All numbers included are not actual, but representations of a theoretical scenario.)

expected life cycle, total return on investment (ROI) is 594% (six times) for a new system vs. 434% (four times) for an upgraded system.

If product life is expected to be short (three to five years), the upgrade option offers better profitability as the system will be paid in full before the end of the product life. If product life is expected to go beyond five years, a new replacement system should offer better long-term profitability and competitive advantage.

Ensuring you have an equipment modernization strategy, including implementing appropriate upgrades and replacement of older existing equipment with new equipment, is key to keeping part costs low and maximizing profitability.

Greg Cooke (gcooke@husky.ca) is business manager, factories and services for Husky Injection Molding Systems Ltd. (www.husky.ca).

Market Snapshot

APPLIANCES

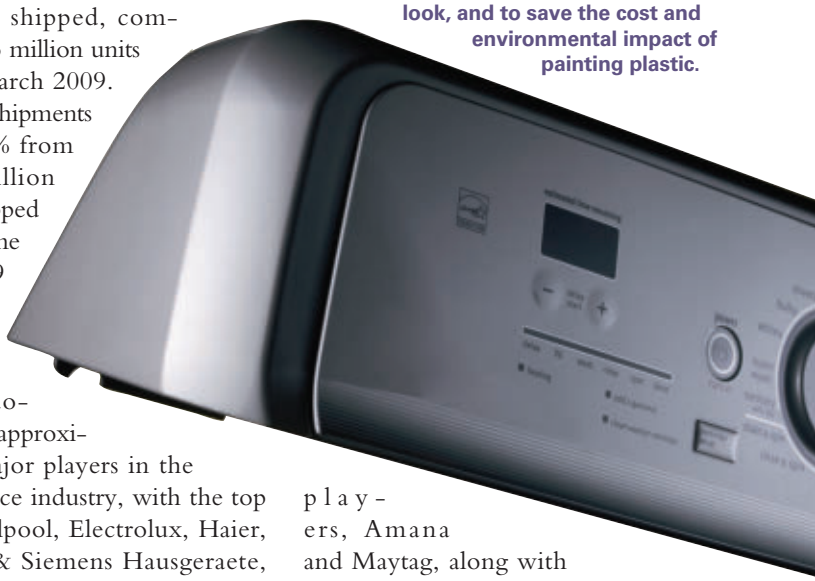
The appliance market suffered with the economic downturn and the collapse of the housing industry, particularly in new construction. But thanks to the "Cash for Appliances" program, the industry is seeing a bit of an uptick in sales lately.—**Clare Goldsberry**

The economic slump has impacted sales of appliances globally, and projections are lukewarm for the future. Global demand for major household appliances is forecast to rise 2.8% annually through 2013, approaching 500 million units, according to a market study from The Freedonia Group, a Cleveland, OH-based market research firm. However, much of that won't be from the U.S. market, but rather by market expansion in developing countries. In developed regions, sales will depend primarily on steady replacement demand, new home building, and the development of new features that prompt upgrading.

The recent "Cash for Appliances" program provided a boost for appliance makers and encouraged consumers to replace their older, less energy-efficient appliances with newer Energy Star appliances. While this U.S. government-sponsored program pushed sales up considerably in the first two quarters of 2010, appliance makers are aware that when the government incentive goes away, sales will fall to pre-incentive levels.

Accordingly, March was a strong month for the U.S. appliance industry, with factory unit shipments up in most of the appliance categories tracked by the Assn. of Home Appliance Manufacturers (AHAM). Shipments in the AHAM 6 category of appliances (washers, dryers, refrigerators, freezers, ranges, and ovens) were up 9.3% in March 2010 with 4.015 million units shipped, compared to 3.675 million units shipped in March 2009. Year-to-date shipments were up 5.5% from the 8.573 million appliances shipped in the same time period in 2009 (see table, p. 18).

According to Freedonia, there are approximately 50 major players in the global appliance industry, with the top seven—Whirlpool, Electrolux, Haier, BSH Bosch & Siemens Hausgeraete, Panasonic, LG Electronics, and General Electric—holding the lion's share of the market. That group accounted for 57% of global market share in value terms in 2008, the year the report was released. These top players manufacture multiple lines of appliances, giving them a competitive edge across the board.



A major appliance maker chose Geon FX Metal Vinyl compound for its laundry consoles to provide a high-quality look, and to save the cost and environmental impact of painting plastic.

Manufacturing in Mexico

It's well known that the appliance industry has had considerable consolidation over the past decade, with Whirlpool coming out as one of the giants in this market segment, having acquired two other big players, Amana and Maytag, along with some other smaller ones. With those consolidations came some plant closures to eliminate duplicate manufacturing, which meant suppliers had to alter their business models for this market.

A natural change in those models includes manufacturing in low-cost locales. China not only is the world's largest market for appliances, also known as "white goods," but also is the world's largest supplier of appliances, nearly tripling production from 1998-2008, says Freedonia's report. That country is the leading producer in the refrigerator, washing machine, and microwave

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Appliance shipments

Appliances	March 2010 units shipped	March 2009 units shipped	% change 3/09-3/10	% change YTD
Cooking appliances				
Electric cooking (ranges, ovens, and cooktops)	450,800	421,000	7.1%	5.4%
Gas cooking (ranges, ovens, and cooktops)	278,900	243,300	14.6%	9.1%
Microwave ovens	880,500	1,046,100	-15.8%	-12.0%
Home laundry				
Washers	882,300	865,100	2.0%	0.1%
Dryers	723,000	707,900	2.1%	3.4%
Kitchen cleanup				
Dishwashers	640,500	527,100	21.5%	10.3%
Disposers	456,300	489,100	-6.7%	-1.1%
Trash compactors	5700	4800	19.5%	-9.8%
Food preservation				
Refrigerators	901,300	775,500	16.2%	12.1%
Freezers	202,900	194,000	4.5%	-4.0%

Source: Assn. of Home Appliance Manufacturers, released April 20, 2010

Factory unit shipments were up in March for most of the appliance categories AHAM tracks.

oven segments, exporting such products to the United States, Western Europe, and Asia.

While U.S. appliance manufacturing has decreased somewhat, Mexico has been the primary beneficiary as a low-cost manufacturing country for major appliances for the North American market. LG Electronics announced in the January/February issue of *MexicoNow* magazine that it has relocated its operations to a 376,000-ft^2 building in Prologis Park Cedros Tepotzotian, Mexico. This was after vacating a 495,000-ft^2 space at O'Donnell Logistics Center II in Cuautalan Izcalli, State of Mexico, Mexico.

In the March/April issue of *MexicoNow*, it was announced that Whirlpool Corp. (Benton Harbor, MI) expanded production of new refrigerators at its plant in Ramos Arizpe. Whirlpool made a $70 million investment in the expansion and added 350 jobs. This expansion will put that plant at capacity, producing a projected 1.2 million refrigerators per year.

Whirlpool's Q1 2010 earnings of $164 million, up from $68 million for the same quarter a year ago, were helped by the $300 million U.S. government rebate program to stimulate consumer spending. First quarter operating profit totaled $241 million, compared to $166 million in 2009, and adjusted operating profit totaled $287 million, compared to $126 million in the prior year.

Sales in North America were $2.3 billion, up 7% from 2009. In Europe, Q1 sales were $739 million. Latin American sales for Q1 hit a record of $1.1 billion, up 65%. Asian sales were also strong at $192 million, an increase of 60% from the prior year.

"We are pleased with the strong operational performance in all of our regions," says Jeff M. Fettig, chairman and CEO of Whirlpool Corp. "We're encouraged with the 18% increase in our global unit volumes during the quarter."

In North America, Whirlpool launched a new laundry pair under its Vantage brand, a new side-by-side refrigerator, and a new tall-tub dishwasher that holds up to 12 place settings. The company, under its KitchenAid brand, introduced a new French-door refrigerator.

New features, new reasons to buy new

Most appliance makers incorporate new features into their platforms every few years to encourage consumers to trade up. For example, Sears is giving its Kenmore appliance brand an overhaul this year that includes the launch of 450 new and/or improved products across its line for 2010. Among the new features are higher-quality handles and knobs, such as Kenmore's signature bow tie handles to add an "elegant look and an ergonomic grip," or blue LED-ringed knobs on laundry products.

Top-load, high-efficiency LCD laundry appliances will launch in July (with smooth touch display) and September (color LCD display). Many of the upgraded appliances will sport a "streamlined modern design" and flush, easy-wipe surfaces. New gas and electric cooking appliances will launch this October, which will also be the month for the launch of new top-load conventional laundry appliances.

Whirlpool is focusing on appliances that meet criteria for the Energy Star label, and already offers more qualified appliances than any other manufacturer, said the company. Plans call for Whirlpool to produce 1 million smart-grid-compatible clothes dryers by the end of 2011, and by 2015, the company will make all of its electronically controlled appliances capable (globally) of receiving and responding to signals from smart grids.

However, in an online survey conducted by Whirlpool, the majority of consumers (68%) want to live "green," but only if convenient to their lifestyle. Price is also a factor. This group said they will search until they find the product they are looking for at the right price. Sales are a factor as well, with 25% of

Midwesterners indicating they will buy what is on sale.

AHAM announced it will launch a third-party program to verify manufacturer energy ratings for refrigerators and freezers through random testing conducted by an independent laboratory. The organization has been working closely with the U.S. Dept. of Energy (DOE) to put in place a credible program that is consistent with DOE test procedures, which are the basis for measuring appliance energy use for both DOE appliance standards and Energy Star.

Material advances for appliances

Since the appliance market is always looking for ways to upgrade its products with new features or styles to encourage consumer purchases, materials often come into play. One of the new trends is the use of bold colors accented by metallic effects. Polymer compounder PolyOne offers this metallic look through its new Geon FX Metal Vinyl compound as an alternative to metal, chrome-plated plastic, or painted plastic.

An appliance manufacturer brought in samples of a painted plastic laundry console to show PolyOne's engineering team, who recommended a switch to the new metallic compound to eliminate the painting step. The customer's engineering and marketing teams for the new laundry units agreed the technology would provide a cost savings and a desirable look for the marketplace, and gave the approval to develop the washer and dryer consoles using Geon FX Metal Vinyl compound.

Mike Balasko, senior marketing manager for PolyOne Geon Compounds, says the consoles on washers and dryers typically are designed with a plastic front piece and plastic endcaps on each side, with a metal backing. "Going with Geon FX Metal Vinyl gave [our customer] the option to design the console as one complete plastic unit, consolidating four parts into one," says Balasko.

The appliance maker had originally molded the console in a standard color and painted it to give the metallic look, Balasko explains. "With PolyOne's precolored metallic-look material, we were able to eliminate the painting process—which is the costly part of the secondary operation—and eliminate the environmental impact of VOCs. That was a good selling feature for them," says Balasko.

PolyOne's color lab worked closely with the appliance maker to provide a color that matched the stringent requirements of the OEM. Additionally, PolyOne's design group helped the customer strategically position weldlines by optimizing the gating system and part geometry, using computer design and simulation analysis. The material supplier then recommended changes to the tooling that would move the weldlines to an area not readily viewed by the user.

"We're seeing companies, primarily in the major appliance market, wanting to replace metal with plastic or replace painted or chrome-plated plastic with a good alternative because it offers a cost saving," comments Balasko. "Precolored metallic materials will reduce the cost of producing these components."

The use of Geon FX Metal Vinyl compound instead of secondary painting enabled the appliance maker to save $500,000 annually in manufacturing costs, while eliminating the estimated 2% scrap created by secondary painting operations. This represented a further $10,000 savings per year, and helped the manufacturer avoid the environmental impact of VOC emissions, as well as the costs associated with shipping the parts from the molder to the painting facility—an additional savings of $50,000/year.

Serving the appliance industry: A molder's point of view

For a molder's take on the appliance industry, Jack Shedd, VP of sales and marketing for custom molder and contract manufacturer Hoffer Plastics (Elgin, IL), spoke at the recent annual convention of the American Mold Builders Assn. One of Hoffer's major markets is appliances, and Shedd has worked many years with the appliance industry in previous positions with another molding company.

"Why play in the appliance industry sector? They have high volumes," was his answer, pointing out that Whirlpool in Clyde, OH makes 22,000 top-load washers a day, as an example. "They make these in the United States because they can't make them in Mexico and ship them back into the U.S. cost effectively."

According to Shedd, Whirlpool has 25 North American assembly locations and uses a considerable volume of resin, which means "there are a lot of opportunities for moldmakers in the U.S. in this market," Shedd told the AMBA audience.

He noted that the appliance market typically has a three-year "refresh" cycle in which it uses the same platform but incorporates new features. This helps drive consumers into new appliances even if their older ones are still in good condition. Whirlpool is the dominant player in appliances with a 36% share of the market, he added, plus their subsidiaries of Amana and Maytag with 12% market share.

Citing some trends, Shedd said that there is continued pressure for low-cost tooling, and hence for overseas tool builds. To be competitive, U.S. moldmakers need to "figure out a better way to skin a cat," he quipped.

Additionally, appliance manufacturers want partners who can be integrators—who can make the mold overseas and then finish or groom it in the United States. "I have to source some low-cost countries, but we're allowed to put 5% onto the cost to cover our participation in the program," he said.

Appliance makers have a 24/7 build requirement thanks to enormous quantity requirements and the short time to market, Shedd added. "They can't get molds fast enough, and with the time differential, they can do better building molds stateside than in China," said Shedd. "But we can count on this industry being here because appliances are large items, making the shipping costs high."

Executive Roundtable:

Goodbye, 'Good enough'; Hello, world class

Say *sayonara* to the status quo. A new exercise in mind bending is required in the post-recession era. **—John Clark**

An old chestnut holds that when the tide goes out, you see all sorts of things previously hidden—and out of sight is out of mind, after all. As the plastics industry starts to find its footing again in the wake of a virtual free-fall during the first three quarters of 2009, it's inevitably time for the kind of soul-searching that has to take place following a historic gale that was capable of taking ships down with all hands (and did), and still may not have blown itself out.

That's why in March PlasticsToday invited a broad-based group of suppliers to sit down in Chicago and talk in two separate Executive Roundtables about the state of the plastics industry: where it's been, where it is, and where it looks to be going.

Here is just a fraction of what we heard. On June 22, you'll also have a chance to view a webinar of the sessions at Plastics Today.com, including a Q&A with **IMM** editor-in-chief Rob Neilley and yours truly, the editors with whom these suppliers graciously shared their insights. They are well worth hearing.

Do we know where we are?

Naturally, the first thing we wanted to know was whether we have indeed emerged from recession and are in a recovery. Economists have drawn their line and said yes, and by definition, one has to concur. But how do the various GDP data play themselves out on shop floors?

Dave Lange of mold component supplier DME wasn't the first to use the phrase "cautious optimism." Christof Heisser of Sigma Plastics beat him to it. "What we see in the marketplace is cautious optimism," Heisser said. "It was a pretty dry desert six months to a year ago, but I do see there is a route to recovery."

The Roundtable's participants **Back row: Christof Heisser (Sigma Plastics); William Goldfarb (Universal Dynamics); Thomas Benson (Thermal Care); Miyuki Matsumine (Asaclean-Sun Plastech); Jeff Lewis (Slide Products); Eric Bullivant (Plastrac); Dave Lange (DME); Gregory Lewis (Matsui America). Front row: Bruce Catoen (Mold-Masters); Mark Sankovitch (Engel North America); David Preusse (Wittmann Battenfeld); John Chalmers (Processing Technologies International); Mark Malloy (Progressive Components); Larry Doyle (The Conair Group). Not pictured: Thomas Worcester (Günther Hot Runner Technology).**

And it was, as Lange predicted, a phrase that would be used more than once. Thomas Benson of Thermal Care put it another way: "The glass bottom is getting thicker. I think the probability of us falling back through again is minimized. Medical and packaging clearly are the two markets that are the strongest, the building industry is still weak, and a lot of others are not nearly as strong. We're still seeing a lot of tight credit out there, which makes it real difficult."

Lange, for his part, observed, "We saw an uptick in the fourth quarter, but primarily because we think that had more to do with molding than the tooling side. We've seen a nice increase, in general, in tooling in North America right now. It seems to be more on the quick-turnaround tooling than on high-volume dedicated molds that are going to run for the next two years."

"Quite frankly, there was nowhere to go but up," said Bruce Catoen of Mold-Masters. "Everybody sat on their wallets for so long, the pent-up demand had to release at some point. We're seeing that release now. The question is, are they going to put their wallets back, or is this going to keep up? From what we see, this is something more sustainable than a bubble, or a mini-bubble. We have to see real programs coming through. We'll see the first tool come through, and we're now seeing subsequent tooling come through after that. This means they're increasing their capacity past even their original expectations, which is very positive for us."

David Preusse (Wittmann Battenfeld) noted that on the machine side, the uptick that began in November 2009 holds some encouraging signs. "We noticed it moving upward

What can processors do to thrive and not just survive?

If you only have time for the bullet points, read what follows—advice we gathered from our Roundtable participants for processors who want to do more than just survive. When you have more time than a coffee break, check out the Roundtable articles online—they expand quite a bit on the pointers offered here in brief.

Jeff Lewis, Slide Products

1. Stay fluid. Speed in production, whatever way you have to accomplish it, is still the only way you're going to reach your goals and quotas. And speed isn't always the key ingredient; it's just you have to identify what's keeping you from producing parts every 9 seconds instead of 13 seconds, and everything that feeds into that you have to make a priority. If you're not meeting your quotas, someone else will.
2. Make your plants a team. Discourage an attitude of everyone-for-himself.
3. Do it at the best cost you can in terms of energy.

Bruce Catoen, Mold-Masters

1. Bring back innovation. It's a cliché, but what made America great was innovation. Bring that back. That innovation spirit is going to be really important in the recovery. Change the paradigm to something different, and play by different rules from everybody else in order to give yourself the advantage.
2. Continued investment in technology is needed to drive your company long term. Running at status quo will not keep you operating profitably.
3. Spend the time to understand your customers' needs and to really address those needs.

Eric Bullivant, Plastrac

1. Empower your employees. If you ask your employees what you can do better, they'll tell you. They have good ideas and if you include them, it makes them feel better about everything they do.
2. Training is important. If you require your employees to learn more, they can run the equipment better and you can cut your cycle times and make more parts.
3. Automate your operations where ever possible.

Miyuki Matsumine, Asaclean-Sun Plastech

1. Re-examine your core business and determine whether your grand strategy is where the market is going.
2. Be energy efficient. At every level of the company, you should be conscious about saving energy and expense.
3. Look into new technology and then take the opportunity to grow by investing in long-term business, not looking only to the short term.

Thomas Benson, Thermal Care

1. Spend some time doing strategic planning. Understand what your business really is.
2. A lot of people don't understand their costs correctly, so carefully **look at where your costs are.** Look at ways you can improve the overall efficiency of the plant.
3. Be flexible. Look for opportunities for shorter runs, or taking in product you might not have done. Where can you go that you haven't gone before?

Dave Lange, DME

1. As an organization, as a molder, **understand what it is that really differentiates you.** "How are we going to be different from every other person that's molding a part?"
2. Be closer to your customer.
3. Be the company that has a little bit of vision to anticipate where things might be five years from now, that starts to carve out the niche, starts to differentiate itself a bit as being more of an expert in a particular area. Continue with your core business, but start carving out that niche.

Christof Heisser, Sigma Plastics

1. Know your market and your future markets.
2. Know your costs. If you don't know your costs, your company is an impend-

in November, although it didn't show well on the P&L statements, but there's certainly an increase in business that started in November. Some markets were less affected—medical and packaging. Automotive was the largest hit: They just turned everything off for a while, but the fact is the auto sector is beginning to buy again, to buy parts, to start putting machines back into operation.

"There are some leading indicators, and it's exciting right now. It's getting healthy because automotive is buying. You're seeing guys who haven't bought for three years coming back and they're buying again. It's a great sign, we're feeling a little bit of relief, and people are smiling."

What is recovery?

Conair's Larry Doyle asked the question, and it's relevant. "Are we going to recover back to the levels of 2008 or 1999?" he posed. "That's always a question in my mind: What do we expect recovery to really mean? I think the market today is stable, and processors are feeling optimistic. We're on the path to recovery, no doubt. It's just going to take a long time, I think, to get back to some normal level, whatever that is."

Something important to note is that the narrative in the

ing train wreck.

3. Invest in technology. You can only be profitable if your productivity is up. The only way you get ahead in productivity, or increase productivity, is to use new technology, the latest and greatest machines. The guys in China buy new stuff.

William Goldfarb, Universal Dynamics

1. Have good old-fashioned communication with your vendors, the partnership we've spoken of, but not on an only-when-there's-something-wrong basis.

2. Look into the future; be open minded to new things. One of our biggest customers was open minded to a new corn-based resin, which was thought to be novel, and now it owns the market. It identified and took the risk.

3. Look from within. Some of these energy savings are really just found from within.

Tom Worcester, Günther Hot Runner Technology

1. From the moldmaking side, innovate, be creative, and think out of the box. Really change your thought process.

2. Processors need to have the same approach. They need to think totally differently now. "Good enough" isn't any longer.

3. What you offer has to be more than just value-added. It has to be, "Can I build this entire unit, or system, can I assemble it totally automated, and can I help in the design of it?"

Greg Lewis, Matsui America

1. Improve your process. Improve efficiency, and reduce running costs.

2. Look at payback differently. It used to be three or five years, but now we're talking about 18 months for payback on a new piece of equipment. That's a tough nut.

Larry Doyle, The Conair Group

1. Processors need to think about "Who am I?" They've got to really understand what their business is about, what their core competencies are, and how they translate those core competencies into competitive advantage. If they can't do that, then they're in trouble.

2. Invest in human capital. Make sure all your people are onboard with who they are, and invest in those skills to make them even stronger and to define those competitive advantages even further.

3. Challenge everything. Just because you've done it that way forever doesn't mean there isn't an alternative out there. Cut cost and improve reliability; cut cost and create a competitive advantage.

David Preusse, Wittmann Battenfeld

1. Know your core competency and find efficiency within it.

2. Embrace technology and innovation. It was required before, and it's certainly required coming out of a recession.

3. Increase the value proposition and vertical integration. The ultimate customers who buy the parts have their pressures in their marketplace. They will go to the next guy; they will move their molds around. It's a nasty business that way, but that's going force people to adapt and change.

Mark Sankovitch, Engel North America

1. Understand your core business. Do what you're good at. Go back and understand it. When you branch out, whether

press regarding recovery can be deceiving, as Thermal Care's Benson was careful to point out. "Talking about the press and that they don't sense the recovery, two things that are very popular—unemployment and consumer confidence—have absolutely nothing to do with recession recovery. They are totally lag indicators."

Tom Worcester of Günther Hot Runner Technology characterized the upturn by saying, "I'm seeing a lot of people over here [in North America] and they're looking at how they can automate, reduce their costs, streamline, the whole shooting match. Do I see a recovery? Or is it possibly a reinvestment hoping to capture some of the work that has been lost to offshore molding? I see people retrenching—let's use that term—and with that in mind, they're looking to stretch the limits, I feel, in order to accomplish their goals."

Echoing Doyle's take, DME's Lange admitted, "The recovery is different from what we're used to seeing. It's not traditional growth for us. We're being forced into areas that we've always talked about wanting to be in, much closer to the processor. Why? Because in the end it's not really the mold base that we're after, it's not the ejector pin, the leader pin bushing—it's a better part."

it's LSR or putting in the cleanroom, do the due diligence.

2. You've got to be able to do forecasting. The days of having 100 machines in a warehouse that you can draw from are gone. Work with your supplier, give them enough time to get you the product so you can be successful.

3. Make sure you have a good understanding of your income statement and your balance sheet. You don't have to be a financial wizard, but you've got to have your house in order. That's extremely important. When that growth comes, you've got to be able to finance that growth.

Mark Malloy, Progressive Components

1. Have strategic planning in place—a vision, a mission, and strong management. Know where you want to go.

2. Communicate. Advertise and market what you do well. Very few molders and moldmakers do this. They have all these strengths and no one knows about them.

John Chalmers, Processing Technologies International

1. Take a more flexible stance regarding the products you're prepared to manufacture. The mindset in Europe and Asia is much more flexible. They understand there's much more market fragmentation.

2. Energy conservation is going to continue to be at the forefront of where people need to look to make up some of these diminished margins.

3. Use technology to overcome shortfalls in the labor pool.

Executive Roundtable

What comes next?

Making a better part is what it's all about, naturally. And the overwhelming consensus is that there has been a paradigm shift in how to get there. Manufacturing in North America had been on the decline ever since the advent of true globalization, and even before that, and the recession only hammered home the manufacturing realignments that had long been under way. Some molders, as Wittmann Battenfeld's Preusse noted, have long had "a successful recipe." Others, for too long, clung to the idea that their operations were "good enough," only to be faced with a devastating wake-up call that world-class operations are the only ones that will thrive.

As Engel North America's Mark Sankovitch put it, "If 'good enough' is what your philosophy is, you're going to get bypassed, because in the purest sense of business it doesn't stand still—it's a moving target and it's always changing. If your whole model said, 'I got it figured out,' well, it may be good for today, but it isn't going to last as you move forward."

> 'We're being forced into areas that we've always talked about wanting to be in, much CLOSER TO THE PROCESSOR. . . . in the end it's not really the mold base that we're after, it's not the ejector pin, the leader pin bushing . . . it's a better part.'

This, he implied, is also true for suppliers, who are trying to find their best shape and size in a new processing environment. Times have changed for everyone, and the new realities will evidence themselves in the ways both processors and suppliers do business. Partnering will become ever more important as lean processors look to suppliers to really be the "solution providers" we hear about. Engineering, training, and program and system development will evidence a much greater and closer cooperation between suppliers and processors than ever before, if for no other reason than most processors no longer have the internal resources they once did, and must depend on suppliers to augment the functions and skill sets lost in the leaning of their operations.

And speaking of skill sets, the rapidly aging skilled labor force in North America was of great concern to all involved. Will plastics add jobs, and will onshoring be a trend with legs? Where will the labor come from? Who will train them?

For much more detailed discussions of these topics from the Roundtables, you can go to plasticstoday.com and search under "Executive Roundtable" to read articles about onshoring, partnering/solution providers, the future of skilled labor, the state of the recovery, and the "good-enough" paradigm shift that's taken place.

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In this recurring column, Glenn Beall of Glenn Beall Plastics Ltd. (Libertyville, IL) shares his special perspective on issues important to design engineers and the molding industry. You can reach him at glennbeallplas@msn.com.

By Design

Winning with service

The dictionary defines service as a "helpful, beneficial, or friendly action or conduct that gives assistance or advantage to another." If you're not offering it, someone who is could be getting your business.

The United States is, and always has been, a major manufacturing country. A significant amount of manufacturing has moved offshore, but this is still an important part of the economy. Maintaining a strong U.S. manufacturing industry is important to everyone reading this article. But why?

Because molders are manufacturers. If you are not a molder, you are either buying from a molder or trying to sell a product or service to a molder. It behooves all of us to do what we can to help the injection molding industry to continue to be a strong, vibrant contributor to the U.S. economy.

Migration to low-labor-rate countries has eliminated most of the marginal and me-too U.S. injection molders. An increasing number of the survivors are following their customers offshore to become multinational molders. Others rely on niche markets. The remaining injection molders tend to be very efficient, progressive, high-tech companies capable of competing in the global economy.

One problem that plagues the latter group of molders is that many original equipment manufacturers' (OEMs') buyers ignore U.S. molders and send all of their new projects offshore. This is discouraging for molders who have invested time and money in becoming competitive. This also deprives OEMs of all of the advantages of having local suppliers who, in many cases, are competitive with offshore suppliers. There is money and time to be saved by reconsidering domestic molders.

Deteriorating customer service

One of the best ways molders can reestablish themselves with American OEM buyers is with the kind of service and personal attention that offshore competitors cannot provide. It is a fact that in their desperate attempts to reduce cost, many injection molding companies have allowed their customer service to deteriorate.

For example, there was a time when a molding company's phones would be answered by a pleasant voice that asked how she could help you. If you asked to speak to Mr. Peppers, you might be told he was out, but was expected to be in the office tomorrow morning, and could anyone else help. If not, she took your message and finished by thanking you for calling and saying that she would deliver your message to Mr. Peppers as soon as he returned. You ended that conversation feeling good and fully expecting to hear from Mr. Peppers the next morning. You also wouldn't mind phoning that company again. Buyers want lean suppliers, but like everyone else, they appreciate and respond to courteous, personal service.

What normally happens today is a cool, professional, recorded voice tells you how pleased they are that you called. This is not impressive when you realize they play the same recording for a politician looking for donations. You are then ordered to punch in the last name of the person you want to talk to. This will produce another recording repeating how important they consider your call, but can't answer it right now. After the beep, you are to leave a message with the promise that your call will be answered as soon as possible.

There is no feedback saying whether or not Mr. Peppers is in the office today or that he has left on a two-week vacation. With no other options, you leave the message that your commuter train just passed his plant and you thought he would like to know that smoke and flames are coming through the windows facing the railroad tracks.

Customers also put a high value on integrity, which, among other things, includes actually doing what you say you will do. Few people and companies practice this kind of integrity today. Those that do, stand out in the crowd. When you source offshore you have to remember that some cultures do not require the honoring of a spoken, or even a written, commitment.

Design as a service

Injection molders know the molding business better than their customers do. If

Molders know a lot about how to design plastic parts for efficient molding. If you want to brush up on your part design knowledge, visit plasticstoday.com/imm and search for "By Design: Part Design" (use quote marks for best results) for articles 101 through 304.

they want to, molders can provide many additional services that will delight their customers. Any suggestion on ways to reduce cost, improve quality, and shorten delivery will encourage customers to return again and again.

During the past few years there have been many advances made in the injection molding industry. The machines, molds, plastic materials, and especially our understanding of the molding process have improved. Regrettably, the same cannot be said for the detailed design of injection molded parts. The mistakes made while the industry was learning in the 1950s and 1960s are still being made today.

The adoption of computer-aided engineering has allowed impressive improvements in the design and development of plastic products. Again, regrettably, these new technologies have not resulted in a corresponding improvement in piece part design. It is important to recognize that injection molders do not mold products. They mold individual parts that are assembled to produce products. This realization provides an opportunity for molders to provide a valuable customer service.

Injection molders have very little control over their customers' product design. They can, however, have a major influence on the individual parts they mold. Every molder knows that simple little details such as a sharp inside corner or a nonuniform thickness can have a drastic effect on the moldability and performance of a part. It is safe to assume that every molder reading this article is producing some plastic parts that were not properly designed for low-cost, high-quality injection molding.

Injection molders can do their customers a valuable service by identifying and eliminating these troublesome part design details before molds are built. Properly designed parts result in reduced cost, better quality, and shorter deliveries by working right the first time. Simultaneous improvements in cost, quality, and delivery will certainly delight any potential customer.

The modern practice of fast-tracking new projects leaves few opportunities for discussing improvements in part design. Many molders are afraid to ask OEMs to consider design changes on a new request for quotation. You will look better than your competitors if you are the only molder making suggestions for improving cost, quality, and delivery.

This is your last chance to eliminate part design problems. If you get the order for the part as designed, you will have to live with the problems for the life of the project. If you fix the design problems now, both you and your customer will benefit—win-win.

Does early retirement make (financial) sense for unscrewing molds?

A case can now be made, both on financial return and technical advantages, for retiring an existing unscrewing mold in favor of one with a collapsible core. **—Alan Hickok and David Helenius**

Unscrewing molds are usually built for many years of production, as they are considered a long-term investment for the production of millions of parts. These are among the most complex of all injection molds, and require the highest amount of expertise both to build and maintain.

Though many leading moldbuilders have evolved their standards over the years, in general, there are still maintenance issues such as broken rollers, damaged racks, water and oil leaks, dropped racks, and so forth. Add to that common part quality issues such as scuffing, ovality, flash, and grease contamination, and it's no wonder that companies often look to a "jump-thread" approach to eliminate the issues of unscrewing molds, or they explore collapsible cores as an alternative.

Recently there's been an evolution of the standardization of the collapsible core approach. This method is now justifying handing a pink slip to an existing unscrewing mold—even one capable of running for the required years ahead—in favor of a new, fully mechanical collapsible core tool.

A radical move?

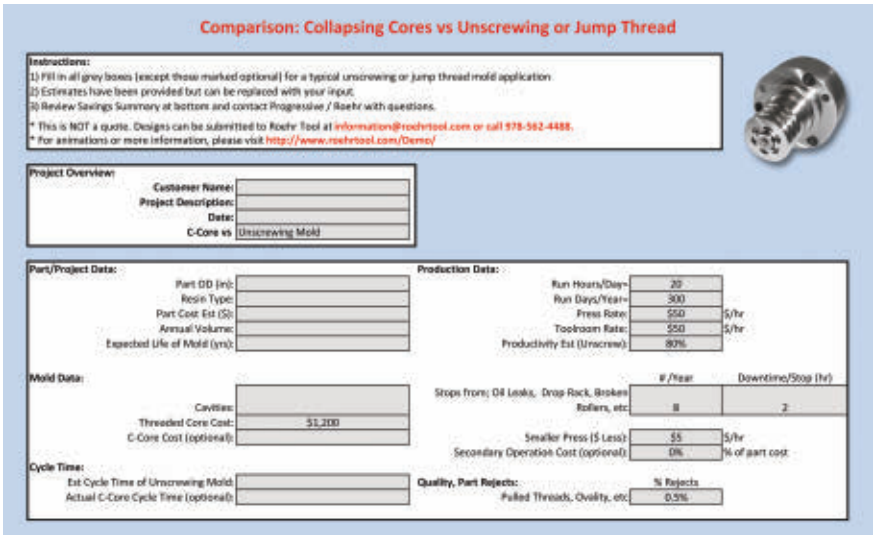
Shelving or gutting an existing, functioning mold may seem like a radical move in these conservative, cost-conscious times, but it's exactly the desire for more profits that's driving people to do the math. One can calculate the return on rebuilding a tool, or at least on salvaging the cavity half and rebuilding the core half, in order to gain returns that outweigh the capital expenditure.

For example, Mold-Rite Plastics Inc. (Plattsburgh, NY) builds and runs molds for its proprietary line of caps and closures. Recently it took a look at the future of two tools with 20 years of service that still had years of production ahead. Rather than simply keeping the tools going indefinitely, they did the math and were able to isolate the savings of converting to mechanical, dove-tail-style collapsible cores developed by Roehr Tool Corp. (Hudson, MA).

The goal for this project was to replace the existing molds with new technology in order to gain tooling with simpler operation, less maintenance, and shorter cycles. Phil Titherington, senior design engineer and toolroom manager at Mold-Rite, learned about the DT Series Collapsible Core from Roehr just as he was beginning to explore his options for replacing a 12-cavity tool to mold a 38-mm cap and a 24-cavity tool to mold a 24-mm cap.

"I was looking at collapsible core options from various suppliers, but when I heard about the DT Series, I sent Roehr drawings for the two projects," explains Titherington. "Technical support was excellent, as we were provided info with the first mold so that we would learn proper handling, disassembly, and assembly of the cores, as well as installation of the cores into the mold base. By the time we built the second tool, everything went very smoothly without the need for assistance."

The new standard product developed by Roehr converts what would have been a complex tool to an open/shut mold. Titherington also emphasizes the ease of mold setup, removability of



If you want to calculate the savings possible by switching your mold from unscrewing mechanisms or jump-thread systems to collapsible cores, you can plug your data into a cost justification calculator at www.procomps.com/math/.

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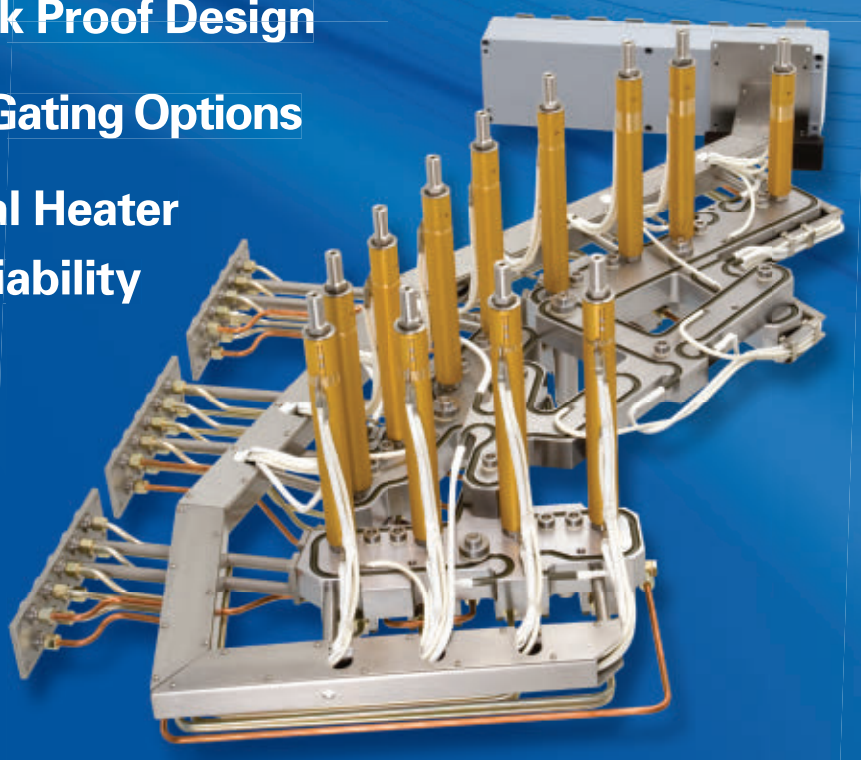

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the cores while the mold is in the press, and ease of maintenance. A final determining factor was greaseless operation. "It's a cleaner process, making it a lot less susceptible to contamination, which is a chief concern for us on the production floor," he says.

Calculating the savings, Mold-Rite confirms that investment in new tooling using DT Core technology was the right move.

Maintenance goals surpassed

Mack Molding (Arlington, VT) recently had the opportunity to quote the replacement of two four-cavity unscrewing molds used to manufacture PVC seal nuts, roughly 1.25 and 2 inches in diameter. The older molds, which were run by another molding company, had a history of excessive downtime, an issue attributed to their unscrewing cores.

Before quoting the project, Mack knew any maintenance costs incurred within the first million cycles would be their burden, as the OEM customer would not be held responsible. Mack was apprehensive about building the new molds using the same unscrewing methods, as the same maintenance issues could arise with the new tooling.

Rather than using flexing-steel-style collapsible cores, stainless steel was required due to molding PVC, and Roehr was able to provide this with its DT Cores. This approach gave Mack engineers the confidence they needed to introduce new designs to the customer for more robust and reliable tools, and reduced exposure to extensive mold maintenance expense.

Mack selected Carlson Tool & Mfg. Corp. (Cedarburg, WI) to build the new tools, and the moldmaker found them to be "very simple molds to design because they didn't have a complex unscrewing system," says Brian Wagner, engineering manager at Carlson Tool. "The simplicity was also apparent in the moldbuilding process. We were excited to be involved in a project that didn't have unscrewing but gave us such a great outcome."

Eliminating the gears, racks, and the cylinder superstructure of an unscrewing mold resulted in the use of a smaller mold base and fewer moving parts. A final review showed notable gains in mold efficiency and productivity over traditional unscrewing methods.

"The OEM customer verified that part quality was much improved and more consistent, thus requiring less destructive testing," states Jeff White, senior account manager at Mack Molding. "Ease of maintenance was also a selling point. Because of how they are constructed, the DT Cores can even withstand welding for repairs or revisions."

'Cycle time is REDUCED and maintenance cost is lowered.'

"From a production standpoint, we have been able to mold complex internal threads very efficiently as a result of the collapsible cores," says Gene Birmingham, manufacturing manager at Mack's Cavendish, VT facility. "Eliminating complex unscrewing mechanisms and additional sequencing saves time and helps us meet our customer's production schedule."

"The simple fact is that the math works," states David Fowler, president of Windspeed Inc. (St. Thomas, ON). "Cycle time is reduced and maintenance cost is lowered." Fowler is a seasoned toolmaker with 40 years of experience, and is now a consultant specializing in tool and part design. "I've worked with clients using collapsible core technology for many years. The benefits of a simpler mold design, faster sequence, and less stress on the part itself results in increased profits for the molder."

Roehr says this new approach also allows for removing the entire core stack while the mold is in the press—impossible with rack and gear systems. This factor alone—eliminating an unscheduled mold pull and increasing cavity utilization—can drive the decision to retire an existing unscrewing tool.

Analyzing the rebuild

Mold-Rite rebuild analysis

- DT Cores simplified the mold design and building process.
- Mold setup is faster, easier—plug and play.
- Mold cycle time was reduced by 50%.
- Part quality much improved, more consistent.
- Maintenance much easier and time spent on it significantly reduced.
- Overall savings calculated to be approximately $40,000 per mold/year.

Mack Molding rebuild analysis

- Simplified the mold design.
- Molds running faster and more efficiently.
- Part quality much improved, more consistent.
- Maintenance time reduced by more than 50%.

Mold-Rite retired its 20-year-old tools and built new ones with dovetail collapsible cores after finding that the cost was justified through overall savings.

Alan Hickok (al.hickok@procomps.com) is Midwest and OEM sales manager with mold component supplier Progressive Components (www.procomps.com) and David Helenius (david.helenius@roehrtool.com) is engineering manager at sister company Roehr Tool.

Contact information

Carlson Tool & Mfg. Corp. | www.carlsontool.com
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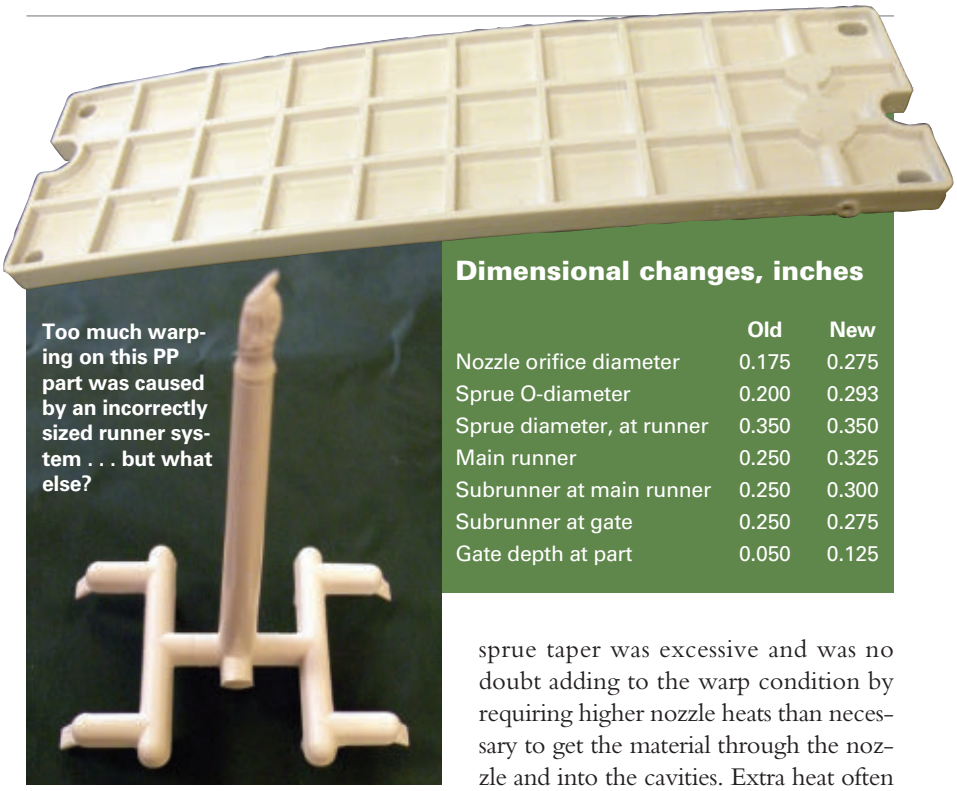
The Troubleshooter

Part 123:
The secret to eliminating warpage

What does it take to remove bending and bowing in your part?

This article continues our series of troubleshooting reports from one of the leading on-the-spot problem solvers in the molding industry. Consultant Bob Hatch of Bob Hatch & Assoc. (www.bobhatchonline.com) has more than 45 years of experience finding solutions to processing challenges. You can reach him at bob.hatchthetroubleshooter@gmail.com.



Too much warping on this PP part was caused by an incorrectly sized runner system . . . but what else?

Dimensional changes, inches

	Old	New
Nozzle orifice diameter	0.175	0.275
Sprue O-diameter	0.200	0.293
Sprue diameter, at runner	0.350	0.350
Main runner	0.250	0.325
Subrunner at main runner	0.250	0.300
Subrunner at gate	0.250	0.275
Gate depth at part	0.050	0.125

My son was home from golf school and we decided to go out for breakfast. While we were out of the office, the UPS driver stopped by and, finding us gone, left a note telling us where to find the day's packages. We got back in the car and headed for the UPS office on the northeast side of town.

I opened the package and found one part and a runner system. Again, there was no note, but seeing the name on the return address, I figured I would be getting a call in a day or so.

I did a quick visual review of the parts and found them to be suffering from a warpage condition that was causing a banana-type bow along the length of the part and sink on the side that didn't have any ribs on it.

From the look and feel of the part, the material was certainly polypropylene. Part thickness was 0.250 inch and the ribs on the one side were 0.150 inch in height. This is a common design and often causes part warpage if everything is not done exactly right.

Next, I examined the runner and for this, I needed to dig into my briefcase for my measuring tools. The main runner was 0.250 inch thick, as were all the other runners. Whatever happened to making the runners the appropriate sizes based on the calculated size of the subrunner that feeds the gate?

The runners were a modified trapezoidal design, all the same at 0.250 inch deep. What about the sprue diameters? We were looking at a two-cavity cold runner mold with a cold sprue dimension of 0.350 inch where the sprue attached to the runner and an O-diameter of 0.200 inch. The nozzle orifice diameter measured 0.175 inch.

I could tell just by looking that the sprue taper was excessive and was no doubt adding to the warp condition by requiring higher nozzle heats than necessary to get the material through the nozzle and into the cavities. Extra heat often is the cause of part warpage.

Troubleshooter's notebook

Part/material: Polypropylene.

Tool: Two-cavity cold runner.

Symptoms/problem: Warpage along the part, sink, cracks near the ribs.

Solution: To eliminate pressure losses in the runner system, enlarge runner dimensions and follow graduated sizing; increase diameters of sprue and nozzle orifice to allow for cooler processing temps; deepen gate at the part to keep it from freezing off before pack and fill is completed; radius ribs for strength.

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The sprue diameters should have been larger to pressurize the runner system. Even though this runner system was small, it needed the correct sizing and heats to keep these long, thick parts from warping or bowing.

I typically use 1.5° of taper on sprue bushings, which equals 0.0175-in/in. Will you find exceptions to this rule? Yes—I design in 3°-5° of sprue taper when working with soft materials such as polyurethane and thermoplastic elastomers.

This sprue was 3.250 inches long, and 3.250 multiplied by 0.0175 inch means the sprue O-diameter would be 0.057 inch smaller than the existing 0.350 inch where the sprue attaches to the runner.

Now we can see that the new sprue O-diameter of 0.293 inch would allow us to increase the general purpose nozzle orifice from 0.175 inch to 0.275 inch. This is a big difference and no doubt would allow the molder to reduce his nozzle temperature accordingly. Don't forget, though, that dropping the melt temperatures excessively is not a good thing for PP since it is subject to brittleness when processed at temperatures lower than the material manufacturers recommend.

Would lowering the nozzle temperatures allow us to speed up the cycle time? Probably not, but it would open up the processing window and eliminate any tendency for the nozzle to string or drool. This is always good for the molding technicians, who already have too many fires to put out in a given day.

Runners, ribs, and radiusing

Next, I decided to take a few minutes to properly size the runner system. I always start with the subrunner that feeds the gate. With a part made of a crystalline material that's 0.250 inch thick, the subrunner that feeds the gates should be 1.5 times thicker than the wall into which it feeds.

This calculation meant our trapezoidal subrunner needed to be 0.375 inch deep. I knew instinctively that was just too thick for these short subrunners. I could see this was going to be a trial-and-error situation, so I mentally reduced this subrunner depth requirement from 0.375 inch to 0.275 inch. This was thicker than the part wall by some 0.025 inch, but not so big that the system would end up with excessively large runners that we would regret later. The runner connecting both of these short subrunners/subgates to the one attached to the short main runner also would be 0.275 inch deep.

For the subrunner attached to the main runner, I stepped up the depth by 0.025-0.030 inch, and that meant the main runner would be 0.325 inch.

It was helpful to have two rectangular subgates in one end of the part; they

would enable the parts to be molded straight instead of warped or bowed. However, I could see that they were going to be a problem thanks to the shallow angle of their design. The subgates were 0.200 inch deep where they attached to the subrunner and 0.050 inch deep where the gate attached to the part.

It's a mystery to me why someone would design a perfectly good rectangular subgate with such a shallow attachment point to the subrunner. Based on a 0.250-inch part thickness, the gate depth should have been half of that, or 0.125 inch instead of 0.050 inch.

It's no wonder these parts were warping. They were being filled with adequate injection pressure, but the gate was freezing off quickly due to the thin design and before any packing material could be injected into the cavities. This meant the parts were being underpacked, and warping resulted. Once the subgates were properly sized, we could play injection and hold pressures like a violin, the part would be properly packed, and the warp would quickly disappear.

These initial changes would take care of the warp, but you probably know me well enough by now to expect that I would look for other problems.

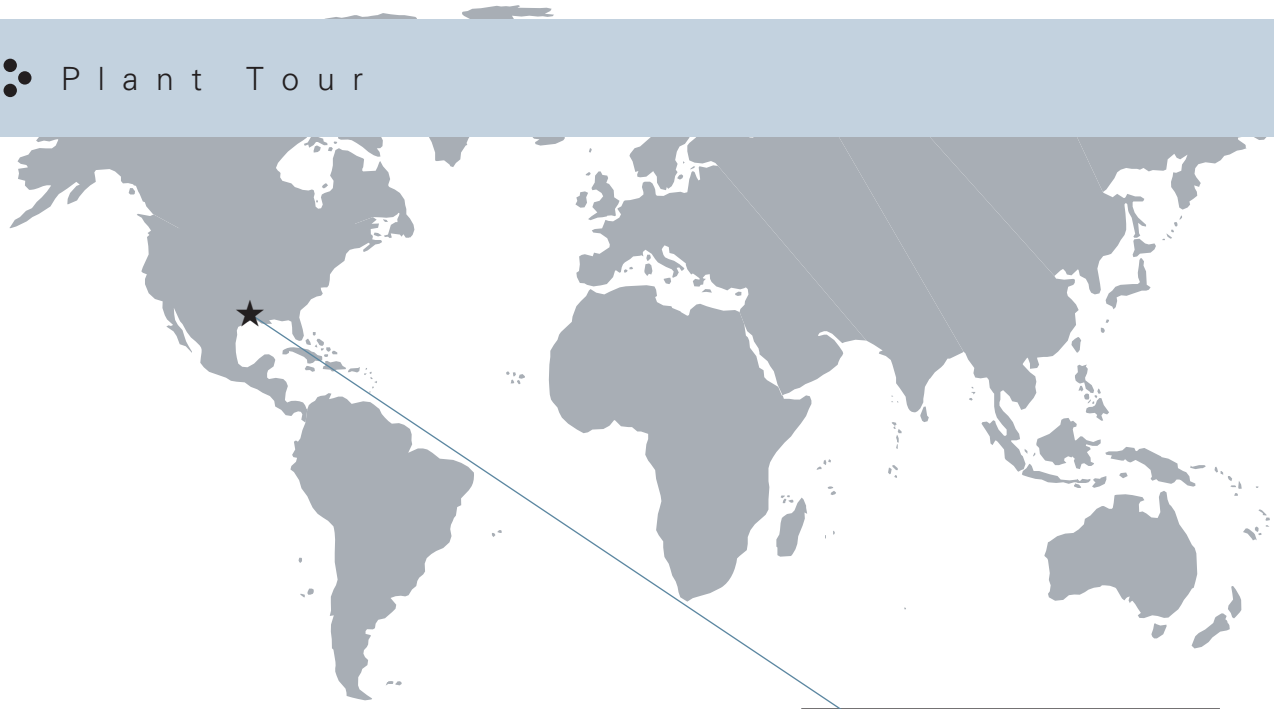
I zeroed in on the ribs. Reaching for my medium point Holiday Inn ballpoint pen, I drew a line where ribs and part wall meet to see if I would get a single or double line. It was a double line everywhere I tested, which, of course, means the ribs were not radiused.

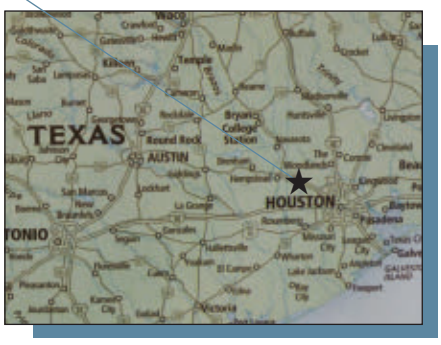
The proper radius for a part that is 0.250 inch thick is a 25% blending radius of 0.0625 inch. Going from zero to a 0.0625-inch radius would provide plenty of impact strength in these typically weak rib areas. Notch sensitivity is a critical issue when working with crystalline materials, and this corrective action would make a huge difference in the cracks I saw where the ribs attached to the parts.

Uh, wait just a moment . . .

The time had come to call the molder. My suggestions for corrective action were well received but I had to keep repeating myself because the molder kept telling me to hold on a minute while he called another toolmaker, molder, or engineer into his office. Of course, I had to bring each person up to speed from the beginning of our discussion as they were added to the group, but ultimately we were able to get everyone clued in on my suggestions. The molder said the changes would be made and he would call me if they had any more questions.

Eventually I received a package with some very well-molded flat parts that did not have any cracked ribs, along with several bags of fresh pecans from way out there in west Texas.

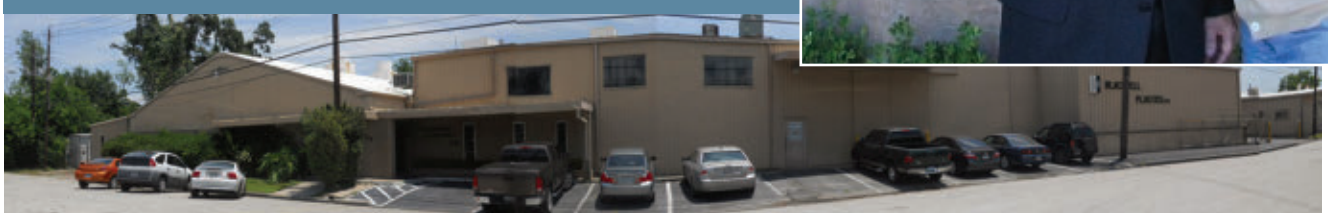




SEVEN DECADES OF CUSTOM MOLDING AND COUNTING

Just back to Houston after serving in the Air Force during World War II, a 21-year-old L.D. Blackwell had to lobby his congressman for a veteran's exemption to buy an injection molding machine.—**Tony Deligio**

Blackwell Plastics founder L.D. Blackwell (left) and company president Jeff Applegate stand outside the molder's main office. Founded in 1939, the company is located just south of the University of Houston.



> “There will always be a need for companies like this. That’s why we can’t be obsoleted, in my opinion.”

Blackwell Plastics Inc., Houston, TX

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Jeff Applegate | (713) 643-6577
www.blackwellplastics.com

In 1946, it was still exceedingly difficult to procure much of anything in post-war America, but Blackwell’s request was granted and he promptly spent $10,000 on a 250-ton HPM, launching himself and his company into the emerging world of custom injection molding. That industry would shape his life in the intervening years and, even today at 85, it continues to capture his imagination. “I’ve just had fun all my life,” Blackwell says. “For 71 years I’ve been doing this, and it has been kind of fun seeing all the new things.”

Originally opened with his father, L.A. Blackwell, in 1939, the company would grow along with plastics and molding, tracking the myriad changes in both. One common theme over its seven decades has been invention. A new and growing class of materials, plastics sparked the creative ingenuity of inventors everywhere, and in addition to its own advances, Blackwell Plastics helped many of these innovators take napkin sketches and crude prototypes through to polished products and commercial success.

The invention that initially launched the company came from L.D.’s father, an auto mechanic who also fished to supplement his income and help support his family. L.A. had created a sliding float—a fishing device that would allow anglers to set their lines at different depths. Initially milled on a lathe from wood, it was L.D. who, looking at a new plastic toothbrush, wondered aloud to his father whether the float could be fabricated from the artificial material.

Father and son would then go about constructing their own plunger-style press to mold the floats, and while his dad, a World War I veteran, died before the machine was completed, L.D. would finish their work. “We sold a lot of [the floats],” Blackwell says. “In fact, that’s how we made a living for many years, just making those little inserts, and they were selling all over the country.”

A lifetime in plastics

From a conference room in the original 6000-ft² building (the company now covers around 90,000 ft² spread among three buildings), Blackwell and Blackwell Plastics president Jeff Applegate discuss the company’s past, present, and future. On three walls surrounding the conference table, parts, products, and pictures from that past serve as ready props to display the truly eclectic problems the company has solved.

L.D. Blackwell’s father, L.A. Blackwell, poses in front of the plunger-style machine he conceived with his son. L.A. passed away while L.D. served in WWII, but his son would go on to complete the machine.

Everything from collaborating with pioneer cardiac surgeon Michael DeBakey to develop the first bypass heart pump for open-heart surgery, to sensors worn by the first astronauts to enter space, to the first Weed Eater adorn the walls or rest on shelves. Intermittently, the shop floor, which is a door and short corridor away, can be heard in the distance, churning out new parts to potentially decorate the walls tomorrow.

It’s cliché to say that every part has a story, but in the case of Blackwell Plastics it’s truly the case, and over 70-plus years, a remarkable anthology of injection molding tales has been amassed. The yellow and green Weed Eater (string grass trimmer, to those unfamiliar) that hangs on the wall originally came to Blackwell Plastics in the early 1970s in the hands of an eager inventor as a set of handlebars with a Briggs & Stratton engine at one end and a wooden disc with small nylon

Top These adjustable floats for fishing invented by L.A. Blackwell pushed father and son into the newly forming injection molding industry. **Middle** Energy-efficient Negri Bossi machines dominate Blackwell Plastics' shop floor. **Above** This cell creates a finished plumbing device, which requires a seal test. A diaphragm is spinwelded into a housing.

strings coming off at the other end. After some effort, its creator, George Ballas, managed to start the device in front of the plant and began trimming grass for Blackwell. Ballas told a skeptical Blackwell his intent for the unwieldy device, and asked him what he should do next.

"I say, 'You've got to have a mold,'" Blackwell recalls, "and he says, 'Well what's a mold? How much do they cost?'" Showing Ballas several molds and describing their fabrication and price tag, Blackwell hoped to discourage the inventor. "Your life savings can end up in a pile of rusty iron and neither of us makes money that way," Blackwell remembers telling Ballas, but Ballas persisted. When he asked for a quote, Blackwell threw out a number he figured would be a conversation ender: $15,000. "[Ballas] said, 'Oh, OK,' and he pulls out a dirty old check. First damn day he wrote me a check, and I thought, 'What am I gonna do?' Called my bluff, I guess."

In time, Ballas and Blackwell would mold parts for a million Weed Eaters, eventually selling the entire company, in which Blackwell had a stake, to Emerson Electric.

Diversity weathers the storms

As we leave the conference room and step into the molding/assembly area, the company's customer diversity is immediately evident on its 30 machines, which range in tonnage from 22-550 with up to 60-oz shots possible. Those machines, which are largely Negri Bossi, are not only creating different parts, but also molding components for completely different industries. In succession, we see the molding of a plumbing device, a wet-wipe lid, an automotive part to prevent hot wiring, a frame for grocery cart advertisements, a safety device for railroads, a blood type test, and a toothbrush.

"All my life we've had an extremely diversified business," Blackwell says, "which has enabled us to go through periods of ups and downs in the plastics industry." Over the last two years, as the global economy slumped, its reverberations didn't spare Blackwell Plastics, but the company, as it has for seven decades, persevered. "We felt the slump last year—don't think we didn't, but we have gone through these for many years," Blackwell says. "All my life I've seen them—ups and downs—and we were able to go through that one because we had some diversification. When some products go down, others go up, even in an economic slump."

According to Applegate, Blackwell Plastics' top 10 customers are in 10 completely different industries, with no single client generating more than 10% of its business. Applegate, who joined Blackwell Plastics in 2003, says the company's current strategy is in response to a changing business environment.

"The injection molding business has gone through a number of evolutions," Applegate says, "from regional/small/custom to global, serving the big OEMs, and now it has kind of come back to where it truly is a regional business service where you're close to your customer and you know your customers." Last year, when production slowed due to the economy, Blackwell Plastics not only invested in its equipment, making upgrades,

but also revamped its website to support its regional focus. According to Applegate, 80% of the company's Web traffic comes from within a range of 300 miles.

In addition to targeting different markets, the company goes after those markets with different technologies, offering pipe and profile extrusion capabilities, which were originally installed in the late 1950s, in addition to molding technology. In a separate building, the company runs five extrusion lines, ranging from 3/4-21/2 inches, plus an additional lab line. On this day, a tube for oil exploration is being run.

The same building that houses extrusion also has the company's toolroom. Originally designed to build molds, the room is now primarily used for tool repair, maintenance, and modifications. The final building onsite would be called a warehouse by most, but Applegate and Blackwell stress it's a "staging area," which houses raw materials and finished parts. Currently being staged is a large open container that will serve as a feeding bucket for a horse. The design prevents spills, so horses can't tip the container and end up consuming dirt as well as feed, while also pacing how fast the animals eat. It's the eighth part we've seen and the eighth different end market.

Walking plastics encyclopedia

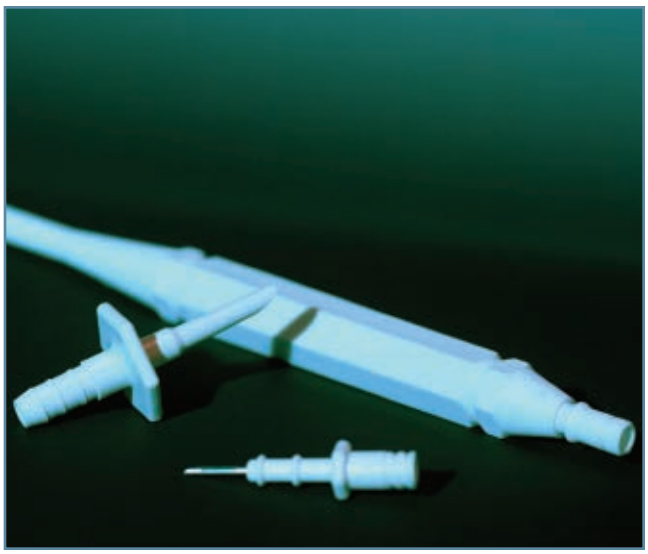
While Blackwell Plastics has all the technological advances you'd expect to see in an established, successful operation, its best asset may be the institutional knowledge of its owner, amassed over a lifetime in plastics. Admitting that many nights stretched into the next day, reading technical articles and journals until one in the morning, Blackwell says his library of engineering books alone could fill the conference room we're sitting in.

"You won't find a more well-read guy than L.D.," Applegate says, "and as far as being self-taught in engineering, in business law, in accounting . . . he's forgotten more than I'll ever know. He's amazing."

In addition to book smarts, Blackwell brings 70-plus years of hands-on manufacturing expertise to bear on the problems the company must solve today. "[Molders] didn't have SolidWorks, core pulls, collapsible cores, CNC machines—things that are standard in the industry," Applegate says, "and he had these really creative ways to get the same things done. With this modern technology, we have all these tools, but in our low-volume high mix, sometimes we have to come back to these innovative techniques of the early days."

Running the company under 13 different U.S. presidents, the country and the industry have seen sweeping change since Blackwell and his father first began building that plunger-style press to mold fishing floats. But as radically different as today's landscape is, Blackwell is convinced it still holds a place for his company. "There will always be a need for companies like this," Blackwell says. "That's why we can't be obsoleted, in my opinion."

Now that's a marketing video: Crank up the volume and watch Blackwell Plastics in motion at plasticstoday.com/imm/articles/tour-0610.



Top A Blackwell Plastics employee handles a part molded for the railroad industry. **Middle** Developed for cardiac surgeon pioneer Denton Cooley nearly 40 years ago, this "blood sucker" is used in open heart surgery and is still molded by Blackwell. **Above** At one time used for mold production, Blackwell Plastics' toolroom now primarily repairs, maintains, and modifies molds.

Materials

Software

Tooling

Machinery

Auxiliaries

Supplies

imm **Search for dozens more new products in the Product Watch section at plasticstoday.com/imm.**

ENGINEERING RESINS TO PLAY STARRING ROLE IN NEXT-GENERATION HYBRID VEHICLES

New automotive-grade offerings in the Noryl modified polyphenylene oxide (PPO) and Valox polybutylene terephthalate (PBT) portfolios of Sabic Innovative Plastics (Pittsfield, MA) are designed to help automakers create alternative power train solutions by displacing weight and increasing performance for hybrid, plug-in hybrid (PHEV), and battery electric vehicles (BEV), according to the supplier.

Hybrid electric vehicles are projected to capture a significant share of the global automotive industry by 2015, says V. Umamaheswaran, director of products and marketing at Sabic IP, Automotive. But although hybrids, PHEVs, and BEVs can reduce fuel consumption and emissions, the additional weight of battery packs—up to 300 kg on a midsized car—can undermine environmental benefits.

To reduce weight, plastics can replace steel in different applications such as battery housings, an approach that is already being taken with leading auto manufacturers. Noryl and Valox are said to be excellent choices for battery components, including frames and housings. These resins also offer significant weight reduction, chemical and temperature resistance, dimensional stability, and flame retardance.

Unlike traditional automotive lead-acid batteries, new higher-energy-density battery packs are composed of many separate battery cells—up to 200 in some cases—and the structure around these cells and their electronic control systems must maintain stringent dimensional stability. With so many stacked components in limited spaces, even a little instability could potentially cause misfits, leakage, or possible damage due to limited clearances.

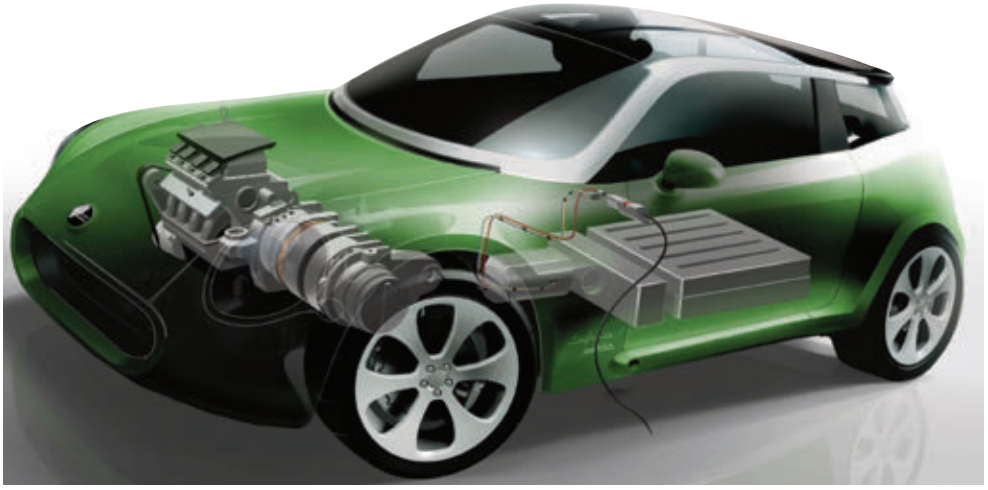
Noryl and Noryl GTX (the latter a blend of PA and PPE) resins offer lower initial mold shrink and warp, lower moisture uptake that minimizes dimensional and mechanical property changes, and a lower and more stable coefficient of thermal expansion (CTE). These high-end properties help keep the performance of the battery pack system stable, regardless of potential changes in environment such as temperature, humidity, and load.

BEVs are also becoming increasingly attractive with the advancement of new lithium ion and lithium polymer batteries that have higher power and energy density. In general, batteries operate best at controlled temperatures, requiring vital temperature management of the battery packs. To cool them, liquid cooling often replaces air-cooling for greater efficiency. As a result, these liquids require chemically resistant, high-performance engineering thermoplastic materials.

Further, if power is withdrawn from a battery, it will heat up, thus requiring materials with appropriate heat resistance. Sabic IP offers a number of materials with these properties, including Ultem PEI with high heat resistance and inherent flame retardance, and Valox PBT with high heat and chemical resistance.

In HEVs, the higher the voltage, the more important electromagnetic interference/radio frequency interference (EMI/RFI) shielding becomes to avoid potential interference from components such as inverters, electronic control units, and the battery management system. LNP says its Faradex compounds based on various resins and their blends from Sabic IP provide exceptional EMI/RFI shielding properties without the heavy weight of metal layers or the environmental risks associated with metallization.

Sabic Innovative Plastics
www.sabic-ip.com



NEW POM ADDS MECHANICAL STRENGTH TO CHEMICAL AND THERMAL

On the opening day of the Chinaplas show in Shanghai in late April, Ticona Engineering Polymers (Florence, KY) rolled out the newest addition to its Hostaform acetal copolymer (POM) family, a grade that ups mechanical performance significantly while maintaining or even boosting POM's long-term stability and chemical resistance.

Improving strength up to 10% and stiffness by about as much, then increasing toughness up to 50%, Hostaform HS15 is taking aim at some sectors where POM has already done well: automotive, fluid handling, sports, conveying, and consumer applications. But Ticona changed the material's chemical backbone to raise its game and go for new applications.

Calling it a new generation of POM that's clearly different from existing copolymers, Vincent Notorgiacomo, the company's POM product manager for the Americas, said it offers much wider design latitude. "That's why our near-term plans focus on applications that were impossible for our POM products in the past," he said, "Ones that were previously addressed using polyamides or metals."

In addition to its mechanical properties, Ticona says Hostaform HS15 can lower costs with improved processing and thermal stability, has the broadest design space of any acetal POM marketed today, and provides excellent resistance to hot water, auto fuels, and concentrated alkaline solutions (pH4-pH14). The combination, says the company, means customers now can use POM in applications that were previously out of its reach.

Ticona Engineering Polymers | www.ticona.com

TRAIN ONLINE TO MAXIMIZE ELECTRIC INJECTION MACHINE PERFORMANCE

Noting that there are some unique differences when processing on electric machines that a molder can take advantage of, the well-known plastics training specialist A. Routsis Assoc. (Dracut, MA) has released a new online training program called "Processing with Electric Injection Molding Machines."

This A. Routsis course is designed to help the trainee take advantage of the capabilities of electric machines. The trainee will learn how to optimize any application on an electric machine by studying first-stage filling, first-stage to second-stage transfer, second-stage pack, screw delay, screw recovery, screw decompression, cooling time, mold opening, part ejection, mold closing, and mold clamping.

"The technology and efficiency of electric molding machines have made them the machine of choice," says company president Andy Routsis.

A. Routsis Assoc. Inc.
www.traininteractive.com

FASTER TOOLING CHANGEOVER POSSIBLE WITH CYLINDER LOCK/KNOB COMBO

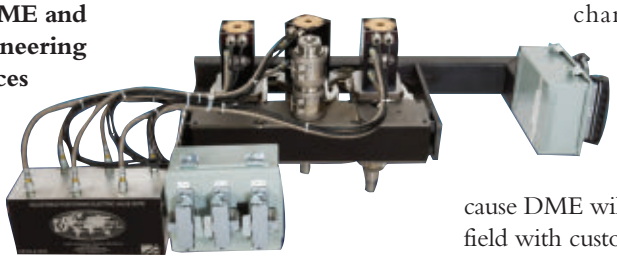
Segen Quick Change cylinder lock systems can be a boon to lean manufacturing initiatives and provide more uptime for machining, molding, and more, according to manufacturer Tooling Technology LLC (Fort Loramie, OH). The system replaces the older nuts, bolts, fasteners, and hand tools required, which significantly reduces time wasted on industrial setups, changeovers, workholding, clamping, fixturing, and alignment.

Jeff Barker, sales director for Tooling Technology, says that the Segen Quick Change system can be used with CNC machining, robotics, milling, and tooling changeovers—"any place you currently use nuts and bolts," he explains. "We have injection molders using them in the platens . . . to save time in tooling changes."

Segen Quick Change devices consist of a steel cylinder lock and a corresponding knob. The cylinder lock, designed to receive and mate with a conical male knob, locates and positions the knob to within 0.0002 inch with a holding force of up to 25,000 lb per device, depending on cylinder specifications. Positively locked in a static state, the cylinder lock actuates when air pressure is applied to release or receive the knob. The cylinder locks stay mechanically locked until pneumatic pressure is applied to automatically release them to ensure a secure, fail-safe hold, even if pneumatic pressure is lost.

Tooling Technology | www.toolingtechonline.com

PETS AND DME INTRODUCE FIRST JOINT PRODUCT: THE ELECTRIC VALVE GATE SYSTEM



Now that DME and Plastic Engineering & Technical Services (PETS) have partnered, the alliance is introducing its first product, a patented Electric Valve-Gate system suited for high-precision cleanroom molding applications. The system offers valve-pin movement of 6 in/sec and closing force greater than 35,000 psi—more than competing products, says DME.

The PETS Electric Valve-Gate can be paired with the company's Electric Valve-Gate Sequencer that offers real-time section views of each valve gate, and the ability to digitally position each valve pin independently in 0.001-inch increments.

DME and PETS are currently developing a High-Cavitation Temperature Controller that will include a real-time graphical user interface (GUI) capable of precisely controlling up to 128 zones. It will offer many user-friendly features, including staged startups to minimize heater burnout, accelerated quick color changes, and automatic temperature lowering to minimize resin degradation. It is scheduled for release this fall.

The alliance is a distribution partnership because of DME's extensive distribution channel. "We're not involved to date with developing the technology, but because DME will be out in the field with customers, we'll be getting the feedback and providing input and influence on future technology," says Bob Starr, director of marketing for DME.

DME and PETS will also be working with select high-end, high-cavitation molders to ensure that the Electric Valve-Gate, High-Cavitation Temperature Controller, and other products currently under evaluation for development and/or further refinements continue to meet their real-world requirements.

DME | www.dmeco.com
PETS | www.petsinc.net

OVERHEAD CRANE KITS REDUCE INSTALLATION TIME, COSTS

Pre-engineered single-girder crane kits in either top-running or under-running configurations allow installers to do their own onsite crane assembly. The kits are shipped complete with all necessary components except the steel beams, which can be purchased locally to save on freight cost.

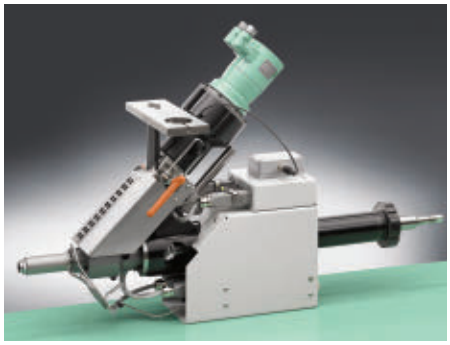
Supplied by Demag Cranes & Components (Cleveland, OH), the crane kits come complete with all components including a wire rope hoist, end trucks, bridge panel, festoon system with brackets, and push-button station. All kits are plug and play, and no

electrical work is required. The kits typically can be assembled in less than 21 hours, an extremely fast rate for the crane industry, according to Demag Cranes.

The crane kits are designed for builders of beam girder cranes in the 3-, 5-, and 10-ton-capacity range. Demag provides all specifications and instructions. Onsite construction and maintenance services are also available.

Demag Cranes & Components
www.demag-us.com

MICRO-INJECTION MODULE MAKES MILLIGRAM-SIZED PARTS



Unlike alternatives on the market that use a combination of screw plasticating or piston injection, the new module from Arburg (Lossburg, Germany) operates using two screws that "share" the preparation, dosing, and injection of the material.

Firstly, a servodriven screw pre-plasticating section, which is installed at a 45° angle to the horizontal injection unit, ensures standard granulates are prepared under ideal conditions. In terms of screw channel depths, the plasticating screw used is similar in design to a conventional three-zone screw.

The molten material is then transported from the pre-plasticating stage to the injection unit. The injection screw is used purely for transport purposes. It has a diameter of only 8 mm, is fitted with a nonreturn valve, and operates according to the screw/piston principle. This permits the smallest shot weights to be achieved with great precision and the required travel distance, Arburg says. At the same time, the interplay of screw pre-plasticating and injection ensures processing that's gentle on the plastic. The melt is continuously fed from the material inlet to the tip of the injection screw. This ensures that the first-in/first-out principle is fully observed.

One challenge with minute shot weights of less than 1g is, in some cases, the very long material dwell time in the injection unit. Furthermore, the displacement distance of the screw is extremely short because of the small injection volume. Arburg says its new micro-injection module is an effective solution to these problems.

Arburg | www.arburg.com

ADD RAPID PART COOLING TO THE CONVEYOR LINE

You say that ambient air does not cool that molded part moving along the conveyor fast enough, even with fans added. Well, now you can add a portable spot air cooling unit to a Dynamic Conveyor (Muskegon, MI) modular system right at the point where it's needed.

DynaCon's Rapid Part Cooling unit will bring air that's up to 25 deg F below room temperature to a designated spot on the conveyor belt. The self-contained, portable unit provides up to 60,000 BTU/hr, offers digital programmable temperature control, and costs as little as $0.10/hr to operate. The system includes a transparent plastic duct structure above the conveyor to keep the cold air flowing over the parts.

The amount of process time that can be saved will vary depending on the atmosphere in that part of the plant, but DynaCon says it will add up to significant money. And should that reduce overall cycle time, so much the better.

Dynamic Conveyor
www.dynamicconveyor.com

LSR MACHINES GET COLD RUNNER TREATMENT

New HM-85HL and HM-120HL horizontal liquid silicone rubber (LSR) injection presses from South Korea's Heung Hwa Injection Machinery (Gyeonggi, Korea) adopt cold runner systems from Japan's Seiki Corp. (Yamagata).

"Our Spear hot runner system is highly suited to molding of small parts of 1g or less because the hot runner size is compact," says Masami Itoh of the Rudiz Team at Seiki. Itoh adds that in the past, compression molding has been the preferred route in Korea for silicone rubber on account of the lack of availability of local machinery options: "European machinery was viewed as expensive." Now, the 85- and 120-tonne presses from Heung Hwa are expected to offer processors in the automotive sector in particular an affordable option. The Spear system uses a combination of a valve pin and retractable runner bush for injection, gate seal, and vulcanization in LSR injection.

Seiki, meanwhile, has also delivered numerous combination hot/cold runner systems for molding automobile keyless entry systems. "The parts are molded from polycarbonate and overmolded LSR in a four-cavity mold held at 136°C," says Itoh.

Heung Hwa Injection Machinery | www.heunghwam.com
Seiki Corp. | www.seiki-hot.com

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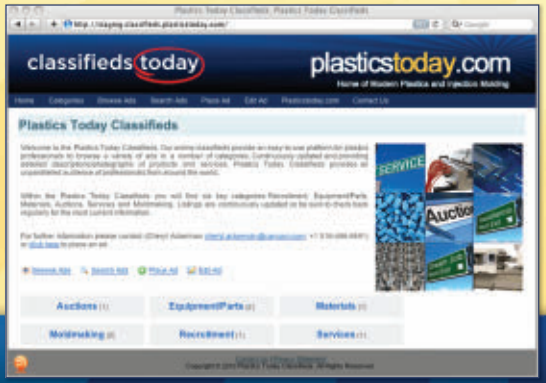

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INDUSTRY EVENTS

June 8-10
Plastec East
MD&M East
EastPack
ATX East
Atlantic Design & Manufacturing Show
Green Manufacturing Expo
Canon Communications LLC
Jacob K. Javits Convention Center
New York, NY
www.plasteceast.com

June 22-25
Expo Pack Mexico
PMMI USA
Centro Banamex
Mexico City, Mexico
www.expopack.com.mx/2010/

July 6-9
MTA Vietnam 2010
Singapore Exhibition Services Pte. Ltd.
Saigon Exhibition & Convention Center
Ho Chi Minh City, Vietnam
www.mtavietnam.com

July 7-8
Renewable Plastics 2010
Crain Communications Ltd.
Brussels, Belgium
www.renewable-plastics.com

Sept. 13-15
SPE TPE TopCon
Society of Plastics Engineers
Hilton-Akron Fairlawn
Akron, OH
www.4spe.org

Sept. 14-16
CAD Retec
Society of Plastics Engineers
Renaissance Nashville Hotel
Nashville, TN
www.4spe.org

Sept. 21-23
Atlantic Manufacturing Technology Show (AMTS)
Society of Manufacturing Engineers
Exhibition Park, Halifax, NS
www.sme.org/amts

Sept. 28-30
Plastec Midwest
Canon Communications LLC
Donald E. Stephens Convention Center, Rosemont, IL
www.plastecmidwest.com

Oct. 3-6
SPE Automotive TPO Global Conference
Society of Plastics Engineers
Best Western Sterling Inn
Sterling Heights, MI
www.auto-tpo.com

Oct. 12-14
parts2clean
fairXperts GmbH
Exhibition Centre Stuttgart
Stuttgart, Germany
www.parts2clean.com

Oct. 12-14
Corosave 2010: International Trade Fair for Protection, Preservation, and Packaging
fairXperts GmbH
Exhibition Centre Stuttgart
Stuttgart, Germany
www.corosave.com

Oct. 14
The Plastics Industry Strategy Seminar
Applied Market Information LLC
The Westin Galleria, Houston, TX
www.amiplastics-na.com

Oct. 14-16
Manufacturing in Mexico Summit
Offshore Group
Saltillo, Mexico
www.offshoregroup.com/summit.asp

Oct. 27-Nov. 3
K 2010
Messe Düsseldorf
Düsseldorf Fairgrounds
Düsseldorf, Germany
www.k-online.de

Oct. 31-Nov. 3
Pack Expo International 2010
PMMI USA
McCormick Place, Chicago, IL
www.packexpo.com

Dec. 1-2
Plastics Caps & Closures
European Plastics News
Marriott Hotel, Brussels, Belgium
www.europeanplasticsnews.com

Jan. 8-11, 2011
Arabplast 2011
AI Fajer Information & Services
Dubai/Messe Düsseldorf
Dubai International Convention & Exhibition Centre, Dubai, UAE
www.arabplast.info

Jan. 12-15, 2011
International Builders' Show/ Nextbuild 2011
National Assn. of Home Builders
Orlando, FL
www.buildersshow.com

March 16-17, 2011
Plastec South
Canon Communications LLC
Orange County Convention Center
Orlando, FL
www.plastecsouth.com

March 21-24, 2011
Automate 2011
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One metal replacement application you should avoid

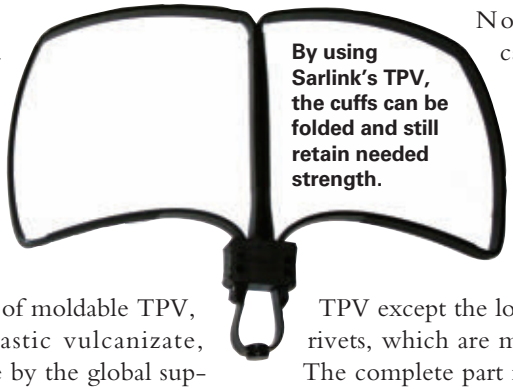
Offering an alternative to heavy metal cuffs, the law enforcement version of the zip tie is making crowd control a slightly simpler matter.—**Rob Neilley**

In crowd control situations that require high-volume arrests, law enforcement can carry several pairs of lightweight Cobra Cuffs and then recycle them when the job is done.

Injection molded handcuffs are already taking hold in the law enforcement market. Jim Reaves, CEO of Milspec Inc. (Asheville, NC), maker of Cobra Cuffs, says the molding material "allowed us to provide a product that is virtually unbreakable and quickly becoming the premier disposable restraint in the market today." Being foldable helps, too.

The cuffs are color-coded to identify detainees by the charges against them.

The material is one of the grades of moldable TPV, thermoplastic vulcanizate, made by the global supplier Sarlink (Leominster, MA). Reaves says, "Using Sarlink in our Cobra Cuffs Restraint application gave us the strength we needed along with the flexibility required so that the product could be folded. We could find no other product that offered this balance of properties and could also be processed in a complex tool."



By using Sarlink's TPV, the cuffs can be folded and still retain needed strength.

Sarlink says all its TPVs are based on dynamically vulcanized rubber in a polypropylene matrix that combines excellent elastic properties and the processing ease of thermoplastics. The TPV used to make Cobra Cuffs is Sarlink 3100, a high Shore D, natural-color material with 250-lb tensile strength, good abrasion resistance, and good colorability, which enables color-coding detainees according to the charges against them.

Brian Bubak, Sarlink's North American marketing manager, says that the entire assembly is injection molded, and that all parts are Sarlink TPV except the locking clip and rivets, which are made of nylon. The complete part is molded in a three-plate tool with a lot of slide action that is fed by a standard cold runner. Parts are robotically picked and the locking clip and rivets are assembled during the folding process.

Contact information

Milspec Inc. | www.cobracuffs.com
Sarlink | www.sarlink.com

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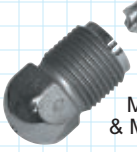

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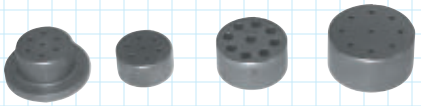

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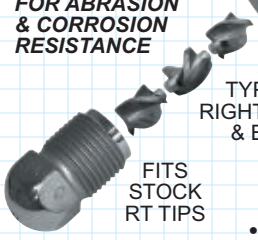

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