

# MoldMaking

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1998-2018



**MMT**  
**30**  
UNDER 30

**The New Face of Mold Manufacturing** PG 12.

**MMT**

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**Gaining a Foothold in Mexico** PG 24.

**Drilling with Milling**  **Transforms 2D Machining** PG 28.

**How to Quickly Generate 3D Runner Mesh** PG 48.



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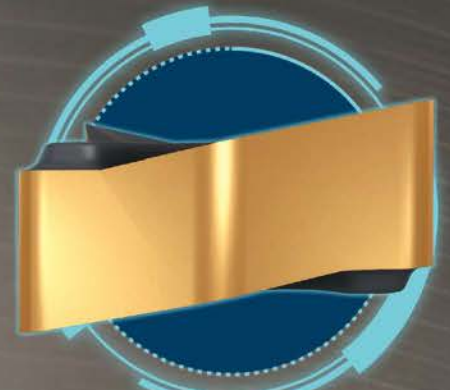
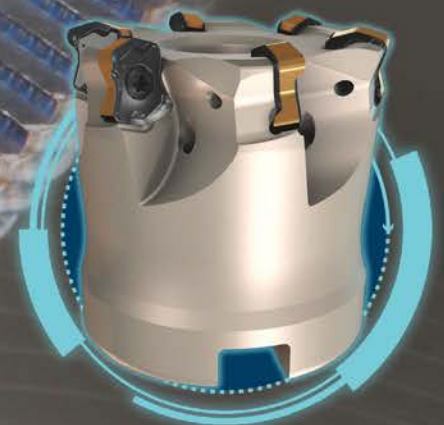
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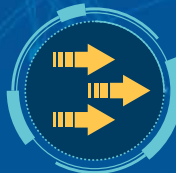
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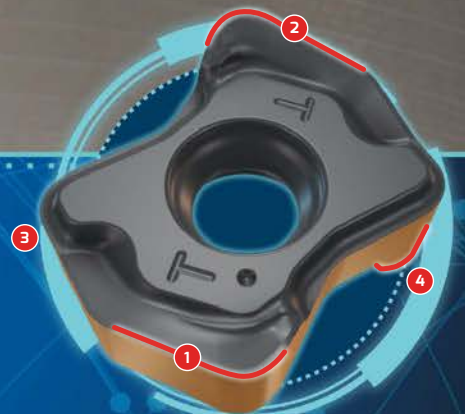
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## Features

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#### 30 Under 30: The New Face of Mold Manufacturing

Young professionals are vital to the moldmaking industry, and it is important to acknowledge those making strides in shaping the industry's future. *MoldMaking Technology* is recognizing the industry's young talent through its inaugural 30-Under-30 Honors Program.

### 24 International Perspective

#### Gaining a Foothold in the "Shangri-La" of Automakers


In 2014, German moldmaker Siebenwurst established a subsidiary company in Querétaro, Mexico. It not only provides support to other German companies in the region but also uses its extensive machine park to produce new molds for a growing customer base.

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### ON THE COVER

Image courtesy of Creative Technology Corp. This month's cover shows the under-30 team at AI Tool. The company has been making superior quality tools for almost 75 years. Doing that consistently and reliably over so many decades requires constantly attracting and developing skilled talent. With its concentrated recruiting, training and employee perks, the company focuses on hiring and retaining millennials and grooming each one to be an expert machinist and tool-maker. AI Tool employs 25 people (or 27 percent of its staff) who are under 30 and who are at various stages in their apprentice/training program.

Pictured front to back, left to right: Rafal Kras, Gregory Zaucha, Geoff Luther (CEO and owner), Sarah Gravina, Analiza Mercado, Erick Venegas, Christopher Camey, Emanuel Cano, Alejandro Teran, Billy Jarrett, Andrew Johansen, Marko Rackovic, Christopher Palminteri, Andrew Clark, Israel Mendoza, Nilesh Lukose, Moises Soza, Pawel Luczak. Not pictured: Christopher Carrillo, Matthew Coffey, Zachary Devore, Angel Heredia, Julian Mendoza, Rodolfo Mendoza, Michael Pietrandoni and Adam Thorson. See the related story on page 12.

Images courtesy of (left to right) Maximum Mold Group, Cheto Corp. S.A. and MoldTrax.

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 VIDEO ACCESS

## 5 TRICKS OF THE TRADE

### Great Tips from This Issue

#### 1. Eyeing Expansion

Many U.S. shops are family-owned and built up to a certain level, and then they are looking for that next step and next evolution. Sometimes it is difficult to figure out what that next step will be.

PG. 10.

#### 2. Boots on the Ground

Experience is what counts when setting up shop in Mexico, especially in tool and mold assembly, which means it is incredibly important to take the time to train employees locally on-site.

PG. 24.

#### 3. All in One

The all-in-one machining concept enables moldmakers to perform multiple operations with one setup, including deep-hole drilling, radial drilling, milling, tapping and boring.

PG. 28.

#### 4. Making It Work

Thermocouple designs that are more maintenance-friendly route the thermocouples outside the nozzle heaters, easing removal and installation.

PG. 32.

#### 5. Don't Mess with the Mesh

Hexa-based runner mesh enables designers to attain required mesh layers with fewer mesh elements.

PG. 48.

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## “They’re Here”



But, not in the creepy way that Carol Anne Freeling portrayed in the 1982 movie *Poltergeist* when her character is staring at the flickering light of a TV set in the dark, talking to ghosts. No, “they” are our next generation of moldmakers! They are finally here, and not just a few—there are many.

As I visited various shops over the past few years, I started to notice something that I was afraid might never happen: the average age of employees was dropping. I was starting to see both engineering and shop-floor personnel a lot younger than I expected. My first real clue that this was happening was a trip to Nypro and NyproMold in 2015 to shoot the magazine’s “MoldMaking Matters: Your Career Can Make a Difference” video that focused on a unique feeder system to attract and keep a young talent pool.

Now, I hate to admit this, but if you were to have asked me just five years ago whether I thought that a younger generation would enter the moldmaking trade, I would clearly have said no. Keep in mind that when *MoldMaking Technology* started back in 1997, the average age of a moldmaker was 56. Today, a handful of shops have an average age of 28! The landscape is changing. Something is happening. All the efforts of this

All the efforts of this industry working within their communities, schools and local governments are paying off. The industry is beginning to see the new face of moldmaking.

industry working within their communities, schools and local governments are paying off. The industry is beginning to see the new face of moldmaking.

So, although we spent a decent portion of this year focused on the past in celebrating *MoldMaking Technology*’s 20-year anniversary, we are now committed to looking to the future, which prompted the launch of our 30-Under-30 Honors program. This special feature on **page 12** acknowledges that the next generation is making its move into moldmaking and, more importantly, it recognizes 30

individuals under 30 years of age who were nominated by their employers and peers because of their commitment, work ethic and passion for the industry. This feature is only our first glimpse at this new face, and we are excited for what the future holds.

If you have a 30-Under-30 candidate in mind, you can nominate that person for *MoldMaking Technology*’s continuing online coverage at [moldmakingtechnology.com/30](http://moldmakingtechnology.com/30). **MMT**

*Christina Fuges*

Christina M. Fuges  
Editorial Director

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## THIS MONTH ON [moldmakingtechnology.com](http://moldmakingtechnology.com)



### SLIDESHOW: Innovation Abounds at NPE2018

Many U.S. moldmakers at NPE2018 chose to collaborate with supplier companies to exhibit their capabilities in multiple locations within the OCCC, while others simply brought their A-games to display in their own booths. Either way, innovative technologies and advancements abounded. [short.moldmakingtechnology.com/about](http://short.moldmakingtechnology.com/about)

### BLOG: Mold Builder Becomes Road Warrior and Raises \$15,000 for iWarriors

Larry Patten of Nebraska-based Dramco Tool rode 10,000 miles across 26 states and raised more than \$15,000 for iWarriors after setting what he thought was a reasonable goal of only \$5,000!



[short.moldmakingtechnology.com/iwarrior](http://short.moldmakingtechnology.com/iwarrior)

### WEBINAR: Innovations in Metal 3D Printing: Machines, Processes and Applications

EOS North America takes a closer look at the past, current and future status of DMLS. EOS North America’s Manager of Research and Applications Development, Dr. Ankit Saharan, presents. This webinar takes place September 27, 2018 at 2 p.m. ET. [gbm.media/eosmetals](http://gbm.media/eosmetals)



### VIDEO: Leadtime Leader Awards

The industry recognizes excellence in mold manufacturing with MMT’s Leadtime Leader Award. Check out this video and visit the Leadtime Leader Zone to read about past winners, check out the benefits and rewards, learn about the criteria, review the questionnaire, and nominate your shop today! [short.moldmakingtechnology.com/competella](http://short.moldmakingtechnology.com/competella)





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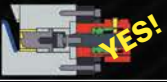





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# Establishing a Moldmaking Operation in Mexico



**Tim Krieger**

*President*

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kriegercraftsmen.com

*Tim Krieger, MMT EAB member and owner of Krieger Craftsmen Inc. in Grand Rapids, Michigan, says that he has learned a lot from opening a new operation in Guadalajara, Mexico, and he shares some of those teachings here.*

**Communications**—It is not just the language barrier. My employees in Guadalajara all speak English, but at different levels. The internet in Mexico frequently goes down, making it necessary for me to find a reliable alternative, other than email, for communicating. WhatsApp Business is a secure tool used for international communications by North American businesses. It enables meetings through video chat, plus it is possible to send large files instantly.

**Opportunity**—For many years, original equipment manufacturers have been developing business in Mexico to take advantage of lower-cost labor and to produce mass quantities of products. This is true not only in the automotive sector, but in all aspects of plastic-injection molding and assembly. Even though the current tariffs are being imposed and the trade wars are extremely relevant, there is a lot of opportunity for moldmaking in Mexico.

**The People of Mexico**—The people in Mexico that I have met, employed and with whom I have engaged are world-class people. I have been honored to bring my Mexican employees (of which there are currently 10 who are full-time) to my Grand Rapids, Michigan, shop for training. Additionally, I am sending my Grand Rapids employees to our shop in Guadalajara. Because of this cross training, we are bonding both personally and technologically, and our teams are talking to each other versus always looking to the boss for support.

I have also found that networking for the purposes of finding and attracting the right people to hire in Mexico is no different than it is here. Word-of-mouth advertising is good advertising, and we must offer competitive benefits and a safe, clean working environment.

**Transportation and Border Concerns**—We have learned to be careful when making promises to customers because clearing customs to ship mold components from the United States to Mexico does not always go smoothly. Sometimes we must go to extremes to get product over the border on time. For example, we bought a first-class plane ticket to make an emergency delivery to the Texas border where my Mexican employees came over to take the replacement componentry personally through Customs. Similarly, purchasing equipment like micrometers and other tools and getting them through Customs and to the shop in Guadalajara has sometimes taken weeks. It took a month to deliver a welder. **MMT**

## EDITORIAL ADVISORY BOARD (EAB)

The EAB enhances the standing of the publication and strengthens its professional integrity through the active involvement of its members.

The Board represents all aspects of the mold manufacturing industry with a balance of moldmakers, molders, original equipment manufacturers and academia, and various moldmaking segments and job functions. A member is selected based on his or her experience and knowledge of the moldmaking industry to serve a three-year term.

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## A Conversation with ... Fairway Injection Molds Inc.

A year ago, Westfall Technik Inc. (Westfall) acquired Fairway Injection Molds Inc. (Fairway), which originally was a family-owned business. How has this changed the way that Fairway operates and serves its customers?

**Dave Cockrell, vice president and general manager:**

Being part of a larger group is good for Fairway, its employees and its customers. One of the nice things about having a partner company in Westfall is that it is vertically integrated. We now have companies in place that start at the product-design level and migrate through prototype and development tooling and production tooling with



This Mitsubishi sinker EDM cell is integrated with an Erowa Robot Multi. It is one of several equipment purchases that will help Fairway Injection Molds expand its capabilities and grow as part of the Westfall Technik group of companies.

Images courtesy of Fairway Injection Molds.



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- Founded in 1977 by Ed McKeown, Steve Katona, Ron Biewener, Jim Hagin and Lee Crumbley and currently has 60 employees.
- Acquired from the Henn family in 2017 by Westfall Technik Inc., a global holding company based in Chandler, Arizona, the goal of which is to provide highly productive plastics manufacturing solutions to serve the medical, packaging and consumer goods industries. Sister companies currently include AMA Plastics Inc. (Riverside, California), AMS Plastics Inc. (San Diego, California), 10 Day Parts Inc. (Corona, California), Elfy's Inc. (Hayward, California) and most recently, NPI Medical Inc. (Ansonia, Connecticut) and Inceptive Design Group (Costa Mesa, California).
- Specializes in the engineering and manufacturing of high-precision, high-volume multi-cavity injection molds.
- Has an In-house Mold Test and Systems Integration Center that ensures mold functionality, part acceptance and production-readiness meet customer requirements before shipment.

Fairway and on to production molding. Several partners are doing production molding all the way through to executed, assembled products ready for shipment to the customer or potentially even to the customer's distribution centers, depending on what is needed. So, it is kind of neat to be part of the value stream where some of our customers are our sister companies, and that is what makes it a little different regarding moldmakers getting bigger. For example, we have three molding machines used for sampling molds, but we do not have a clean room. If we had to do a mold trial for a customer in a clean room, all we would have to do is call one of our sister companies and start making plans.

Many shops in the United States are family-owned and built up to a certain level, and then they are looking for that next step and next evolution. Sometimes it is difficult to figure out what that next step is going to be. Fairway landed with a group of plastics experts that truly value what Fairway is and what it can contribute. The goal of the company here is for Fairway to grow and become much larger than what it is today. The current management team at Westfall backs that up with very aggressive capital spending for the company. Through July this year, we have put in well over a million dollars' worth of improvements, and we are not done. It is all an effort not only to solidify our current standing as a company but to do so with an eye on future expansion plans and where we want to be three years from now.

### Describe some of the improvements that you mentioned?

**Cockrell:** We have made significant improvements already in our EDM group. For example, we added a new EDM cell with two new Mitsubishi sinker EDM machines that an Erowa robot serves. We also have purchased a brand new Yasda

YBM950V hard-machining center for a total of three Yasdas, and we have worked on our infrastructure. We put in an all new compressed-air system, an all new chilled-water plant and an all new virtualized-computer server and backbone system, including new wiring, cabling, switches and so on. Every bit of our computer network is brand new.

We have an enterprise resource planning (ERP) system that we are in the process of implementing, and we plan to finish that and have the system be live as of January 2019. It is an IQMS ERP system and eventually, all eight of the companies currently under the Westfall umbrella will be interconnected in a network as one large company. The primary objective is on the financial side as it drastically simplifies the accounting process and the financial reporting process, but there are several other benefits that come with being on the software as well. We have every intention of employing many aspects



Employees at Fairway Injection Molds run Yasda CNC machining centers in the company's hard-milling department. Fairway recently took delivery of a new Yasda YBM950V hard-machining center (pictured on the far right) to expand its ability to supply customers with very precisely machined parts, like shut-offs and other mold components, without the need for secondary handwork.

of Industry 4.0 across Fairway and Westfall as a whole. AMA Plastics, one of our sister companies, would be regarded as the flagship company for IQMS implementation because every molding machine in its plant is integrated and monitored in real-time using the software. We are still evaluating how well it will work for mold shops and have been testing machine monitoring for the last two to three years. We expect that Fairway will roll out a comprehensive monitoring system within the next 12 to 18 months.

### What does Fairway offer customers that sets it apart as a moldmaker?

**Cockrell:** One of the things that we do well for our customers is that we provide very accurate molds. One of the primary

reasons for that is that we work in a temperature-controlled environment that only varies about  $\pm$  one degree over 24 hours, and that is the entire production shop. We try to evaluate and purchase machines that do not vary by more than 0.0002 inch over 24 hours because those are machines that we can automate. Machine builders claim that their machines hold 0.0001 inch or 0.0002 inch, but the real test of any machine tool is how it performs over time. We put new machines through strenuous evaluation and they must be able to run unmanned and hold tolerance, otherwise we cannot use them. Our alternative is to regress and put an operator in front of the machine, which is going to cost more.

We do a lot of hard machining. We hard-machine shut offs, and we hard-machine molding areas. There is no hand-working of any of our parts when we use this process. There is no such thing as fitting. Everything is simply done, and the coordinate measuring machine (CMM) plays a critical role in how we get to that point. There is a demand for highly accurate mold components, so we invested in Zeiss CMMs to integrate into the manufacturing process. Our customers tell us that when they run our molds and they do their inspections, the CPK numbers that they get off the molded parts are typically better than what they expect because everything is basically the same. More often than not, our mold trials are one to two tests and then they are ready to ship.

Of note is that about 25 percent of our business, on average, is spare parts. This is because we can build the parts to the print and to the model with no hand-fitting, and the customer can take that part, drop it right in the mold and be back up and running at 100-percent cavitation. We also have mold designs that allow the customer to take the cavities and cores and the ejector pins out from the front face of the mold, and that allows them to get back up and running far more quickly than pulling the whole mold out and being down for a day or two. But, it all depends on the customer. If the customer really puts an emphasis on staying in production, then there are things that we can do to make sure that we put them in the best situation to stay in production. Some of our customers also have requirements that the molds have the ability to run for 10–20 million cycles before replacement, and we have been able to satisfy some of the toughest requirements to ensure long-lasting molds. **MMT**

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Young professionals are vital to the moldmaking industry, and it is important to acknowledge those making strides in shaping the industry's future. *MoldMaking Technology* is recognizing the industry's young talent through its inaugural 30-Under-30 Honors Program.

## The New Face of Mold Manufacturing

MoldMaking Technology selected the recipients from reader nominations based on their potential leadership within the company where they work or for their industry passion and involvement. If you have a 30-Under-30 candidate in mind, you can nominate that person for the magazine's continuing online coverage: [moldmakingtechnology.com/30](http://moldmakingtechnology.com/30)

**Gregory** attended East Leyden High School and worked summers at A1 Tool Corp. (A1 Tool). He then went on to Triton College and later to the University of Illinois-Chicago for engineering. He worked as he earned his degree in 2015, and then he became a design engineer at A1 Tool. Gregory has worked on the design, mechanics and implementation of multiple organizational improvements at the company. He has not been able to implement all his leadership efforts yet, but there are many more to come as he continues working in the design engineering department, improving mold designs and complex mold-action capabilities.



**Gregory Zaucha (27)**  
Design Engineer  
A1 Tool Corp. (Melrose Park, Illinois)

Both the industry and his peers have recognized Gregory for his efforts. He won the TMA High School Student Award and the American Mold Builders Association Apprentice of the Year Award. He won second place in the University of Illinois-Chicago Senior Design Project to improve manufacturing processes at Magenta LLC, and A1 Tool awarded him the "Employee of the Year" title.



**Rafal Kras (26)**  
Design Engineer  
A1 Tool Corp. (Melrose Park, Illinois)

**Rafal** started working part-time at A1 Tool Corp. (A1 Tool) while attending Triton College full-time. He then transferred to the University of Illinois-Chicago for engineering, where he went to school full-time and worked part-time until he earned his degree. Rafal has been working as a design engineer since 2015. During his tenure at A1 Tool, he has worked on the design, mechanics and implementation of multiple organizational improvements.

Rafal won second place in the University of Illinois-Chicago Senior Design Project to improve manufacturing processes at Magenta LLC, and in January 2018 he decided to continue his education by attending graduate school at University of Illinois-Chicago.

**M**oldmaking may be known as a one-off industry, but that is not an accurate description of the current employment landscape across many mold shops. Those who are under 30 are entering and staying in this niche trade. And, I am not just talking about one noteworthy individual—I am seeing multiple workers under 30 making an impact across the shop floor in everything from engineering departments to human resources and marketing.

For example, A1 Tool Corp., Westminster Tool, Ameritech Die & Mold, Franchino Mold & Engineering and Mantz Automation are a handful of shops in this feature that employ numerous under-30 workers and that nominated more than one under-30 employee who made the honoree list. The question is: How are these shops able to attract and retain the next generation of moldmaking professionals?

“Retaining a younger crew starts with selection,” Ameritech Die & Mold Program Manager Mark Rotman says. “It is important to choose employees who have a natural curiosity for what we do. If they do not have the excitement for the trade initially, it is not likely going to change. We spend a minimum of seven weeks evaluating select candidates to make sure we have had a good opportunity to evaluate them.

This also provides a great opportunity for them to evaluate us as well.”

Company culture is also an intentional strategy among these five shops, as they have found it has a direct impact on retaining a young crew. Culture can take various forms, including offering unconventional perks that cater directly to the social and economic needs of under-30 employees, such as no-cost health insurance, an on-site meal program and gym access with a trainer. Culture can also mean an environment set up to train someone with no skills, continuous learning opportunities, a focus on leadership skills, commitment to work/life balance, community involvement and open communication that encourages idea sharing and feedback among all employees.

In the end, having youth in a shop feeds on itself. The more young people that a shop employs, the more attractive it is for young people to join that workforce because they see what their peers are capable of achieving in only a few years of employment. Young people observe the job enjoyment and fulfillment of their peers and are amazed by the technology available to their peers.

Now, let me introduce some of these next-generation moldmakers who made *MoldMaking Technology’s* inaugural 30-Under-30 honoree list.

**Danielle** is not what you typically would envision as an EDM specialist, but that is exactly the role she has filled at Westminster Tool. Danielle graduated in 2013 from Windham Technical High School in Windham, Connecticut, from the manufacturing technology program. She was easily considered best in the class. Not only has Danielle mastered the programming and operation of an EDM machine in four years, she is leading the department. Her commitment to continuously improve and take ownership of improving processes has made her a critical part of the team. Danielle also has created and provided EDM training for all employees. Her dedication ensures the future talent development of the shop with consistent and repeatable measures. Danielle is a



**Danielle O'Connor (23)**  
EDM Specialist  
Westminster Tool  
(Plainfield, Connecticut)

key component for all shop tours, customer visits and community outreach. Her ability to communicate and share the innovation about a career in manufacturing with the public is exceptional. Danielle volunteers at all the company's school outreach programs and is enthusiastic about the opportunities that manufacturing provides. She is a great example of a young moldmaking star.

**Regina** came to Westminster Tool on a tour while a student at Grasso Technical High School in the mechanical design and engineering technology program. She applied and was ultimately selected for a work-based learning internship while still attending high school. After her graduation in June 2015, Regina accepted a full-time position.

In her three years at Westminster Tool, she has spent a year in sales, a year in engineering and design and the last year in production planning and scheduling. In each area, Regina recommended and implemented improvements that not only streamlined processes but have better-enabled the company to exceed customer expectations. Beyond this, she documented and created training documents for Westminster Academy to ensure continuity and consistency in training. One of Regina's most influential contributions to Westminster Tool is her vast knowledge and expertise because of exposure to several departments. She possesses a deep understanding of processes from conception to production that is way beyond her years. Regina is the go-to person at Westminster Tool, as she has the responsibility, wisdom and respect of the entire shop and all with only three years out of high school. Regina perfectly embodies the types of opportunities that this industry provides—while most young adults would be entering their last year of college with a mound of debt, she is running a shop floor.

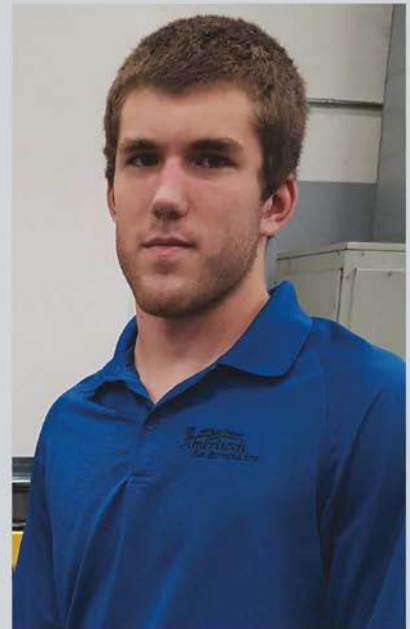


**Regina Byrne (20)**  
Production Planner  
Westminster Tool  
(Plainfield, Connecticut)



**Michael Shinn (28)**  
Lead Assembly Technician  
Ameritech Die & Mold  
(Mooresville, North Carolina)

**Michael** enrolled in the Apprenticeship 2000 program during his senior year in high school and has been with Ameritech Die & Mold (Ameritech) since 2007. He has worked extensively in each department. Mold assembly became his preferred work, which led him to the role of lead assembly technician in 2013. Michael quickly began making changes to improve work-flow efficiency in assembly. For example, he reorganized the assembly area with a cart system using multiple shelves for the BOM components for a new job, increasing work space. He set up cabinets and work benches for better tool storage and management. He also added a computer workstation with CAD to share the entire mold assembly with the team. Michael focused on continual improvement, which cut assembly time in half. He also is involved with the shop's apprenticeship program. He enjoys teaching and acts as a mentor to potential apprentices during a four-day evaluation workshop. Michael's training results in better-qualified apprentices entering the CNC department.



**Mike Merzke (19)**  
Moldmaker Apprentice  
Ameritech Die & Mold  
(Mooresville, North Carolina)

**Mike** started as an apprentice at Ameritech Die & Mold (Ameritech) in 2016, and although his experience in this industry is limited, his injection mold knowledge is typical of employees after four or five years. He has always been very inquisitive and never misses an opportunity to learn from his mentors. What stands out most about Mike is the level of responsibility that he has demonstrated. Between helping with younger siblings, completing his Eagle Scout award and working long hours in the assembly area, he always shows dedication to the task at hand. Over the past few months, Mike has continued to grow his capabilities by taking on a role in the EDM department. During this time, he has become proficient at using the wire EDM machine to burn pockets in workpieces that are typically 70 to 80 percent complete in the overall manufacturing process.

Mike's attention to detail ensures that the job is completed promptly and without mistakes. He is passionate about learning every aspect of injection moldmaking, from the time he spends in assembly to speaking with processors during mold sampling. Mike desires to understand the whole picture and not just one area. His maturity and ambition are refreshing.



**Daniel Wolf (22)**  
Machinist, Ameritech Die & Mold South (Ormond Beach, Florida)

**Daniel** started sweeping floors and emptying trash cans at Ameritech Die & Mold South (Ameritech South) after high school. Immediately, he interacted with coworkers, asking questions and showing a genuine excitement for the trade. Daniel pursued a college degree in the evenings while working as a general unskilled laborer at Ameritech South. After two years, he earned an associate degree in industrial management and received various accolades, including a NIMS Certificate, a Machining Certificate and an Entrepreneur Excellence award. Around the time of his college graduation, the shop needed to fill a position working with EDM machines, high-speed mills and CNC lathes. Daniel started working on the sinker EDM machine and quickly learned EDM theory and general machining principles. He then moved on to wire EDM. He also went back to college to earn a bachelor's degree in engineering technology. At the same time, Daniel moved to EDM electrode manufacturing and CAD/CAM. When Ameritech South moved locations, Daniel took over the EDM sinker cell, including a high-speed graphite mill, electrode handling robot, and a sinker EDM machine. He also ran a high-speed mill for finishing mold cavities and an older three-axis mill for basic component machining. Ameritech South says that Daniel has become an integral part of its shop. Ameritech South says that he is great to work with and always exhibits a calm demeanor with a smile and a high degree of personal integrity. He is always ready to jump in and help, no matter what the task is or how dirty the job. Plus, he constantly thinks outside the box when challenges arise.





**Clint Seeley (21)**  
EDM Operator  
Ameritech Die & Mold (Mooresville, North Carolina)

**Clint** joined Ameritech Die & Mold (Ameritech) through the Apprenticeship 2000 program in 2014 while starting his senior year of high school. He just graduated with an associate of applied science degree in mechatronics technology and will receive his journeyman's certificate. Clint started in the small components department using the manual lathe, Bridgeport and surface grinders to manufacture ejector pins and small injection mold components. Typically, apprentices spend the first year in this area before moving onto the 2D, CNC machining department. However, because of his level of maturity, stellar work ethic and methodical questions, the company presented Clint with a unique career opportunity. Clint happily accepted and was eager to begin immediately. After only two months, he moved to fill a need in the EDM department, which consisted of a CAD/CAM workstation for designing and programming electrodes, a CNC graphite mill equipped with a robot capable of holding 144 electrodes and two sinker EDM machines fed by a single robot capable of holding 180 electrodes.

By the end of the first week, he was mounting electrodes, loading them in the graphite mill robot, checking and changing out necessary tooling and loading preprogrammed tool paths in the machine so that the graphite mill would machine unattended. Within a few months, Clint was able to inspect the electrodes, load them into the EDM cell robot and set up the EDM machines to run unattended on his own. Next, he learned to use CAD/CAM software to model and program electrodes. By the end of his first year, he was trained and capable of performing all tasks in the EDM department.

Clint now runs the EDM department and is currently training a second-year apprentice to take over his position so he can continue to move and grow within the company. Clint has learned all aspects of moldmaking. His character, ambition and work ethic make him a very important part of the team. He broke the boundaries at a very young age and has set an example for future Ameritech apprentices by showing them that anything is possible.



**Rebecca Kluever (21)**  
Design Engineer  
Mantz Automation (Hartford, Wisconsin)

**Rebecca** is exactly what the tool and die industry needs. As a high school senior, she already had all the technical education classes under her belt, solidified her welding skills and held a part-time job at a local metal fabricator running a brake press. Rebecca also wanted to become an engineer, so she took some college courses. At Mantz Automation (Mantz), she did mold teardowns for maintenance and repair for a few months. She also worked with toolmakers to pound out inserts, ground pins and make slide components before moving to the CNC department to set up blocks and run programs. Next came EDM, polishing and sampling. Rebecca now has a solid overview of what it takes to make a mold. It was then on to design, where her natural enthusiasm took over. Although there were struggles, Rebecca stuck with it, and today she is a solid member of the design department, designing her molds and taking a leadership role in the department helping others. She gained friends and respect. The effort Rebecca put forth and the questions she asked proved that she was serious about learning the trade. Rebecca also works with Mantz high-school and tech-school recruitment, encouraging women to enter the trades and giving shop tours to parents. Her speaking skills and enthusiastic personality make her a perfect fit for this role.



**Adam Wagner (29)**  
CNC Programmer  
Mantz Automation  
(Hartford, Wisconsin)

**Adam** has helped Mantz Automation (Mantz) change the way its people use programming software, and his quiet and steady leadership has changed the way the company cuts steel. Leadership like that is no surprise from a U.S. Marine veteran who is now building a career in moldmaking. He is an example of a new generation of toolmakers who possesses the perfect blend of new-age thinking and old-school work ethic. Hired as a boring bar operator on second shift, Adam started to work and learn as he moved through the CNC department. His experience with boring bars and five-axis machining revealed the benefits and flaws of both old and new technologies, which he shared between departments. He then changed the way the departments worked. Adam's leadership style and personality made it all happen naturally. His calm exterior and desire to improve everything he touches have positively impacted the people around him. Although Adam writes computer code for the company's CAM system today, he always jumps in to do what is necessary.



**Brandon Schafer (29)**  
Mold Designer  
Franchino Mold & Engineering (Lansing, Michigan)

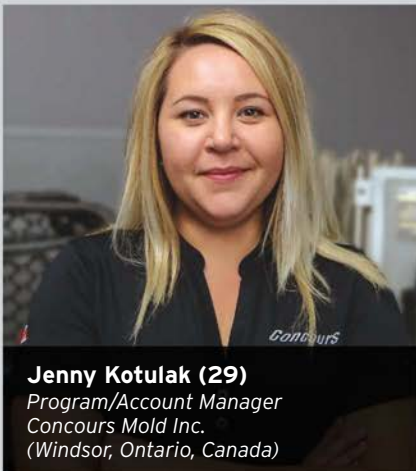
**Brandon** was hired at Franchino Mold in 2012 while attending the Manufacturing Engineering Technology/Design Associates program at Lansing Community College. He continued his studies while working full-time and completed the program in 2013. Brandon quickly took his school learning and applied it to his daily work and took the initiative to ask questions and learn the entire process of mold building beyond the scope of design. In addition to embracing knowledge beyond his job title, Brandon is always eager to help future designers and toolmakers and regularly volunteers to speak about the design process to students on tours from local-area talent centers. He took a leadership position to help his fellow designers with program-specific support and with computer support. Most recently, Brandon was asked to contribute to an in-house committee tasked with shaping the way that the design department uses and shares files within a network to reduce redundancy and increase uptime. Brandon regularly works overtime to meet customer expectations, possesses an excellent attendance record and refuses to shy away from a tough project. In short, Brandon finds a way to get things done and does it while creating productive working relationships with co-workers and customers.



**Chris Cook (28)**  
Machining Team Leader  
Franchino Mold & Engineering (Lansing, Michigan)

**Chris** accepted a position at Franchino Mold & Engineering (Franchino Mold) in 2014. He is one of the brightest stars in machining at the company. He has already proven himself to be a leader by furthering his education, taking on new projects and overseeing company initiatives involving long-time employees who are twice his age. Chris currently holds a general associate degree and is in pursuit of his manufacturing engineering technology degree from Lansing Community College. He is also earning his designation as a journeyman precision machinist. Chris is proficient in all phases of machining, including both horizontal and vertical machining. Franchino Mold trusts Chris to both program and run the most expensive and complex machines, which he does while mentoring younger employees. Chris works with multiple apprentices teaching the moldmaking process. Instead of simply showing them what to do when a problem arises, Chris teaches them to work the problem and find solutions. He focuses on both hard and soft skills. Most recently, he developed strategies for deploying a new five-axis machine with multiple heads, decreased programming and run times for his machine and increased machine use for his area. Chris was recently promoted to team leader, overseeing all horizontal machining.

The team, team leaders, plant managers and executives respect Chris. His quiet, "can-do" attitude is an example to all those around him, which is why many apprentices seek out his guidance when they have questions. Franchino Mold says it is lucky to have Chris as an employee, not only for his machining skills but for his ability to guide future leaders in moldmaking as they work their way through school and through Franchino Mold's in-house apprenticeship program.



**Jenny Kotulak (29)**  
Program/Account Manager  
Concours Mold Inc.  
(Windsor, Ontario, Canada)

**Jenny** joined Concours Mold Inc. (Concours Mold) in 2012 with a strong work ethic and ambition but without moldmaking experience. She has worked her way up through several positions over the last six years. She started as an estimating administrator who received RFQs from the sales team and then organized and processed the information for quote completion by the tool estimator. Jenny also worked as a production control administrator. In that role, she presented design and customer requirement data to the management team to help organize team schedules to increase throughput and overall shopfloor capacity. She then advanced to program manager and was responsible for all direct customer contact from the design and manufacturing phases to tool shipment to the customer's production line. Today, Jenny is the program manager with added-account manager duties, including communicating and retrieving information from current and potential customers and providing quoting and negotiating requirements from the Concours Mold team to the customer. She learned and mastered every challenge along the way to her current position.

Jenny is also taking extra courses at Atocrates/St. Clair College to earn her master's certificate in project management working toward a project management professional designation through the Project Management Institute. This program teaches students the skills and knowledge necessary to bring projects to completion on time, on budget and within the requirements. Along with her extraordinary work ethic, Jenny has brought great organizational and time-management skills to each of her roles at Concours Mold.



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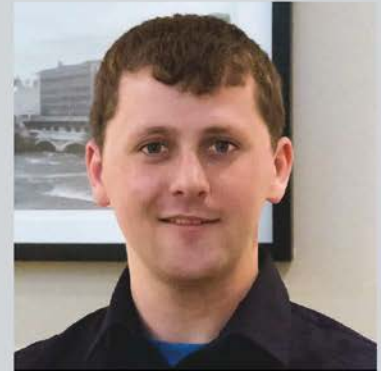
**Britteny Willis (28)**  
Human Resources  
Paragon D&E  
(Grand Rapids, Michigan)

A lot of things are teachable, but passion is not one of them. **Britteny** is an energetic and enthusiastic advocate for not only Paragon D&E (Paragon), but for the moldmaking industry as well. Part of her role in human resources is to fill open positions. She noticed early on that there just were not enough applicants and quickly realized that it is up to industry itself to develop and nurture excitement for careers in moldmaking. Britteny helped organize outreach and educational programs for local middle schools and high schools and set up plant tours with students and teachers. She is the champion at Paragon for Career Quest in Grand Rapids, which exposes students to high-growth occupations in advanced manufacturing, construction, health sciences and information technology via various activities and engagement with professionals like Britteny. She has made a positive impact steering people toward manufacturing and moldmaking in particular. Britteny also is on the team that brought Paragon the title of "Best and Brightest Top 100 Companies to Work For" in 2017. She has participated in panel discussions at the American Mold Builders Association National Conference and at Amerimold 2018.



**Cameron Larimie (29)**  
Five-Axis Machine Operator and Programmer  
Calframax  
(Ontario, Canada)

**Cameron** started his career at Calframax in 2006 through the Ontario Youth Apprenticeship Program (OYAP), which taught him how to use a surface grinder, Bridgeport and manual lathe, providing foundational knowledge for his future. Cameron worked his way through the assembly process and cycled through each machining department, allowing him to gain experience and knowledge and create innovative ways to improve throughput, efficiency and tool life. A year later, Cameron started full-time at Calframax and continued his education at St. Clair College at night twice a week. He then moved on to programming and using larger, more complex machines, such as a manual and CNC boring mill, CNC lathe and a five-axis milling and turning center. The management team relies on Cameron's experience and skill to train employees on this technology. For example, he has condensed three machine operations into one, saving time and increasing efficiency. He transferred a milling operation into a turning operation, reducing machining time from nine hours to one, and he implemented Power Inspect for two Okuma milling and turning centers, reducing wait times for the verification of coordinate measuring machines.



**Mitchell Fox (23)**  
Moldmaker  
Accede Mold & Tool  
(Rochester, New York)

**Mitchell** is a third-generation moldmaker. His grandfather, Al Fox, established Accede Mold & Tool (Accede) in 1981 and his father, Roger Fox, was a moldmaker and is the current owner and president of Accede. Mitchell started his moldmaking apprenticeship at Accede when he was 18 in 2012. He continued to work as an apprentice while attending college, graduating from Rochester Institute of Technology in 2017 with a degree in mechanical engineering technology. After graduation, Mitchell began to work full time at Accede, continuing his moldmaking apprenticeship. Throughout high school, Mitchell was active with FIRST Robotics as a member of Webster Schroeder/Thomas High School's team, SPARX 1126. The mission of FIRST is to inspire and encourage students as young as six years old to embrace STEM concepts and careers. Mitchell's latest endeavor at Accede is building a four-cavity Class 101 pilot mold with multiple side-actions, including hydraulically actuated lift and strip slides and a direct valve-gated hot manifold.



**Benjamin Warner (28)**  
Project Manager, Xometry (Bethesda, Maryland)

**Ben** is one of the most exciting young talents at Xometry. He has both a bachelor's degree and a master's degree in mechanical engineering from the University of Maryland and is a certified project management professional. He has been with the company for three years and plays a crucial role in helping the company develop its injection molding offerings. He manages an injection molding team and engages in part and mold design review with customers. He has become known for his hands-on, insightful approach to projects. Ben also manages complex injection molding projects from start to finish, delivering excellent customer service throughout the process. He has played a key role in Xometry's growth from a tiny startup to where the company is today.



**Jim Nowak (26)**  
Apprentice  
Tri-Par Die and Mold Corp.  
(South Elgin, Illinois)

**Jim** is a second-year apprentice with all the qualities necessary for a future moldmaker. He completed many metalworking programs offered at a nearby community college at his own expense before beginning his journey in the metalworking profession. Jim is intrigued by how things work, pays attention to details and is not afraid to ask questions when disassembling a tool or programming a CNC machine. He has recognized that moldmaking is a highly rewarding profession, as it requires skill and education to operate today's manufacturing technologies.



**Mandy Lewandowski (24)**  
Laser/TIG Welding Specialist  
Alliance Specialties and Laser Sales  
(Wauconda, Illinois)

**Mandy** joined Alliance Specialties and Laser Sales in 2016 and has become a trusted, go-to resource. She started as a driver for the company's delivery service, but she had a desire to do more. She joined the welding team this year and has been a great asset to the laser- and TIG- welding departments. What sets her apart is her willingness to help and get involved wherever and whenever necessary. Mandy is an example of the hardworking, curious, ambitious team members that the company employs who contribute by making a difference for customers every day.



**Joe Charette (24)**  
Owner  
JC Machine Ltd. (Windsor, Ontario, Canada)

**Joe** is a visionary. At 19, he started a precision machining contract shop for several industries, including moldmaking. He purchased a Toshiba boring mill three years ago and just added a Hermle C42U five-axis machine, making his company one of the only companies in Southwest Ontario to possess such high-end technology for mold and die work. Joe has great work ethic and leads six employees by example on the shop floor. To date, Joe has made a trade mission overseas to visit and evaluate other high-level builders to help him decide where the future is for his company.



**Brian Goda (28)**  
Mold Design Engineer  
Aptiv  
(Warren, Ohio)

**Brian** is a results-driven engineer who has been in the injection molding industry for five years. He is a graduate of the plastics engineering technology program at Penn State Erie, The Behrend College and started at Aptiv (formerly Delphi) in 2017 as a mold design engineer. Brian also was a member of the Army National Guard where he served in the A-BTRY 107th as a field artillery tactical datum systems specialist for six years. He was honorably discharged from the military in 2015 with the rank of E-5 (sergeant) and was the leader of his squad.

Brian has a successful track record in new tooling project management (both domestic and international) and overall program management. His process-engineering and program-management experience exposed him to thermoplastic and thermoset applications in the medical, automotive and consumer products industries. This experience affords him a broad perspective and a unique skillset for becoming a top tool designer. Brian takes an interest in new technologies and is always seeking to learn and implement new information into his daily and long-term goals. He is hungry to learn, and his attention to detail is evident in his work. He is always willing to go above and beyond to complete a task.



**Nicole Nettesheim (24)**  
HR Generalist  
Sussex IM (Sussex, Wisconsin)

**Nicole** exceeds the traditional scope of human resources and employee support. She helps care for more than 400 employees and has an active, leading role in workforce development, including benefits administration, records management, interviewing, conflict resolution and training initiatives. She also is directly involved in the management, setup, execution and follow-up of career fairs and educational events and is becoming the company spokesperson in communications efforts to reach and motivate the young workforce. Candid Conversations, a series of video interviews with Milwaukee-area manufacturers willing to share insights and best practices, recently featured Nicole. She also co-manages the company's social channels about employee communications and recruiting while developing content for the corporate website. She is an optimistic and energized performer, strengthening the industry through her dedicated efforts, fresh insight and willingness to learn.



**Steven Kronenberger (25)**  
Associate Mold Designer  
Wepco Plastics  
(Middlefield, Connecticut)

**Steven** joined Wepco Plastics (Wepco) one year ago without injection molding experience but with a strong product design background, which enables Wepco to offer customers product development and design work. He currently designs 90 percent of the molds that come through the shop, designs all the electrodes for new molds and assembles the projects for the moldmakers. He essentially manages each mold project by tracking the time from design to completion. Since he has become a part of the team, Steven has worked very closely with the moldmakers and toolroom workers to understand the company's capabilities and goals better. Steven has quickly become an integral part of the team. In the future, he will be learning programming, machine setup, grinding and many other skills. He also serves as part of the communication chain as products move from a design to a tangible part. He provides a means for moldmakers and customers to interact and to understand each other's needs better, which strengthens customer relationships and improves the end product. Steven's can-do attitude and ability to learn and adapt quickly earns him a very bright future at Wepco.



**Mina Girges (27)**  
Manager of Advanced Planning & Analytics  
Omega Tool Corp.  
(Tecumseh, Ontario, Canada)

**Mina** is a problem solver who goes beyond the call of duty. He has demonstrated leadership and initiative in helping Omega Tool Corp. (Omega) reach its goals and has helped his co-workers to embrace change by understanding the pain points and finding simple, innovative solutions. Mina successfully learned the fundamentals of moldmaking and machining while applying his other industry knowledge. He has been instrumental in the design, development and implementation of a new management and production system. Mina's organizational and leadership skills helped him guide staff in defining new roles and duties while streamlining the use of resources. Also, he worked with the software developer to tailor a new management software to the company's needs and wants.

Currently, Mina is working on automating the scheduling department with software and is spearheading a paperless initiative. Since Mina started working at Omega two years ago, he has made countless improvements to machine utilization and data tracking. He also fully automated the metric reports for transparent, easy access. Mina has the right mindset to help Omega move forward.



**Jake Zielinski (23)**  
Lead Moldmaker  
Extreme Tool and Engineering  
(Wakefield, Michigan)

**Jake** is a selfless, caring, honest and responsible young man. He originally aspired to become an engineer but found the shop's hands-on work environment more interesting. After completing the moldmaker apprenticeship program, he decided to earn his bachelor's degree in business while working full-time. At work, Jake leads by example yet understands that lifelong learning is part of the process.

Jake is committed to the local area and loves where he lives. He is an avid outdoorsman and finds pleasure in hunting and trapping and in fishing and boating. As a former multi-season athlete, Jake keeps himself busy and healthy. He is an active volunteer, supporting many local causes. He also coaches the local high-school football team and mentors young men to help them realize their potential, which is important as the company moves toward mentoring versus managing the next generation of talent. He is an active member of the Knights of Columbus and participates in and supports a local musical club called Marty's Goldenaires Drum and Bugle Corp. Jake is proud of his faith and not afraid to show it. He says he is grateful for all his God-given gifts and talents.



**Cody Proctor (24)**  
Journeyman Moldmaker, CS Tool Engineering (Cedar Springs, Michigan)

**Cody** started working part-time at CS Tool Engineering during high school. Immediately upon graduation, he became a full-time employee and earned his journeyman's certificate. He is starting his fifth year as a moldmaker. Cody is a shining example of next-generation employees who are excited about working with their hands. They like taking raw blocks of steel and turning them into molds that produce products people see and use every day. Cody understands the meaning of a full day's work and eagerly listens to the more experienced moldmakers as they work. He is also always willing to participate and represent the company at its local Career Tech Center, help with student evaluations and man the booth during annual career fairs. If given the opportunity, Cody shares his knowledge with other young people about the possibilities in moldmaking.

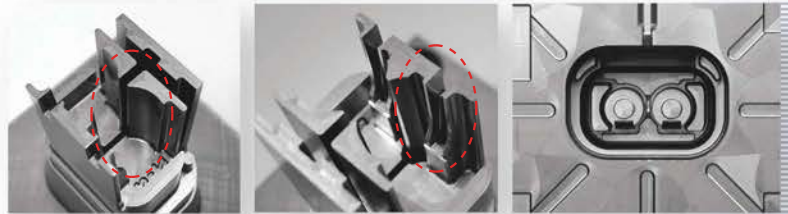
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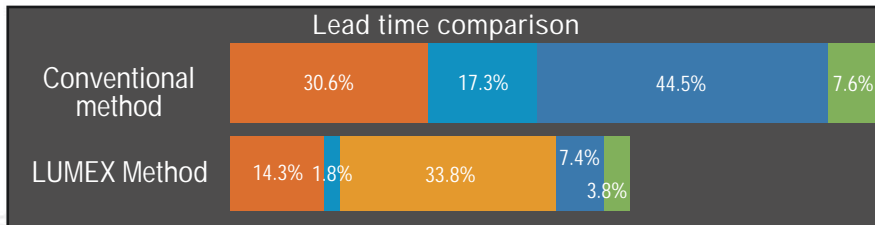


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**Marshall Collis (27)**  
*Moldmaker*  
Maximum Mold/Max 3 LLC  
(Benton Harbor, Michigan)

**Marshall** has been with Maximum Mold for the past five years as a trained journeyman moldmaker. He shows leadership and compassion while sharing his determination, hard work, productivity and positive attitude. He never hesitates to take on a challenge or a difficult task.

Marshall comes from a family of toolmakers. He has always had an interest in computers and technology while enjoying a challenge, so moldmaking was a perfect fit. Marshall began his apprenticeship in June 2013 at Max 3. He mastered all the required technical classes with above-average grades and ultimately completed his apprenticeship in May 2017. During his five years at Max 3, he has worked closely with other trained journeyman toolmakers, affording him the experience to complete new mold builds on his own.

Marshall even took a leadership position on a time-sensitive project with high-level quality and quantity requirements. He completely machined 1,100 parts (in which two pieces were assembled into one unit with a total of 550 assemblies) from start to finish and managed the customer delivery in under two weeks. This project demonstrated Marshall's determination and competency to complete a difficult job, which required the skills for CNC setup and programming using both 2D and 3D data, running two or more machines simultaneously and managing continuous quality control and part inspection.

Marshall also has the gift of creating a team-oriented mindset across the shop. He can "rally the troops" to complete a common goal. Marshall's hard work and "I'll give-it-a-shot" attitude has paid off for the company and for his career.



**Matthew Graves (25)**  
*Project Manager*  
HTS International  
(Knoxville, Tennessee)

**Matt** started with HTS International (HTS) in 2016, helping to open the company's first North American operations. A graduate of the University of Tennessee's mechanical engineering program, he was the first engineering hire at HTS, bringing CAD and FEA simulation experience to the team. Matt plays a leading role in driving customer success with new technology. He works as a project manager, managing conformal-cooling channel design, simulation and deliveries. His projects interface with several leading molding companies and original equipment manufacturers in the packaging and automotive sectors, including several members of the Fortune 500 and Fortune Global 500.

Matt's engineering background enables him to develop a simple, equation-based, steady-state simulation approach to conformal cooling analysis that cuts typical simulation time for customers from 25-30 hours for full, transient analysis, down to 5-10 minutes for a steady-state approach. This approach has resulted in faster decision-making analysis for customers, greatly speeding the timeline involved in conformal cooling design. HTS project managers work in a hybrid sales-engineering role in which Matt has flourished. Recruiting several key accounts, Matt has demonstrated sales prowess beyond his years. This has made a key impact for a company just getting started in the United States.

Project management is not always easy. In the face of a critical mold build lead time in late 2017, Matt took a leading role in developing solutions on a timeline that worked for the customer. This resulted in turning a sour experience into a positive one, earning the trust of a new user of conformal cooling.



**Timothy Baker (24)**  
*Project Engineer*  
Burteck  
(Windsor, Connecticut)

**Tim** completed his internship at NyproMold. He also has a long family history in the moldmaking and plastics industries. Burteck hired him as a project engineer immediately after he graduated from Wentworth Institute of Technology with a bachelor's degree in electromechanical engineering. He began making an impact on the business immediately. Tim offers a unique perspective, and he maintains a level of maturity beyond his years. This has enabled him to mesh well with the team and gain the respect of his colleagues.

Tim has worked on the mold-assembly benches alongside moldmakers, performed CNC programming with CNC specialists, acquired new skills running injection molding machines with process engineers and assisted program managers on highly technical development projects while demonstrating the necessary soft skills to deal effectively with customers.

In every instance, Tim has added value and technical insight. For example, one of Tim's side projects was revamping the company website. His biggest achievement to date is acting as the project lead, managing the planning and execution for the company's NPE2018 booth. Tim understands that to be truly successful in this industry, he must have a combination of hands-on experience, critical thinking skills, emotional intelligence and long-term vision.





**Jared Newman (26)**  
 Class A Moldmaker  
 MME Group (Pine City, Minnesota)

**Jared** came to MME Group (MME) six years ago as a part-time employee while attending trade school. He immediately fit in with the company culture of “see it, own it, solve it, do it” and quickly made an impact in the toolmaking division. Jared moved to building complete, highly complex injection molds in less than five years. His quick rise to a Class A moldmaker is due to his mechanical ability and emotional intelligence. He also participated in extending training and multi-faceted teams throughout the organization. Recently, the toolroom manager took very ill, and Jared became the unofficial leader of the new tooling side of the shop without being asked. He took charge while the manager was on extended leave. Jared’s amazing attitude and smile is a blessing to be around every day. His technical ability coupled with innate people skills has made him a go-to guy for problem solving and “how-do-we-get-this-done” questions. In his continuous desire to learn, Jared attends industry events, offsite classes and company motivational team meetings. MME partners with local schools to grow future toolmakers, and Jared leads company tours and trains incoming apprentices. **MMT**

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# Gaining a Foothold in the "Shangri-La" of Automakers

In 2014, German moldmaker Siebenwurst established a subsidiary company in Querétaro, Mexico. It not only provides support to other German companies in the region but also uses its extensive machine park to produce new molds for a growing customer base.

Mexico is a rapidly growing location for manufacturing in North America. According to consulting agency Roland Berger, Mexico currently is the seventh largest location in the world for automotive production and wants to join the top five by 2020. For that to happen, original equipment manufacturer (OEM) suppliers and partners also would have to increase their capacities in the region of Mexico significantly, and many are doing so. New production startups require new tools and molds that must be delivered one year before production startup or general practice begins. In the case of Mexico, these tools and molds mainly have to be delivered from abroad.

## Demand Is Growing Rapidly

"The industrialization phase begins when the tools for the new startups are delivered to the plants. This time is characterized by numerous, quickly occurring changes since there is no time to return the tools to a German moldmaker in Germany or elsewhere in the world. As a tool and moldmaker in the automobile sector, you have to be able to ensure local service on-site," Christian Siebenwurst, managing director of Siebenwurst Modell- und Formenbau in Dietfurt, Germany, says. "Of course, mold shops can be found locally in Mexico, but with the extremely high demand of the rapidly growing automotive industry today, these companies' capacities are fully booked, and usually there is not enough



As a system supplier for well-known companies from the automotive industry, Siebenwurst supports its customers from the design-model phase to series production.

time to wait, for example, until a local group has a five-axis machine available."

This is why Siebenwurst established a new subsidiary in Mexico in 2014 to support German companies in the North American region. With about 800 employees in Germany, Poland, China, Mexico and the United States, Siebenwurst produces and services die casting and injection molding tools for 3D-molded parts that are made of aluminum, sheet metal and plastics. This includes integrated solutions for special processes that are used to produce large-area components with a special focus on lightweight construction solutions. As a system supplier for well-known companies from the



Siebenwurst invested in both three-axis and five-axis milling machines from DMG MORI, a 500-ton Williams & White die-spotting press, a mobile laser-welding machine, indoor and gantry cranes, a wire EDM machine from Mitsubishi, a die-sinking machine from ONA and the installation of a CAD/CAM workstation from Tebis.

community, like German moldmakers in Mexico. That is to say, you have to organize meetings through the German Chamber of Commerce.”

Siebenwurst emphasizes that it is important to start with a small team to get a sense of the new market and, in case of failure, be able to pull in the reins. But, a top priority is to have team leaders in the country who understand the technology, the business and the local market. “Getting successfully established in a new market like Mexico means working with someone who has market knowledge and contacts.”

automotive industry, Siebenwurst supports its customers from the design-model phase to series production.

“We have to be there for our customers to provide service, product development, tool maintenance and, last but not least, new product development,” Maximilian Siebenwurst, managing director of Siebenwurst Mexico, says. “Our customers include German OEMs such as Audi, Volkswagen, BMW and Daimler as well as their suppliers, who currently are expanding their capacities in the region greatly. This is why in 2014, with only four employees, we founded Siebenwurst CAD CAM Solution S. de R.L. de C.V. to provide services.

“Our cooperation partner CAD CAM Solutions was new to the Mexican market as well,” Maximilian Siebenwurst continues. “We knew our existing customers to whom we were delivering tools in Mexico, but we did not have any local contacts in Mexico at the time. To service our customers in Mexico, we then sought out local tool and mold shops in Mexico who worked for us to perform mold modifications.” According to Siebenwurst, this was not an easy task, but the company managed to establish local contacts and partners to service the molds through networking, trade shows and existing contacts. “But, you need to carefully consider with whom you want to work. By and large, you have to agree on values, how you deal with customers and the quality of claims, in spite of language barriers and cultural differences.”

“When we started our operations in Mexico, we already knew two or three moldmakers, as well as some Canadian moldmakers with Mexican subsidiaries, which was a first contact,” Maximilian Siebenwurst says. “The local industry is not that huge, so you have to connect with a local

### **Knowledge Transfer Is a Top-Priority**

“Our advertising slogan, ‘German toolmaker in Mexico,’ is synonymous with claims for high quality—claims that our customers expect in the automobile industry and claims that we must live up to,” Christian Siebenwurst says. “This is why you not only must have the right partner locally but also must be able to transfer the appropriate expertise.”

According to Siebenwurst, this means, first and foremost, locating suitable employees in Germany who are prepared to travel to Mexico to supervise employee training, to ensure quality and to look after the customers. “For smaller companies like ours—in comparison to OEMs like BMW or Daimler who can offer immense incentives for their employees to go abroad—we need to convince our employees that they are part of the team, that they help this team to build up a new company abroad and that this new subsidiary in Mexico or in other countries strengthens the company,” Maximilian Siebenwurst says.

“It’s important to take away their fear that their move is about cutting their job. You need to convince them that it’s a positive challenge and a chance.”

“Once you have set up shop, experience is what counts, especially in tool and mold assembly, which means it is incredibly important to take the time to train employees locally on-site,” Christian Siebenwurst says. “The employees receive three to six months of training in Mexico, depending on their educational background. Many of them come from technical colleges with a bachelor’s degree in mechanical engineering or other engineering disciplines. They are at about the same level as our apprentices during their second year of training and need to be trained on the job. It’s not a formal



Siebenwurst's operation has evolved from a pure service location to a fully functional manufacturing facility implementing modifications in-house and manufacturing new mold and tools with a maximum weight of 30 tons.

apprenticeship but on-the-job training to qualify them to assemble molds, operate machines or design tools. This is accepted excellently by the Mexican workers. We don't experience any problems locally."

Since 2016, the employees also have received training for an extensive range of machinery used not only for mold and tool corrections and maintenance but also for new molds for production startups. It also helps to offer employees good working conditions, Siebenwurst says, since in Mexico there is plenty of work for trained specialists.

Today, Siebenwurst's operation has evolved from a pure service location to a fully functional manufacturing facility that implements modifications in-house and manufactures new mold and tools with a maximum weight of 30 tons. The

facility features a 1200-square-meter production area. The company has invested in both three-axis and five-axis milling machines from DMG MORI, a 500-ton Williams & White die-spotting press, a mobile laser-welding machine, indoor and gantry cranes, a wire EDM machine from Mitsubishi and a die-sinking machine from ONA and the installation of a CAD/CAM workstation from Tebis.

The efforts pay off. During the first two years, 90 percent of customers that the company served were preexisting and from Germany (they were OEMs that moved production to Mexico). New business, which the company generates from new, local customers that mostly are from the automotive sector, already accounts for 75 percent of all sales.

Meanwhile, with 25 employees at the Querétaro location, Siebenwurst is well underway in Mexico. "The market is developing extremely fast. There's a lot of work," Maximilian Siebenwurst says.

For other mold shops looking to set up shop in Mexico, the brothers provide simple advice. They both say, "You have to have stamina. You need responsible managers with broad experience on site right from the start, and you have to create the necessary knowledge transfer if you want to land large, lucrative orders." **MMT**

#### CONTRIBUTOR

Barbara Schulz is Gardner Business Media's European correspondent. She can be reached at [bschulz@gardnerweb.com](mailto:bschulz@gardnerweb.com).

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The DOOSAN logo is positioned in the top left corner of the advertisement. It features the brand name in a bold, italicized, sans-serif font. The background of the entire advertisement is a blue-tinted photograph of a large industrial machine, specifically a horizontal twin-pallet 5-axis machining center, with a large aircraft engine component being processed. The machine's complex structure, including a large spindle and various support beams, is visible against a dark, industrial setting. In the top right corner, there is a white shield-shaped logo containing a stylized animal head, likely a dog or wolf, representing the Doosan Infracore brand.

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## CNC Deep-Hole Drilling with Milling Transforms Moldmaker's 2D Machining Processes

By Cynthia Kustush

Midwest Mold Services (Midwest Mold) in Roseville, Michigan, used to outsource boring mill and gundrill work to companies that service the overflow from mold builders with more work than they can handle. It became clear over the last two years that with the boom in automotive jobs came elongated lines of shops waiting for that work to be done and returned. Once the work came back, the rush would begin and overtime became standard, as were extended lead times. Because of this, Midwest Mold became the first mold shop in the United States to purchase a CNC machine from Cheto Corp. S.A. (Oliveira de Azeméis, Portugal), an investment that brought the outsourced work in-house and solved multiple challenges, according to Midwest Mold President and CEO John Hill.

Plastics engineers founded Midwest Mold in 1994. They were seeking to provide support to automotive original equipment manufacturers (OEMs) and their Tier 1 custom molders. Hill says, "I came from a large production mold builder, and every time we would get these emergency repairs or engineering changes, it would interrupt the flow of the new tool builds and jeopardize delivery dates. We saw that as an opportunity." Going down that path was a very good



Images courtesy of Midwest Mold Services.

Midwest Mold Services purchased this Cheto IXN2000 deep-hole drilling and milling CNC machine for its ability to perform all required 2D machining in one setup, saving a significant amount of time and money in addition to reducing lead times. Midwest Mold is the first U.S. moldmaking company to own a Cheto.

### MIDWEST MOLD SERVICES

**PROBLEM:** Outsourcing gundrill and boring mill work significantly extended lead times and affected delivery dates, requiring a lot of overtime and expense.

**SOLUTION:** Midwest Mold Services invested in a Cheto Corp. S.A. IXN2000 deep-hole drilling and milling CNC machine.

**RESULTS:** Midwest Mold Services gained the ability to perform both deep-hole drilling and milling on one machine, which significantly reduced lead times and costs.

opportunity, he says. However, it became very cyclical in nature—when molds were not breaking, less work was available. Before long, regular customers began asking for new molds, and because Midwest Mold had all the necessary equipment (like the ability to receive and process mold data, CNC machines, programming software and a skilled workforce), the company began building new molds. "The rest is history, as they say," Hill says. "Today, about 75 percent of our revenue is new tool construction, and then a portion of that is prototypes, repairs and engineering changes to tools that we have built." In 2006, the company began offering low-volume molding of non-automotive plastic parts in an effort not to compete with its customer base.

### Vendor Capacity Dried Out

"For the past 20 years, we've been designing and building high-volume production tools without a gundrill or boring mill on our premises," Hill says. Midwest Mold began using the consulting services of Harbour Results Inc. (HRI), which forecasted two years ago that automotive OEM demands would exceed the capacity of Tier 1 and 2 mold suppliers.

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“We were hearing and seeing that happen, and then it was not long before we started feeling it,” he says. “It negatively affected our lead times and our delivery dates, and it was causing us to pay excessive overtime to compensate for services that our sub-suppliers used to be able to provide us in the past.”

Hill says that he began researching various brands of gundrill machines, knowing that his company had to bring that capability in-house as soon as possible. Molds that Midwest Mold builds often run in 2,000-ton and 2,500-ton injection presses. “But, our sweet spot is in the 300- to 750-ton range, and the majority of our machines are set up around that X and Y travel, size-wise,” he says. Purchasing a gundrill that would be large enough to accommodate the molds Midwest Mold was building required Hill to custom-order it and be patient. “It’s the same with any of the gundrill manufacturers for machines of that size, whether it’s a German manufacturer or U.S or European, the gundrill is a built-to-order machine,” he says. “So, we knew that we would have to get in line and wait our turn. When your machine is done, it is done.”

While he was searching, Hill also contacted Dan Meehan, president of Performance Machinery LLC (Sterling Heights, Michigan), a CNC machine supplier with whom Midwest Mold has built a 20-year relationship. It turned out that Meehan was in negotiations with Cheto Corp. S.A. (Cheto) to be its U.S. distributor. “The timing was perfect,” Hill says.

Meehan explains that he met Carlos Teixeira, Cheto’s CEO, at IMTS 2016 and immediately saw a great potential partner whose technology was just starting to take off in Portugal and Europe. “We both felt it also could make a sincere impact on the U.S. mold-building community,” he says.



The Cheto IXN2000 is a seven-axis machine. The automatic rotary table measures 1,600 millimeters by 1,300 millimeters and spindle speed is 4,500 rpm. The all-in-one concept enables moldmakers to perform multiple operations with one setup, including deep-hole drilling, radial drilling, milling, tapping and boring. For Midwest Mold Services, its ability to drill 40 inches in one direction is a significant benefit.

## Not Your Ordinary CNC

“The more that Dan and I talked, the more I got exposed to Cheto’s equipment and capabilities, which were unlike anything that I had ever seen before,” Hill says. “This machine can do the milling. It can do the deep-hole drilling, and it can do all the 2D work on one machine. The workpiece goes on this machine, and it does not come off until 100 percent of the 2D work is completed.”

The Cheto IXN2000 is a seven-axis machine. The automatic rotary table measures 1,600 millimeters by 1,300 millimeters and the spindle speed is 4,500 rpm. According to Cheto, the all-in-one concept enables moldmakers to perform multiple operations with one setup, including deep-hole drilling, radial drilling, milling, tapping and boring. “It is not simultaneous machining like a five-axis CNC, but the Cheto has seven movements,” Hill says. The pivot point



Midwest Mold Services is already seeing a 20-percent reduction in the amount of direct labor on the 2D side of the mold-building process since it began using the Cheto IXN2000. Gundrilling and boring work that used to be outsourced and that would take three to six weeks to complete now can be done in-house in five days or less. Additionally, the Cheto uses water-based coolant instead of oil, which offers a safer, cleaner process and eliminates cross-contamination with little or no deceleration in cutting speeds.

of the head is at the very front of the column, so it can index up and down 25 degrees and 15 degrees, with an option for  $\pm 25$  degrees. Additionally, the spindle can travel all the way to the center of the table to reach smaller parts. “The table can rotate any increment of 360 degrees, and then there are the X, Y, Z and W axes. Users can machine all four sides. They can set it up on its side. They can do compound angles. It’s just so versatile,” he says. This machine is a game changer because again, it is a 2D machine for the mold building side of mold manufacturing, and it can do it all versus a machine that only does gundrilling or milling.” Meehan says that other unique features of the Cheto include the fact that it is a “floor-mounted” machine, meaning that there is no need to pour deep, expensive foundations. Also, every Cheto has linear glass scales or encoders (or both) on every axis.

Because of his long-term relationship with Meehan, and because Cheto wanted to bring a machine to the United States, Hill says that he knew he would get the support he needed, and it made his decision easy. “I was looking at other machines, but it was because of the multitasking capabilities that I bought the Cheto IXN2000 deep-hole drilling CNC machine sight-unseen,” he says.

### Capability and Capacity Count

The 3D contouring machining centers that Midwest Mold owns cannot do what the Cheto can do, but the Cheto *can* do what the 3D contouring machines can do, Hill says. “I

can drill holes with my other CNC machines. I just can’t drill deep holes. I can purchase standard, through-coolant spindles and drills for the standard CNC machines but not up to 40 inches in length. They are limited to about 16–18 inches, and a lot of that has to do with the Z height because they are vertical machines that must compensate for the cutter length and for the size of the blocks being machined. To go deeper, we go horizontal, and that is what the Cheto is, a horizontal machine.”

He says that the Cheto IXN2000’s footprint is about 22 feet by 22 feet. “We basically have a big room built around the table, column and base, and they have to be able to move away from each other, so we have a much longer horizontal machine,” he says. While most boring mills are horizontal for that length and size, Hill says they do not have the unique capabilities of the Cheto. “Had we settled for just a gundrill, we would have only solved one problem here. With the Cheto, we solved multiple problems. That machine can drill 40 inches in one direction and that is significant.”

### Gaining Control Over a New System

Midwest Mold has 43 employees, two of whom have received training on the Cheto IXN2000, working in tandem to get full use of the equipment. Hill says it was a very involved process once the machine was delivered from Portugal. For example, he says that the controller on the Cheto is new to Midwest Mold. “We’re very used to FANUC controls, Mitsubishi controls and the programming software, but the Cheto uses the Wise Active Control system. It also uses a European control called Fagor CNC 8065 Windows 7, which is not used commonly in the U.S. mold-making industry. So, our guys are learning new software, learning a new control, learning a new machine and Cheto is training them simultaneously, which has enabled them to get jobs up and running fairly quickly.”

Meehan explains how the patented Wise software increases the Cheto’s machine performance, giving Midwest Mold additional advantages. “The software measures load on both the spindle motor and the drive motor to detect the hardness changes in the block of steel and automatically adjusts the feedrate to facilitate this hardness change,” he says. “This feature also increases the tool life by as much as three to four times the normal length according to Cheto users that we talked to in Portugal.” Meehan adds that the Wise monitoring function also measures the coolant pressure in the cut. “The Cheto uses a water-based coolant instead of oil, which is truly unique.” He says that using coolant combined with the Wise software and the newer technology in drills enables the user to run a safer process with little or no deceleration in cutting speeds. “Using coolant versus oil eliminates any cross-contamination as the block moves through the shop from machine to machine,” he says. “Coolant is cleaner for



the operator, and it is contained because we install mist collectors on the Cheto machines.”

Cheto also uses a screw-driven, high-pressure pump which provides more consistent pressure for more stable machining, plus the Wise software can detect holes and cavities as the drill breaks into and out of the steel, which is another unique feature, according to Meehan.

### Saving Real Time and Money

When asked to quantify the time that Midwest Mold is now saving with the new Cheto, Hill says that previously, the 2D work was being handled in-house and that the mold halves would then be sent out for gundrilling and boring. Taking into consideration the shipping time plus the time that the work waits to get on a machine at the sub supplier and then the actual machining time, he says it would take anywhere from three to six weeks to get the two mold halves machined and returned. “With the Cheto, we are doing everything in five days or less,” he says. “That is real time, and time is money.”

“Cheto understands the machining and the processing,” Hill says. “Cheto knows that for us to be profitable in mold building, we must reduce the amount of direct labor that

goes into building a mold. There are so many steps that must happen, but if we can reduce the amount of direct labor, we can improve our profitability. This machine does just that—it reduces the direct labor, it reduces setup time. It’s a game changer. I can’t say enough about that.”

Since the installation and training on the Cheto in June, Midwest Mold is already seeing a 20-percent reduction in the amount of direct labor on the 2D side of the mold-building process, Hill says. “The 2D is only a portion of the total mold build, but that 20-percent time savings gives us more capacity to do more work without adding more direct labor,” he says. “It also gives us the ability to improve the timeframe in which we get these jobs done. We’re always against the clock—that is just the way the trade is, so any hours that we save and any efficiency improvements that we make equals dollars that we save.” **MMT**

#### FOR MORE INFORMATION

Cheto Corp. S.A. / 351-256-820-384 / [cheto.eu/en](http://cheto.eu/en)  
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Have you found yourself asking, “Are our molds too big for standard product portfolios?” Standardization of mold base, mold plates and components offer the mold builder the advantage of ordering quickly and economically off-the-shelf items. Mold designers and mold builders can use this standardization concept further with the many components required to make even the larger molds. The standards will free up more time and money for other machining requirements within the mold build.

#### Primary topics include:

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- How standard components come to the rescue when space is available.
- Standard components for large mold assemblies.
- Plate sequencing and core movement with standard components.

DATE & TIME:

**Tuesday, October 23, 2018, 2 pm ET**

**Register at: [short.moldmakingtechnology.com/Hasco1023](http://short.moldmakingtechnology.com/Hasco1023)**

## Manifolds: To PM or Not to PM, Part 3

By Steve Johnson

The August issue's article on manifolds and preventive maintenance (PM) explained the impact of environmental factors on manifold performance. This piece focuses on the impact of five non-maintenance-friendly manifold design features that our repair technician students shared. They claim that these features complicate manifold PMs to such a level that the technicians would rather wait until the manifold breaks to repair it.

### Valve Pins and Piston Components

Technicians usually remove the valve pins and piston components first so that they can gain access to the manifold. Some systems have as many as 10 components per position, comprising the piston-cup assembly (not including the seals), which technicians must carefully remove and place in a holder or tray so as not to damage or mix up the position of the fragile tips.

A huge time-saver is a system design that only requires the technician to remove the valve pin to split the mold, as the piston housing components can remain in the plate. For a 16-cavity tool, this can save four to eight hours and several dollars in O-rings or seals (and much more if the components are particularly difficult to reinstall).

A huge time-saver is a system design that only requires the technician to remove the valve pin to split the mold, as the piston housing components can remain in the plate.

### Wiring

Technicians often complain about systems that require a complete teardown to replace a nozzle heater or thermocouple. This process results in lower cavitation, as molders cannot afford to have a mold down to regain one or two cavities. Fortunately, most manifold designs today front-load these components, which enables technicians to replace them in the press.

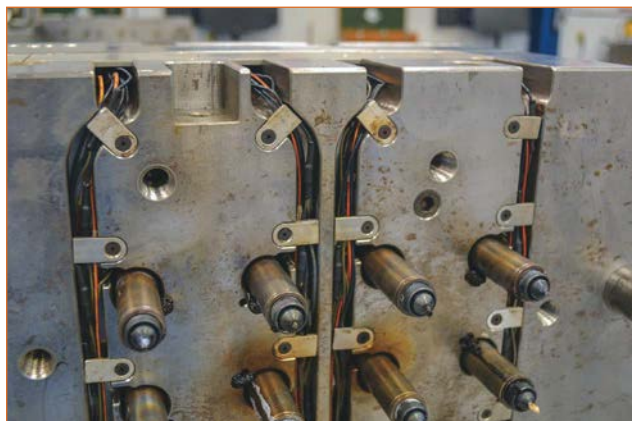
Often, disconnecting the wires at the control box and pulling them through the access holes to route through the plate is the most labor-intensive part of the PM process on molds with eight cavities or more. To avoid this, we recommend milling through the plates whenever possible, which allows the



Here, a technician uses specifically weighted slide hammers to control the force he is applying as he removes valve pins. This technique reduces the risk of damage.

technician to wire-tie the wires together (still screwed into the connector strips), forming a unit or harness for removal and installation. We have seen this method knock off another four to eight hours and reduce the chance of damage to the connector screw or a mix up with the heater and thermocouple.

The use of clips to hold the wires that lead to the control box in wire channels that are "too small" is another design pet peeve of many technicians. The clips are individually screwed in, which makes the process of removing screws that are filled

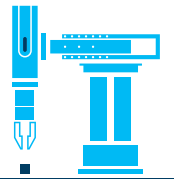


This manifold has holes after slotting that yield faster and safer removal and installation of the electrical wiring. Use a cover over the slots, if necessary.

Images courtesy of MoldTrax.

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with residue or that are installed too tightly extremely time-consuming. Spring clips are a more efficient method.

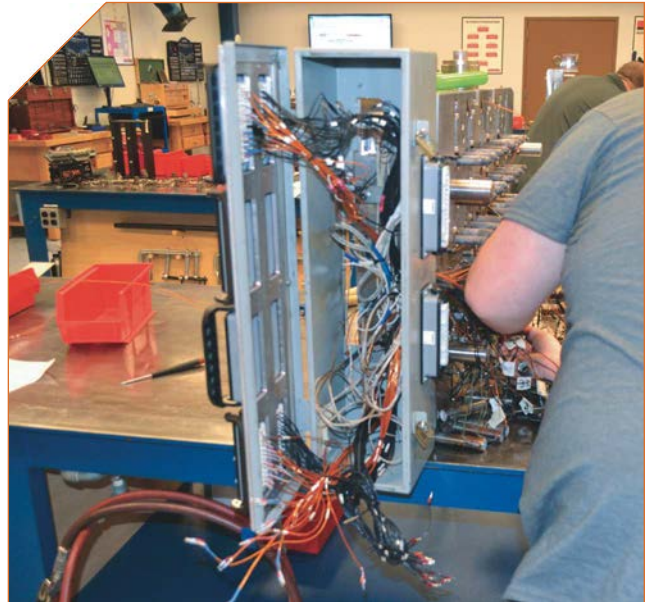
## Control Boxes

The design of the control box should enable the connectors to pass through the slots in the covers, ensuring that the connectors are part of the wiring harness. Otherwise, completely disconnecting all the wires is required. It is also helpful to hinge covers onto the control box, enabling them to swing open for easy access to the back of the connectors and to the mounting bolts.

We recommend mounting control boxes an inch from the plate as opposed to mounting them directly onto the plate. This method provides an air gap that allows vent residue to escape so that the gas does not coat the electrical connections inside the box.

## Heaters and Thermocouples

A full PM requires a technician to remove the nozzles, heaters and thermocouples to clean the manifold plates and the internal air and waterlines. This process can add hours to a PM program if the nozzles are not cleaned regularly and coated with a silicone anti-seize for easy release. Technicians will easily damage nozzle heaters and thermocouples that are stuck if they do not follow careful removal practices. A technician should place the removed heaters and thermocouples on a cart while they are still harnessed to the connectors. Then the technician should move them to a safe location away from the bench.



A roomy, hinged control box with nice "pass-through" slots cut for the connectors.

Some thermocouples are designed to run under the heater the full length of the nozzle, which requires difficult bends stuffed into tight pockets. Designs that are more maintenance-friendly route thermocouples outside the nozzle heaters, easing removal and installation.

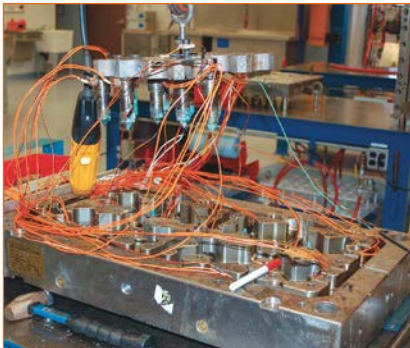
Some manifolds have heaters that are integrated into the nozzles to yield better temperature control. From a maintenance perspective, this better be true because the trade-off is expensive. The entire nozzle must be replaced if the heater goes bad, and the removal, handling and cleaning is more tedious.

## Bridges, Manifolds and Nozzles

Removing bridges, manifolds and nozzles from the plate assembly is not difficult when the manifold is designed with robust and evenly spaced eyebolt holes in which to lift. This also enables technicians to use an overhead hoist to help break the initial seal instead of relying solely on a pry bar. If using a pry bar, a technician can avoid tool marks and unnecessary damage by documenting the process,



This special tool provides technicians with a firm grip when they are removing stubborn heaters. The tool will not damage the outer sheath.



When a manifold is hanging from a hoist, the nozzles could fall, so technicians should cover the tips to protect them from damage.

ensuring that the entire toolroom is aware of the exact spot to place the bar. With some manifold systems, this common practice requires heating up the manifold and bridge to about 250°F so that the plastic “spike” that forms between them breaks more easily.

Other systems have free-floating nozzles instead of nozzles that are bolted into their respective plate locations. The cold “spike” pulls the nozzles out when the technician removes the manifold. The spike also can fall and damage the tips. As technicians remove the manifold, it is imperative that they use short sections of rubber hose to protect the tips.

These manifold designs add extra labor hours and increase the risk of damage to manifold components. Repair shops with more skill are making simple modifications to manifold system designs to promote more

#### CONTRIBUTOR

Steve Johnson is president of MoldTrax, which provides specialized course work, hands-on bench training, maintenance software, maintenance products, toolroom design and maintenance efficiency auditing.

#### FOR MORE INFORMATION

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 419-281-0790  
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frequent cleanings and to lessen the chance of expensive component replacement. However, most shops will not entertain these types of modification and struggle to perform PM on a manifold when it is long overdue. Others are stuck with poorly designed systems that wreak havoc on production schedules.

As hot runners continue to grow in popularity, technicians in our classes who run and maintain these systems on a daily basis hope that designers strongly consider more maintenance-friendly manifold designs to ease maintenance, prolong manifold life and meet production requirements. **MMT**

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## New Rules on Bonus Depreciation

By Michael J. Devereux II, CPA, CMP  
The Tax Cuts and Jobs Act (the Act) allows mold shops to claim 100-percent bonus depreciation for eligible property that they place in service after September 27, 2017 through December 31, 2022. The claim amount phases out 20 percent for each of the following five years. This past August, the U.S. Treasury issued a notice of proposed rulemaking related to bonus depreciation (or first-year depreciation deductions).

Mold shops are allowed a depreciation deduction for the exhaustion, wear and tear and obsolescence of property that they have used in the business. For tangible property, the allowable depreciation deduction is determined under the Modified Accelerated Cost Recovery System (MACRS).

Before the Act, qualified property was defined as new property. Moldmakers were allowed an additional bonus depreciation (or first-year depreciation deduction) equal to 50 percent of the adjusted basis in the property.

### Proposed Regulations

Tax reform made the following changes to the bonus depreciation rules: a new, 100-percent bonus depreciation percentage; an expanded definition of eligible property to include used, depreciable property; and an extended, placed-in-service phase-out date from before January 1, 2020, to before January 1, 2027 (which extends the ability of mold shops to claim bonus depreciation by seven years).

The new U.S. Treasury regulations identify the following requirements for property to qualify for bonus depreciation:

*The depreciable property must be a MACRS property that has a recovery period of 20 years or less, some purchased software or qualified improvement property that shops place in service after September 27, 2017 and before January 1, 2018.* For moldmakers, this includes most machinery, equipment and tooling that they do not use in the conduct of research (which would be deductible as the expenditures are paid or incurred). Also, the purchased software would qualify (as long as shops do not purchase it as part of the purchase of a trade or business). Qualified improvement property includes improvements to the shop that do not expand its footprint.

*The original use of the property must commence with the shop, or used equipment must meet specific requirements.* The original use of the eligible property must commence with the company, or the shop must not purchase the used equipment



from a related party. Tax reform broadened the definition of property eligible for bonus depreciation to include used property. This will impact mergers and acquisitions, as many middle-market transactions are structured as asset sales. That is, if a mold shop purchases all of the assets of another shop, it can claim 100-percent bonus depreciation on the purchase price that is allocated to otherwise eligible assets.

*Eligible property must be placed in service by the shop within a specified period.* A shop must place the asset in service after September 27, 2017 and before December 31, 2027 to qualify for bonus depreciation. An asset is considered in service once it is ready, available and capable of performing its intended function.

Documenting when a shop places an asset in service is more important than ever, especially if the asset has the potential to qualify for 100-percent bonus depreciation. Historically, the IRS has pushed for latter placed-in-service dates to slow depreciation deductions. However, if a shop places an asset in service around September 27, 2017, the IRS may want proof that it meets the requirements for the 100-percent bonus depreciation.

*The depreciable property must be acquired after September 27, 2017 or acquired by the shop under a written, binding contract entered into by the shop after September 27, 2017.* The regulations also clarify that assets that are custom-manufactured, constructed or produced for a shop are subject to the written, binding contract rules. For example, if the contract states the date that the parties entered into the contract, the closing date and the delivery date, then the date that the parties entered into the contract is the date that the shop acquired the property. For self-constructed assets (that do not qualify as research expenditures), the *acquisition date* is the date that the shop begins manufacturing, constructing or producing the property.



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## PEER NETWORKING

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When it comes to problem solving and strategizing, why reinvent the wheel? Sharing best practices with industry peers who share like positions can be a valuable resource, which is why the AMBA has implemented peer networking webinars to help its members connect.

In these facilitated, online sessions, business leaders share and learn how others approach key aspects of their businesses and then can implement those same strategies efficiently and easily – all from the comfort of their own offices. “Peer networking allows us to collaborate with others from outside our area of influence. It builds trust between AMBA members and also helps us recognize whether or not we’re going in the right direction with a particular issue,” said John Hill, president of Midwest Mold Services, Inc. Hill was one of 12 AMBA members who attended the association’s first peer networking webinar geared to senior leaders and found the platform a beneficial way to spend an hour over lunch.

By 2019, AMBA will bring virtual problem solving to other areas of the mold building operation, such as operations, sales & marketing and human resources - providing the opportunity for others to engage, problem solve and connect.

“WE ALL FIGHT SIMILAR BATTLES; PEER NETWORKING IS A GREAT WAY TO LEARN HOW DIFFERENT PEOPLE THINK AND RESOLVE THOSE ISSUES.”

STEVE ROTMAN  
President, Ameritech Die & Mold  
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For a schedule of future peer networking webinars, visit [amba.org](http://amba.org).

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## Elections

Bonus depreciation is automatic unless a shop instead elects a particular class life. Mold shops must make an election for each class life for which it does not want bonus depreciation. For example, if a shop elects out for all seven-year assets, it would claim bonus depreciation on all otherwise eligible assets and depreciate the seven-year assets under the normal MACRS rules. U.S. Treasury regulations do not make any changes to these rules.

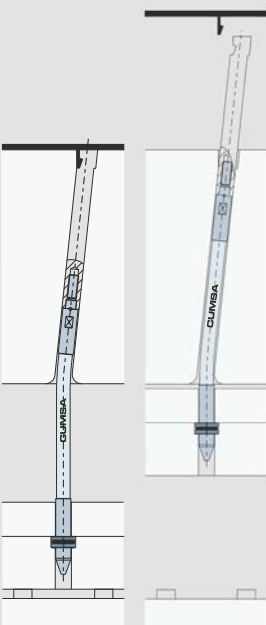
However, given the overlap of the 50-percent bonus depreciation that existed before tax reform and the new 100-percent bonus depreciation, transition rules are necessary. The 100-percent bonus depreciation is automatic. Mold shops also can elect out of the 100-percent bonus depreciation in favor of the 50-percent bonus depreciation. However, such election would apply to all property for which bonus depreciation is eligible and not by class life.

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## Technical Corrections

While unlikely to pass during an election year, Congress is considering a technical correction bill related to tax reform. One of the more prominent provisions relates to the class life of qualified improvement property placed in service after December 31, 2017. The Congressional writers intended a 15-year period, making it eligible for bonus depreciation. However, because of a drafting error, qualified improvement property placed in service after December 31, 2017 is a 39-year property.

The bottom line is that because of the increased percentage of bonus depreciation from 50-percent to 100-percent and the broad definition of eligible assets to include any MACRS property with a class life of 20 years or less, mold shops can benefit greatly from the new bonus depreciation rules.

Many shops should consider cost segregation on their plant and property because by segregating the real property (typically 39-year life property) from personal property (typically 15-year life property or less), they will be able to depreciate their capital assets more quickly. [MMT](#)

## CONTRIBUTOR

Michael J. Devereux II, CPA, CMP is a partner and director of manufacturing, distribution and plastics industry services at Mueller Prost LC.

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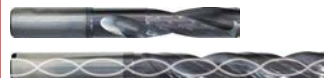


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# Index Growth Continues to Slow

Supplier deliveries curb decline of the Index, at 51.4 for August.

Registering 51.4 for August 2018, the Gardner Business Index (GBI): Moldmaking recorded another month of volatile but slowing growth since reaching an all-time high in February. Compared to the same month one year ago, the Moldmaking Index is down 9.3 percent, but compared to the beginning of the calendar year, it is down 15.8 percent. Gardner Intelligence’s review of the underlying data for the month reveals that contraction in new orders and backlog and no change in employment and exports were the primary drivers of the four-point drop in the Moldmaking Index between July and August. Supplier deliveries continued its accelerating growth trajectory for another month, which helped the Moldmaking Index from falling further in August.

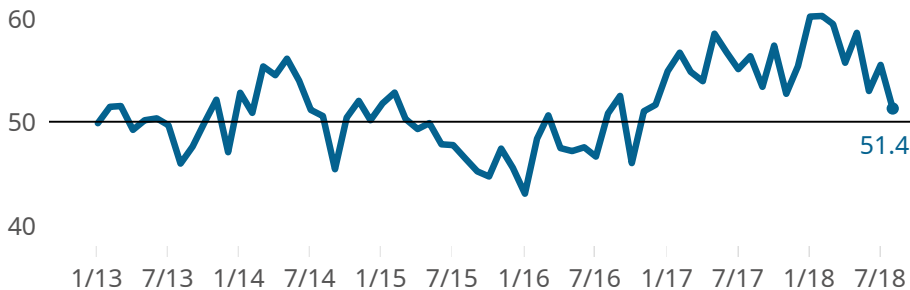
The contraction in new orders was a surprise given the strength of the overall manufacturing economy in 2018. The latest new orders reading marks an end to the longest continuous expansion in new orders on record at almost 20 months. By comparison, the prior new orders record, which was set in 2014, lasted only eight months. [MMT](#)



**ABOUT THE AUTHOR**

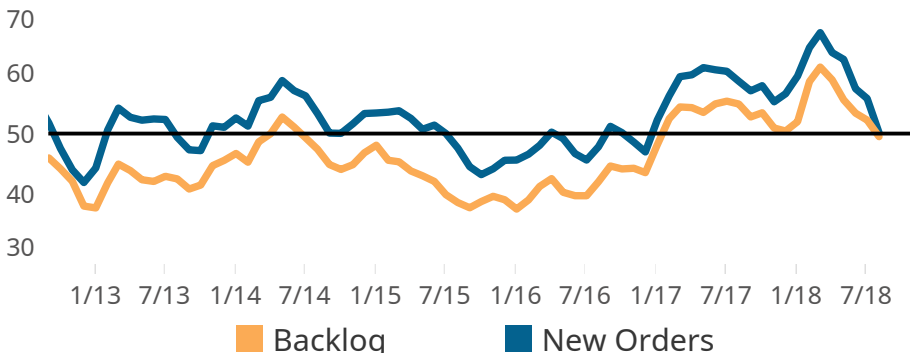
Michael Guckes is the chief economist for Gardner Intelligence, a division of Gardner Business Media (Cincinnati, Ohio, United States). He has performed economic analysis, modeling and forecasting work for nearly 20 years among a range of industries. He is available at [mguckes@gardnerweb.com](mailto:mguckes@gardnerweb.com)

■ Gardner Business Index (GBI): Moldmaking



Contraction in new orders lowered August’s Moldmaking Index data, which was only partially off-set by strength in supplier deliveries. All components of the Moldmaking Index reported either slowing growth or contraction during the month.

■ New Orders and Backlog (3-Month Moving Average)



August saw new orders report its first contractionary reading since the fourth quarter of 2016. However, moldmakers should be able to maintain current production levels given that backlogs have expanded during the last 18 consecutive months.



Stay Ahead of the Curve with Gardner Business Intelligence. Visit GBI’s blog at [gardnerweb.com/economics](http://gardnerweb.com/economics).



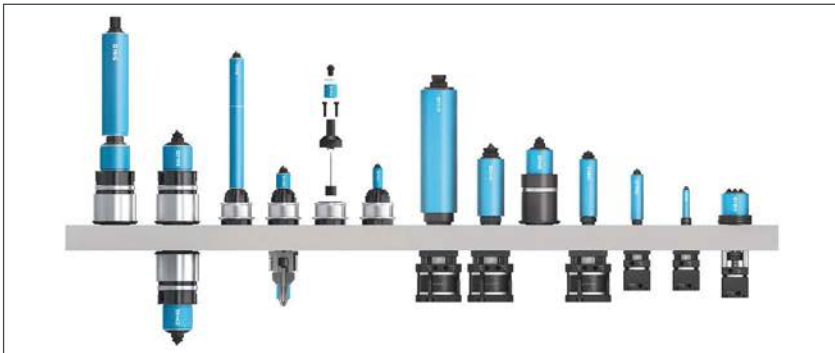
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## HOT RUNNERS/MOLD COMPONENTS



### Valve Gate Actuators Built Without O-Rings to Withstand Wear

**Mold Hotrunner Solutions Inc. (MHS)** expanded its line of cooling-free valve gate actuators to cover a full range of injection molding applications. MHS has expanded both product lines for the new internally actuated Rheo-Pro iVG nozzles and the manifold mounted black box cylinders. MHS says that both product lines for the new internally actuated Rheo-Pro iVG nozzles and the manifold mounted Black Box cylinders have been expanded to bring their performance to plastic part applications of every size and for every industry. The products are built without o-rings entirely so that the products can withstand being worn out by force or heat, even at temperatures of 850°F. MHS says that because the pistons have no soft seals or lubrication, they require virtually no maintenance over the life of a mold.

**MHS - Mold Hotrunner Solutions / 905-873-1954 / mhs-hotrunners.com**



### Lifters Simplify Release of Small Undercuts in Molds

**Cumsa USA** offers new lifters from the Smart Worm family for the release of small undercuts. The company says that this new component is ideal for releasing small undercuts and that it comes in two versions.

Cumsa USA offers a simple version called the Smart Worm Pin (WP). It is capable of fitting small clips with short ejection strokes (ranging to 30 or 60 mm). Cumsa also offers the Smart Worm Lifter (WL), which is a long version to help simplify the release of small undercuts for large molds that require more ejection strokes (ranging to 125 mm). The Worm Lifter is compatible with Cumsa DR lifters.

Cumsa USA offers both Smart Worms in different sizes. The Worm Pin comes in Ø6 and Ø8 mm and the Worm Lifter in Ø8 and Ø12 mm. Cumsa USA says that the advantage of the Smart Worms is that they do not need any mechanism in the ejector plates. Smart Worms have bendable cores that range to six degrees. The core makes it possible to release the undercuts simply by pushing up from the ejector plates.

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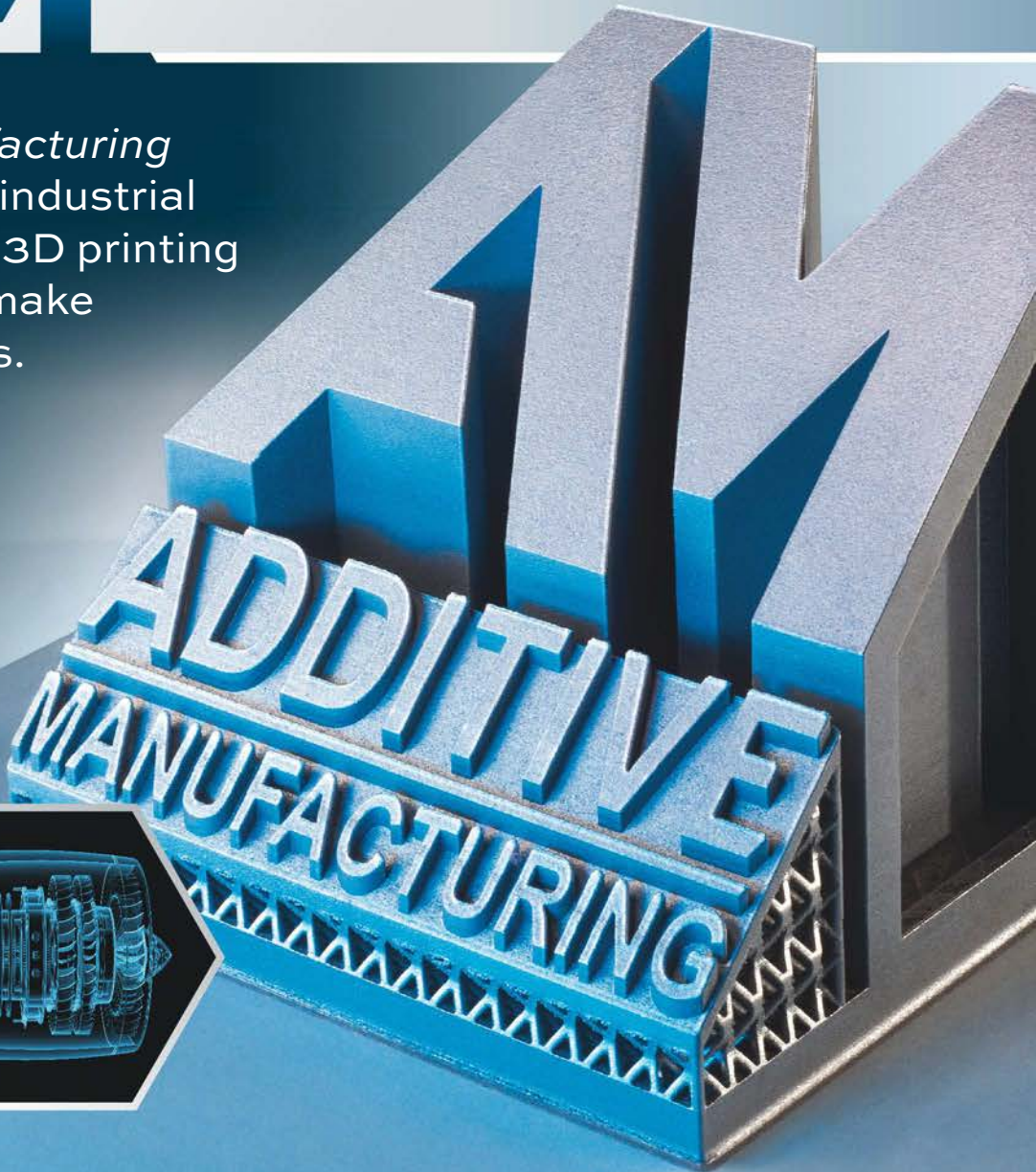
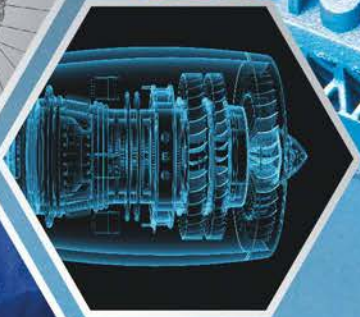


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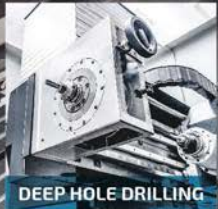
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## HOT RUNNERS/MOLD COMPONENTS

### Latch Function on Stamp Prevents Movement on Arrow Inserts

To prevent unintended movement of the arrow insert, **Meusburger** now offers stamps with a latching function, which the company says ensures higher process reliability during the injection molding process and prevents parts from being marked incorrectly.

The latching of the arrow insert into defined positions guarantees that the arrow remains in a fixed position. The main body of the stamp also remains at the same height as the arrow insert and therefore is named "with fixed height." The company says that users can easily remove the stamp at the split line face because of a withdrawal thread in the main body. Made of stainless



steel 1.4112 with a hardness of 52 HRC, the stamp can be used at temperatures up to 340°C. Meusburger says that because of the low installation height, the stamp also is well-suited for installation in very thin molding plates. The new stamp is available in different variations: month (E 2420 R), year (E 2424 R), 0-9 (E 2422 R) and a blank main body for individual configuration (E 2429 R). The diameters range from 4 to 12 mm. The CAD data is available in the Meusburger web shop.

**Meusburger US Inc. Standard Molds /**  
**704-526-0330 / [meusburger.com](http://meusburger.com)**



### Undercut Release Component's 3D Ball Adapter Prevents Binding

**PCS Co.** launched the ProLifter, a standard undercut release component. PCS Co. says that the ProLifter is unique in that it is self-aligning and compensates for any misalignment from cumulative manufacturing tolerances and compound angles. The ProLifter consists of a three-piece assembly with an optional fourth piece.

Product pieces include the bar or rod, the adapter ball assembly and a guide shoe. PCS Co.'s optional piece for the ProLifter is a keeper key, which is designed for use with a rod. Five assembly sizes are available, including ¼, 3/8, ½, ¾ and 1". The 3D ball construction on the ProLifter eliminates excessive wear and binding.

**PCS Co. / 800-521-0546 / [pcs-company.com](http://pcs-company.com)**



### Nozzles on Hot Runner System Enable Wide Molding Window

**Mastip Inc.** offers Nexus pre-assembled and pre-wired systems that incorporate FlowLoc nozzle technology. Mastip supplies Nexus Systems pre-assembled and pre-wired so that they are ready to be installed into a mold without the need of pre-heating. Nexus is suitable for automotive, appliance and electrical applications. Mastip says that FlowLoc nozzles on its Nexus pre-assembled system facilitate a thermal profile that enables a wide molding window without the risk of polymer leakage while offering protection from accidental cold-condition starting. Nexus Systems are able to process a wide range of commodity and aggressive, engineering-grade polymers, are suitable for high-pressure applications and are fully customizable to suit any specific requirements.

Mastip's Nexus systems are compatible with FlowLoc 16, 19 and 27 series thermal-gate nozzles, which attach securely to the manifold with a threaded connection to provide a leak-proof solution. Mastip says that Nexus includes a customized wiring trunk to match specific mold layouts and offers quick removal of the complete unit from the mold for ease of service.

**Mastip Inc. / 262-644-9400 / mastip.com**



### Pre-Hardened Steel Designed for Machinability

**Hasco's 1.2714HH** is a pre-hardened EU tool steel that is designed for dimensional stability and toughness. It has a

maximum hardness of 400 HB. Benefits to users include excellent material properties for machining, welding, surface coating and use in injection molding tools, the company says. Other applications for the material include the production of cavity inserts, cores and sliders. The steel also is designed for wear resistance and polishing and etching properties. It can be nitrided, coated at temperatures below 510°C. Plates made from this steel are readily available from stock. Special dimensions as well as P and K20 plates of 1.2714HH are available on request.

**Hasco / 877-427-2662 / hasco.com/hasco/en**

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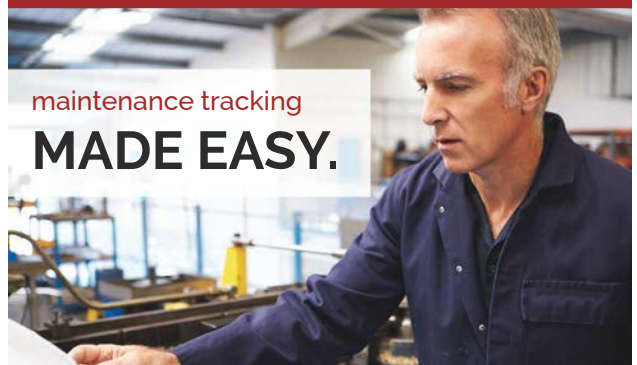
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## Database Helps Molders Limit Molding Out-of-Spec Parts

**Mobile Specs** offers a searchable database in the form of a website and app that provides processing parameter set points for more than 20,000 molding materials. The site offers processing information from more than 100 North American resin suppliers like Polyone, Nexeo, Channel Prime, Entec and Chase Plastics.

Mobile Specs says its search engine is innovative and enables users simply to type what they are looking for and then instantly view results. Users can search by supplier, product, family or grade. Units are available in US and SI. Mobile Specs says that its engineering team is constantly updating the Mobile Specs database and that the app stays current. Opportunities are available to join a Mobile Specs email list or create an account, which enables users to build favorites lists. A login is not required to use the search engine.

**Mobile Specs LLC / [mobilespecs.com](http://mobilespecs.com)**



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SelfLube, Inc. Coopersville, MI USA ISO 9001:2008 800-690-3600 [info@selflube.com](mailto:info@selflube.com)



## Mold Washer Combines Spray and Ultrasonic Actions for Flexibility

Blackstone-NEY Ultrasonics, a division of **Cleaning Technologies Group LLC**, introduces an innovation in an aqueous-parts cleaning system that combines spray and ultrasonic functions. The new patent-pending Rotosonic cleans heavily soiled parts in a single machine, which could prevent users from having to purchase a spray cabinet and an ultrasonic machine separately.

Blackstone-NEY Ultrasonics says that the washer gives the ultimate in flexibility, offering the use of a single process or both, depending on the needs of the user. The machine has a compact design and eliminates the need for manpower and the safety risks associated with moving parts from washer to washer.

**Cleaning Technologies Group LLC / 877-614-4480 / [ctgclean.com](http://ctgclean.com)**



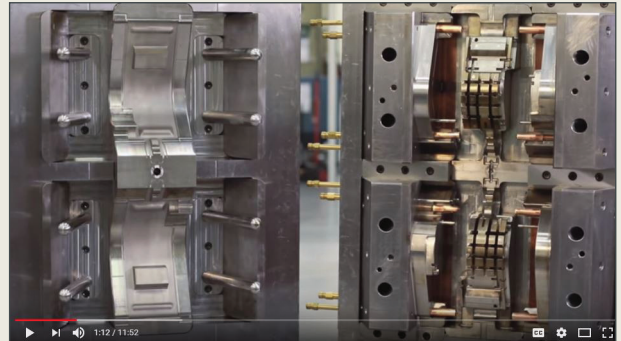
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## THIS MONTH ONLINE SOCIAL MEDIA



### YouTube Videos

#### Mold Making Matters: Your Road to Success

This video looks at various jobs and skill levels within the moldmaking industry. Apprentices, design engineers, program managers, CNC programmers, tool programmers, CNC operators, EDM operators, moldmakers and moldmaking technicians all play a vital role in the industry. Hear what they each do and why they find their jobs rewarding. [youtube.com/c/moldmakingtechnology](https://youtube.com/c/moldmakingtechnology)

### Facebook Popular Posts

MMT's partnership with The Manufacturing Alliance podcast started when Tony Demakis, founder of The Manufacturing Alliance, approached MMT Editorial Director Christina Fuges to do a podcast on MMT's 20th anniversary. They looked back over her history with the magazine and had a lively discussion about the past 20 years of innovation in moldmaking and what's to come. Want to join the podcast? Check it out at MMT online. [facebook.com/moldmakingtechnology](https://facebook.com/moldmakingtechnology)



### Twitter Hot Tweets

Check out these awesome Alliance Laser Sales, iWarriors and Westminster Tool Freedom Run race medals. On Sunday July 23, 2018 Westminster Tool hosted its 4th Annual iWarriors 5K Freedom Run and shared the results of the fundraising efforts. The company gives a big shout out to the sponsors and donors. Next year's run is June 21, 2019. [twitter.com/MMTMag](https://twitter.com/MMTMag)



### LinkedIn Conversations

MMT seeks new, bold presentation ideas at Amerimold 2019. Check out the entry form so you can submit your idea. Amerimold gives you the chance to speak to a crowd of industry professionals looking to learn. [linkedin.com/company/moldmakingtechnology](https://linkedin.com/company/moldmakingtechnology)



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## HOT RUNNERS

# How to Quickly Generate 3D Runner Mesh

By Cloud Tsai

Three-dimensional runner mesh technology simulates filling behavior and temperature variation inside the runner, which helps analyze uneven temperature distribution that shear heating and multi-cavity mold-flow imbalance induces. The mesh quality is essential for generating an accurate simulation.

Designers using simulation software used to prepare the 1D pass curve with a 2D cross-section mesh and then create 3D runner mesh through sweep or other tools for solid mesh generation. For simpler runner designs, the software advancements of today enable designers to semi-automatically generate 3D runner mesh with wire frames and runner parameters like the diameter. These tools are essential in mold-filling simulation and will significantly affect the analysis results.

However, more complicated runner designs require significant time and effort to build models for numerous and sophisticated 3D runner mesh. New mesh technology for high-quality runner models with hexa-based solid mesh, node types and node preview features can help designers quickly create runner models with 3D mesh.

Hexa-based runner mesh enables designers to attain required mesh layers with fewer elements. It is built with high-resolution and high-quality mesh and can also help reduce operation and analysis time.

At the connection of the runner curves, node types automatically are provided based on the curve amount, angles and runner types. This new runner mesh technology provides a

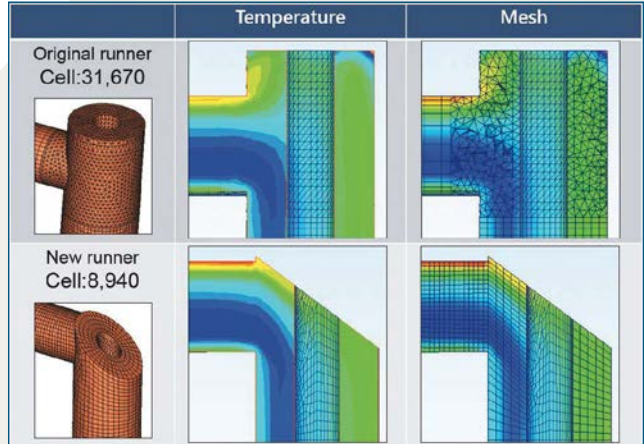


Image courtesy of Moldex3D.

New hexa-based runner mesh requires fewer mesh elements and better mesh quality for more accurate analysis results.

real-time node preview, so designers do not have to wait until the end of mesh generation. The runner mesh result will match the node setting perfectly without deformation. The software also generates a hexa-based mesh for common runner layouts and boundary-layer mesh for more complicated runner layouts. Users can choose common gate node types for mesh generation.

High-speed, high-quality mesh technology automatically generates the high-resolution hexa-based mesh in which the mesh model perfectly matches the original runner design with high accuracy. [MMT](#)

### CONTRIBUTOR

Cloud Tsai is the manager of the product R&D division at Moldex3D.

### FOR MORE INFORMATION

Moldex3D, EPS FloTek / 888-Moldex3D / epsfloTek.com



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Brian Bendig, President, Cavalier Tool & Manufacturing

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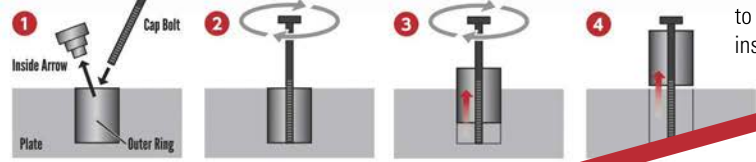
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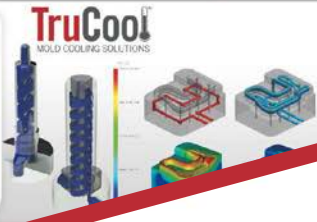
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