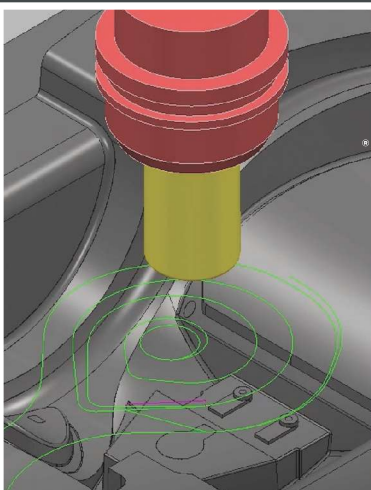
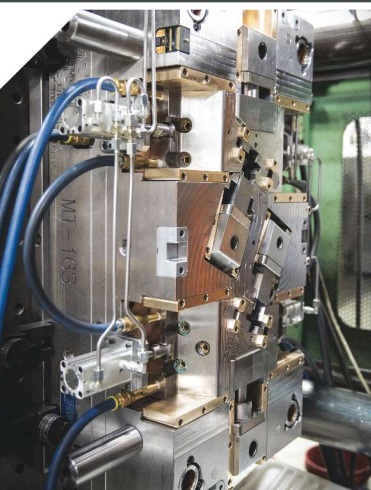


# MoldMaking TECHNOLOGY®

**20**  
YEARS  
1998-2018

# 2018

## Technology Review and Sourcing Guide



**MMT**

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

**MORE THAN  
1,000 COMPANIES  
In Print & Online!**

A review of this year's  
moldmaking product  
developments alongside a  
supplier sourcing grid

# ADVANCING STANDARDS WITH OVER 1200 NEW ITEMS...THAT'S v12.



Progressive continuously develops mold innovations that then become global industry standards. Following this year's NPE and Amerimold exhibitions, we are proud to announce Version 12 of our new catalog program:

- New sizes: From Blade Ejectors that begin at .015" thickness, to through hardened Ejector Pins that are 50" in length.
- Modular mechanisms: ModuLifters feature accelerated/decelerated lifter travel, with pre-engineered cooling available.
- Mold Monitoring: Advancements in maintaining molds and tracking asset activity.

In all, 30 new products and 1200 individual items have been added, making this our largest and most comprehensive product line expansion ever. Be aware of these benefits for your tools. Contact Progressive to receive not only a new catalog, but the next generation of advancements for injection molds.

**PROGRESSIVE**  
C O M P O N E N T S

Want what's new? Call 1-800-269-6653 or go to [www.procomps.com/v12](http://www.procomps.com/v12)

# Takumi

The Art of Productivity



Introducing: **Takumi U800**  
High Speed 5 Axis  
Gantry Machining Center

See us at  
IMTS Booth  
338420

At Takumi, we implement stringent processes to design and build rigid and reliable machining centers that exceed our customers' expectations. Our new U800 5-axis gantry machining center features an extremely rigid design, with the trunnion table mounted directly to the heavy duty cast frame.

Learn more at: [takumiusa.com/art](http://takumiusa.com/art)



Takumi USA | 7220 Winton Drive | Indianapolis, IN 46268  
**TAKUMIUSA.com | 844.302.3792 | info@takumiusa.com**

Machine shown with options. Information may change without notice.

A division of  
**Hurco Companies, Inc.**



## Get Tooled Up



It's no surprise in a year hosting three major manufacturing trade events—NPE, Amerimold and IMTS—that many of you mold shop owners, engineers, designers, builders, machine operators and toolroom personnel are ready to investigate and invest in new technology to address some of your most pressing challenges.

On top of that, our travels and conversations so far this year have brought to light a variety of mold shop technology needs, including more powerful design and toolpath software; CAD/

CAM systems capable of parametric solid modeling; strong surface generation; catalog components; feature recognition; scanning and reverse engineering; programming verification; process simulation; high-performance machining technologies (additive and subtractive); high-speed, multi-axis CNC machines; multi-axis milling; 3D printing; hybrid machines; cells with robots feeding EDM and CNC machines; multi-tasking machines; welders and spotting presses.

All of this makes the timing of *MoldMaking Technology's* annual *Technology Review and Sourcing Guide* perfect, as it serves to aid your product, equipment and service decision-making process. Its accurate, comprehensive, easy-to-read and use data on today's technology, equipment, products and services will ease your research and decision making.

Our printed guide and online database offer more than 1,000 manufacturers, distributors and suppliers for more than 200 product and service categories that you employ daily. To keep this information current, *MoldMaking Technology* surveys and updates its supplier database every spring with the latest company contact information and product/service offerings.

This month's *Technology Review and Sourcing Guide* includes a portion of that database alongside special tips, features and technology reviews published throughout the past year. The format includes key supplier profiles preceding a sourcing grid tailored to match suppliers with their respective product/service offerings (*advertisers are noted in boldface type*), followed by technical product and service reviews, tips and features.

The year's latest moldmaking product developments within mold engineering/design, build and maintenance/repair are broken down into the following 10 sections: software, additive manufacturing, mold materials, hot runners, mold components, cutting tools, machining, EDM, inspection/measurement and mold maintenance, repair and surface treatment.

The data within this year's condensed grids appears in its entirety online at [moldmakingtechnology.com/suppliers](http://moldmakingtechnology.com/suppliers). We encourage you to continue your search for even more of the latest in supplier and product information by visiting the various zones at [moldmakingtechnology.com](http://moldmakingtechnology.com).

We hope this annual guide provides you with some purchasing power during your decision making process. Please contact me via e-mail at [cfuges@gardnerweb.com](mailto:cfuges@gardnerweb.com) with any comments or feedback. **MMT**

*Christina Fuges*

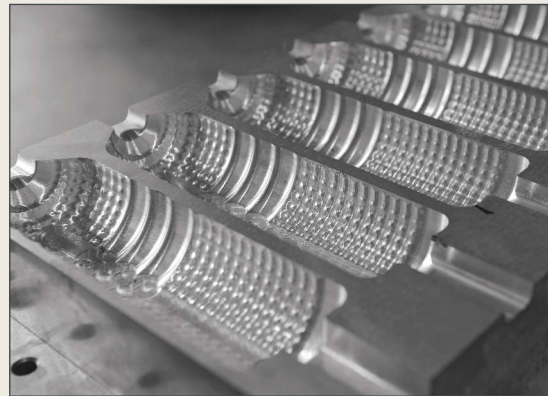
Christina M. Fuges  
Editorial Director

Follow MMT on:



Follow @MMT\_ChristinaF

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



### SUPPLIERS

Browse our entire database of moldmaking suppliers at [moldmakingtechnology.com/suppliers](http://moldmakingtechnology.com/suppliers). You can search by company name or by product category name, including automation, CAD/CAM, cutting tools and toolholders, EDM, hot runner systems, inspection/measurement, machining centers, mold components, mold maintenance, repair and surface treatment, mold materials, molds/tools/dies, and additive manufacturing.

### NEW PRODUCTS

At [moldmakingtechnology.com/products/new](http://moldmakingtechnology.com/products/new) you can access hundreds of product announcements provided to us by companies. Browse the most recent write-ups or search by category to keep up on what's currently on the market.



### ZONES

Visit [moldmakingtechnology.com/zones](http://moldmakingtechnology.com/zones) to view a special area of *MoldMaking Technology* online where you'll be able to find deep collections of information on technology-specific suppliers, products and other important business and management topics, which include past *MoldMaking Technology* articles relevant to the topic, products and suppliers. Plus, you can search articles within each zone for more specific information.



- Additive Manufacturing
- Automation
- Software
- Cutting Tools
- EDM
- Hot Runners
- Inspection/Measurement

- Machining
- Mold Components
- Mold Maintenance & Repair
- Mold Materials
- Surface Treatment
- Business Strategies
- Next Generation



### 5 Product/Service Sections

Products and services are grouped into 10 categories.

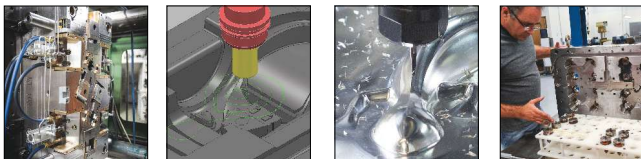
In each category, relevant supplier profiles precede a sourcing grid tailored to match suppliers with their respective products and services. *Advertisers are noted in boldface type.* This is followed by a sampling of related product releases.

- 5** Software
- 13** Additive Manufacturing
- 23** Mold Materials
- 33** Hot Runners
- 45** Mold Components
- 61** Cutting Tools
- 73** Machining
- 95** EDM
- 103** Inspection/Measurement
- 109** Mold Maintenance, Repair & Surface Treatment

### 120 MoldMaking Marketplace

### 120 Ad Index

**For more product and supplier information, visit [moldmakingtechnology.com](http://moldmakingtechnology.com).**



Cover images (left to right) courtesy of Creative Technology Corp., Autodesk, Heidenhain Corp. and MoldTrax.

#### Publisher

Ryan Delahanty ..... rdelahanty@gardnerweb.com

#### Publisher

Joe Campise ..... jcampise@gardnerweb.com

#### Editorial Director

Christina M. Fuges ..... cfuges@gardnerweb.com

#### Senior Editor

Cyndi Kustush ..... ckustush@gardnerweb.com

#### European Correspondent

Barbara Schulz ..... bschulz@gardnerweb.com

#### Managing Editor

Karen Cornelissen ..... kcornelissen@moldmakingtechnology.com

#### Art Director

Carla M. Turner ..... cturner@gardnerweb.com

#### Advertising Production Manager

Chris Larkins ..... clarkins@gardnerweb.com



**GARDNER**  
Business Media, Inc.

6915 Valley Avenue  
Cincinnati OH 45244-3029  
P 513-527-8800  
Fax 513-527-8801  
[gardnerweb.com](http://gardnerweb.com)  
[moldmakingtechnology.com](http://moldmakingtechnology.com)

Richard Kline | Chairman and CEO  
Richard Kline, Jr. | President  
Travis Egan | Group Publisher  
Steve Kline, Jr. | Chief Data Officer  
Ernest Brubaker | Chief Financial Officer  
Melissa Kline Skavlem | Chief Marketing Officer  
Phil Louis | Chief Technology Officer  
Julie Ball | Audience Development Manager  
William Caldwell | Advertising and Production Director  
Tom Beard | Custom Content Director  
Jeff Norgord | Creative Director  
Kate Hand | Editorial Operations Director  
Dave Necessary | Strategic Engagement Director

#### Subscription Inquiries:

For questions or issues related to your subscription, please call 513-527-8800 or email [subscribe@moldmakingtechnology.com](mailto:subscribe@moldmakingtechnology.com)

#### ALSO PUBLISHER OF

- Modern Machine Shop
- Products Finishing
- Plastics Technology / PT Handbook
- Production Machining
- CompositesWorld
- Additive Manufacturing
- IMTS Directory
- Products Finishing Directory
- NPE Official Show Directory
- Automotive Design & Production
- Modern Machine Shop Mexico
- Products Finishing Mexico
- Techspex

*MoldMaking Technology* (ISSN 1098-3198) is published monthly and copyright © 2018 by Gardner Business Media Inc. 6915 Valley Ave., Cincinnati, OH 45244-3029. Telephone: (513) 527-8800. Printed in U.S.A. Periodicals postage paid at Cincinnati, OH and additional mailing offices. All rights reserved.

POSTMASTER: Send address changes to *MoldMaking Technology* Magazine, 6915 Valley Ave., Cincinnati, OH 45244-3029. If undeliverable, send Form 3579.

CANADA POST: Canada Returns to be sent to IMEX Global Solutions, P.O. Box 25542, London, ON N6C 6B2. Publications Mail Agreement #40612608.

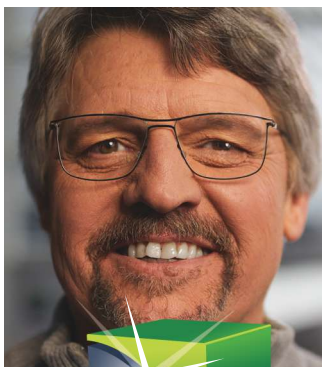
The information presented in this edition of *MoldMaking Technology* is believed to be accurate. In applying recommendations, however, you should exercise care and normal precautions to prevent personal injury and damage to facilities or products. In no case can the authors or the publisher accept responsibility for personal injury or damages which may occur in working with methods and/or materials presented herein, nor can the publisher assume responsibility for the validity of claims or performance of items appearing in editorial presentations or advertisements in this publication. Contact information is provided to enable interested parties to conduct further inquiry into specific products or services.





# Ideas come out of their shell

## WHERE DREAMERS & DOERS CONNECT.



With digital manufacturing disrupting our comfort zones, inspiring and educating a new generation of Dreamers & Doers is critical. Find out how IMTS has helped Rick Hoffman's 150-person job shop, EIMCo, go 26 years without a single layoff and guided his vision to connect a younger generation with manufacturing at [IMTS.com/RickH](https://www.imts.com/RickH)

# IMTS2018

International Manufacturing Technology Show Sept 10-15, 2018 · McCormick Place · Chicago



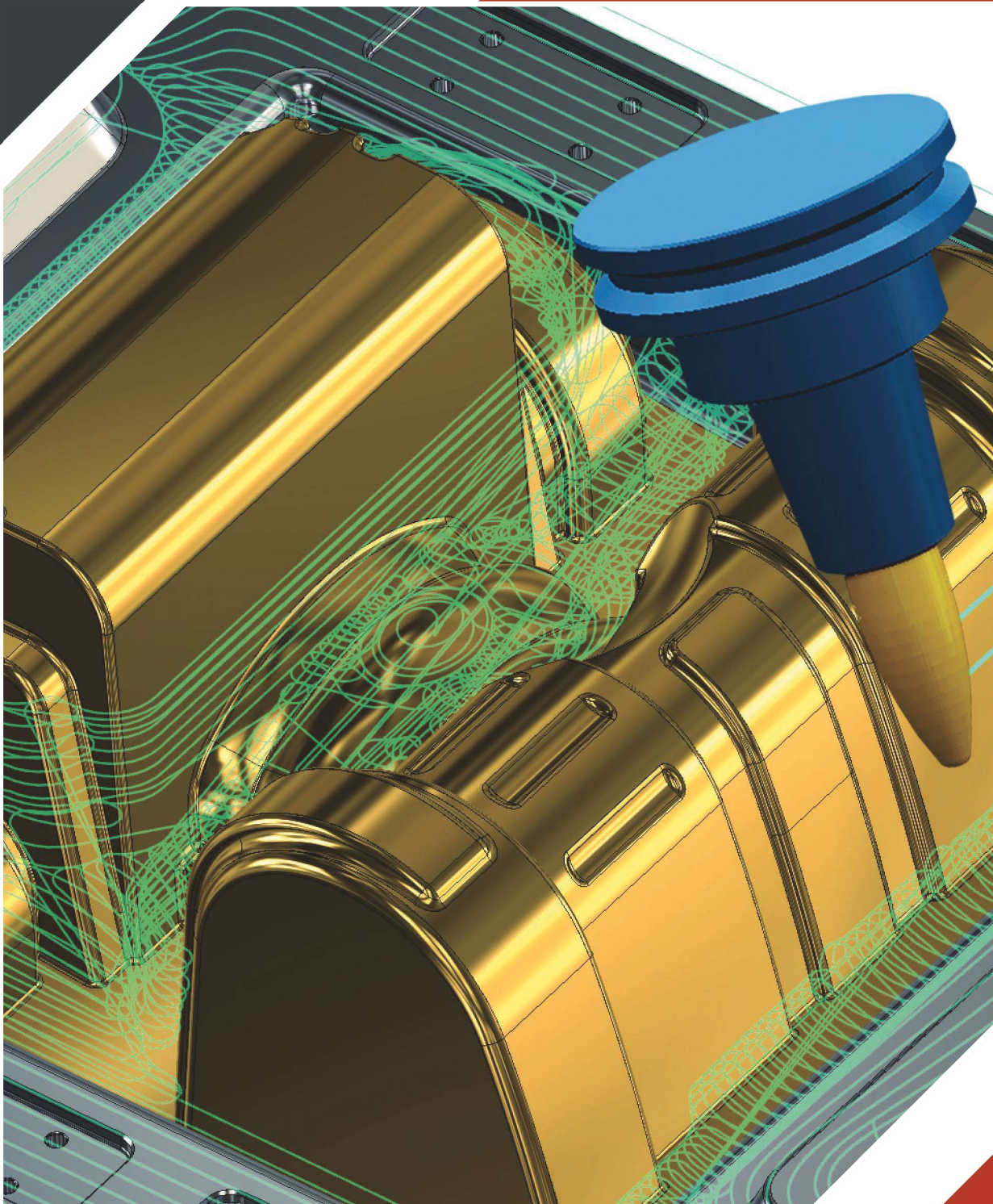
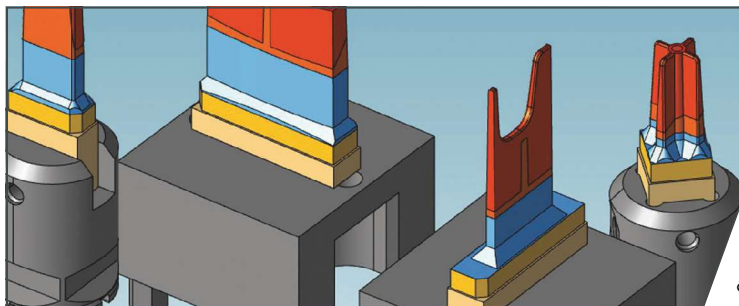


Image courtesy of Mastercam/CNC Software.



			Design						
			CAD (Computer Aided Design)	CAE (Computer Aided Engineering)	CAM (Computer Aided Manufacturing)	CIM (Computer Integrated Manufacturing)	Mold Design Services	Mold Flow and Simulation Services	Reverse Engineering Software
COMPANY	Advertisers are listed in bold type.	See Ad	1	2	3	4	5	6	7
3D Systems – Cimatron Software – Novi, MI, 248-596-9700			1		3				
Autodesk – San Rafael, CA, 415-507-5000			1	2	3				
Beaumont Technologies Inc. – Erie, PA, 814-899-6390				2			5		
BobCAD-CAM – Clearwater, FL, 727-442-3554			1		3				
CAE Services Corp. – Batavia, IL, 630-761-9898				2			5		
CAMWorks/Geometric Americas Inc. – Scottsdale, AZ, 480-367-0132			1	2	3	4			
CGS North America Inc. – Oldcastle, ON, 519-737-6009	10		1		3				
CGTech – Irvine, CA, 949-753-1050	9		1	2	3				
Creative CNC LLC – Hartland, WI, 262-347-3939			1		3				
Dassault Systemes – Waltham, MA, 781-810-5011			1	2	3				
DME/Milacron – Madison Heights, MI, 248-398-6000	51							6	
DZynSource LLC – East Killingly, CT, 860-933-2917			1	2					
Edgecam by Vero Software – Forest Lake, MN, 866-334-3226			1		3				
Epicor Software Corp. – Austin, TX, 512-328-2300									
ESPRIT by DP Technology – Camarillo, CA, 805-388-6000			1	2	3	4			
GibbsCAM by 3D Systems – Moorpark, CA, 805-523-0004			1		3				
Hurco Companies Inc. – Indianapolis, IN, 317-293-5309	1								
Iscar Metals Inc. – Arlington, TX, 817-258-3200	63								
JDL Technical Services – LaSalle, ON, 519-919-7391									
JobBoss – Bloomington, MN, 800-777-4334			1						
Kubotek3D – Marlborough, MA, 508-229-2020			1	2	3				7
Master3DGage – Anaheim, CA, 714-970-1683			1		3				7
Mastercam / CNC Software – Tolland, CT, 860-875-5006			1	2	3				7
Moldex3D, EPS FloTek – Naperville, IL, 630-778-7773			1	2	3	4			
Open Mind Technologies USA Inc. – Needham, MA, 339-225-4557			1		3				
Siemens PLM Software – Plano, TX, 800-498-5351			1	2	3				7
Sigma Plastic Services Inc. – Schaumburg, IL, 847-558-5600				2					
SIMCON – Weursele, Germany, +49 2405 645710							5		
Smart Attend Inc. – Aurora, ON, Canada, 866-210-9630	79								
SolidCAM Inc. – Newtown, PA, 866-975-1115			1	2	3				
SpaceClaim Corp. – Concord, MA, 978-482-2100			1	2	3				
Surfcam by Vero Software – Thousand Oaks, CA, 818-991-1960			1		3				
Synergetic Eng. & Manufacturing Services – Windsor, ON, 519-903-0303			1	2	3		5		7
Tebis America Inc. – Troy, MI, 248-524-0430			1		3				7
TopSolid / Missler Software Inc. – Addison, IL, 630-889-8055			1	2	3	4	5		
TST Tooling Software Technology LLC – Clarkston, MI, 248-922-9293			1	2	3		5		7
Verisurf Software Inc. – Anaheim, CA, 714-970-1683			1		3	4			7
VISI by Vero Software – Clarkston, MI, 248-922-9293			1	2	3		5		7
WorkNC by Vero Software – Southfield, MI, 248-351-9300	8		1		3	4			
XMD – Expert Mold Designer, Windsor, ON, 519-903-0303			1	2	3		5		

For more supplier listings, go to [moldmakingtechnology.com/suppliers](http://moldmakingtechnology.com/suppliers).

	Manufacturing Software					Other Software							
	CNC Software	Coordinate Measuring Machine (CMM) Software	Manufacturing Automation Software	NC Simulation and Verification Software	Data Management Software	Data Translation Software	Mold Flow and Simulation Software	Mold Quoting Software	Production/Inventory Control Software	Scheduling Software	Shop Floor/Plant Layout Software		
	8	9	10	11	12	13	14	15	16	17	18	WEBSITE	
				11			14					cimatron.com	
			10	11	12	13	14				18	autodesk.com	
							14					beaumontinc.com	
												bobcad.com	
							14					caeservices.com	
				11		13						camworks.com	
												camtool.com	
				11	12		14					cgtech.com	
8												creativecnc.net	
				11	12	13	14					solidworks.com	
												dme.net	
					12			15				dzynsource.com	
			10	11								edgecam.com	
					12							epicor.com	
				11								espritcam.com	
8				11		13						3dsystems.com/gibbscam	
8												hurco.com	
									16			iscarmetals.com	
8			10		12			15	16	17		JDLTech.ca	
			10		12				16	17	18	jobboss.exactamerica.com	
				11		13						kubotek3d.com	
	9		10			13						master3dgage.com	
8			10	11								mastercam.com	
							14					epsflotek.com	
				11								openmind-tech.com	
	9			11	12	13	14				18	siemens.com/plm	
							14					virtualmolding.us	
							14					simcon-worldwide.com	
			10		12				16			smartattend.com	
				11								solidcam.com	
												spaceclaim.com	
			10	11								surfcam.com	
				11		13						synergeticgroup.com	
				11	12	13						tebis.com	
						13						topsolid.com	
8	9			11		13	14	15		17		tst-software.com	
	9					13						verisurf.com	
			10	11	12	13	14					visicadcam.com	
			10	11	12	13		15		17		worknc.com	
						13						synergetic-xmd.com	

Image courtesy of Open Mind Technologies USA.



## Not all CAM systems are created equal

WorkNC is the closest system to “single button” programming and has several automatic toolpath types to fit your every need such as Roughing, Finishing, Optimization, Remachining, Contouring, Curve Machining and Hole Boring.

WorkNC takes the guess work out of your cutter path generation because it's AUTOMATIC. Just enter a few basic parameters to get your job running and the automated CAM software takes care of the rest. WorkNC provides its own lightening fast graphic toolpath editor and generic post processor generator program.

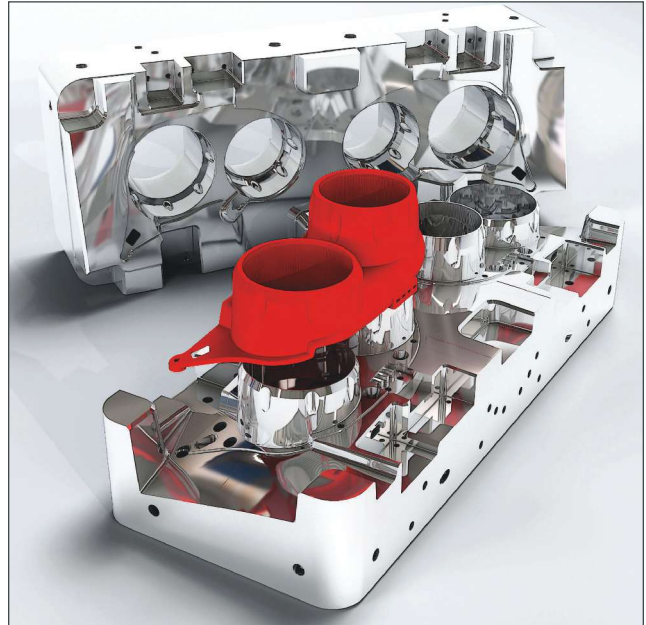
**See for yourself how WorkNC can dramatically improve your manufacturing efficiency.**

Call us at 248-351-9300 or go to [www.worknc.com/testdrive](http://www.worknc.com/testdrive).



**vero**  
Software

[www.worknc.com](http://www.worknc.com)



### Package of Programs Offers New Features for Accelerated Mold Design

**Missler Software** has the “Program That Part Challenge,” a new program to demonstrate the raw power of the TopSolid solution. In addition to the “Program That Part Challenge,” Missler Software debuts TopSolid'Tooling, which the company says groups together TopSolid'Mold, TopSolid'Progress and TopSolid'Electrode and further speeds mold design and manufacturing. Some of the new TopSolid'Tooling functionality includes automated separation of cavity blocks, accelerated definition of moving parts, intuitive positioning of ejection components, regulation design with a safety margin and automated production of workshop documents (electrodes). Show visitors can enroll in the “Program That Part Challenge” experience TopSolid'Tooling's new features.

**Top Solid / Missler Software Inc. /**  
**630-889-8055 / [topsolid.com](http://topsolid.com)**

### Automation Software Introduces Built-in Locating System

**XMD** presents the latest update to its mold design software, introducing automated clamping and built-in locating systems—a first for the industry, according to the company. The latest update is designed to automatically locate holes required for the FCS system based on the user's exact specifications of the machine, facility and clamping tool. The system is also built to automate placement of new holes to solids imported from any software for quick placement even at the shopfloor level. XMD says that the software is used widely by mold manufacturers, incorporating the system into CNC machine tables such as FCS, FPT's Fast Mill and more.

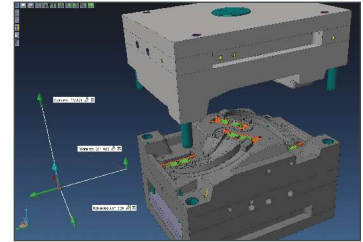
**XMD - Expert Mold Designer - Synergetic Eng & Manufacturing Services /**  
**519-737-9638 / [synergetic-xmd.com](http://synergetic-xmd.com)**



## Job Tracking Software Streamlines Shopfloor Processes

**TST Tooling** says that TSTracker streamlines shopfloor processes and increases the client's bottom line. The company also distributes VISI CAD/ CAM/ CAE and VISI-PEPS laser and wire software. According to the company, these programs are known globally for the competitive advantage they provide to the tooling industry in the design and manufacturing of plastic injection molds, 2D through five-axis milling, electrode production and others, servicing a multitude of manufacturing industry sectors such as automotive, electronic, medical and aerospace. The company also sells and supports Factory Wiz Monitoring and DNC software and DYNAFORM Simulation software for the tool and die industry.

**TST Tooling Software Technology LLC /**  
248-922-9293 / [tst-software.com](http://tst-software.com)



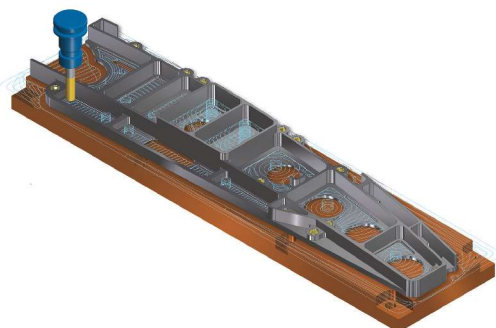
## CAD/CAM Software Update Includes New 2D/3D Milling Features

**Mastercam's** Mastercam 2018 introduces new 2D/3D milling features, design improvements and turning and mill-turn enhancements. Stock awareness has been added to select 2D tool paths and enable tool motion on the top, bottom or both values of the stock. This provides safer and more optimized tool motion. The workflow for all 3D High Speed tool paths has been streamlined and gives users fine control over where to cut. High-speed Hybrid tool paths now offer smoothing controls and deliver a finer finish.

Mastercam's new Chip Break control prevents problems in stringy material like aluminum or plastic by enabling users to set length and time conditions, and retract and dwell options. Mill-Turn machine definitions now contain tailstock and quill components, tailored to user's machines.

A new set of turning strategies automate tool path generation and support for Sandvik Coromant's CoroTurn Prime inserts and PrimeTurning method. PrimeTurning is said to provide higher metal removal rates, productivity gains and increased tool life in a variety of materials.

**Mastercam - CNC Software Inc. /**  
800-228-2877 / [mastercam.com](http://mastercam.com)

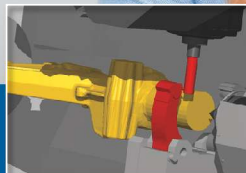


## VERICUT® CNC Machine Simulation Software

### Running your first part without VERICUT...



**CRASH  
DETECTED!**

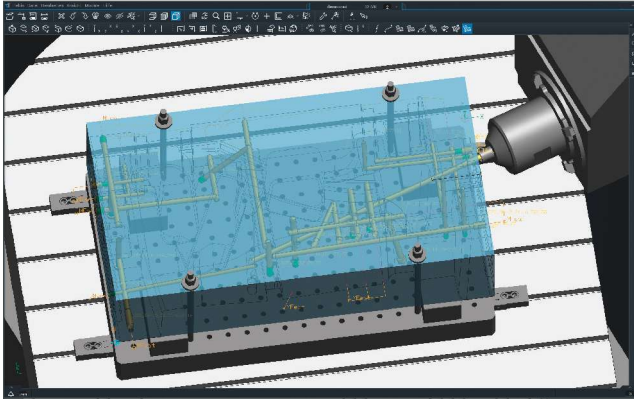


- **Optimize** feed rates for faster cycle times
- **Test** alternative machining strategies virtually
- **Speed up** new CNC machine implementation
- **Reduce** collisions, scrapped parts & prove-outs

**Right the first time. Every time.**

9000 Research Dr, Irvine, California 92618  
(949) 753-1050 • [info@cgtech.com](mailto:info@cgtech.com)

**30 YEARS**  
**CGTECH.com**



### Latest Software Has New Features for Deep-Hole Drilling

**Tebis America's** Version 4.0 has enhanced features. For example, it can create area curves during part comparison to enable better detection and limitation of modified areas. The new function creates non-overlapping shifted surfaces from any curves at defined angles.

In addition, users can automatically morph parts together with the most complex trimming curves in surface morphing. The new release fully retains geometry of the original curves and transfers the color properties 1-1. Also, users can include curves in surface morphing.

In the latest Version 4.0, deep-hole drilling in the CAM area has better orientation to support automated calculation and machining. The software also comes with a new tool type that has an extended set of cutting data and special speeds, feed rates, cooling types and depth sections that deep-hole drilling requires.

The latest issue of Version 4.0 has simpler toolpath definition in five-axis milling. Additionally, the software has improved function operating convenience. The release includes options for fast vector smoothing and for tilt-optimized calculation of tool paths. These features are available even without the manual definition of vectors.

**Tebis America Inc. / 248-524-0430 / [tebis.com](http://tebis.com)**

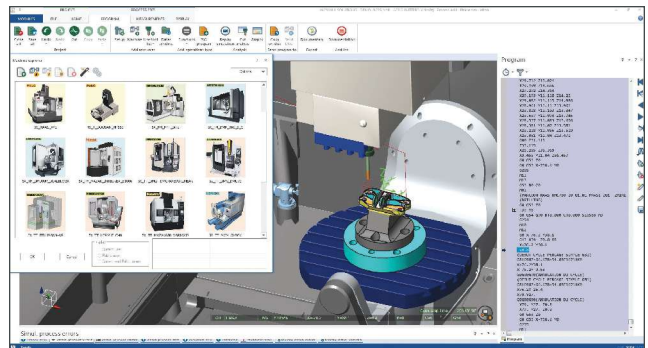
### Simulation Software Reduces Debugging, Improves Cycle Times

The 2017 NCSIMUL Solutions simulation software from **Spring Technologies** is designed to provide ease of use and automation for manufacturers to move toward Industry 4.0. New features include new probing strategies, support for turning after milling which enables one-click NC machine turnaround, cutting tool management with 3D definitions, one-click project update, project export and import, automatic performance analysis and automatic graphic detection of machining risk zones and less-than-optimal cutting conditions.

NCSIMUL Machine is designed to provide realistic CNC simulation of the machining process. Users can simulate, verify, optimize and review programs based on the characteristics of the machine tools. Three-dimensional graphics help prevent machining crashes while algorithms and embedded process-based knowledge optimize cutting conditions. The software provides machining verification in three steps: investigating and correcting coding errors, simulating to locate collisions and correct motion errors, and validating the part cut and result. The company says that the software can reduce debugging time, improve cycle times and process optimization efficiencies and prevent spindle collisions, tool breakage and scrap.

Spring has also optimized its 4CAM add-on module so that it is more efficient and supports best practices with existing CAM products. The new version is designed to be a reliable, flexible, secured and automated tool for selecting which production resources to deploy.

**Spring Technologies Inc. / 617-401-2197 / [ncsimul.com](http://ncsimul.com)**



*Unleash the Cat... and slash the time you'd normally spend polishing steel.*

# CAM-TOOL

CAD/CAM System for Molds & Dies

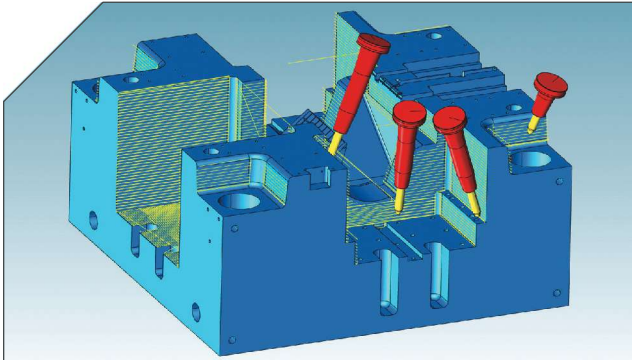
## 1-519-737-6009

Call us Today!

[www.camtool.com](http://www.camtool.com)

CGS North America Inc.  
**CGS**





### CAM Software Enables Use of Conical Barrel Cutting Technology to Reduce Cycle Times

**Open Mind Technologies** hyperMILL CAM software's MAXX Machining finishing module, a performance package of the hyperMILL CAM software suite, is a CAM programming source that enables the use of conical barrel cutter technology to reduce cycle times by more than 90 percent. The company says that MAXX Machining is ideal for planar, ruled and curved surfaces in complex five-axis components. hyperMILL MAXX Machining offers three modules for finishing, roughing and drilling.

**Open Mind Technologies USA /**  
**888-516-1232 / [openmind-tech.com](http://openmind-tech.com)**



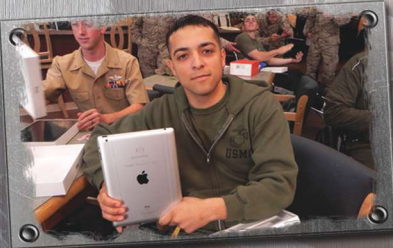
### Machine Monitoring Software Automatically Collects Data for Easy Use

**R.E.R. Software's** InFocus Machining is a complete machine monitoring and job tracking and analysis solution that automatically collects the machining hours of a job and each component. It is specifically designed for the mold and die tooling industry to meet the challenges of day-to-day operations. The company says that the technology ensures that adoption into an organization is seamless. The company says that InFocus Scheduling centralizes the schedule, coordinates the work flow with lineups on the floor and highlights all potential scheduling issues with clear visibility into any open capacity on all resources.

**R.E.R. Software Inc. / 586-744-0881 / [rersoftware.com](http://rersoftware.com)**

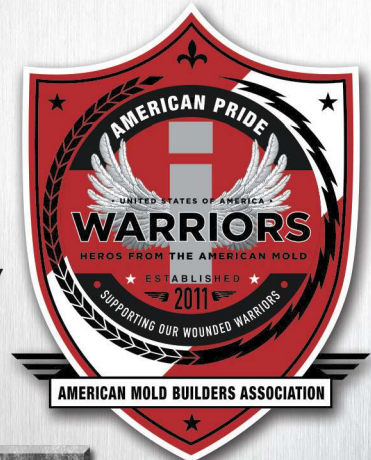
# THEY GAVE THEIR ALL. LET'S GIVE SOME BACK.

The mission of iWarriors is to honor severely injured members of all branches of the Armed Forces by providing them with personalized iPads. With help from members of the American Mold Builders Association, MoldMaking Technology Magazine and others we can provide iPads to assist in a service members rehabilitation and recovery from physical injuries, post traumatic stress and traumatic brain injuries.



*Please Donate Today!*

To donate or learn more visit  
**[www.iWarriors.org](http://www.iWarriors.org)**  
 iWarriors.org is a 501(c)3 non  
 profit 98.5% of all donations  
 directly benefit the iPad program



A Proud Sponsor  
**MoldMaking  
 TECHNOLOGY**

Like us on 

**[www.iWarriors.org](http://www.iWarriors.org)**



# CAD-for-CAM Toolboxes Help Design Better Molds

By Ben Mund

Most part-manufacturing processes today begin with a CAD model rather than a print. For subcontract mold shops, it may be the finished part model file that comes in from the customer's design staff. Then, it is the moldmaker's turn to construct the CAD model of the *mold* that will form the finished plastic part. That has its own inherent challenges because moldmakers have many things to think through about the mold, which the part designer may not consider. One of those things is part removal.

Most CAM software packages accept a wide variety of specific or neutral CAD file types. Many also have a robust CAD engine of their own, giving the user the ability to create the model from scratch, if necessary. CAM software packages also provide a number of tools to easily adjust the CAD file. However, one of the crucial CAD elements that CAM packages can offer moldmakers is a set of specialized CAD-for-

Parting line calculation is crucial in ensuring that the mold is sectioned properly. Good CAM software will offer the ability to calculate optimal parting lines from the CAD model, which is something that the part designer often does not consider.

CAM tools that focus on the machinist's needs *after* the machinist opens the part file.

CAD-for-CAM tools enable quick, temporary model changes that do not impact the final part design but can streamline toolpath generation and often promote better part finishes. These often start with the ability to "heal" flawed surfaces or solids data, making the part usable.

Other tools are geared toward temporarily filling holes or shallow pockets and identifying solid-model features that the machinist can quickly turn "on" or "off" in the CAM package for programming purposes. This can make the cut over a part smoother before those details are machined and help yield a better, higher-quality finish at a faster pace.

Other powerful CAD-for-CAM tools focus on the creation of the mold itself. Parting line calculation is crucial in ensuring that the mold is sectioned properly. Good CAM software will offer the ability to calculate optimal parting lines from the CAD model, which is something that the part designer



Image courtesy of CNC Software.

CAD-for-CAM tools frequently promote better part finishes.

often does not consider. Similarly, tall, thin elements on a molded part can pose challenges to the machinist, who has to try to separate areas where electrodes might be appropriate. Automated CAM tools that automatically pull EDM electrodes from a CAD model make the process much faster and more precise.

As a general rule, designers are more focused on the nuances of the finished part, while CAM programmers, manufacturing engineers and machinists concern themselves with *making* the part, and the first step is the mold. That is no small feat either, and machinists often need to be every bit the artist that a designer has to be to manufacture a good mold. Happily for moldmakers, excellent tools in CAD/CAM packages are available that make the job easier. **MMT**

Machinists often need to be every bit the artist that a designer has to be to manufacture a good mold. Happily for moldmakers, excellent tools in CAD/CAM packages are available that make the job easier.

## CONTRIBUTOR

Ben Mund is a senior market analyst for CNC Software Inc.

## FOR MORE INFORMATION

CNC Software / 800-228-2877 / mastercam.com

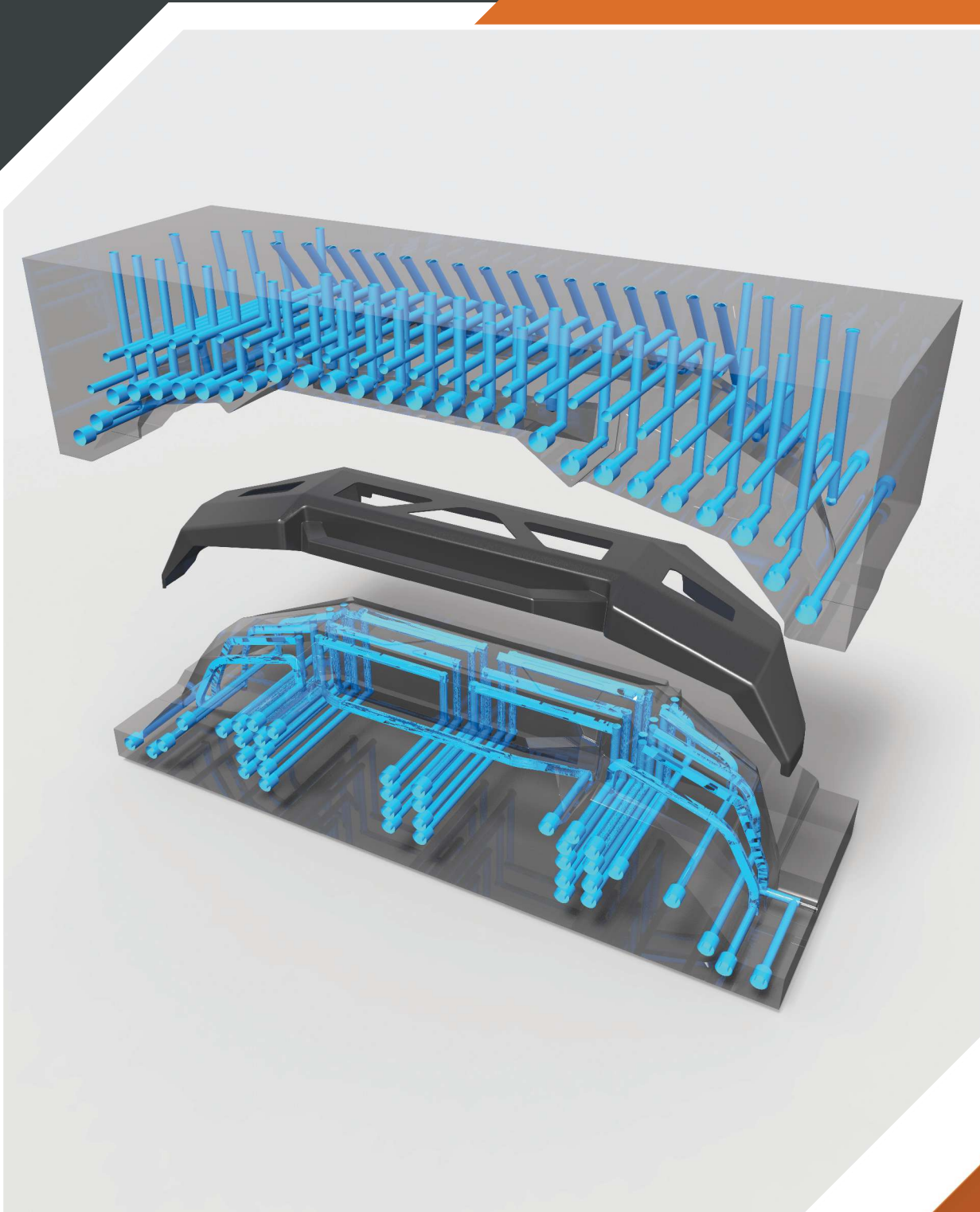
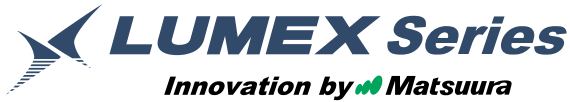


Image courtesy of Conformal Cooling Solutions.



**Matsuura Machinery USA, Inc.**  
325 Randolph Ave.  
St. Paul, MN 55102

Phone: 651-289-9700

[MatsuuraUSA.com](http://MatsuuraUSA.com)

## PRODUCTS/SERVICES



### Matsuura LUMEX Avance-25

The Matsuura LUMEX Avance-25 metal laser sintering hybrid milling machine relies on one-machine, one-process manufacturing of complex parts and molds by fusing metal laser sintering (3D SLS) technology with high-speed milling technology.

The machine is capable of processing parts and molds up to 256 mm x 256 mm x 185 mm with an option allowing processing of 256 mm x 256 mm x 300 mm. See the Matsuura LUMEX Avance-25 at IMTS in the South Hall, Booth 338148.

### Matsuura LUMEX Avance-60

The Avance-60 boasts the largest Powder Bed Platform on the market and can process parts and molds up to 600mm x 600mm x 500mm.

The machine provides an increased speed of powder distribution to the surface along with a fully-integrated automatic powder supply, collection and recycle system.

Matsuura's combination of best-in-class CNC Milling and high speed Direct Laser Melting has fundamentally revolutionized the AM marketplace.



### Matsuura Machinery USA LUMEX Additive Manufacturing Center

Matsuura's Additive Manufacturing laboratory and demonstration facility is located within Matsuura's corporate headquarters in St. Paul, MN.

The Center functions as a showroom and as a development center. Matsuura USA is developing new powders and new hybrid technologies at the location. In addition, Matsuura engineers perform service bureau work for customers and test cuts to prove out the hybrid process.

The Center currently houses four machines which are producing components and are available for customer demonstrations.

## WEBSITE



Matsuura USA delivers unmatched excellence in 5-axis, vertical, horizontal, linear motor, multi-tasking CNC machine tools and machines with a powder bed metal AM platform and machining capability.

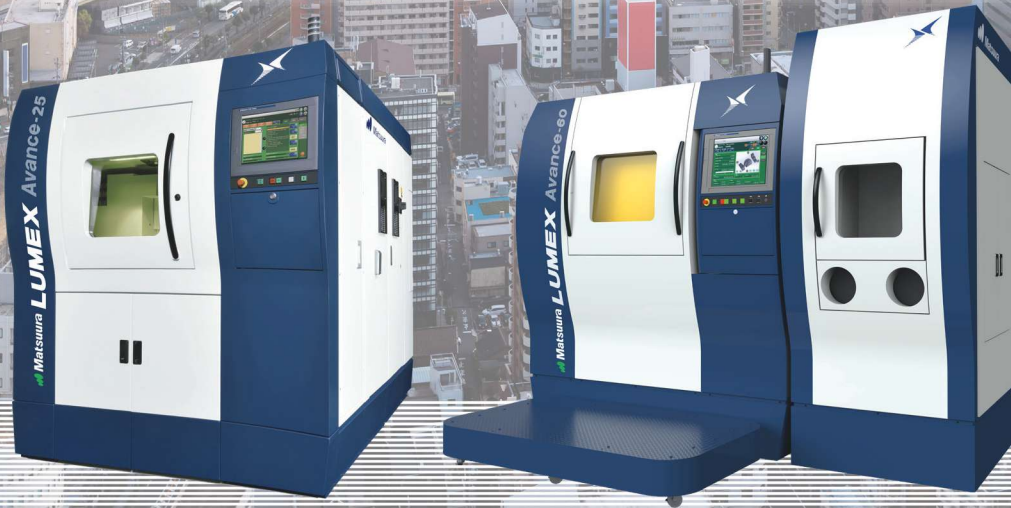
[MatsuuraUSA.com](http://MatsuuraUSA.com)

## PRODUCT CATEGORIES

- Five-Axis Machining Centers
- Horizontal Machining Centers
- Vertical Machining Centers
- Linear Motor Machines
- Additive Manufacturing (AM)
- 3D Printing
- Hybrid Machines



# CREATE THE FUTURE



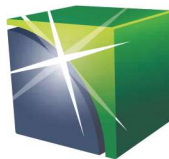
Challenge Conventional Thinking From **VISION** to **REALITY**

CNC Milling and High Speed Direct Laser Melting, Matsuura has  
**REVOLUTIONIZED** the AM Marketplace

With Matsuura's LUMEX **FREEDOM** of **DESIGN**,  
make the impossible, **POSSIBLE**

*Matsuura's **INNOVATIVE** and **UNIQUE** combination of technology platforms  
enables the production of parts and molds in a method that has never been  
possible nor imagined.*

**SEE US IN ACTION:**



IMTS2018

McCormick Place  
Chicago, IL

Sep 10 - 15, 2018  
South Hall, Booth 338148

**Register for a free gift at the show! Email us at [MatsuuraLUMEX@MatsuuraUSA.com](mailto:MatsuuraLUMEX@MatsuuraUSA.com)**



Learn more about the Matsuura LUMEX Avance Series

[matsuurausa.com](http://matsuurausa.com) | [MatsuuraLUMEX@MatsuuraUSA.com](mailto:MatsuuraLUMEX@MatsuuraUSA.com) | 800-518-4584



**EOS North America**  
**28970 Cabot Dr. #700**  
**Novi, MI 48377-2978**

**Phone: 248.306.0143**  
**Fax: 248.306.0298**

[eos.info](http://eos.info)

## PRODUCTS/SERVICES

EOS is the global technology leader for industrial 3D printing of metals and polymers. Founded in 1989, the independent company is a pioneer and innovator for holistic solutions in additive manufacturing. Like no other company, EOS is mastering the interaction of laser and powder material.

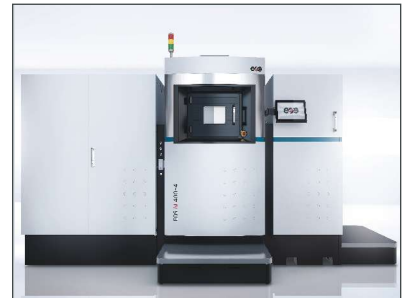
EOS provides all essential elements for industrial 3D printing. System, material and process parameters are intelligently harmonized to ensure a reliable, high quality of parts and thus facilitating a decisive competitive edge. Furthermore, customers benefit from deep technical expertise in global service, applications engineering and consultancy.

EOS nurtures a vibrant ecosystem of partners and, by means of venture investments, helps incubate promising start-ups. It's this interaction along with the whole industrial value-chain that enables the development of extensive solutions for 3D printing.



### EOS M 290

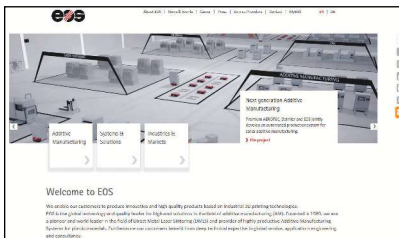
The EOS M 290 is the benchmark for the industrial 3D printing of high-quality metal parts, with enhanced quality management features. With a building volume of 250 × 250 × 325 mm and a powerful 400-watt fiber laser, it allows a fast, flexible and cost-effective production directly from CAD data.



### EOS M 400-4

Designed for industrial applications, the EOS M 400-4 offers a large build-volume of 400 × 400 × 400 mm combined with four lasers for up to four times higher productivity. It shatters boundaries of manufacturing as it meets the most demanding requirements of modern production environments in terms of efficiency, scalability, usability and process monitoring.

## WEBSITE



[eos.info](http://eos.info)

## PRODUCT CATEGORIES

- **Machines for Metal Parts**
- **Machines for Polymer Parts**
- **Metal Materials**
- **Polymer Materials**
- **Material Handling Equipment**



# The Leader in Industrial 3D Printing Technology

Transform your business with additive manufacturing.  
The factory of the future is here!

Digitization is rapidly impacting the manufacturing world. Make the decisive step towards an advanced and agile production with industrial 3D printing – including connected part and data flow. EOS provides a comprehensive solution and service portfolio, and is your trusted partner for implementing 3D printing into the production environment.



[info@eos-na.com](mailto:info@eos-na.com)



[linkedin.com/company/EOS](https://www.linkedin.com/company/EOS)



[@EOSNorthAmerica](https://twitter.com/EOSNorthAmerica)



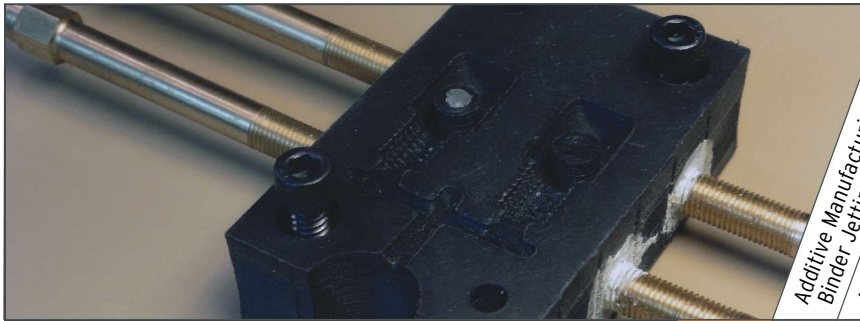
[facebook.com/EOSGmbH](https://www.facebook.com/EOSGmbH)

**Together, we are shaping the future of manufacturing.**



[www.eos.info](http://www.eos.info)



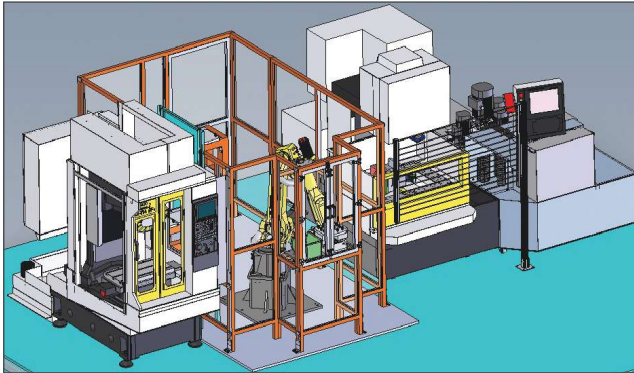


			<div>Additive Manufacturing Machines- Binder Jetting</div> <div>Additive Manufacturing Machines- Directed Energy Deposition</div> <div>Additive Manufacturing Machines- Material Extrusion</div> <div>Additive Manufacturing Machines- Material Jetting</div> <div>Additive Manufacturing Machines- Powder Bed Fusion</div> <div>Additive Manufacturing Machines- Vat Polymerization</div> <div>Additive Manufacturing Machines- for Ceramic Parts</div> <div>Additive Manufacturing Machines- for Composite Parts</div> <div>Additive Manufacturing Machines- for Metal Parts</div>									
COMPANY	Advertisers are listed in bold type.	See Ad	1	2	3	4	5	6	7	8	9	
3Dprintedparts.com	– Grand Rapids, MI, 616-871-9889							6				
3D Platform	– Roscoe, IL, 779-771-0000				3							
3D Systems	– Rock Hill, SC, 803-326-3900							6				
Absolute Machine Tools Inc.	– Lorain, OH, 440-960-6911			2			5					
AddUp Inc.	– Waynesboro, PA, 240-707-9147			2							9	
Arburg Inc.	– Rocky Hill, CT, 860-667-6500				3							
ARCAM	– Molndal, Sweden, 46 31 710 32 00			2			5				9	
Baker Industries	– Macomb, MI, 586-286-4900											
BeAM	– Cincinnati, OH, 513-236-0623			2							9	
CGTech – Irvine, CA, 949-753-1050		9										
Concept Laser	– Grapevine, TX, 817-328-6500			2			5					
DMG MORI	– Hoffman Estates, IL, 847-593-5400			2							9	
Envisiontec	– Dearborn, MI, 313-436-4300							6	7	8		
EOS North America – Novi, MI, 248-306-0143		17		2					7	8	9	
ExOne	– North Huntingdon, PA, 724-863-9663		1						7		9	
Formlabs	– Somerville, MA, 617-702-8476											
GF Machining Solutions	– Lincolnshire, IL, 847-913-5300						5				9	
GPI Prototype & Manufacturing Services Inc.	– Lake Bluff, IL, 847-615-8900						5				9	
Linear AMS	– Livonia, MI, 734-422-6060											
MachineWorks Ltd.	– Sheffield, UK, 44 114 223 1370											
Mazak Corp.	– Florence, KY, 859-342-1700											
Met-L-Flo Inc.	– Sugar Grove, IL, 630-409-9860											
Methods 3D Inc.	– Sudbury, MA, 978-443-5388						5	6		8	9	
O.R. Laser	– Elk Grove Village, IL, 847-593-5711			2			5					
Proto Labs Inc.	– Maple Plain, MN, 763-479-3680											
Quickparts.com Inc.	– Atlanta, GA, 770-901-3200											
Renishaw Inc.	– West Dundee, IL, 847-286-9953			2							9	
Roland DGA Corp.	– Irvine, CA, 949-727-2100											
Sandvik Osprey	– Neath, UK, +44 163 964 3121											
Saratech	– Mission Viejo, CA, 949-481-3267				3		5	6		8	9	
Sciaky Inc.	– Chicago, IL, 708-594-3800			2							9	
SLM Solutions NA Inc.	– Wixom, MI, 248-243-5400						5				9	
Sodick Inc. – Schaumburg, IL, 847-310-9000		100					5				9	
Star Rapid	– Guangdong, China, 864-751-4838							6				
Stratasys Direct Manufacturing	– Valencia, CA, 661-295-4400							6				
Stratasys Inc.	– Eden Prairie, MN, 800-937-3010				3	4				8		
Trumpf Inc.	– Farmington, CT, 860-255-6000			2								
UL LLC	– Northbrook, IL, 847-272-8800											
voxeljet AG	– Friedberg, Germany, 49 821 7483 100											
Xometry	– Gaithersburg, MD, 240-252-1138		1		3						9	

For more supplier listings, go to [moldmakingtechnology.com/suppliers](http://moldmakingtechnology.com/suppliers).

	Additive Manufacturing Machines for Polymer Parts	Hybrid Additive Manufacturing Machines	Material for Additive Manufacturing	Material for Additive Manufacturing-Ceramics	Material for Additive Manufacturing-Composites	Material for Additive Manufacturing-Metal	Material for Additive Manufacturing-Polymer	Material-Handling Equipment for Additive Manufacturing	Part & Tooling Production Services-Additive Manufacturing	Postprocessing Equipment for Additive Manufacturing	Safety Equipment for Additive Manufacturing	Software for Additive Job & File Management	Software for Additive Manufacturing-Part Design	Training and Consultancy Services-Additive Manufacturing	
	10	11	12	13	14	15	16	17	18	19	20	21	22	WEBSITE	
					14	15		17						<a href="http://3dprintedparts.com">3dprintedparts.com</a>	
	10	11				15								<a href="http://3dplatform.com">3dplatform.com</a>	
					14	15		17						<a href="http://3dsystems.com">3dsystems.com</a>	
		11												<a href="http://absolutemachine.com">absolutemachine.com</a>	
														<a href="http://addupsolutions.com">addupsolutions.com</a>	
10														<a href="http://arburg.us">arburg.us</a>	
					14									<a href="http://arcam.com">arcam.com</a>	
								17						<a href="http://bakerindustriesinc.com">bakerindustriesinc.com</a>	
		11						17						<a href="http://beam-machines.com">beam-machines.com</a>	
											20			<a href="http://cgtech.com">cgtech.com</a>	
														<a href="http://conceptlaserinc.com">conceptlaserinc.com</a>	
														<a href="http://dmgmori.com">dmgmori.com</a>	
														<a href="http://envisiontec.com">envisiontec.com</a>	
10				13	14	15	16		18				22	<a href="http://eos.info">eos.info</a>	
								17						<a href="http://exone.com">exone.com</a>	
10			12											<a href="http://formlabs.com">formlabs.com</a>	
														<a href="http://gfms.com/us">gfms.com/us</a>	
								17						<a href="http://gpiprototype.com">gpiprototype.com</a>	
								17						<a href="http://linearmold.com">linearmold.com</a>	
												21		<a href="http://machineworks.com">machineworks.com</a>	
		11												<a href="http://mazakusa.com">mazakusa.com</a>	
								17						<a href="http://metlflo.com">metlflo.com</a>	
														<a href="http://methods3d.com">methods3d.com</a>	
														<a href="http://or-laser.com">or-laser.com</a>	
								17						<a href="http://protolabs.com">protolabs.com</a>	
								17						<a href="http://quickparts.com">quickparts.com</a>	
														<a href="http://renishaw.com">renishaw.com</a>	
					14	15								<a href="http://rolanddga.com">rolanddga.com</a>	
					14									<a href="http://materials.sandvik/metalpowder">materials.sandvik/metalpowder</a>	
10				13	14	15		17			20	21	22	<a href="http://saratech.com">saratech.com</a>	
								17						<a href="http://sciaky.com">sciaky.com</a>	
					14									<a href="http://slm-solutions.us">slm-solutions.us</a>	
														<a href="http://sodick.com">sodick.com</a>	
					14	15		17						<a href="http://starrapid.com">starrapid.com</a>	
					14	15		17						<a href="http://stratasysdirect.com">stratasysdirect.com</a>	
10	11			13		15	16	17	18		20	21	22	<a href="http://stratasys.com">stratasys.com</a>	
														<a href="http://us.trumpf.com">us.trumpf.com</a>	
										19				<a href="http://voxeljet.com">voxeljet.com</a>	
								17						<a href="http://voxeljet.com">voxeljet.com</a>	
10					14	15								<a href="http://xometry.com">xometry.com</a>	

Image courtesy of Avante Technology LLC.



## Robotics Work on 3D Parts to Increase Throughput in Automation Cell

An automation cell from **Methods Machine Tools Inc.** is designed to decrease the time from 3D printing to final post-processing by combining additive manufacturing with robotics and subtractive processes, which provides fast, highly efficient production of finished 3D parts.

The 20-ft. cell includes a 3D-printed product in-feeding station which shuttles 3D parts on build plates into a FANUC America C600 EDM that makes a cut between the parts and build plates. In the next station, a FANUC robot snaps the plates from the printed parts and transfers the parts to a FANUC RoboDrill for a final machining operation.

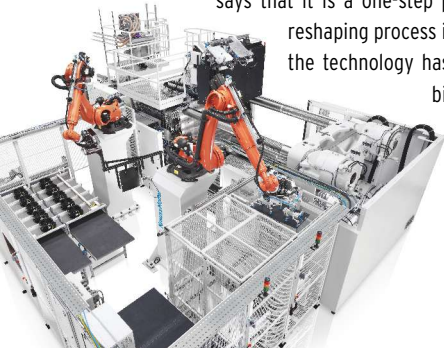
**FANUC America / 248-377-7000 / [fanucamerica.com](http://fanucamerica.com)**

**Methods Machine Tools Inc. / 978-443-5388 / [methodsmachine.com](http://methodsmachine.com)**

## Technology Combines Processes for Strong, Lightweight Components

**KraussMaffei** offers FiberForm technology and the GXW 450-2000/1400 multi-component injection molding machine cell featuring swivel plate technology. The FiberForm process combines the thermoforming of organo sheets and injection molding into a single process. This process results in fiber-reinforced plastic components that are particularly lightweight yet feature a high level of strength. KraussMaffei says that FiberForm is a high-strength, lightweight metal replacement for the automotive industry. The company describes the process as an ideal combination of thermoforming and injection molding and says that it is a one-step procedure for using an integrated reshaping process in the mold. The company says that the technology has short cycle times and the capability of handling large industrial quantities.

**Krauss-Maffei Corp. / 859-283-0200 / [kraussmaffeigroup.us](http://kraussmaffeigroup.us)**



## Economic 3D Printer Uses Powder Bed Process

**O.R. Laser** says its Orlas Creator metal 3D printing platform offers a new paradigm for the high quality, economic 3D printing of metal products and parts. According to O.R. Laser, Orlas Creator has a powder bed process that utilizes a high-quality laser and a proprietary recoater blade that has speeds up to 30 percent faster than comparable systems.

O.R. Laser is releasing the Orlas Creator with an open source materials approach, which means that customers are not locked into an arrangement with any specific materials supplier. However, the company is aware of the issues that arise from processing metal AM powders, and the company says it is keen to offer its customers options for optimal performance with the Orlas Creator.

Therefore, O.R. Laser is in collaboration with Heraeus with the goal of qualifying Heraeus powdered materials for the Orlas Creator and then developing specific 3D printing parameters and guidelines for Heraeus powders. To do that, Heraeus will obtain an Orlas Creator system and test it with a wide range of its powdered materials.

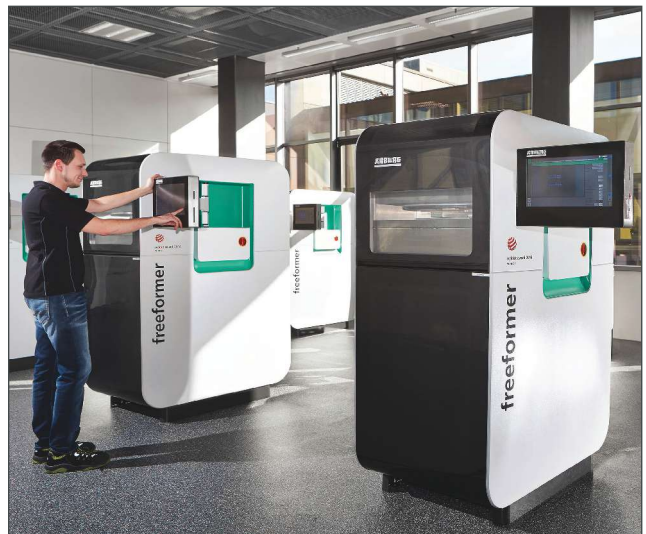
**O.R. Laser / 847-593-5711 / [or-laser.com](http://or-laser.com)**



## Plastic Additive Machine Offers Material Choice and Optimization

With a freeformer and numerous functional parts, **Arburg Inc.** says its Plastic Freeformer (APF) is suitable for prototyping and industrial additive manufacturing of functional parts. Freeformer customers can qualify their own materials using the APF process and optimize process parameters to the application at hand. Arburg says that an enormous advantage in this context is that certified original materials can be used. In addition to amorphous standard granules such as ABS, PA and PC, the company's range of qualified materials includes elastic TPE, medical-grade PLLA, PC that is approved for the aerospace industry and semi-crystalline PP.

**Arburg Inc. / 860-667-6500 / [arburg.us](http://arburg.us)**







### AM Powder Designed to Create Conformal Cooling Channels

**Uddeholm USA** announces the launch of Corrax additive manufacturing powder, a product designed for the additive manufacturing of tooling components. Uddeholm says that using Corrax additive manufacturing powder enables the creation of conformal cooling channels to reduce cycle times. Uddeholm maintains that Corrax powder is excellent for additive manufacturing tooling applications because of high demand, short run series and the ever-increasing need for shorter lead times.

Uddeholm announces its 350th anniversary as a manufacturer of industrial tool steels in 2018. Based in Hagfors, Sweden, Uddeholm has delivered high-alloyed steels since opening in 1668. Uddeholm provides tooling solutions through technical know-how, advice and support to customers from over 90 countries around the world. Uddeholm serves customers in a wide range of industries, providing local stocking and technical support for tool steels, mold materials and specialty alloys. Uddeholm opened its first facility in the United States in 1925.

**Uddeholm USA / 800-638-2520 / bucorp.com**

### Conformal Cooling Design and Cleaning Services and Standard Cooling Components

TruCool Conformal Cooling from **DME** is designed to maximize cooling efficiency through additive metal manufacturing. This line of conformal cooling products with complex cooling channels conforming to the part surface geometry provides greater overall cooling coverage with even distribution while maintaining a targeted, consistent temperature and reducing cycle times by as much as 60 percent. DME announces three new products and services to the TruCool line. First, DME Design Services builds on decades of moldmaking, mold design, thermal analysis and conformal channel design to provide customers with the most reliable, robust and efficient mold design. It comes with the ability to trouble shoot, clean and descale both conventional and conformal cooling water channels to maximize the lifespan and efficiency of intricate conformal and conventional cooling through a closed-loop, computer-controlled, automated process. Second, DME says its new cooling aftermarket services and equipment provide the ultimate cooling channel cleaning, diagnostics and maintenance. Third, DME announces its new line of TruCool "standard" conformal-cooled components, which includes core pins, gates and sprue bushings.

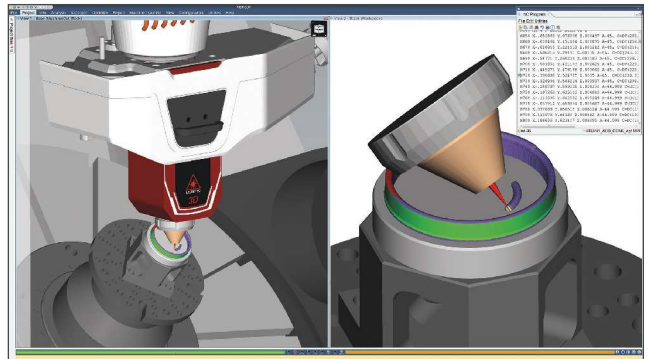
**DME - Milacron / 800-626-6653 / dme.net**



### Metal 3D Printer Combines Laser Sintering and High-Speed Milling

The Sodick OPM250 metal 3D printer from **Plustech Inc./Sodick Inc.** combines laser sintering of metal powder and high-speed milling in the same machine. This can speed production of tooling components such as cores and cavities with conformal cooling channels. Additive manufacturing reportedly can produce in one piece components that would normally be assembled from multiple parts.

**Sodick Inc. / 888-639-2325 / sodick.com**



### Additive Manufacturing Simulation Offers Virtual Experimentation

**CGTech** offers additive manufacturing (AM) simulation capabilities in Vericut. The additive module of Vericut simulates both additive and traditional machining capabilities of hybrid CNC machines. CGTech works with its customers and technology partners to solve AM challenges including accurate laser cladding and material deposition, collision detection between the machine and additive part, and the discovery of errors, voids and misplaced material. CGTech says that Vericut 8.1 adds the ability to identify potential problems that can occur when integrating additive methods. The simulation uses the same post-processed NC code that is used to drive the CNC machine. Users can virtually experiment with combining additive and metal removal processes.

CGTech says that Vericut's model of the hybrid process assures customers that parts will be developed correctly without incurring damage to the part, the machine that builds it or to the laser equipment.

**CGTech / 949-753-1050 / cgtech.com**

# Democratizing 3D Printing of Injection Mold

By Christina Fuges

Bob Zollo is founder and CEO of Avante Technology LLC, which focuses on educating and assisting companies seeking to incorporate desktop fused deposition modeling (FDM) 3D printing as part of their work process. Zollo has developed 3D printing materials, technology and design guidelines specifically for 3D-printed injection molds. His experiences led him to developments and insights on 3D-printed moldmaking:

**Design.** Zollo believes that the next major obstacle to broader adoption of 3D-printed molds is overcoming the lack of know-how in designing these molds. He says that printed plastic molds differ from metal molds in their surface energy, mechanical strength and heat conductance. He says, for example, “Increase the draft of internal pins and structures to ensure smooth movement between mold halves. If 3-percent draft was specified in the CAD drawing for metal molds, revise this to 4 to 5 percent for printed plastic molds.” Holes should be printed slightly smaller in diameter, so they can be post processed to smooth the interior. Other examples of principles that need to be learned and applied include how to adapt the infill and outer layer print strategy to optimize mechanical strength.

Zollo believes that the next major obstacle to broader adoption of 3D-printed molds is overcoming the lack of know-how in designing these molds.

**Materials.** “Engineers designing a part usually begin with mechanical and other physical characteristics and then select material based on these requirements. For me, it seemed logical to start with the mechanical and chemical properties required to create high-performance parts and molds and formulate the

material to meet these requirements,” Zollo says. After coming to this realization, he began to focus on developing materials for finely extruded parts. He went back to the lab and worked with a few of his previously developed materials and discovered that some of the compounds worked well for 3D printing. The result of Zollo’s R&D was a carbon-nanotube reinforced, high-performance composite filament for plastic composite molds. This composite material can handle the required stress

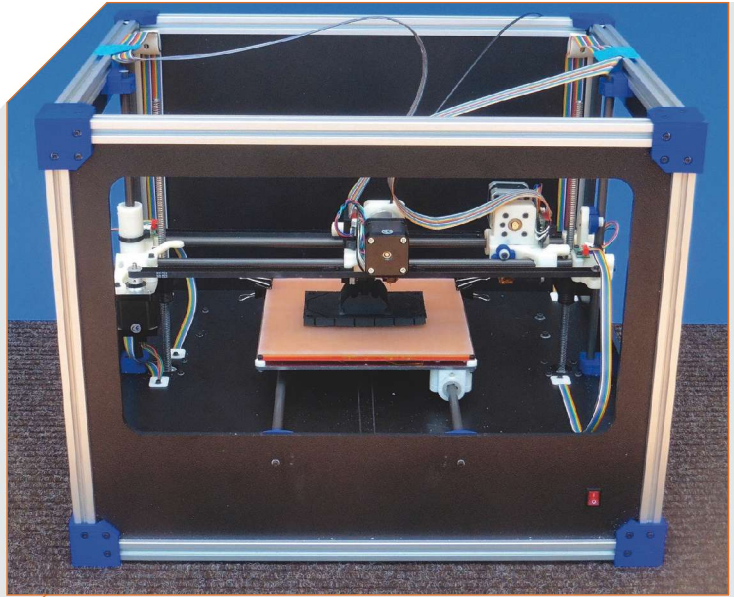


Image courtesy of Avante Technology LLC.

This proprietary, high-precision desktop 3D printer has automatic print bed contour profiling and spring-loaded pins to measure the exact height of 25 points on the print bed.

and is resilient in the molding process. “It also possesses low surface energy (like Teflon), which means the injected material comes in and just glides over the surface,” Zollo says.

**The 3D printer.** When Zollo tested printing precision molds and parts on a range of open-source printers, he was not satisfied with the precision, reliability and quality of any third-party printers. So, he and CTO Ron Aldrich set out to develop a proprietary high-precision desktop printer. The approach was to develop and optimize a printer for the material, not the other way around.

“Our high-precision 3D printer looks like a conventional FDM printer,” Zollo says. Several subtle features enable precision printing, like the 25-point measurement of the entire print bed before each print job to create a 3D profile of any deviation in flatness, an ARM Cortex processor-based controller board and proprietary printer driver controls of the stepper motors. The STL file-slicing engine software has also been customized to deliver more consistent plastic flow for a denser, smoother finish. When Zollo tested printing molds in his lab, he was surprised to learn that his printed molds could easily support 100+ cycles, depending on the design of the mold and the material being molded. [MMT](#)

## CONTRIBUTOR

Bob Zollo is founder and CEO of Avante Technology LLC.

## FOR MORE INFORMATION

Avante Technology LLC / 425-273-4740 / [avante-technology.com](http://avante-technology.com)



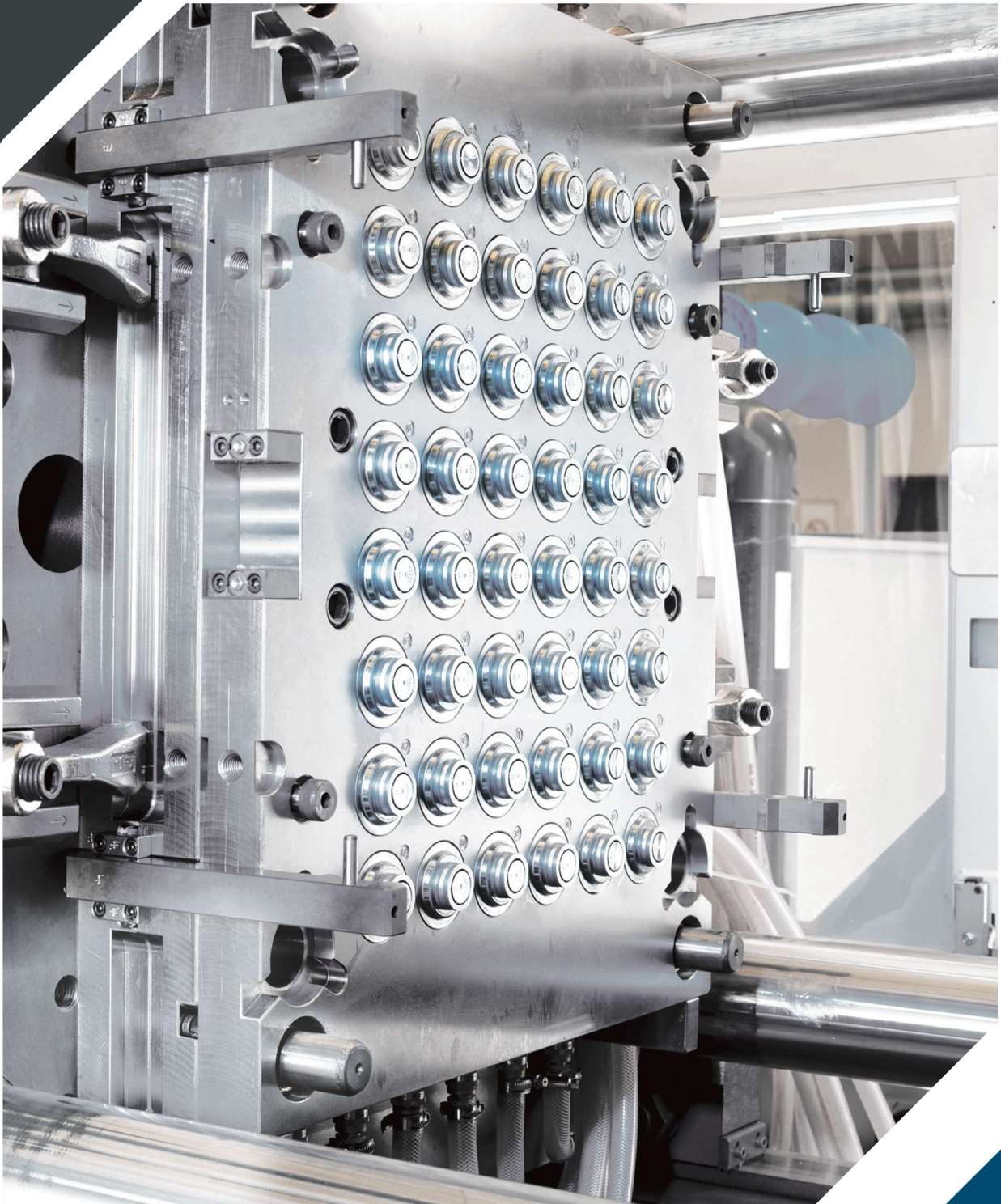


Image courtesy of Schmolz + Bickenbach USA.





**EDRO Engineering  
and Specialty Steels, Inc.**



California / Pennsylvania / Illinois  
West: 800-368-3376  
East: 800-368-3376

[edro.com](http://edro.com)

## PRODUCTS/SERVICES



### Innovative Tooling Solutions

#### Specialty Steels, Aluminum, Copper Alloys, Custom Mold Bases and Precision Machining Services

EDRO is a leading manufacturer of custom mold bases and specialty steels for the plastics and rubber tooling industries. EDRO also offers a comprehensive line of premium tool steels, aluminum and copper alloys.

**RoyAlloy™**  
STAINLESS STEEL

**MOLDMAX®**  
MOLD ALLOYS

**QC-10®**  
ALUMINUM

**BÖHLER**  
TOOL STEELS

## WEBSITE



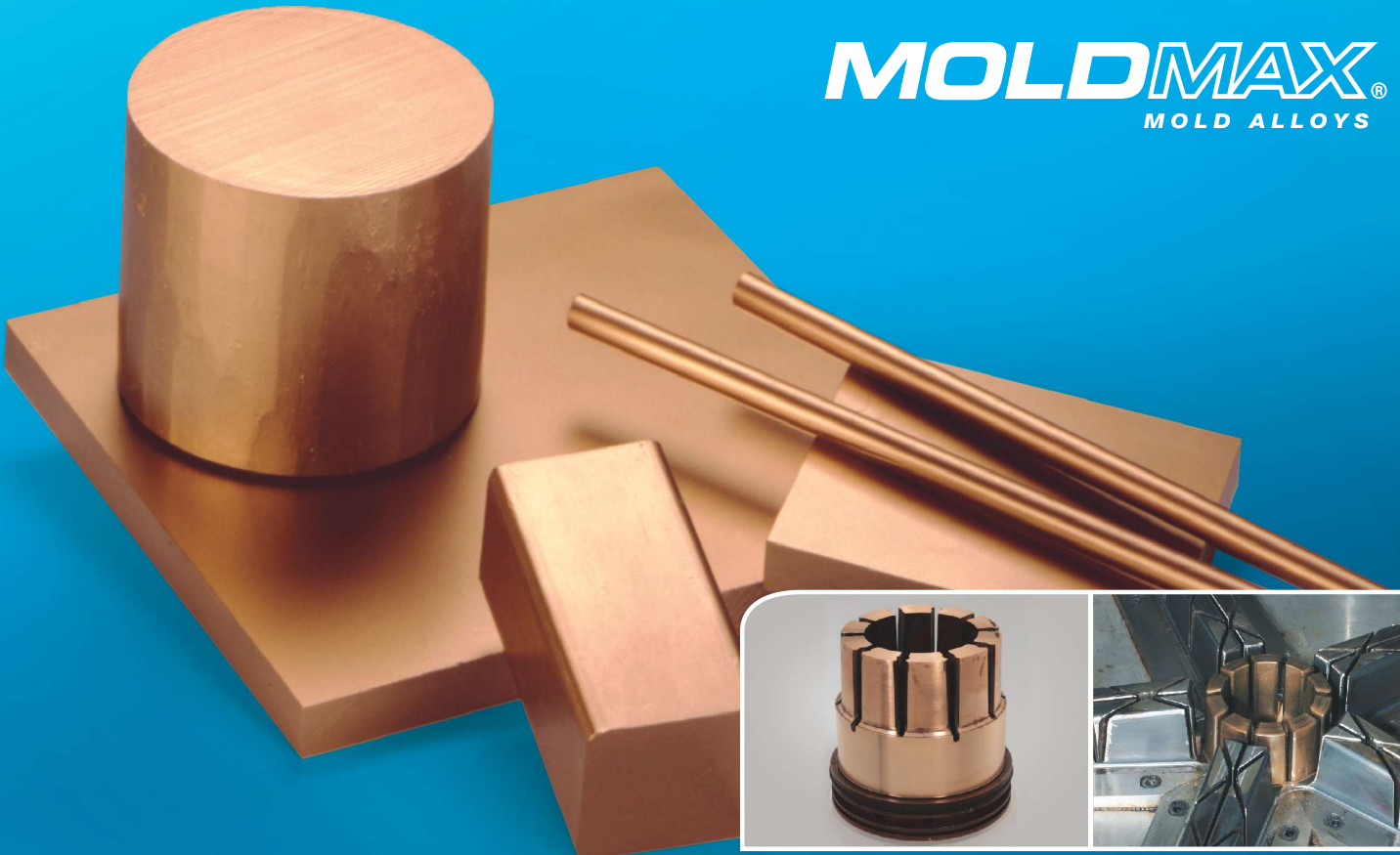
EDRO is a leading manufacturer and distributor of custom mold bases, specialty steels, and aluminum for the plastics tooling industry, consisting of two main divisions that service a diverse range of customers.

[edro.com](http://edro.com)

## PRODUCT CATEGORIES

- Custom Mold Bases
- Precision Machining Services
- Stainless Steel
- Tool Steel/Mold Steel
- Aluminum
- Copper Alloys

**MOLDMAX<sup>®</sup>**  
MOLD ALLOYS



**EDRO** is a proud distributor of  
**MOLDMAX<sup>®</sup>** Alloys  
MOLD ALLOYS

**MOLDMAX<sup>®</sup>**  
MOLD ALLOYS

High conductivity alloys  
for the plastic mold industry

GRADE	HARDNESS (HRC)	THERMAL CONDUCTIVITY (BTU/FT HR °F)	APPLICATION
<b>MoldMAX<sup>®</sup> HH</b>	40 HRC	75	Injection Molds – longest life, Blow Mold components
<b>MoldMAX<sup>®</sup> LH</b>	30 HRC	90	Injection Molds – fastest cycle, Blow Mold components
<b>MoldMAX<sup>®</sup> V</b>	28 HRC	92	Injection Molds – fastest cycle, Blow Mold components
<b>MoldMAX<sup>®</sup> XL</b>	30 HRC	40	Injection Molds requiring good polishability, large sizes
<b>PROtherm<sup>™</sup></b>	20 HRC	145	Injection and Blow Molds, hot runner tips

EDRO EAST (888) 368-3376  
EDRO WEST (800) 368-3376  
INFO@EDRO.COM | EDRO.COM

**EDRO**



**International Mold Steel**  
**6796 Powerline Drive**  
**Florence, KY 41042**

Phone: 859-342-6000  
 Toll-Free: 800-625-6653  
 Fax: 859-342-6006  
 Email: britt@imsteel.com

[imsteel.com](http://imsteel.com)

## PRODUCTS/SERVICES



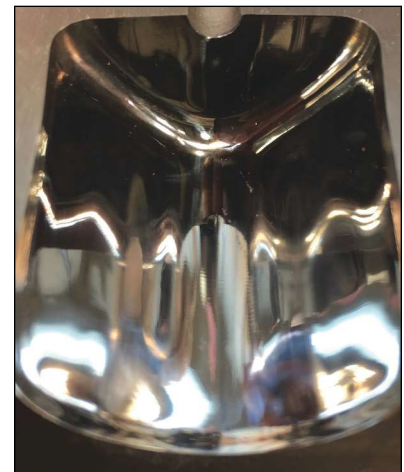
### Nak 55

Pre-hardened to 38-42 HRC. Uniform hardness even in large cross sections of material. Never needs stress relieving. Machines 30-40% faster than P20. Highly weldable without showing any evidence on the plastic part. EDM layer is easy to remove. Material stocked up to 12-3/4" thick. Rounds available up to 22" in diameter.



### Nak 80

Pre-hardened to 38-42 HRC. Uniform hardness even in large cross sections of material. Never needs stress relieving. Machines 10-15% faster than P20. Highly weldable without showing any evidence on the plastic part. EDM layer is easy to remove. Polishes up to a lens-quality finish. Material stocked up to 12-3/4" thick. Rounds available up to 5" in diameter.



### S-Star ESR

Plate product comes in the annealed hardness range and can be heat-treated up to 50-53 HRC. Round product comes in the pre-hard condition (31-34 HRC), however this can also be heat-treated to 50-53 HRC.

Excellent corrosion resistance, Superior mirror-finished surface. Minimal distortion, less than +/-0.03% after heat treatment.

## WEBSITE



International Mold Steel supplies specialty mold steels. IMS also provides value-added processes such as surface grinding, squaring, milling, gundrilling, and CNC machining.

[imsteel.com](http://imsteel.com)

## PRODUCT CATEGORIES

- Band Saws
- Grinding Machines
- Gundrilling Machines
- Milling Machines
- Tool Steel/Mold Steel
- Vertical Machining Centers



☆☆☆☆ **KNOCK-OUT** ☆☆☆☆

# THE COMPETITION WITH THE **ONE-TWO PUNCH!**

FROM



**DAIDO STEEL**

**PLASTIC & RUBBER MOLD STEELS**

**NAK80** & **NAK55**  
**(38-42 HRC)** **(38-42 HRC)**

High Polish – lens quality SPI A-I Finish

Easy to Machine – no hard spots

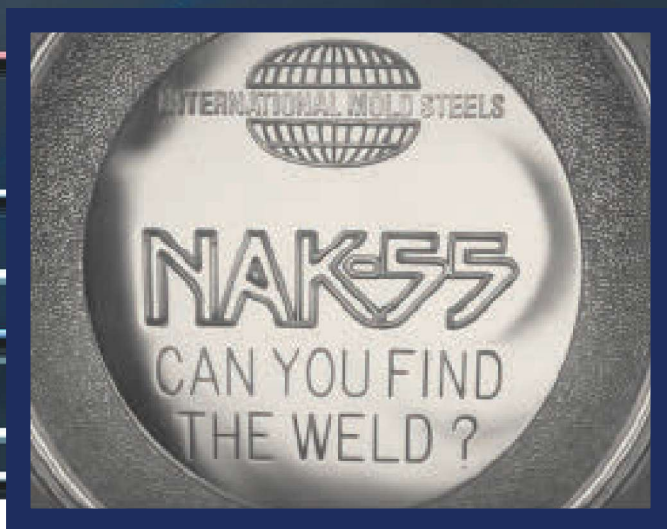
Very Stable – does not need stress relieving

Capable of the perfect weld – polished and textured surfaces

Easy to Machine – 30-50% easier than P20

Very Stable – does not need stress relieving

Capable of the perfect weld – polished and textured surfaces



INTERNATIONAL MOLD STEEL, INC.



☆☆☆☆☆☆☆☆ A DAIDO STEEL PARTNER COMPANY ☆☆☆☆☆☆☆☆

INTERNATIONAL MOLD STEEL, INC.



WWW.IMSTEEL.COM | 800.625.6653



COMPANY	Advertisers are listed in bold type.	See Ad	Aluminum Alloys	Aluminum Cast Plate	Beryllium Copper	Beryllium Copper Substitute Alloys	Brass
			1	2	3	4	5
Alpase	– Chino, CA, 951-685-2155		1	2			
Alro Steel Corp.	– Jackson, MI, 517-787-5500		1	2	3	4	5
Ampco Metal Inc.	– Arlington Heights, IL, 847-437-6000					4	
Arconic	– Cleveland, OH, 216-641-4623		1				
Aviva Metals	– Houston, TX, 800-231-0771				3	4	5
BMS Burns	– Medina, OH, 800-345-7693						
<b>Buderus Edelstahl GmbH</b>	<b>– Windsor, ON, 519-562-6651</b>	<b>30</b>					
Clinton Aluminum and Stainless Steel	– Clinton, OH, 330-882-6743		1	2			
Diehl Tool Steel Co.	– Cincinnati, OH, 513-242-8900						
Dix Metals Inc.	– Huntington Beach, CA, 888-810-9660		1	2			
DMS	– Oldcastle, ON, 519-737-6743		1				
Dow Corning Corp.	– Midland, MI, 989-496-6000						
<b>Edro Engineering and Specialty Steels Inc.</b>	<b>– Walnut, CA, 909-594-5751</b>	<b>25</b>		<b>2</b>			
Ellwood Specialty Steel	– New Castle, PA, 724-657-1160			2			
Finkl & Sons Co., A	– Chicago, IL, 773-975-2510		1				
Finkl Steel Canada	– Brampton, ON, 905-457-2501						
General Plastics Manufacturing Co.	– Tacoma, WA, 253-473-5000						
<b>Hasco America Inc.</b>	<b>– Fletcher, NC, 828-650-2600</b>	<b>49</b>					
IBC Advanced Alloys	– Franklin, IN, 317-738-2558				3	4	
Industeel USA LLC (Arcelormittal)	– Coatesville, PA, 610-383-3000						
<b>International Mold Steel Inc.</b>	<b>– Florence, KY, 859-342-6000</b>	<b>27</b>					
Ipsco International	– Attleboro, MA, 508-226-1776		1				
Matron Performance Alloys	– Mayfield Heights, OH, 216-383-6800				3	4	
National Tool & Manufacturing	– Wheeling, IL, 847-806-9800						
Omni Mold Systems	– Lisbon, CT, 888-666-4755						
OnlineMetals.com	– Seattle, WA, 206-285-8603		1	2	3	4	5
PCP Canada	– Saguenay, QC, 418-677-3939			2			
Performance Alloys & Services Inc.	– Germantown, WI, 262-255-6662					4	
Precision Marshall Steel	– Washington, PA, 724-222-2100						
Rudolph Bros. & Co.	– Canal Winchester, OH, 800-375-0605						
Schmolz+Bickenbach USA Inc.	– Carol Stream, IL, 630-682-3900				3		
Sturdell Industries	– Rochester, NY, 585-464-0800						
Superior Die Set Corp.	– Oak Creek, WI, 414-764-4900		1				
TCI Precision Metals	– Gardena, CA, 800-234-5613		1	2			5
Tekcast Industries RI	– Warwick, RI, 401-785-9500						
thyssenkrupp Materials - Copper and Brass Sales	– Southfield, MI, 800-926-2600		1	2	3	4	5
Uddeholm USA	– Elgin, IL, 630-883-3100				3	4	
Vista Metals Corp.	– Fontana, CA, 909-823-4278		1	2			
Wacker Chemical Corp.	– Adrian, MI, 517-264-8500						
Yarde Metals	– Southington, CT, 860-406-6061		1	2			

For more supplier listings, go to [moldmakingtechnology.com/suppliers](http://moldmakingtechnology.com/suppliers).

<i>Bronze</i>	<i>Copper Alloys</i>	<i>Foams</i>	<i>Liquid Rubber</i>	<i>Polyurethane Prepolymers</i>	<i>Stainless Steel</i>	<i>Tool Steel/Mold Steel</i>	
6	7	8	9	10	11	12	WEBSITE
							<a href="http://alpase.com">alpase.com</a>
6	7			10	11	12	<a href="http://alro.com">alro.com</a>
6	7						<a href="http://ampcometal.com">ampcometal.com</a>
							<a href="http://arconic.com">arconic.com</a>
6	7						<a href="http://avivametals.com">avivametals.com</a>
					11	12	<a href="http://bmsburns.com">bmsburns.com</a>
						12	<a href="http://buderus-steel.com">buderus-steel.com</a>
					11		<a href="http://clintonaluminum.com">clintonaluminum.com</a>
					11	12	<a href="http://diehlsteel.com">diehlsteel.com</a>
					11	12	<a href="http://dixmetals.com">dixmetals.com</a>
							<a href="http://dmscomponents.com">dmscomponents.com</a>
		8	9				<a href="http://dowcorning.com">dowcorning.com</a>
					11	12	<a href="http://edro.com">edro.com</a>
					11	12	<a href="http://ess.elwd.com">ess.elwd.com</a>
						12	<a href="http://finkl.com">finkl.com</a>
						12	<a href="http://sorelforge.com">sorelforge.com</a>
		8					<a href="http://generalplastics.com">generalplastics.com</a>
					11	12	<a href="http://hasco.com">hasco.com</a>
6	7						<a href="http://ibcadvancedalloys.com">ibcadvancedalloys.com</a>
					11	12	<a href="http://industeel.info">industeel.info</a>
					11	12	<a href="http://imsteel.com">imsteel.com</a>
					11		<a href="http://ipscoinernational.com">ipscoinernational.com</a>
	7						<a href="http://materion.com">materion.com</a>
					11	12	<a href="http://ntm.com">ntm.com</a>
					11	12	<a href="http://omnimold.com">omnimold.com</a>
6	7			10	11	12	<a href="http://onlinemetals.com">onlinemetals.com</a>
							<a href="http://pcp-canada.com">pcp-canada.com</a>
6	7						<a href="http://moldstar.com">moldstar.com</a>
						12	<a href="http://pmsteel.com">pmsteel.com</a>
			9	10			<a href="http://rudolphbros.com">rudolphbros.com</a>
	7				11	12	<a href="http://schmolz-bickenbach.us">schmolz-bickenbach.us</a>
					11	12	<a href="http://sturdell.com">sturdell.com</a>
						12	<a href="http://superiordieset.com">superiordieset.com</a>
	7					12	<a href="http://tciprecision.com">tciprecision.com</a>
			9	10			<a href="http://tekcast.com">tekcast.com</a>
6	7				11		<a href="http://tkmna.com">tkmna.com</a>
	7				11	12	<a href="http://bucorp.com">bucorp.com</a>
							<a href="http://vistametals.com">vistametals.com</a>
			9				<a href="http://wacker.com">wacker.com</a>
					11		<a href="http://yarde.com">yarde.com</a>

Image courtesy of Ellwood Specialty Steel.



## Steel Solutions Offered Closer to North American Customers

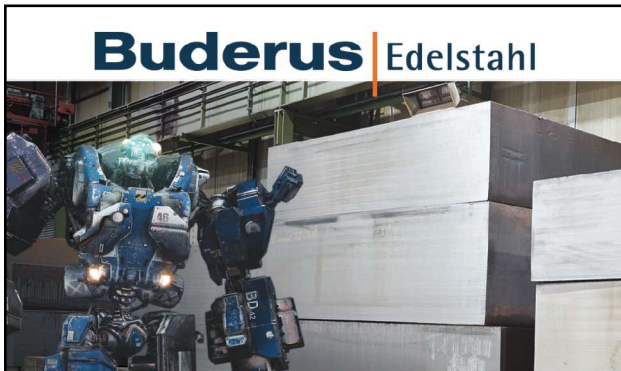
**Scana Steel USA Inc.**, Scana's Chicago-based U.S. hub, stocks various tool and die steel grades in different sizes for delivery to North American customers. The company also produces grades such as P20, O2, O6, S5, S7, W2, 420, H10, H11 and H13 in forms of bars and blocks with a maximum thickness of 50" for hot or cold work applications. The company's U.S. branch performs and outsources sawing, cutting, gun drilling and milling tool and die steel bars or blocks to deliver products as close to near net shape as possible to the North American customers. In-house steelmaking, forging, heat treatment and machining are company traditions that go back over 360 years in Sweden. As a global company, Scana supplies forged steel products for clients in tool steel, machine and energy markets.

**Scana Steel USA Inc. / 224-277-2020 / [scanasteel.com](http://scanasteel.com)**

## Plastic Mold and Tooling Alloys for High Production Demands

**Materion Performance Alloys** says that MoldMax plastic tooling alloys provide a unique combination of strength, thermal conductivity and machinability. The benefits of using MoldMax for plastic molding process include shorter cycle times and improved part quality. Materion offers a variety of MoldMax alloys to meet the high production demands of the plastic processing industry.

**Materion Performance Alloys / 800-375-4205 / [materion.com](http://materion.com)**



### **NO LIMITS**

**Buderus Mold Block Depot - Bumper & IP block.  
Regular and HiHard.**

**Mold Block up to 120,000 LB.**

**Full-service available regarding pre-machining.**

**Made in Germany ThruHard Supreme,  
the world's finest steel for large tools,  
now available from stock in Canada.**

**An approved Vendor at the key Auto Companies.**

**Minority supply can be accommodated.**

**Dan Coll,**

**Representative: [Dan.coll@buderus-steel.com](mailto:Dan.coll@buderus-steel.com) 519 562 6651**

## Group of Mold Materials Features Wear-Resistant Products

**Finkl Steel Canada** has the patent-pending, pre-hardened mold steel Corebloc, which was engineered for injection molding tools and for the core plate of injection molds up to 40" (1015 mm) in size. Finkl says that the excellent ability to harden through characterizes this steel in comparison to standard materials like 4140 and 1.2312, and that Corebloc's machinability and resistance to wear are outstanding.

Corebloc is suitable for laser-hardening, chrome-plating and nitriding. Finkl says that users save from expenses on core-side molds and tools. Finkl also offers the plastic mold steel MD-Xtra SH (Super Hard). Microalloying additions ensure higher hardness levels than material that is typically available.

With a hardness ranging to 43 HRC, the wear resistance is significantly increased. Polishability is guaranteed up to 1200 grit. MD-Xtra SH is ideal for manufacturing sophisticated automotive components with extremely smooth surfaces. Its remelted counterpart, MLQ-Xtra, combines these benefits with a guaranteed SPI A1 finish.

**Finkl Steel Canada / 800-268-3077 / [finkl.com](http://finkl.com)**

## Solution for Manufacturing Reflector and Lens Molds

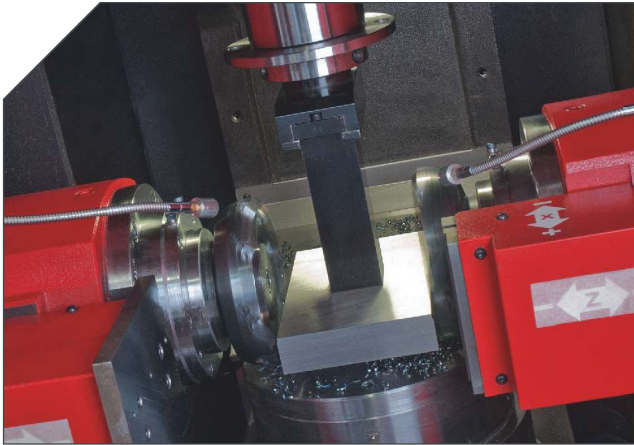
**Schmolz+Bickenbach USA** offers extremely corrosion-resistant, hardened high-grade steel Formadur PH X Superclean from DEW. With its excellent polishability, Schmolz+Bickenbach says that Formadur PH X Superclean is an ideal solution for manufacturing reflector and lens molds. Formadur 2083 Superclean from DEW also is resistant to corrosion. Resistance to wear makes this material ideal for PVC extrusion tools and smaller cross section injection molds. Schmolz+Bickenbach also features Corroplast FM from DEW at NPE2018. Corroplast FM is a material engineered for sophisticated plastic mold bases. The company says that this free-machining, pre-hardened stainless steel has outstanding machining characteristics and dimensional stability.

**Schmolz+Bickenbach USA Inc. / 800-323-1233 / [schmolz-bickenbach.us](http://schmolz-bickenbach.us)**

## Alloy Has Consistent Microstructure for Surface Finishing

**Ellwood Specialty Steel (ESS)** is now stocking an improved P20 modified alloy that the company says is tailored to the needs of the moldmaking industry for superior mold finishes. Ellwood recognizes that as demand grows for molds with mirror polishes and complex texture patterns, the capability of the mold steel becomes a critical factor for achieving perfect parts. Ellwood uses a refined chemistry to optimize internal properties in addition to its advanced steelmaking processes. Ellwood says that as a result, mold builders can use ESS P20 Modified for their toughest jobs. ESS P20 Modified alloy has consistent through hardness and microstructure, which enable successful surface finishing. Block sizes are available in thicknesses ranging to 25" and are cut in custom sizes for quick delivery.

**Ellwood Specialty Steel / 724-657-1160 / [ess.elwd.com](http://ess.elwd.com)**



### Steel Requires Less Machining than D2 after Heat Treatment

**Diehl Tool Steel Inc.** now offers **Hitachi Metals America, LLC's** SLD-i cold work premium tool steel, which is an advanced tool steel grade used in various blanking and forming applications where advanced, high-strength steel (AHSS) parts are processed. It is produced using the same heat treatment as D2 but exhibits better wear and toughness when used for forming and trim sections. It also shows better wear than 8-percent cold-rolled steels for specific draw sections of large automotive dies.

Because of the unique manufacturing process, Hitachi SLD-i also minimizes heat treating deformation. Hitachi SLD-i requires less machining after heat treatment and a decreased amount of shape adjustment than D2. In specific application areas, customers have experienced improvement over conventionally applied D2. SLD-i is now available in flat cross-sections up to 5" thick and provides an effective combination of wear resistance, toughness and tool performance. Diehl can machine Hitachi SLD-i tool steel to toolmaker tolerances using its Accu-Square process.

**Diehl Tool Steel Inc. / 513-242-8900 / [diehlsteel.com](http://diehlsteel.com)**  
**Hitachi Metals America LLC / 248-465-6400 / [hitachimetals.com](http://hitachimetals.com)**

### Mix of Mold Plate Materials Available

**Clinton Aluminum and Stainless Steel** stocks the full spectrum of alloys. Clinton Aluminum and Stainless Steel's mold plate products include M1, Duramold-2, Duramold-5, M5, Formodal, Alumold, Hokotol and Weldural along with its new product CA-7 plus, which the company says helps close the gap between the cast products and the heavy forged 7000 plate.

Clinton Aluminum and Stainless Steel has millions of pounds of aluminum plate, bar, rod, sheet and structural shapes at its multiple processing facilities. Multiple plate saws in each facility help the company process customer orders quickly and accurately, and the company's logistics team delivers daily to help customers meet critical lead times.

**Clinton Aluminum and Stainless Steel / 800-826-3370 / [clintonaluminum.com](http://clintonaluminum.com)**



### Custom Machine-Ready Blanks Are Made to Order

Custom machine-ready blanks from **TCI Precision Metals** provide the high value process of finish machining by eliminating material prep and other time-consuming processes. Machine-ready blanks can be furnished as close as  $\pm .0005$ " dimensionally and as close as .0002" in flatness, squareness and parallelism.

For custom machine-ready blanks, typically, square, rectangular or round stock is milled to the customer's net specifications. TCI Precision Metals specializes in producing flat plate stock, which minimizes part movement during final machining. Feature-added blanks are milled to the same tight tolerances as custom blanks, but include one or more added features—milling, hogging, roughing or finish CNC machining, if required.

Machine-ready dovetail blanks are made-to-order from one to thousands, each including a precision dovetail to match the customer's brand and model of workholding fixture. The company says these blanks are perfect for four- and five-axis machining.

**TCI Precision Metals / 800-234-5613 / [tciprecision.com](http://tciprecision.com)**

### Pre-hardened Steels Eliminate the Need for Heat Treat

**International Mold Steel** offers mold base steels and cavity and core steels. It has Toolox 33 and Superplast Stainless mold base steels. It also has cavity and core steels like Nak 55, Nak 80, PX5 Modified P20, S-Star 420 Modified, DH2F Modified H-13 and Toolox 44.

The company says its pre-hardened steels save time by eliminating the need for heat treatment, which eliminates the need for secondary machining. With mold shop deliveries getting shorter and shorter, International Mold Steel's customers need to squeeze as much time out of their mold builds as possible.

In some cases, its customers are seeing double the cutter life of their tooling. International Mold Steel says that these qualities increase savings for the moldmaker and the mold.

**International Mold Steel Inc. / 800-625-6653 / [imsteel.com](http://imsteel.com)**



# Welding Pre-hardened 40 Rockwell Material

By Paul Britton

Welding pre-hardened 40 Rockwell material requires certain conditions and considerations. Here are some tips for employing safe shop welding practices.

Prior to making a welding repair, slowly heat the workpiece in a furnace or with a gas burner to between 600°F and 750°F. Heat the workpiece from the bottom if a gas burner is used. Maintain uniform temperatures within the recommended range during the entire repair. It is ideal to heat the mold in a furnace to achieve uniform temperatures. This is easy to do for small molds but may not be practical for large molds.

Localized preheating is the most effective option for large molds. All the same, adhere to the following steps:

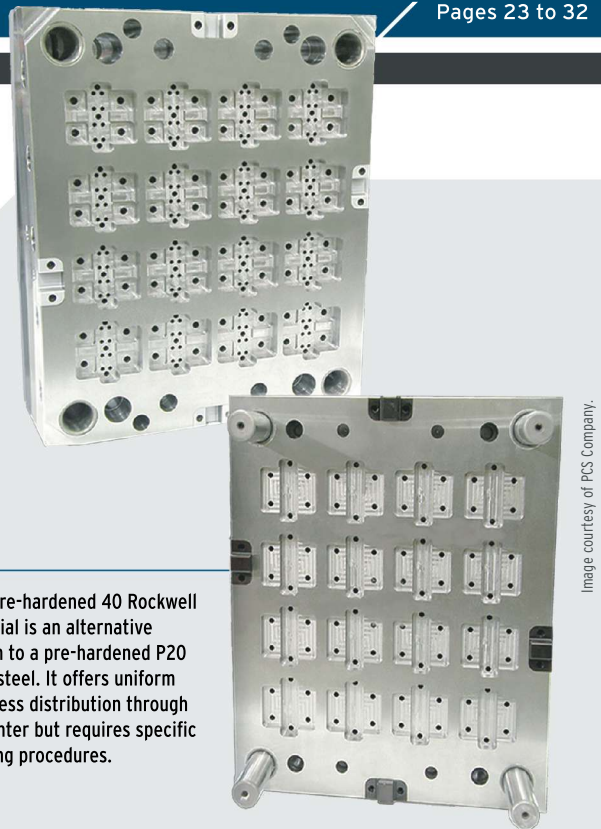
- Maintain the preheat temperature at least 2 inches away from the area that will be welded in all directions.
- Use an oxygen-propane gas burner with a low-flame temperature.
- Heat the mold carefully and gradually while keeping 18 inches between the flame and the mold surface.
- Apply a temperature choke or a surface contact thermometer to accurately measure the preheating temperature.
- Reheat as necessary during welding to maintain a temperature above 600°F.

The recommended welding parameters for pre-hardened 40 Rockwell material are as follows:

Rod Diameter	Electrode Diameter	Current/Amps
0.0470"	0.0470"	40~70
0.0630"	0.0630"	70~150
0.0946"	0.0946"	150~250

Only use pre-hardened 40 Rockwell copper-coated welding rods, which are copper-coated for either TIG or Heli-Arc welding.

When you are ready to begin your weld, ensure that the mold is free of oil, rust, scale residue or any other potential



Pre-hardened 40 Rockwell material is an alternative option to a pre-hardened P20 mold steel. It offers uniform hardness distribution through its center but requires specific welding procedures.

Image courtesy of PCS Company.

contaminants. Completely remove all cracks and surface treatments. Remove sufficient stock, and ensure only sound material remains to repair any cracks. Round all sharp or square corners to a minimum radius of 0.120 inch, and dress corners where stock was removed by rounding them to a minimum radius of 0.120 inch.

Once welding is complete, it is time for post-weld heating. This requires the following procedure as it will ensure the welded section is completely restored to a uniform hardness:

- Heat the weld-repaired workpiece to between 860°F and 940°F.
- Hold this range for a minimum of one hour to re-age the material. Conduct the re-aging process immediately after welding.
- Heat with a furnace or a gas burner. If a gas burner is used, heat from the bottom, but keep the entire welded area and 2 inches surrounding the weld in the post-heat temperature range for a minimum of one hour.
- Cool slowly to room temperature.
- Perform post-weld heating after every three layers of weld buildup to alleviate welding stress and avoid over-aging of the adjacent parent metal. **MMT**

## Technique Pointers

- Use DC normal polarity.
- Use lowest possible amperage for the job.
- Use backhand welding.
- Use smallest diameter rod possible.
- Weld small beads.
- Peen weld as necessary.
- Proceed immediately to post-weld heating when welding is complete.

## CONTRIBUTOR

Paul Britton is vice president and director of International Mold Steel.

## FOR MORE INFORMATION

PCS Company (Sales) / 800-521-0546  
 sales@pcs-company.com / pcs-company.com  
 International Mold Steel (Support) / 859-466-0981  
 britt@imsteel.com / imsteel.com



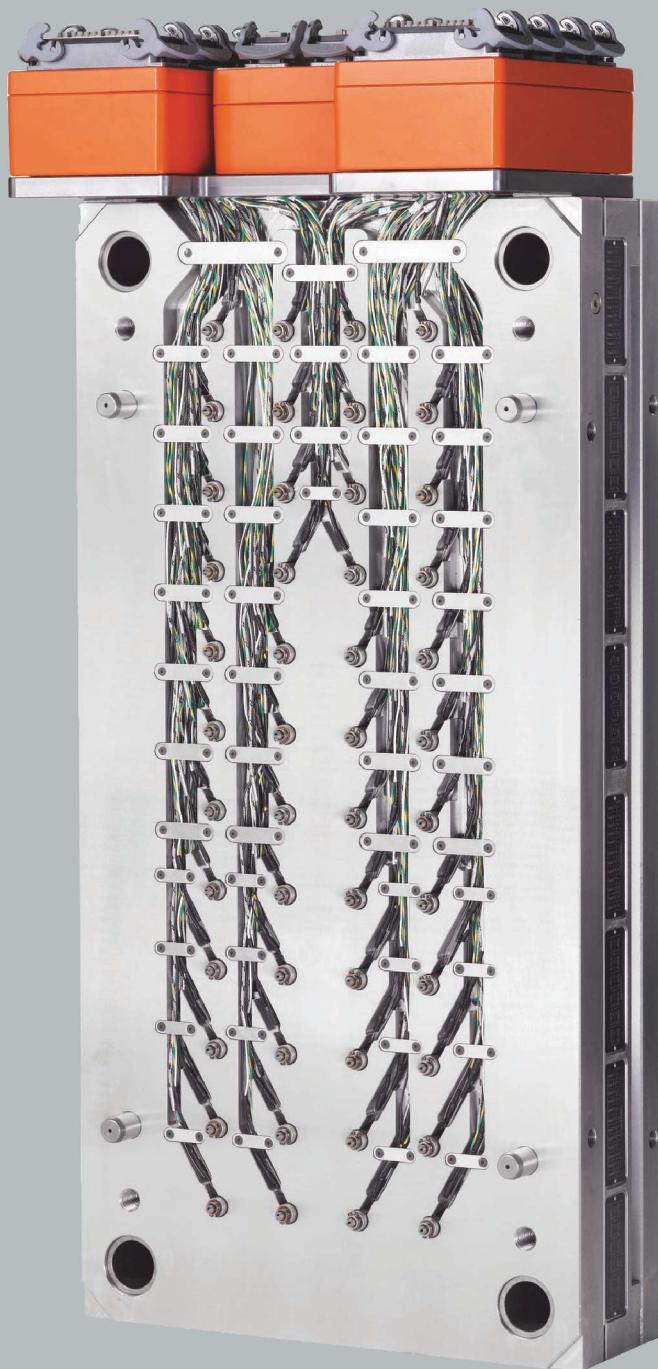


Image courtesy of Hasco America Inc.



# THE COMPETITIVE ADVANTAGE FOR U.S. MOLD BUILDERS.

JULY 2018 | MONTHLY UPDATE



## AMBA SKILLS CERTIFICATION

### A NEW INDUSTRY STANDARD

AMBA Skills Certification assesses and certifies the skills of front-line mold building workers to the highest standard in the industry and is the only certification specific to mold manufacturing. AMBA Skills Certification recognizes mastery in three skill sets: Primary Mold Builder, Master Mold Builder and Master CNC Technician. With certification, mold builders and technicians receive recognition and visibility through AMBA Skill Certification Credentials (USPTO-registered) that will follow them throughout their career path. [To order tests or download resources, visit \*\*amba.org\*\*.](#)

### TOOLS & RESOURCES

#### Study Guides

- Prepare for skills certification tests

#### Skill Standards

- Create internal training and apprenticeship programs
- Assist local technical educational institutions in formulating their curricula

#### Post-Test Reports

- Assess levels of competencies in current workforce
- Identify opportunities for advanced internal training

## COMPANY SPOTLIGHT

### TRAINING & RETAINING AT BYRNE TOOL + DESIGN

AMBA Skills Certification is helping mold manufacturing operations, such as Byrne Tool + Design, Rockford, MI, recruit, train and retain qualified employees. According to Andy Baker, strategic account manager at Byrne Tool + Design, "By testing and quantifying the value of our employees' training and skills, we are able to provide employees with a clearer learning path and a real sense of accomplishment."



Baker further explained that the Skills Certification program is a great way to build, and test, an apprenticeship program and provides guidelines for mold building operations to evaluate their training curricula. "At first, employees were hesitant about taking the tests until they learned they would have access to an outline before testing to use as a study guide," said Baker. "Now, testing has provided an atmosphere of friendly competition, and...a sense of pride in knowing they have mastered the skills. It pushes the envelope on engagement, which can have a direct effect on retention."

### COMPETITIVE ADVANTAGE: WORKFORCE DEVELOPMENT

#### AMBA SKILLS CERTIFICATION

- Certifies to the highest industry standard
- Builds training and apprenticeship programs
- Provides competitive edge in the marketplace
- Creates a sense of pride, accomplishment and a higher standard of competency for the U.S. mold building industry

## NOT A MEMBER?

# JOIN TODAY!

Get exclusive access to networking opportunities, industry benchmarking reports, cost-reduction programs and more. Visit [AMBA.ORG](https://www.amba.org) to find out more today.

Get the competitive advantage for your company.

[AMBA.ORG](https://www.amba.org) | [INFO@AMBA.ORG](mailto:info@amba.org) | 317.436.3102



**Mold-Masters Limited**  
 Armstrong Ave., Georgetown, ON L7G 4X5, Canada  
 Phone: 905-877-0185

[milacron.com/hotrunners](http://milacron.com/hotrunners)

## PRODUCTS/SERVICES

### Master-Series

Offering proven performance and reliability, Master-Series systems utilize many of our benchmark hot runner system technologies to deliver reliable high-quality molding results and repeatability. They are the ideal solution for a wide range of resins and applications across any industry.

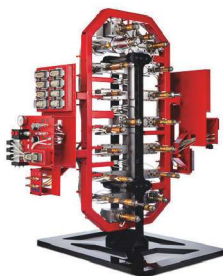
FEATURES: excellent thermal profile for consistent high-quality results; iFLOW manifold technology for superior balance and color change performance; brazed heater technology that will outlast the life of the tool; the largest portfolio of actuation options; energy efficient to reduce operational costs; removable tips and gate seals for quick and easy maintenance; the industry's best 10-year warranty.



### Fusion Series G2

Completely pre-assembled and pre-wired Fusion Series G2 hot runner system allows for quick and easy one step drop in installation and connection.

FEATURES: ensures your mold is back into production as quickly as possible; focuses on high quality and economical part production, Fusion Series G2 hot runners are supported with global technical support and rapid spare part supply; geared toward molding medium to large parts, it is the ideal system for automotive, appliance and logistic applications.



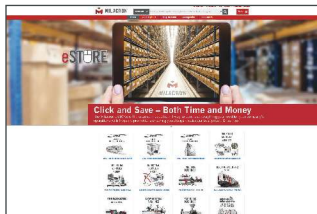
### E-Multi - All Electric Auxiliary Injection Units

E-Multi converts existing equipment to enable multi-shot and multi-material molding, expanding your operations potential. The proven E-Multi platform is fully compatible with any IMM and the ideal solution for precision molding applications in any industry.

FEATURES: proven performance and reliability in a variety of applications with a broad range of resins; energy efficient and suitable for cleanroom applications; optional Servo Carriage for sprue break applications; fully featured controller capable of integrating additional functionality to centralize and simplify various mold functions.



## WEBSITE: THE FUTURE IS IN STORE



The Milacron eSTORE is a one-stop destination for Mold-Masters hot runner systems, parts and spares, Milacron and Ferromatik branded injection molding machine parts and DME mold components and

industrial supplies. The eStore instantly connects you to the products you need, day or night. You have the ability to choose from parts and supplies across our stable of the plastic industry's leading brands, including Milacron, Mold-Masters, Ferromatik, Uniloy, and DME.

[store.milacron.com](http://store.milacron.com)

## PRODUCT CATEGORIES

- Hot Runners & Control Systems
- Hot Runner Manifolds
- Sprue Bushings
- Hot Halves
- Auxiliary Injection Units
- Temperature Controls, Monitors and Sensors





**INCOE Corporation**  
**1740 E. Maple Road**  
**Troy, MI 48083**

Phone: 248-616-0220  
 Fax: 248-616-0227

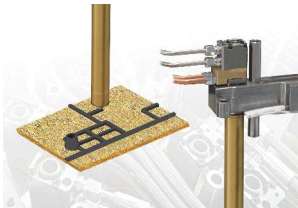
[incoe.com](http://incoe.com)

## PRODUCTS/SERVICES



INCOE Hot Runner Systems are the heart of the injection molding process, managing and controlling Melt Logistics® inside the mold. For 60 years, the plastic injection molders for all markets have come to rely on the technology, service, filling simulation and on-site technical support INCOE offers. By providing customers innovative and creative solutions helps ensure they remain productive and competitive. INCOE's global commitment is to be your partner, producing value in your process, and ultimately delivering satisfaction where it counts.

DIRECT-FLO™ Gold hot runner systems offer proven performance advantages, unitized leak-proof reliability and cost effectiveness in the most demanding applications. Features include custom and standard system configurations, non-valve and valve gate systems, mold flow analysis and exclusive OPTI-FLO® manifold systems; all designed to reduce cycle times with improved part quality.



HEM miniature hydraulics are powerful and highly compact and widen the choice of possible gating points while creating enough space for supply lines—not just because of the smaller dimensions, but because the outlets for the cooling lines can be arranged in four different directions. The new patented and improved thermal separation of distributors and cylinders prevents the hydraulic oil reaching critically high temperatures. This helps protect moving parts and seals and means no cooling down is required once production work is complete.



SoftGate® valve pin speed control is an important core product for process optimization through hot runner technology. Instead of an abrupt sudden opening of the valve gate nozzle, the flow cross-section is continually opened and released through SoftGate® and the nozzle opening time required for optimum quality can be set and a careful injection is thus reproducibly ensured. For example, all changes in pressure and speed of the melt occurring during the process are much better coordinated, resulting in a continuous melt stream reducing or eliminating hesitation marks.

## WEBSITE



The multi-language website is a resource and information tool for customers in any market. Features include product search, RFQs, videos, and an array of product guides, manuals and brochures in PDF format for easy download.

[incoe.com](http://incoe.com)

## PRODUCT CATEGORIES

- **Hot Runner Systems for Micro- to Large-Part Applications**
- **Thermal Tip, Sprue and Valve Gate Designs**
- **Temperature, Sequential and Valve Gate Controls**
- **Complete Hot-Half Systems**
- **Stack Molding Systems**
- **Single-Nozzle Systems**
- **Screen Pac Melt Filtration**
- **IMN (Injection Machine Nozzle)**



## Your partner for successful mold making

INCOE provides Mold Makers with Hot Runner Technology solutions throughout the entire process — from engineering mold review and filling simulation to on-site technical support.

Our global commitment is to be your partner — producing value in your process — and ultimately delivering satisfaction where it counts.



**HOT RUNNER SYSTEMS**

**[www.incoe.com](http://www.incoe.com)**

North America | Europe | Asia | South America

# mastip™

hot runner solutions

**MASTIP INC**  
240 Info Highway  
Slinger, WI 53086

Phone: 1-262-644-9400

[mastip.com](http://mastip.com)

## PRODUCTS/SERVICES



### Nexus™ Systems

Nexus™ Pre-Assembled and Pre-Wired Systems are designed as a complete turn-key solution for quick and simple installation. Delivering fast, simple installation out of the box without requiring any further assembly, it features fully customizable frames, electrical connections, tip and nut options and nozzle lengths to suit your application requirements. Nexus Systems incorporate the advanced leak protection of FlowLoc Technology and benefits from a superior thermal profile providing a wide molding window for a broad range of polymers.



### VeriShot™ Single Valve Gate

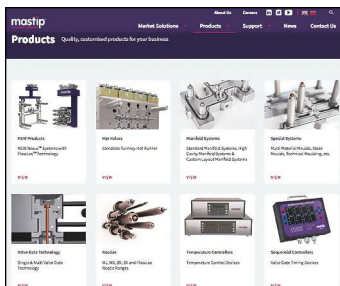
The VeriShot™ system sports an extremely compact design that significantly reduces mold height requirements as it acts as a locating ring housing the mechanics. This design feature ensures perfect alignment between mold and machine platens. Pre-assembled, VeriShot features Mastips FlowLoc threaded leak proof nozzles with advanced heating technology for optimum control with Stainless Steel construction for maximum service life. The VeriShot enables you to precisely control your injection process.



### FlowLoc™ Range

The FlowLoc™ Technology Nozzle Range is designed to provide a secure, leak-proof solution for multi-cavity manifold systems. FlowLoc™ incorporates advanced heating technology with embedded heaters for exceptional thermal performance. The FlowLoc™ Range is ideal for Mastip's next generation Nexus™ Systems and Single Valve Gate Solutions. FlowLoc™ Technology is suitable for a wide range of applications, including small to medium automotive, medium to large appliances, large packaging and large part electrical applications.

## WEBSITE



The multi-language website includes extensive CADs, information and specification guides in PDF for easy download.

[mastip.com](http://mastip.com)

## PRODUCT CATEGORIES

- Hot runner systems with a range of flow bores and lengths
- Thermal gates, valve gates and multi-gate solutions
- Tip and nut construction to suit commodity or engineering polymers
- High cavity manifold systems
- Manifold systems designed to your specific layout
- Single nozzles including valve gate control
- Hot half construction for seamless integration with cavity plate
- Speciality systems including rheological balancing
- Stack hot runner systems
- Temperature controllers
- Sequential gate controllers





## *We make things better*

Founded in 1991, Mastip designs and manufactures high-quality components for proprietary injection nozzles. Our reputation for delivering engineering excellence in hot runner technology has steadily grown until today when Mastip now provides total injection molding solutions to over 40 countries via distribution partners and subsidiary operations in the USA, Europe, and China.

With our deep understanding of polymer engineering, a keen appreciation of tooling and production techniques, plus an outstanding history of global

customer service, Mastip produces rheologically balanced manifolds and a complete range of nozzle solutions to suit all types of injection molding applications from medical, electrical and appliances through the electronics and automotive space.

Mastips thermally optimized hot runners and components are engineered to enable our customers to produce the highest quality plastic components and products for the lowest cost. Today, Mastip supplies complete Hot Half or manifold only solutions into most markets covering engineering-grade resins, high cavity systems or multiple material applications.

Mastip considers every customer a long-term partner. To that end, Mastip strives to deliver competitively priced solutions of the highest quality with support and technical assistance, that in this market, is second to none.



To find out more contact:  
Dave Shirley, General Manager - Mastip Inc  
+ 1 262 366 0117 + 1 262 644 9400  
[dave.shirley@mastip.com](mailto:dave.shirley@mastip.com)

**mastip**<sup>™</sup>  
hot runner solutions



COMPANY	Advertisers are listed in bold type.	See Ad	<div>Hot Halves</div> <div>Hot Runner Manifolds</div> <div>Hydraulic Valve Gate Nozzles</div> <div>Mechanical Valve Gate Nozzles</div> <div>Mold Cleaning Services</div>				
			1	2	3	4	5
<b>Alliance Specialties and Laser Sales Inc. – Wauconda, IL, 847-487-1945</b>		<b>111</b>					<b>5</b>
Ampco Metal Inc. – Arlington Heights, IL, 847-437-6000					3		
Athena Controls – Plymouth Meeting, PA, 610-828-2490							
CB Mould Services Inc. – Caledon, ON, 905-880-8029			1	2	3		
Dalton Electric Heating Co. Inc. – Ipswich, MA, 978-356-9844							
<b>DME/Milacron – Madison Heights, MI, 248-398-6000</b>		<b>51</b>	<b>1</b>	<b>2</b>			<b>5</b>
Ewikon Molding Technologies, Inc. – Rockford, IL, 815-874-7270			1	2	3		
Extrude Hone – Irwin, PA, 724-863-5900				2			
Gammaflux – Sterling, VA, 703-471-5050							
Gunther Hot Runner Systems Inc. – Hoffman Estates, IL, 630-293-4650			1	2	3	4	
<b>Hasco America Inc. – Fletcher, NC, 828-650-2600</b>		<b>49</b>	<b>1</b>	<b>2</b>	<b>3</b>		
Hotset America Corp. – Swainsboro, GA, 912-289-1844				2			
HRSflow – Byron Center, MI, 616-228-6900			1	2	3		
Husky Injection Molding Systems – Milton, VT, 802-859-8000			1	2	3	4	
IMS Company: Industrial Molding Supplies – Chagrin Falls, OH, 440-543-1615						4	
<b>INCOE Corp. – Troy, MI, 248-616-0220</b>		<b>37</b>	<b>1</b>	<b>2</b>	<b>3</b>		
<b>Intex Tooling Technologies – Aurora, ON, Canada, 289-840-1095</b>		<b>106</b>					
J-Tech Hotrunner Inc. – Caledon, ON, 519-927-1067			1	2	3	4	
Manner USA Inc. – Lawrenceville, GA, 770-449-1820			1	2	3	4	5
<b>Mastip Inc. – Slinger, WI, 262-644-9400</b>		<b>39</b>	<b>1</b>	<b>2</b>	<b>3</b>		
Melt Design Inc. – St. Charles, IL, 630-443-4000			1	2			
MHS - Mold Hotrunner Solutions – Georgetown, ON, 905-873-1954			1	2	3	4	
<b>Mold-Masters/Milacron – Georgetown, ON, 905-877-0185</b>		<b>Back Cover</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	
Molders Choice Inc. – Parma, OH, 216-458-1220							
Orycon Hot Runner Systems – Ocean, NJ, 732-922-2400			1	2	3	4	
OSCO Inc. Runnerless Molding Systems – Rochester Hills, MI, 248-852-7310			1	2	3	4	
<b>PCS Company – Fraser, MI, 586-294-7780</b>		<b>59</b>	<b>1</b>	<b>2</b>			
Plastic Engineering & Technical Services – Auburn Hills, MI, 248-373-0800			1	2	3	4	
Plastic Process Equipment Inc. – Macedonia, OH, 216-367-7000							
Polyshot Corp. – West Henrietta, NY, 585-292-5010			1	2	3	4	
Priamus System Technologies LLC – Brunswick, OH, 877-774-2687							
Runipsys North America – Oldcastle, ON, 519-737-0874			1	2	3	4	
SISE Plastics Control Systems Inc. – Atlanta, GA, 404-495-5968							
StackTeck Systems Limited – Brampton, ON, 416-749-1698				2			
Synventive Molding Solutions – Peabody, MA, 978-750-8065			1	2	3		
Technoject Machinery Corp. – Bolton, ON, 905-951-7144			1	2	3	4	
Thermal-Tech Systems Inc. – West Chicago, IL, 630-639-5115			1	2	3	4	5
Thermoplay S.P.A. – Pont Saint Martin (AO), Italy, 39 125 800311			1	2	3		
Watlow – St. Louis, MO, 314-878-4600							
Yudo Inc. – Livonia, MI, 734-744-8120				2	3		

For more supplier listings, go to [moldmakingtechnology.com/suppliers](http://moldmakingtechnology.com/suppliers).

Mold Maintenance and Repair Services	Pneumatic Valve Gate Nozzles	Servo Valve Gate Nozzles	Temperature Controls, Monitors, Sensors	Thermal Edge Gate Nozzles	Thermal Hot Tip Nozzles	Thermal Multi-Gate Nozzles	Valve Gate Controllers	Valve Gate Sequencers	
6	7	8	9	10	11	12	13	14	WEBSITE
6									<a href="http://alliancelasersales.com">alliancelasersales.com</a>
	7				11				<a href="http://ampcometal.com">ampcometal.com</a>
			9						<a href="http://hotrunnercontrol.com">hotrunnercontrol.com</a>
			9	10	11	12	13	14	<a href="http://cbmouldservices.ca">cbmouldservices.ca</a>
			9						<a href="http://daltonelectric.com">daltonelectric.com</a>
6			9		11		13	14	<a href="http://dme.net">dme.net</a>
	7		9	10	11	12			<a href="http://ewikonusa.com">ewikonusa.com</a>
									<a href="http://extrudhone.com">extrudhone.com</a>
			9				13		<a href="http://gammaflux.com">gammaflux.com</a>
	7		9	10	11	12	13		<a href="http://gunther-usa.com">gunther-usa.com</a>
	7		9	10	11	12	13	14	<a href="http://hasco.com/gb">hasco.com/gb</a>
			9				13		<a href="http://hotset-worldwide.com">hotset-worldwide.com</a>
	7	8	9		11		13	14	<a href="http://hrsflow.com">hrsflow.com</a>
	7		9	10	11	12	13	14	<a href="http://husky.ca">husky.ca</a>
	7		9		11				<a href="http://imscompany.com">imscompany.com</a>
	7		9	10	11	12	13	14	<a href="http://incoe.com">incoe.com</a>
6									<a href="http://intextooling.ca">intextooling.ca</a>
6	7		9	10	11	12	13	14	<a href="http://jtechhotrunner.com">jtechhotrunner.com</a>
	7		9				13	14	<a href="http://m-form.com">m-form.com</a>
	7		9	10	11	12			<a href="http://mastip.com">mastip.com</a>
	7		9	10	11	12			<a href="http://melt-design.com">melt-design.com</a>
	7		9	10	11	12	13	14	<a href="http://mhs-hotrunners.com">mhs-hotrunners.com</a>
	7		9	10	11	12		14	<a href="http://moldmasters.com">moldmasters.com</a>
			9						<a href="http://molderschoice.com">molderschoice.com</a>
	7		9	10	11	12	13	14	<a href="http://orycon.com">orycon.com</a>
	7		9		11	12	13	14	<a href="http://oscocsystems.com">oscocsystems.com</a>
			9				13		<a href="http://pcs-company.com">pcs-company.com</a>
	7		9	10	11	12	13	14	<a href="http://petsinc.net">petsinc.net</a>
			9						<a href="http://ppe.com">ppe.com</a>
	7		9	10	11	12	13		<a href="http://polyshot.com">polyshot.com</a>
			9						<a href="http://priamus.com">priamus.com</a>
					11	12		14	<a href="http://runipsys.com">runipsys.com</a>
			9						<a href="http://sise-plastics.com">sise-plastics.com</a>
									<a href="http://stackteck.com">stackteck.com</a>
	7		9		11	12	13	14	<a href="http://synventive.com">synventive.com</a>
	7		9	10	11	12	13	14	<a href="http://technoject.com">technoject.com</a>
6	7	8	9	10	11	12			<a href="http://thermal-tech.com">thermal-tech.com</a>
	7		9				13	14	<a href="http://thermoplay.com">thermoplay.com</a>
			9		11				<a href="http://watlow.com">watlow.com</a>
	7		9	10	11	12	13	14	<a href="http://yudo.com">yudo.com</a>

Image courtesy of Orycon Hot Runner Systems.





## Gating Solutions Increase Productivity and Eliminate Cold Runners

**Husky Injection Molding Systems** offers the Ultra Helix valve gate, which Husky says the Ultra Helix valve gate will last as long as the other parts of the mold. The Ultra Helix valve gates can last for millions of cycles, which increases productivity and lowers cost. Husky says that when combining the Ultra Helix valve gate with the Ultra Sync-E hot runner and Altanium controller, customers have achieved more than 15 million cycles without the need for gate or nozzle maintenance. And, with the Ultra Helix, it is possible to replace a nozzle tip without having to repair or change the cavity.

Husky's Ultra SideGate technology is designed to eliminate cold runners. Husky says that the Ultra SideGate eliminates complex assembly steps that, if done incorrectly, can lead to plastic leakage. Additionally, the Ultra SideGate does not require any software and procedures that are usually associated with side gates. With Husky's new Ultra SideGate Inline, it is now possible for users to control the temperature at each tip.

**Husky Injection Molding Systems / 802-859-8000 / husky.ca**



## Manifold Hot Runner System Caters to Special Gating Requirements

**MHS - Mold Hotrunner Solutions** offers new Contour manifold hot runner systems that provide injection mold designers the ability to place gates at any angle for plastic parts with curves or special gating requirements.

At the core of this new technology is the Rheo-Pro Swing Lock, a fully adjustable mechanism that allows each nozzle to securely engage the hot runner manifold at any angle. In combination with new cooling-free Black Box valve gate technology, Contour hot runners offer a solution for angled gating applications such as contoured automotive plastic parts.

The system enables perpendicular melt injection into the curved surface of a cavity for uniform cooling around the gate area for high-quality gating results. The hot runner manifolds also stay flat, which the company says eases mold integration. The valve gate systems are available with gate diameters from 2-6 mm and melt channels ranging from 10-22 mm.

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

## Controller Has Touch Screen for Quick Information Access

**Orycon Hot Runner System** T-500 Hot Runner Controller architecture is based on cards of six zones each. Orycon says that a touch screen with fast response, high-resolution graphics provides an intuitive operator interface.

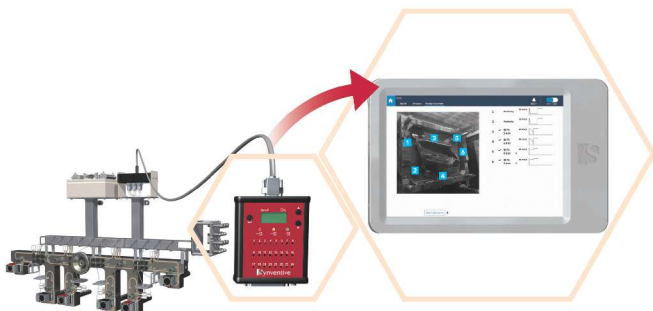
A zoom screen provides access to detailed information for each individual zone, including amp draw, percentage of power being used, set point and actual temperature, plus any existing alarm condition. The zoom screen enables quick changes like switching operating mode or set point or turning the zone on and off. The display has a setting to show cavities in the oval and manifold zones in rectangular-shaped windows. Orycon says this gives the operator a first glance indication of the zone function that is easy for the eyes to spot.

A set-up screen provides setting choices for J or K thermocouples, the length of warm-up time, the maximum settable temperature, the boost time, the decrease in temperature when the unit is in the park mode and the temperature in Celsius or Fahrenheit format. The user can also field calibrate the unit by following a simple procedure so as to meet ISO or other regulation requirements.

Communications with the press are standard and the user can predetermine response to press alarms or hot runner anomalies at set-up. Response options include turning on a stack light, sounding a horn or turning off a single zone or the entire controller.

**Orycon Hot Runner Systems / 732-922-2400 / orycon.com**





### Hot Runner System Diagnostic Tools Save Time and Boost Quality

**Synventive's** SVG+ hot runner system features a simple design requiring no cooling lines or plates. The system saves time by providing monitoring and diagnostic tools from outside of the molding machine, resulting in less downtime, less scrap and increased reliability. The system upgrades easily to activeGate control technology for lower operating costs and improved quality. The system makes it possible to mold complex geometries and high-quality, Class A part surfaces in less time. The SVG+ hot runner systems are equipped with a new modular actuator design and patent pending SynCool3 technology. SynCool3 provides cooling of the actuators without the need for separate cooling lines. These systems are delivered with a Valve Monitoring Interface (VMI) for monitoring, diagnostics, and trouble shooting from outside the molding machine. VMI provides measured individual pin movement data and allows operators to check whether the valve pins are moving as intended.

**Synventive / 978-750-8065 / Booth 225**

### Hot Runner Certification Deepens Knowledge and Sharpens Skill

Studies by hot runner makers show that 60-75 percent of all molds that are built today incorporate a hot runner system. The **MoldTrax** Hot Runner Certification course gives participants a better understanding of typical hot runner components and critical areas in maintenance. The course also covers the situations that warrant project management and how often that should occur, and it covers the effects of heat expansion. Other topics include bench techniques for work on hot runners, strategies for safety and strategies for minimizing mistakes that cause systems to be "flooded" or "encapsulated." The course covers electrical issues like heater and thermocouple testing, removal and replacement and the proper use and care of cables, connectors and controllers.

The Moldtrax training includes input from industry experts who have been designing, cleaning, repairing and running all types of hot runner systems for decades. The level of training for each attendee is evaluated by asking the participant questions to assess his or her skill level so that Moldtrax can assign each student an appropriate system on which to work. Moldtrax has a variety of systems from different manufacturers to challenge the apprentice and the veteran repair technician alike. Working in two-man teams, participants will completely disassemble, troubleshoot and correct electrical issues and then ultrasonically clean, reassemble and retest their molds.

**MoldTrax / 419-281-0790 / moldtrax.com**

### Needle Valve System without Control Unit Meets Quality Requirements

The servo driven FLEXflow One needle valve systems for hot runner nozzles from **HRSflow** have a simple driver module that is designed to replace an otherwise necessary control unit. This module comes with a default setting that fully opens and closes the needle.

Using an External Smart Interface (ESI) that is connected for this purpose, needle stroke and velocity can be individually set for specific applications, even when there are multiple steps. Technicians can individually program as many as 24 valve pins per system using this ESI. HRSflow says that once these parameters have been saved in the driver module, the system is ready to produce high-quality molded parts consistently without a control unit.

As an additional safety factor, the needle valve system comes with a maximum torque for the servomotor when manufacturing occurs. When the maximum torque value is reached, the electronics shut down to prevent damage to the hot runner system and mold. The FLEXflow One system is connected with a Safety Interface Box (SIB) that communicates with the injection molding machine's controller, which is designed to ensure safe working conditions.

HRSflow says that the FLEXflow One needle valve system does not require an additional control unit for operation. The company says that it provides high-quality part performance, reduces clamp force, has a wider process window, ensures the reliability and repeatability of the process and has the same connection from the IMM for the sequential control as traditional hydraulic and pneumatic hot runners.

**HRSflow / 519-973-0212 / hrsflow.com**



### Compact Nozzle Enables Injection on the Inside Surface of Part

**Thermoplay's** newly expanded small nozzle series features the F Ø11. Designed to meet the increasing requirements of special applications in cosmetic, medical and food packaging markets, the nozzle features a small pitch and is now available for valve gate applications. The F Ø11 valve gate nozzle has a minimum pitch of 17 mm. Because of its compact profile, the nozzle is useful in restricted areas and enables injection on an "inside" surface of the part. The nozzle and tip design enable low thermal dispersion, giving maximum flexibility to the moldmaker in designing the cooling system.

The patented Thermoplay heaters uniformly distribute heat along the whole nozzle surface, providing low energy consumption (at 150W maximum per nozzle). Thermoplay says that the moldmaker can easily replace the tip for maintenance with the mold installed in the injection machine. Valve-gate actuation can be pneumatic or hydraulic, individual- or plate-actuated, which Thermoplay says makes the nozzles useful for high-cavitation applications requiring increased precision. The pin, available in a cylindrical or conical option, is designed to minimize the witness mark on the part (gate diameter from 0.8 to 1.2 mm) providing the highest quality finish. Thermoplay says that the FØ11 valve gate nozzle series combine flexibility and quality and are available in lengths from 56 to 146 mm.

**Thermoplay S.P.A. / 39-125-800311 / thermoplay.com**

# Six Key Factors for Evaluating a Hot Runner System

By David Hoffman and John Blundy

Here are six important items to consider when evaluating a hot runner system:

**1. Manifold heaters.** For installation, most manufacturers use a press. If the heater contact with the manifold is not uniform, there will be hot spots created in the heater element, which causes premature failure and non-uniform heating of the manifold itself. Also, process capability can be affected especially with some engineering materials, as their viscosity may be more temperature sensitive than commodity resins like polypropylene and polyethylene.

**2. Nozzle heaters.** Measuring the ohm resistance for each nozzle heater can provide good information when troubleshooting the hot runner system. Too great a variance may prevent uniform temperature profiles and the potential for process variation will increase. Plus, the life of a heater with less efficiency is reduced because of the required increase in workload.

**3. Nozzle tip orifice.** Pressure differences in plastic injection molding are defined in the Hagen Poiseuille equation, where (Q) is the flow rate, (l) is the runner length, (n) is the material viscosity and (r) is the radius of the flow channel:  $\Delta P = (8Qln) / (\pi r^4)$ . The equation shows that any slight difference in "r" value, which includes the orifice in a hot runner nozzle and gate tip, is affected to a magnitude of the fourth power. This means that a small change in radius will result in a rather large difference in pressure drop from gate tip to gate tip. The common perception is that if the gate tips are all within tolerance, this will not matter. However, it is important to ask what the acceptable tolerance is along with the gate tip dimensions. Just because they are within tolerance does not mean there will not be a difference in pressure drop.

**4. Stack height.** It is important to check the uniformity of the stack height across all nozzle tips. If these dimensions vary, then the engagement with the gate will also vary, and these variances could affect process capability because of resulting differences in channel geometry. Ask for the inspection report and consult the manifold supplier for an acceptable tolerance. Revisit the pressure drop equation to see if the tolerance that the supplier provides is acceptable for a given process and set of parts.

**5. Flow channels.** All gun drill manufacturers will claim variances of 0.001 inch per inch of travel. Check that they can verify that the cross drilling of the flow channels does not leave a step at the intersection of the cross-drilled runners. Refer to the earlier equation again. Check that the gun drill manufacturer scoped and honed the channels. Variations in flow channels could create differences in pressure drop through the regions



Image courtesy of INCOE Corp.

This four-drop hot runner system has pressed-in tubular heaters.

of a manifold. Again, this refers to the portion of the equation involving the radius (r), which is raised to the fourth power. Steps in the flow channel can create dead spots, which do not flush well when purging and cause color-change issues and material-degradation problems. Also, the steps make it possible for material to sit in the manifold for extended periods, which increases the likelihood for thermal degradation of the polymer. The polymer's natural flow path around the channel intersections also causes these dead areas. This happens even if the channel intersections are perfectly aligned.

**6. System cost.** The cost of the system is often one of the most important things to consider, but relying solely on quotes from various suppliers is not the best way to approach the issue. Familiarity with the options that each hot runner supplier offers is helpful. Staying on top of the items presented here will reduce downtime, improve part quality and decrease overall costs. [MMT](#)

## CONTRIBUTOR

David Hoffman is a senior instructor and development manager for plastics education and training for the American Injection Molding Institute (AIM). John Blundy also contributed to this piece when he served as vice president of business development at Beaumont Technologies Inc.

## FOR MORE INFORMATION

American Injection Molding Institute / 866-344-9694 / [dhoffman@aim.institute](mailto:dhoffman@aim.institute) / [aim.institute](http://aim.institute)  
Beaumont Technologies Inc. / 814-899-6390 / [beaumontinc.com](http://beaumontinc.com)



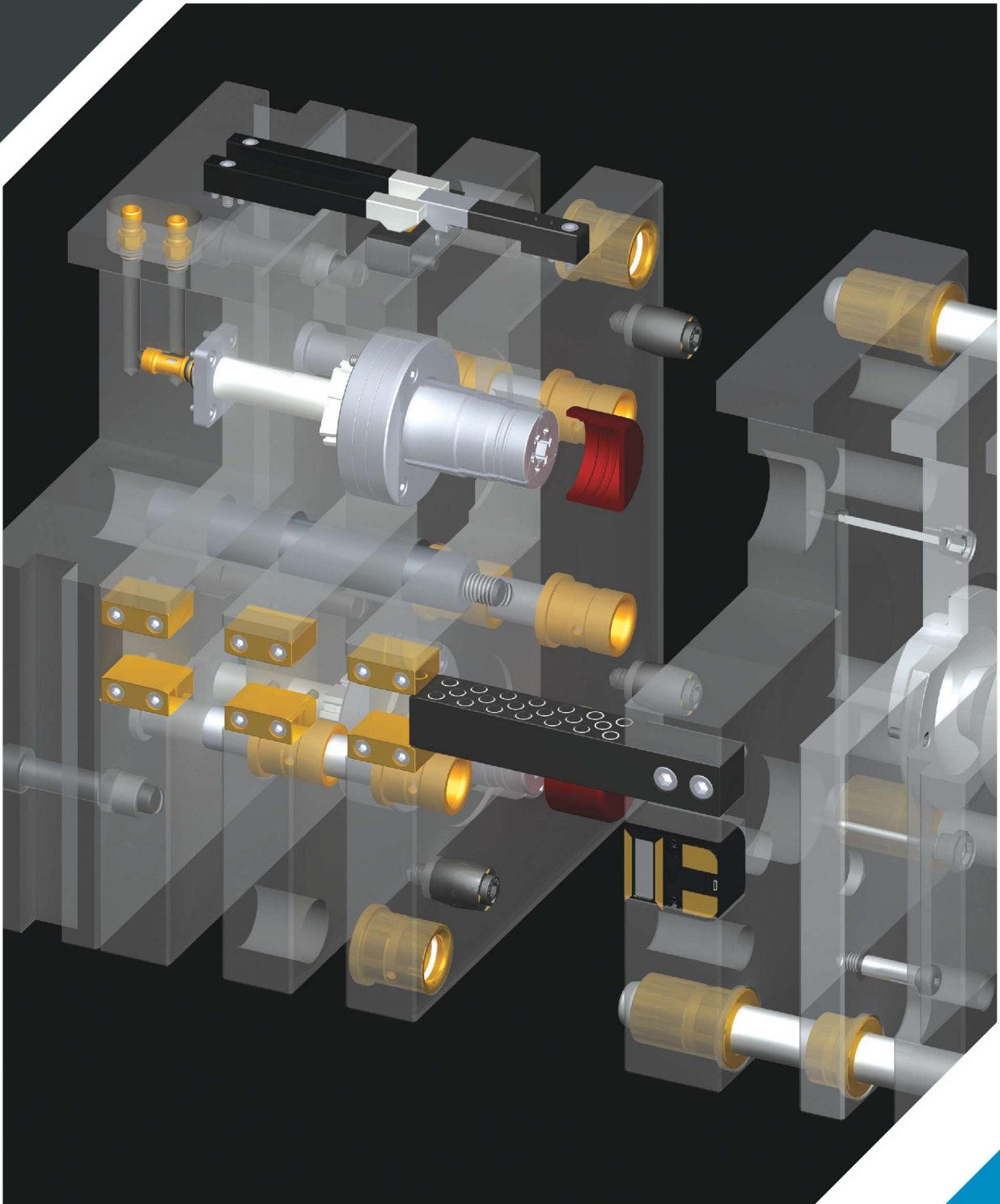
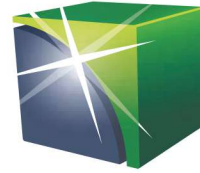


Image courtesy of Progressive Components.



IMTS2018

## 2018 TOP SHOPS WORKSHOP

SEPTEMBER 13, 2018 | IMTS  
McCORMICK PLACE | CHICAGO, IL

**BUILD YOUR MACHINING BUSINESS**  
*Modern Machine Shop* Top Shops Workshop is the place to build your business. The event will connect the leaders in machining and metalworking – the top shops, the top suppliers, the top innovators.

**REGISTER  
TODAY!**

Gardner Business Media Metalworking Group

Modern  
Machine  
Shop

PM/PRODUCTION  
Machining

**MoldMaking**  
TECHNOLOGY.

**AM** ADDITIVE  
MANUFACTURING

**D&P**

**TECHSPEX**

[TopShopsEvent.com](http://TopShopsEvent.com)

IN PARTNERSHIP WITH:



# PROGRESSIVE COMPONENTS

**Progressive Components  
International Corporation**  
235 Industrial Drive  
Wauconda, IL 60084

Toll-Free: 800-269-6653  
Phone: 847-487-1000  
Fax: 800-462-6653

[procomps.com](http://procomps.com)

## PRODUCTS/SERVICES



### Mold Monitoring

With the release of our new V12 Catalog, Progressive has expanded its mold monitoring product line to include:

- Cve Monitor, OnDemand and Cve Live, together provide unprecedented access to your tool's activity and performance.
- System Cooling provides molders the ability to monitor water flow and temperatures inside the mold.
- System Cooling Test Rig offers a time-saving way for mold builders to qualify circuitry and analyze and test cooling circuits during maintenance.
- Asset Tracking is now available with the new ProFile Asset Tags.



### Maintenance Solutions

Progressive's newest product line, brought to you by sister company ToolingDocs, includes:

- Toolroom Bench, designed to industry best standards, enables more efficient mold assembly and disassembly.
- Color-coded Status Tags for easy mold status identification.
- Synthetic Mold Grease.
- Magnetically mounted Mold Light Bars that increase visibility for in-press repairs.
- Cable Checker and Mold Checker for testing hot runner cables and manifolds.



### Tooling Standards

Progressive leads with innovation to help customers increase productivity and reduce costs. Many Progressive products have become industry standards such as:

- Z-Series Alignment Locks, engineered to outperform others.
- Through Hardened Ejector Pins with increased core hardness of 48-50 HRC.
- ModuLifters, modular lifter assembly that simplifies undercut release.
- DT Cores, designed to help reduce lead times and speed mold building.
- Tapered Daters made from 420 SS preventing flash with LSR, Nylon, etc.

## WEBSITE



Progressive Components is the only American mold component supplier with direct, seamlessly integrated distribution wherever your tools are built and run. To learn more, give us a call at 800-269-6653, or visit us online:  
[procomps.com/contact](http://procomps.com/contact)

## PRODUCT CATEGORIES

- Off-the-shelf Standards and Mold-Ready Components
- Alignment Locks and Plate Sequence Control Items
- Standard Lifters, CamActions and Collapsible Cores
- Expanded Mold Monitoring Capabilities
- Toolroom Supplies and Software



**HASCO®**  
Enabling with System.

**Precision in  
Moldmaking  
since 1924.**

**HASCO America, Inc.**  
**270 Rutledge Rd. Unit B**  
**Fletcher, NC 28732**

Phone: 877-427-2662  
Fax: 828-684-7960

[hasco.com](http://hasco.com)

## PRODUCTS/SERVICES



### HASCO's P1 Plate Newest Material: Pre-hardened Steel 1.2714HH (L6) for Moldmaking

This pre-hardened tool steel has excellent dimensional stability and toughness. With a maximum hardness of 400 HB, it makes for optimum processing properties with regard to machinability. Mold-builders benefit from the superior material properties, especially with regard to machining, welding, surface coating and use in injection molding tooling. Other applications for the material include the efficient production of cavity inserts, cores and slides. P1 plates are kept in stock.



### HASCO Z1545/... Gear Housing and Z1547 Gear Rack Units

The HASCO stack mold components Z1545/... and Z1547/... now are in two sizes: 2.5 and 5 modules. The standardized HASCO components allow the simple, reproducible and inexpensive construction of stack molds of this type. The low height of the components permit small distances between the tie bars on the machine while supplying high opening forces through the use of high-quality materials. DLC-coated slideways minimize wear and extend maintenance intervals. All standardized components are available from stock.



### HASCO Z1790/... Latch Lock

The HASCO Z1790/... is a compact round latch lock that can be mounted on the inside—the round latch lock Z1790/... is used with a Z1791/...pulling rod. Internally mounted latch locks have the advantage of not increasing the outside dimensions of the injection mold. The latch locks have small space requirements permitting strokes of between 30 and 130mm. The pulling rod Z1791/... can be fit in both the intermediate plate and the clamping plate. The stroke can be adjusted as required by shortening the pulling rod. The housing can similarly be cut to length in order to align it to the plate thickness.

## WEBSITE & APP



For more than 94 years, HASCO has been supporting its customers' success with agility, simplicity and performance. The company and products will be presented in a new, clear appearance. HASCO is the world's leading supplier of modular standard mold units, accessories and hot runner technology. The company's hallmark is based on state-of-the-art standardized mold products. With over 700 employees worldwide, HASCO supplies the highest quality products and services. Visit our website for more information. [hasco.com](http://hasco.com)

## PRODUCT CATEGORIES

- **Mold Components**
- **Mold Bases**
- **Mold Plates**
- **DLC Standard Components**
- **Collapsible Cores**
- **Unscrewing System**
- **Hot Runner Components**
- **Hot Runner Manifolds**
- **Temperature Controls, Monitors, Sensors**
- **Tool Steel/Mold Steels**

# HASCO®

*Enabling with System.*

*Where  
technology  
meets  
application*

## *HASCO enables moldmaking*

Enabling is our main area of expertise.  
We define international standards and revolutionized  
moldmaking with the invention of our standard mold base.

Today, we rely on our innovative strength to set  
tomorrow's standards for our customers.



**Z**

metric moldmaking components  
to the highest quality since 1924.

**H**

hot runner systems, nozzles and  
controllers with top accuracy  
and flexibility.

**K**

machined plates with the HASCO standard  
guiding holes for bushings and pins  
ready for assembly.

**P**

machined plates in many thicknesses,  
sizes and materials ready for your  
design and next process step.



**HASCO AMERICA Inc.**

270 Rutledge Road, Unit B, Fletcher, NC 28732

T +1 828 650-2600, F +1 828 684-7960

[quotes.america@hasco.com](mailto:quotes.america@hasco.com)

[www.hasco.com](http://www.hasco.com)



**DME Co.**  
 29111 Stephenson Hwy, Madison Heights, MI 48071, USA  
 Phone: 800-626-6653

[dme.net](http://dme.net)



## PRODUCTS/SERVICES



### Mold Bases & Plates

Standard to pre-engineered assemblies, plates and components provide the economic and technical benefits of interchangeability. Greater metallurgical consistency and more cleanliness in cavity steels mean more reliability for customers. Off-the-shelf standards, like the new DME XPress mold base that can ship within 24 hours to fully customized bases and plates, DME can provide it all.



### Mold Components

The DME line of mold components includes thousands of proven and reliable low-cost items. From ejector & core pins, slide action and mold cooling items to innovative engineered solutions for molding undercuts & threads. DME has all your mold technology needs.



### Industrial Supplies (MRO)

With tens of thousands of products to choose from, DME Industrial Supplies product portfolio includes products for all stages of the moldmaking, molding and repair processes. Auxiliary Equipment such as driers, conveyors and mold service tables, Aftermarket Tooling and Machine Supplies, Safety Products, Purging Compounds and Mold Sprays. DME is your full product & service provider. How can we help you today?

## NEW WEBSITE



Open 24/7 - 365 - Order from anywhere, anytime. Registered users receive premium benefits including free UPS ground freight, promotional discounts, order traceability, quick order and more!

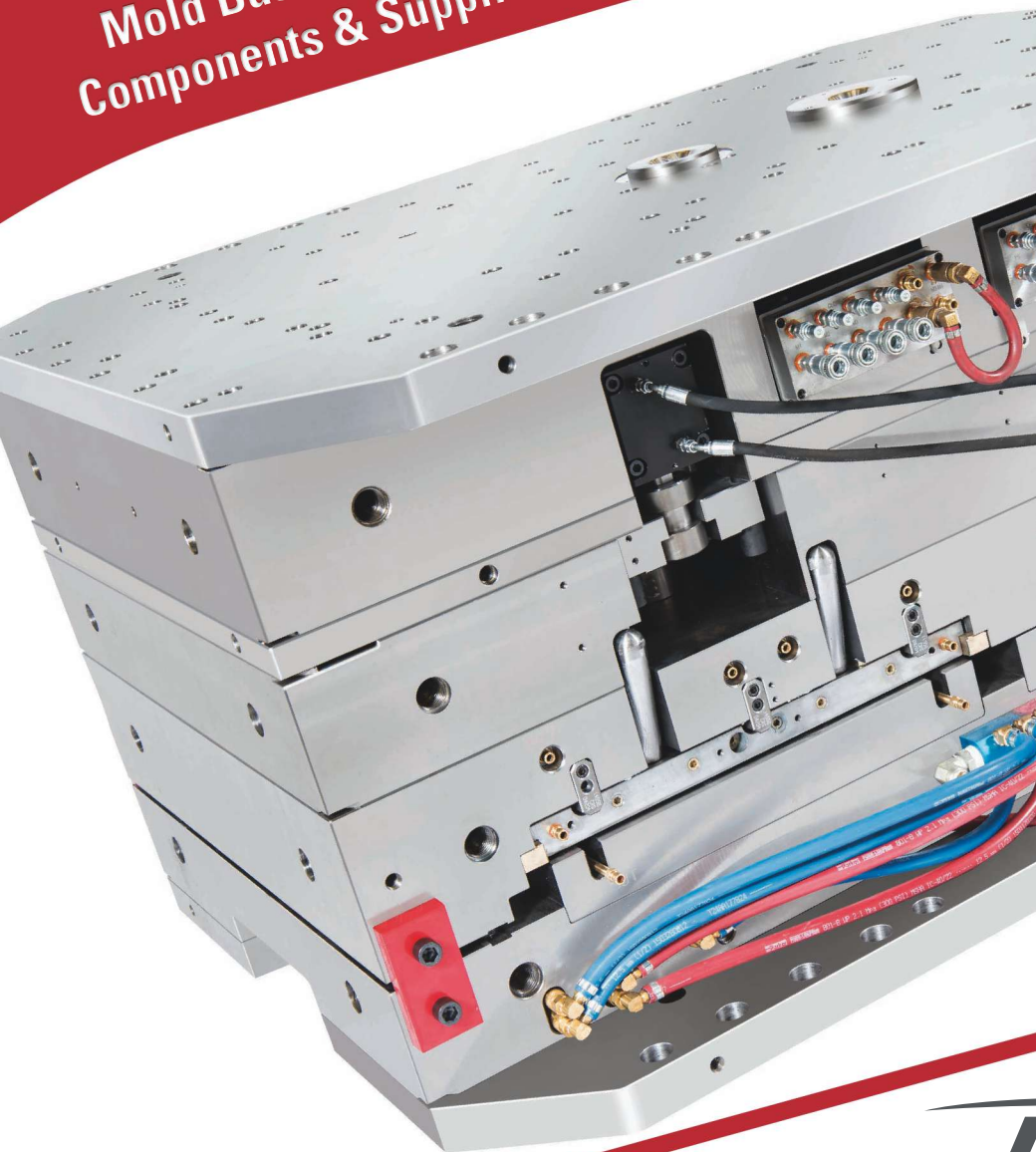
[store.milacron.com](http://store.milacron.com)

## PRODUCT CATEGORIES

- **Mold Bases & Plates**
- **Mold Components**
- **Industrial Equipment & Supplies (MRO)**
- **MUD Systems & Quick-Change Prototyping Adapter**
- **Moldmaking & Polishing Equipment**
- **Hot Runner & Control Systems**
- **Hot Runner Repair, Service & Aftermarket Parts**
- **Conformal Cooling Products, Design & Service**
- **Mold Flow Analysis**



# Mold Bases, Plates, Components & Supplies



Plates



Components



Hot Runners  
& Controllers



Industrial Supplies



Conformal Cooling  
Technologies



## Designed & Built For You.

DME the originator of the "Standard" Mold Base, supports you globally for all your mold base needs. When you require the best tools to produce consistent high quality results, look no further than DME for premium mold bases, mold components, industrial supplies, mold steel and value added services. DME, your complete Mold Technology Solutions Provider.

Contact us for your next molding project.

Call Toll Free at: 800.626.6653

Or visit us at: [www.store.milacron.com](http://www.store.milacron.com)



Mold Bases & Plates

**DME Press™**  
Mold Bases

- Ships Same or Next Day
- 16,200 Combinations
- Interchangeable Plates
- Finish Ground  $\pm 0.01"$
- P20, #3 Steel A & B Plates
- With or Without Guided Ejection
- CAD Available



**eSTORE**  
[store.milacron.com](http://store.milacron.com)



# LEADTIME LEADER AWARD TURNS 15!

*MoldMaking Technology* has been honoring excellence in mold manufacturing for 15 years with its annual Leadtime Leader Award. To celebrate this milestone, the magazine acknowledges all of its past winners and honorable mentions.



## PAST WINNERS:

2003 Advance Tool  
2003 M & M Tool and Mold  
2004 Wentworth Mold Group  
2004 M & M Tool and Mold  
2005 Minco Tool and Mold  
2005 M & M Tool and Mold Inc.  
2006 Extreme Tool and Engineering  
2006 A.J. Tool Co. Inc.  
2007 Chicago Mold Engineering  
2007 Tech Tool and Mold  
2008 Commercial Tool and Die  
2008 Extreme Tool and Engineering  
2009 Commercial Tool and Die  
2009 Byrne Tool and Die  
2010 Triangle Tool  
2010 Mold Craft Inc.  
2011 United Tool and Mold Inc.  
2011 Mold-Tech Inc.  
2012 Industrial Molds Group  
2013 Tech Mold Inc.  
2014 Westminster Tool Inc.  
2015 Cavalier Tool and Manufacturing  
2016 Krieger Craftsmen  
2017 Graphic Tool Corp.  
2018 Maximum Mold Group

**NOMINATE YOUR SHOP TODAY AT**

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

PRESENTED BY:

**MoldMaking**  
TECHNOLOGY®

For complete information, eligibility requirements and nomination forms, please visit [short.moldmakingtechnology.com/leader](http://short.moldmakingtechnology.com/leader), or contact Editorial Director Christina Fuges at [cfuges@gardnerweb.com](mailto:cfuges@gardnerweb.com) or at (513) 338-2187

SPONSORED BY:

**PT** Plastics  
Technology



### PAST HONORABLE MENTIONS:

2003 Ultra Tool Group  
2003 Eimo Americas  
2003 Graphic Tool Corp.  
2003 Peterboro Tool  
2004 Century Die  
2004 Summit Mold  
2005 StackTeck  
2005 IDEAS Inc.  
2006 MSI Mold Builders  
2006 IDEAS Inc.  
2007 Synergetic M2M Group  
2007 M & M Tool and Mold Inc.  
2008 StackTeck Systems Ltd.  
2009 Armin Tool and Manufacturing  
2009 Elite Mold and Engineering  
2010 H.S. Die and Engineering  
2010 CS Tool Engineering  
2011 MSI Mold Builders  
2011 JM Mold South, Inc.  
2012 M&M Tool and Mold  
2013 Micro Mold Company Inc.  
2014 Aalbers Tool and Mold Inc.  
2015 Dynamic Tool and Design  
2016 MSI Mold Builders  
2017 Concours Mold Inc.

Remember, it's not just about being the shop with the shortest delivery times. It's about what you do with what you have. Whether your company is an industry leader, or aspires to be one, *MoldMaking Technology's* Leadtime Leader program was created for your shop. These Awards share best practices and recognize companies that are excelling in customer satisfaction, workforce development, industry involvement, continual improvement, business growth, technology employed and more.

Winners are chosen by staff editors and a judging panel of select processors and OEMs based on the shop's innovation, efficiency, quality and commitment.

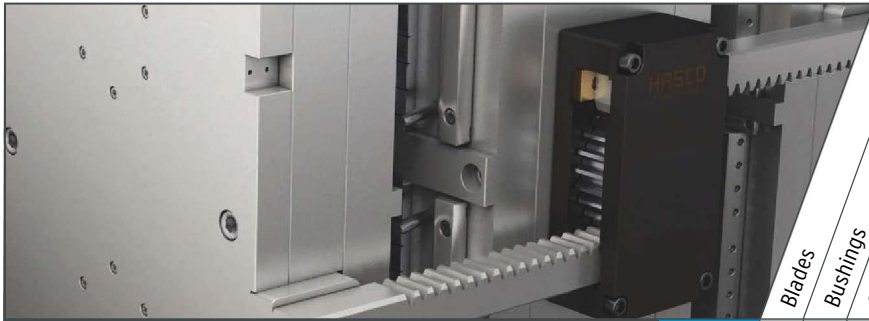
Judging considerations include the mold shop's commitment to world class quality, performance in leadtime and deliveries via efficient manufacturing processes; current and projected sales growth; innovation in technology and business strategy implementation; industry involvement; and customer satisfaction.

### CONTACT:

Please e-mail Editorial Director  
Christina Fuges at:  
[cfuges@gardnerweb.com](mailto:cfuges@gardnerweb.com)



# Mold Components



COMPANY	Advertisers are listed in bold type.	See Ad														
			1	2	3	4	5	6	7	8	9	10	11	12	13	14
<b>Agathon Machine Tools Inc.</b> – Bethel, CT, 203-730-8741		<b>59</b>		<b>2</b>										<b>12</b>		
<b>Alba Enterprises Inc.</b> – Torrence, CA, 909-941-0600		<b>57</b>	<b>1</b>		<b>3</b>	<b>4</b>			<b>7</b>	<b>8</b>				<b>12</b>		
Better Molding Solutions – Ellington, CT, 860-454-8656																
BMS Burns – Medina, OH, 800-345-7693			1	2	3	4		6	7	8	9			12	13	14
CB Mould Services Inc. – Caledon, ON, 905-880-8029								6								
Choice Mold Components Inc. – Clinton Twp., MI, 586-783-5600			1	2	3	4		6	7	8				12		14
Craftsman Tool & Mold Co. – Aurora, IL, 630-851-8700																
Cross Tool & Manufacturing Inc. – Flagstaff, AZ, 928-779-4218				2												
<b>Cumsa USA</b> – Troy, MI, 248-850-8385		<b>58</b>						<b>6</b>	<b>7</b>							
Dalton Electric Heating Co. Inc. – Ipswich, MA, 978-356-9844															13	
<b>DME/Milacron</b> – Madison Heights, MI, 248-398-6000		<b>51</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>			<b>12</b>	<b>13</b>	<b>14</b>
DMS – Oldcastle, ON, 519-737-6743			1	2		4		6				10		12	13	14
<b>Edro Engineering and Specialty Steels Inc.</b> – Walnut, CA, 909-594-5751		<b>25</b>														
Ezell Precision Tool Co. – Clearwater, FL, 727-573-3575			1	2		4										14
<b>Hasco America Inc.</b> – Fletcher, NC, 828-650-2600		<b>49</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>			<b>10</b>	<b>11</b>			<b>14</b>
Hawk Mold & Die Supply Inc. – Pipersville, PA, 800-488-7757			1	2		4		6	7					12		14
Hotset America Corp. – Swainsboro, GA, 912-289-1844				2					7		9		11	12	13	14
i-mold GmbH & Co. KG – Erbach, Germany, +49 6062 8093 30												10				
IMS Co: Industrial Molding Supplies – Chagrin Falls, OH, 440-543-1615			1	2	3	4	5	6	7						13	
Ipsco International – Attleboro, MA, 508-226-1776				2		4										
Mac-Mold Base Inc. – Romeo, MI, 586-752-1956																
Meusburger US, Standard Molds – Charlotte, NC, 704-526-0330																
Misumi USA Inc. – Schaumburg, IL, 847-843-9105				2	3	4		6	7							
<b>Mold Base Industries Inc.</b> – Harrisburg, PA, 717-564-7960		<b>56</b>		<b>2</b>			<b>5</b>		<b>7</b>							<b>14</b>
MouldPro – Rancho Cucamonga, CA, 909-941-0600			1			4			7	8				12		
National Tool & Manufacturing – Wheeling, IL, 847-806-9800																
Nonnenmann Inc. – Sterling Heights, MI, 586-977-8190			1	2	3	4			7							14
OMNI Mold Systems – Lisbon, CT, 888-666-4755																
<b>PCS Co.</b> – Fraser, MI, 586-294-7780		<b>59</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>		<b>6</b>				<b>10</b>				<b>14</b>
PFA Inc. – Germantown, WI, 262-250-4410																
PMI Industries Inc. – Rochester, NY, 585-464-8050																
Precision Ground Inc. – Lakemoor, IL, 815-578-2613			1	2		4			7							
Precision Punch Corp. – Berlin, CT, 860-229-9902						4			7							
<b>Progressive Components</b> – Wauconda, IL, 847-487-1000		<b>Inside Cover</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>		<b>6</b>	<b>7</b>					<b>12</b>		<b>14</b>
Roehr Tool Corp. – Hudson, MA, 978-562-4488						4										
RUD-Chain Inc. – Hiawatha, IA, 319-294-0001																
SelfLube – Coopersville, MI, 616-837-9721				2		4			7					12		
Smith Enterprises – Wood Dale, IL, 630-595-0202			1	2		4			7							
Superior Die Set Corp. – Oak Creek, WI, 414-764-4900				2		4						10				
Unitherm Insulation Systems – Lewisville, TX, 972-436-1401																

For more supplier listings, go to [moldmakingtechnology.com/suppliers](http://moldmakingtechnology.com/suppliers).

Taperlocks																																				
	Internal Mold Cooling Products																																			
	Jigs																																			
	Leader Pins																																			
	Lifters																																			
	Locating Rings																																			
	Mold Bases and Frames																																			
	Mold Insulation																																			
	Mold Monitoring Devices																																			
	O-rings																																			
	Pressure Controls, Sensors, Monitors																																			
	Quick Mold-Change Systems																																			
	Side Actions or Cam Actions																																			
	Slides																																			
	Socket Head Cap																																			
	Sprue Bushings																																			
	Stop Pins																																			
	Straight Locks																																			
	Support Pillars																																			
	Switches or Indicators																																			
	Thermal Pin/Heat Pipes																																			
	Wear Plates																																			

Image courtesy of Hasco America Inc.

### Component Supplier Provides Mold Venting and Mold Polishing Solutions

**DMS** offers the Almo worm-gear device, which enables inserts to be tightened and released inside the mold cavity. DMS also offers the Balzi mold-venting valve, which helps resolve the most common effects of poor cavity venting. The company has Boride-bonded abrasive products, including polishing stones, diamond-compound mounted points and industrial sharpening stones. It has i-Mold tunnel gate inserts designed for bottom gating and Exaflow gate inserts for tunnel and rear-surface applications; Kool Flow compact water manifold systems for injection molding, resistant welding, pneumatic control, vacuum forming, die casting, extrusion technology and water distribution; Diprofil hand-held machines and diamond tools for tool, die and moldmaking; Desoi thread unscrewing devices; full-color, high resolution mold plaques.

DMS also has Bolex P ball-guided ejector bushings made of special roll steel bush casing, hardened and ground to hold fixed inside a high-resistant bronze cage for guiding the balls running along the cage. The unique feature is that the balls do not run aligned, but at a slight angle, enlarging the contact area and enabling greater load capacity. This system enables the precision balls to circulate endlessly. Typically, these are used in the ejector system when a friction-free application is required. DMS displays BZ hydraulic locking cylinders with robust cam-finger design to withstand heavy loads in a compact package for use in molds with side actions, slides or core pulls.

**DMS / 800-265-4885 / [dmscomponents.com](http://dmscomponents.com)**

### Special Seals Give Cooling System Durable High-Temperature Stability

**Hasco America Inc.** offers a reworked cooling system that can withstand long-term service temperatures ranging to 250°C, depending on the medium employed. A special sealing element makes this possible which, in contrast to conventional sealing rings, has the requisite long-term heat stability.

The HT range supplements Hasco's standard range. All the cooling elements bearing the letters "HT" at the end of their designation contain the new sealing elements as standard. As part of this development project, Hasco reviewed and refined the throughput of the couplings. Hasco says it's possible to increase throughput by up to 10 percent. The cooling system resists a higher temperature and offers more effective cooling by using connecting couplings with a shut-off valve.

**Hasco America Inc. / 828-650-2600 / [hasco.com](http://hasco.com)**



**At MBI we don't just build Mold Bases we build TRUST!**

**Starting at the RFQ we carefully review your Design Files to find any problems that might show up in manufacturing. Then we work with you to solve any issues before we cut steel.**

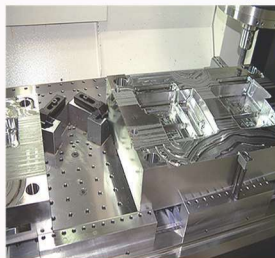


**Mold Base Industries Inc.**

For more information visit  
[www.moldbase.com](http://www.moldbase.com)

1-800-241-6656

**MBI offers Parting-Line machining saving the Mold Builder lead time and money.**



### Tunnel Gate Inserts Designed for Large Contour Steps

**Meusburger Georg GmbH & Co KG** has two new tunnel gate inserts suitable for large contour steps. The company says its tunnel gate inserts with a "banana-like" geometry are the ideal solution for hidden gate marks. Such a geometry enables plastic injection from the bottom of the component. Additionally, a clearly defined tear edge guarantees an exact tear of the sprue. Meusburger says that the high surface quality enables good flow properties and therefore the highest process safety during the injection molding process.

The geometry of the E 1693 and E 1694 tunnel gate inserts create additional fields of application. This geometry facilitates fast, easy manufacturing of tunnel gates with large contour steps. The E 1693 tunnel gate insert is for high-level contours. With the E 1693, the gating point of the molded part can be behind a step or fillet or above the split line face. The E 1694 tunnel gate insert is for low-level contours, and it enables gating below the split line face.

**Meusburger Georg GmbH & Co KG / 43 5574 67060 / [meusburger.com](http://meusburger.com)**





### Tunnel Gate Inserts Provide Clean Parts and Runner Separation

Tunnel gate inserts from **i-mold GmbH & Co. KG** are made for bottom (submarine) gating in cases where the upper or visible surface of the part cannot have blemishes from gate vestige. The inserts ensure unrestricted passage of the melt and that the molded part and the runner or gate are separated cleanly, either at the edge or on the underside of the part. It ensures this separation so that the upper, visible surface is completely free from gate vestiges.

The TGH design (Tunnel Gate High Level) permits the internal gating of parts in the region of the parting line in cases where the parts have a rim all the way around or are ribbed close to the edge. The TGL design (Tunnel Gate Low Level) is used for the gating of parts featuring an internal contour below the parting line. The tunnel gate inserts are suitable for the processing of most polymers. Like all i-mold tunnel gate inserts, the TGH and TGL versions are machined from HSS steel (M2/1.3343) and are exchangeable. DMS and PCS Company are both distributors of the i-mold gate inserts.

**i-mold GmbH & Co. KG / 49 6062 80933-0 / i-mold.de**

### Trunnion Lifter Slide Cuts Mold Build Time, Cost

Mold and die component manufacturer **SelfLube** offers its trunnion lifter slides, which come in inch and metric and are available with or without self-lubricating graphite. The company says that these slides are ideal for mold builders because they reduce build time and cost since they are finished and ready for installation in the tool. The company also offers bushings, wear strips, parting line locks and gib assemblies, among other products from its 10,000 standard part numbers.

SelfLube, which sells directly, offers a range of components, including bushings, wear strips, parting line locks, gib assemblies and more. The company can customize its standard offerings to accommodate any size or special feature that a customer might require.

**SelfLube / 800-690-3600 / selflube.com**

### Double-Racked Lifters Save Time and Simplify Tool Construction

**Cumsa USA** Double Racks Lifters (DRs) are designed to save time, reduce the size of the over-all mold and simplify tool construction. They also help cut down the ejection stroke. This patented system is oriented along a straight, vertical plane, improving rigidity and limiting the need for angled channels through multiple mold plates. Unlike conventional lifters, DRs eliminate complicated cam-action operations. Their straight-movements enable them to move more smoothly, causing less friction and reducing the impact on tool performance. The ejection stroke of the DRs range from 100 mm-125 mm but can accommodate a larger ejection stroke upon request. Cumsa currently offers this line in a variety of sizes ranging from 16 mm wide to 72 mm and in release undercuts ranging from 14 mm to 52 mm.

**Cumsa USA / 248-850-8385 / cumsa.com**

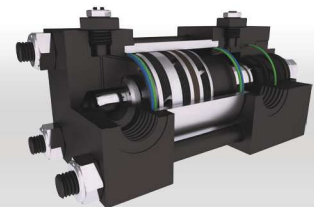


## INNOVATIVE SOLUTIONS



### Micro Injection Molding Machines

Established Production Machines that are Small, Flexible, Efficient, Fast, Quiet and Simple to Use



### Cylinders Designed for Molds

Vega Gives the Mold Designer Flexible Command of Optimizing the Cylinder Around the Mold



### Quick Knockout Couplers

Save Time, Save Money on Every Mold Change

For Sales and Support contact:



Call: **909.941.0600**  
Email: [info@albaent.com](mailto:info@albaent.com)  
[www.ALBAGENT.com](http://www.ALBAGENT.com)



## Three-Plate Latch System Installs and Adjusts Easily

Designed for simplicity and positive plate pulling, the three-plate latch system from **Alba Enterprises** installs easily. The system mounts externally, so the latch and cam plate assembly provide for easy adjustment of the plate stroke. External mounting also provides for easy adjustment of positive-plate stop positions. The company says that a socket head cap screw can easily adjust the LS01 and LS02 cam plates while they are still in the machine. Since the latch and the cam plate are separately attached to the mold, there is no possibility of over-

stroking the machine and causing mold damage.

Alba Enterprises offers this system in a variety of sizes to meet a variety of applications.

**Alba Enterprises Inc. /**  
**909-941-0600 / [albaent.com](http://albaent.com)**

## [ PRODUCTFOCUS ]

COMING SOON  
FALL 2018!!

### UNDERCUTS / SMART WORM PIN

WP

**BRAND-NEW SMART WORM PIN FOR THE RELEASE OF SMALL UNDERCUTS!**

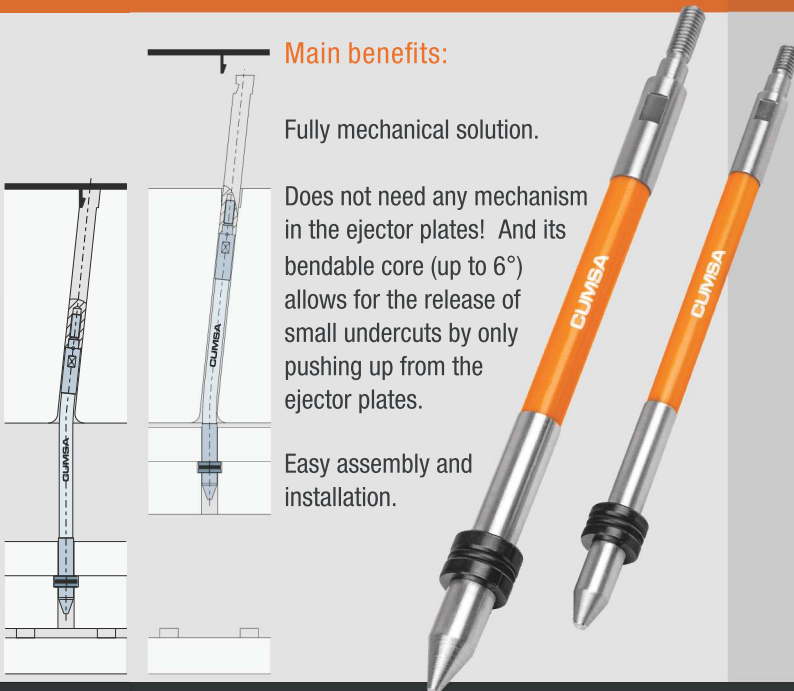
The Smart Worm Pin comes in 2 sizes : Ø6 and Ø8mm, and two different lengths depending on the ejector stroke required : either up to 30mm or up to 60mm.

#### Main benefits:

Fully mechanical solution.

Does not need any mechanism in the ejector plates! And its bendable core (up to 6°) allows for the release of small undercuts by only pushing up from the ejector plates.

Easy assembly and installation.



**CUMSA**  
USA

950 Stephenson Hwy  
Troy, MI 48083  
1 248 850 8385  
[info@cumsausa.com](mailto:info@cumsausa.com)

[www.cumsa.com](http://www.cumsa.com)



## Flat Ejectors Have Tight Dimensional Tolerances for Flash-Free Production

Flat ejectors are suitable for areas of injection molds like ribs or bars. The **Hasco America Inc.** flat ejectors have particularly tight dimensional and shape tolerances. Hasco says they permit optimum functioning of the mold and the flash-free production of injection moldings. To ensure that they can readily reach the corner geometries of wire-eroded holes, the Hasco flat ejectors Z4656 and Z4655 have either two or four corner radii over the full length of the ejector blade. The ejectors enable a wide range of solutions for the functional demolding of plastic articles from injection molds. The flat ejector Z4655 has a corner radius of 0.2 mm on all four sides. The Z4656 has two corner radii, and it is suitable for segmented cavities. Hasco flat ejectors are available ex stock in all sizes and can be mounted straightaway without requiring any adaptations. For a longer service life with elevated wear protection, Hasco offers versions Z4650 and Z4651 with a DLC coating.

**Hasco America Inc. /**  
**828-650-2600 / [hasco.com](http://hasco.com)**





### Cooling System Accessories Give Users Better Control Over System

**Frigel North America Inc.** has introduced advanced 3PR control technology and variable frequency drives (VFD) for its new Aquagel GPV Process Pump sets, which combine to ensure that the pumps operate at peak efficiency while consuming the lowest possible amount of energy and giving users the ability to gain precise control of the units. The enhanced Aquagel GPV is part of Frigel's family of pumping, reservoir and filtration systems designed for use with its central cooling systems, the Ecodry and the Heavygel.

With Frigel's 3PR control console, users can easily monitor all data in real-time for the pump stations. 3PR enables users to access full operating schematics that monitor pump performance such as pressures, flow rates and VFD capacity, and it gives users the ability to make adjustments on the fly. Real-time data, combined with trouble-shooting options, gives users the ability to gain precise control of the system.

3PR has alarm and fault indicators and a dated history log to identify any potential system issues. It has all pump values including pressures, calculated flow rates and temperatures, real-time data for pressures versus set points and pump variables in real-time including speed, frequency, and electrical consumption. The VFD pumping assembly on the Aquagel GPV pump sets automatically equalizes the pressure depending on the process cooling demands like the number of machines, pressures and flow rates.

Additional highlights of the Aquagel GPV pump sets include modular bolt-on capabilities that integrate into Ecodry or Heavygel central systems, multiple choices of high-efficiency pump and motor assemblies to meet any system requirements, a pre-wired inverter drive per pump (range 40-60 Hz), manual mode operation that is available with each inverter, automatic pump cycling (including standby pumps to equalize running times) and a complete, factory-supplied trim with non-ferrous wetted surfaces.

**Frigel North America Inc. / 847-540-0160 / [frigel.com](http://frigel.com)**

## Precise Centering, Small in Scale

### Miniature Agathon Centering System

The newest precision standard for injection mold-making



- **Free from play** | no skid stacking of mold plates
- **Compact design** | bushing optional
- **Smarter choice** | easier and less expensive tool design
- **Convenience** | quick change of mold inserts

**AGATHON**  
SWITZERLAND

Agathon Machine Tools | 9 Park Lawn Drive  
Bethel, CT 06801 | Tel. 203 730 8741  
[mailamt@agathonusa.com](mailto:mailamt@agathonusa.com) | [agathon.ch](http://agathon.ch)

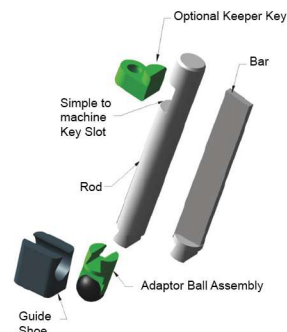
**PCS**  
COMPANY  
Turn To The Industry Experts

## ProLifter™

### Introducing the only 3-Dimensional ball lifter!

#### Features:

- Simple to design and install into a mold
- 3D Ball Lifter allows free movement in multitude of directions
- Non-binding, self-aligning at very low friction



Unlike other lifters that have issues with binding and excessive wear, the ProLifter is designed to allow free movement in all directions.

Phone: 800-521-0546 E-mail: [sales@pcs-company.com](mailto:sales@pcs-company.com) [www.pcs-company.com](http://www.pcs-company.com)



## How to Advance Molding Undercuts

By Garry Zydron

Collapsible cores have long been touted as a viable alternative for molding undercut details like internal threads as opposed to using traditional unscrewing mechanisms like racks and gears. Several potential benefits result from using collapsible cores, not the least of which is eliminating the messy unscrewing cores, and yet it can be difficult convincing a moldmaker or a molder to use the technology. A new flush-style core design just might help to overcome objections and advance the molding of undercuts.

Here are seven good reasons to consider this new technology:

- **Durability.** The most common objection is that the cores do not have the durability to last three million cycles. In some cases, this might be true, but the patented flush-style core has succeeded in attaining eight to 10 million cycles. For example, flush-style cores were used for a 24-cavity tool molding a wine cap measuring 30 millimeters by 40 millimeters. The cap's wall thickness reduces to 0.25 millimeters for the tear-off strip. There are pin shut-offs on both sides of the core, and the slides shut off on the core, which shapes the bottom of the cap. The mold ran for eight years and averaged between one million and five million cycles per year.
- **Radius positioning.** This project was successful because unlike other styles of collapsible cores, the radius on a flush-style core (located on its pin) is positioned internally versus at the core's tip. This is so that the pin's top surface is flush with the core's top, enabling the part to be designed with a consistent wall thickness.
- **Ring design.** Also unique is that the inner and outer fingers of the flush-style cores are positioned on two separate rings versus one. Wire EDM improves the fit between the fingers, and all the fingers open independently so that the sides of the fingers do not wear.
- **Core assembly.** The core assembly uses straight, true diameters, further improving the fit and core durability and accuracy. These true diameters act like a pin and bushing with almost no wear.

These wine caps were molded for eight years at a volume between one million and five million cycles per year using the original patented, flush-style collapsible cores.

- **Core fit.** Working without tapered-fit surfaces makes it easier to fit the core into the mold. A straight pin ensures that the core is open to the proper molding position, so the molded part shows only a witness line and no flash. This new fit also improves thermal transfer by fitting a true diameter.
- **Cost and cycle time.** A collapsible core design can help mold parts with undercut details at one-third the cost of an unscrewing mold and half the cycle time. It is no longer necessary to design in a rack mechanism because there is no need for it. This is because of the cost reduction coupled with a simpler mold design. The notably faster cycle time is achieved because there is no unscrewing of the part.
- **Footprint.** A final point to consider is that collapsible cores have very small footprints, which means that the designer can position more parts in the same size mold or the same number of parts in a smaller mold using a smaller press. When compared to an unscrewing mold, the difference is dramatic, as cavitation can be increased by a third or even half again as much in the same size mold. [MMT](#)

### CONTRIBUTOR

Garry Zydron is the president of Collapsible Core Inc.

### FOR MORE INFORMATION

Collapsible Core Inc. / 630-408-1693 / [collapsiblecore.com](http://collapsiblecore.com)

Image courtesy of Collapsible Core Inc.



Image courtesy of Haimer USA and Hermle Machine Co.



**Iscar Metals, Inc.**  
**300 Westway Place**  
**Arlington, TX 76018-1021**

Phone: 817-258-3200  
 Toll-Free: 877-294-7227  
 Fax: 817-258-3221  
 Email: [info@iscarmetals.com](mailto:info@iscarmetals.com)

[iscarmetals.com](http://iscarmetals.com)

## PRODUCTS/SERVICES

### Machining Intelligently

ISCAR is about productivity. We help you reduce the cycle time to produce your part which increases your current machine tool capacity improving your profitability.

Upon close working collaboration with industry, we have developed solutions to optimize productivity. We understand the unique requirements of many industries and continually improve and introduce new ideas directly related to what we learn. Whether you are an automotive, aerospace, medical, die and mold, oil and gas equipment manufacturer or a general machining subcontractor, we have a solution to help you increase your throughput and resolve your machining challenges. We listen, and then we invest, to bring to market something better.

ISCAR has a comprehensive portfolio of machining solutions along with expert system software and tool management accessories to provide an unparalleled machining experience. Many variables come into play when applying tooling and ISCAR ensures that a high level of support is present to guarantee the best possible machining experience.

### Become a Master - ISCAR LOGIQ Chess Lines

For 2018, ISCAR has released the new LOGIQ line of cutting tools. This portfolio of new tooling solutions addresses some very specific machining environments. Typically, (multi-flute) indexable milling technology has been limited to above 0.500".

ISCAR has developed new 90 degree and high feed milling systems under the brand name **NANMILL** with diameters as small as 0.315". These small inserts have 3 cutting edges providing a very economical approach to milling with impressive depth of cut and feed rate. Today's lathes, in many cases, have live tooling stations where expensive solid carbide end mills are used. NANMILL could be a cost-effective substitute. A special wrench is supplied with the tool to make indexing quick and easy.

In reviewing for new ideas for small diameter drilling operations the new LOGIQ campaign expands the sumocham line down to 4mm diameter. Typically, the only choice in this diameter range was a solid carbide or HSS drill. ISCAR has broken through the technical barriers to now offer a high performance small diameter indexable drill. The quick-change head replacement feature of this drill makes it an intelligent choice for the high production part run, especially well suited to the swiss machine environment. Small tools can potentially produce big savings. These are just 2 examples of the many new LOGIQ solutions. Visit our website: [www.iscar.com](http://www.iscar.com) to see the entire offering.



## WEBSITE



Iscar is a dynamic full-line supplier of carbide metal cutting tools which cover a broad range of applications and industries. Browse Iscar's site to find the newest innovations in metal removal. Contact Iscar for more information.  
[iscarmetals.com](http://iscarmetals.com)

## PRODUCT CATEGORIES

- Cutting Tools
- End Mills
- Inserts
- Lathe Tooling and Accessories
- Reamers
- Toolholders
- Tool Selection Software (ITA)



**LOGIQMILL**  
ISCAR CHESS LINES

# Indexable Profile Milling Ball Master

Visit ISCAR Booth #431800 West Building  
**IMTS 2018**



No Setup  
Time



Ideal for Finishing Applications



Ideal for Semi Finishing and  
Roughing Applications

**MILLCHAM**  
BALLNOSE LINE

**Indexable Ball Nose** with  
No Setup Time for **High  
Accuracy, Finishing and  
Semi Finishing** Applications



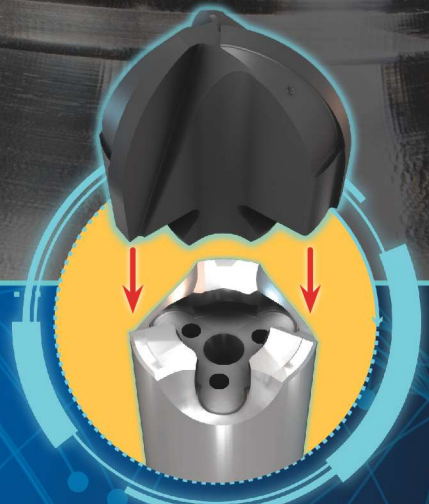
Ease of Use



Profiling, Roughing,  
Semi Finishing &  
Finishing applications



Cost Effective  
Insert



**Innovative  
Clamping System**

**MACHINING IN DUSTRY 4.0  
TELLIGENTLY**

Member IMC Group  
**iscar**  
[www.iscarmetals.com](http://www.iscarmetals.com)



**Walter USA, LLC**  
**N22W23977 RidgeView Pkwy. W**  
**Waukesha, WI 53188 US**

Phone: 800-945-5554

[walter-tools.com](http://walter-tools.com)

## PRODUCTS/SERVICES

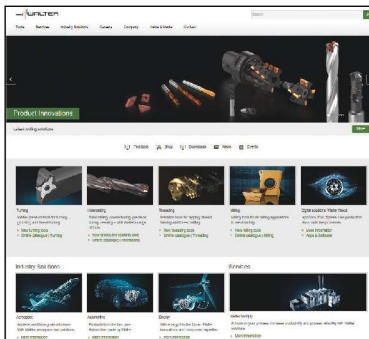
### M4000 with Tiger-tec® Gold

M4000 is the universal system for all users who want to have as many options as possible when milling. That's because the M4000 range can master all machining tasks with one type of indexable insert. Whether used in shoulder milling cutters, high-feed milling cutters, face milling cutters, chamfer milling cutters, T-slot milling cutters, helical milling cutters or routing cutters, the square system inserts can be used across the entire M4000 range. For routing cutters and helical milling cutters, the range also has an additional rhombic indexable insert.

The low storage and procurement costs clearly show that this system places particular emphasis on cost efficiency. Efficiency is also maximized thanks to extremely easy handling and impressive performance data across the M4000 tool family. And with the new Tiger-tec® Gold indexable inserts, our high-performance milling tools are achieving an unprecedented level of productivity.



## WEBSITE



[walter-tools.com](http://walter-tools.com)

## PRODUCT CATEGORIES

- Coolants
- Cutting Tools
- End Mills
- Finishing Services
- Inserts
- Lathe Tooling and Accessories
- Machining Services
- Profilers
- Reamers
- Toolholders



# Tiger-tec® Gold


## Go for better, go for Gold.



**For those who won't settle for anything but the best: Tiger-tec® Gold**

If you had to make a choice right now – between maximum tool life, uncompromising process reliability and optimum productivity – which one would you pick? Why not choose the freedom to never have to choose again. Stay true to your own high standards in every way. Choose Tiger-tec® Gold.

[walter-tools.com/us](http://walter-tools.com/us)

 **WALTER**  
Engineering Kompetenz





COMPANY	Advertisers are listed in bold type.	See Ad	Balancing Equipment						Coolants	Cutting Fluids	Cutting Tools	End Mills	Grinding Wheels
			1	2	3	4	5	6					
<b>Alouette Tool Co. Ltd. – Fairport, NY, 585-388-1240</b>		<b>102</b>				<b>4</b>	<b>5</b>	<b>6</b>					
Big Kaiser Precision Tooling Inc. – Hoffman Estates, IL, 247-770-2999						4	5						
Cobra Carbide – Riverside, CA, 951-280-4700						4	5						
Cole Carbide Industries Inc. – Orion Township, MI, 586-757-8700						4	5						
<b>Crystallume – Santa Clara, CA, 408-653-1700</b>		<b>70</b>				<b>4</b>	<b>5</b>						
CVD Diamond Corp. – London, ON, 519-457-9903						4	5						
Dapra Corp. – Bloomfield, CT, 860-242-8539						4	5						
Data Flute – Pittsfield, MA, 413-499-3895						4	5						
Drill Masters – Eldorado Tool – Milford, CT, 203-878-1711						4							
EDM Network Inc. – Sugar Grove, IL, 630-466-5588													
Emuge Corp. – West Boylston, MA, 508-595-3600					3	4	5						
Greenleaf Corp. – Saegertown, PA, 814-763-2915						4	5						
<b>Haimer USA – Villa Park, IL, 630-833-1500</b>		<b>71</b>	<b>1</b>			<b>4</b>	<b>5</b>						
Horn USA Inc. – Franklin, TN, 615-771-4100						4	5						
Ingersoll Cutting Tools – Rockford, IL, 815-387-6600						4	5						
<b>Iscar Metals Inc. – Arlington, TX, 817-258-3200</b>		<b>63</b>				<b>4</b>	<b>5</b>						
JM Performance Products Inc. – Fairport Harbor, OH, 440-357-1234													
Kennametal Inc. – Latrobe, PA, 800-446-7738					3		5						
LMT USA Inc. – Waukegan, IL, 847-693-3270						4	5						
Micro 100 Tool Corp. – Meridian, ID, 208-888-7310						4	5						
Millstar – Orion Twp., MI, 586-573-9450						4	5						
Monster Tool Co. – San Marcos, CA, 888-227-2433						4	5						
Nachi America Inc. – Greenwood, IN, 317-530-1001						4	5						
Niagara Cutter – Troy, MI, 248-528-5220						4	5						
NSK America Corp. – Hoffman Estates, IL, 847-843-7664													
OSG USA Inc. – Glendale Heights, IL, 630-790-1400						4	5						
Rego-Fix Tool Corp. – Whitestown, IN, 317-870-5959			1										
RobbJack Corp. – Lincoln, CA, 916-645-6045						4	5						
RoundTool Laboratories – Huntington Beach, CA, 800-854-2431						4	5						
Sandvik Coromant Co. – Fair Lawn, NJ, 201-794-5000						4	5						
Scientific Cutting Tools – Simi Valley, CA, 805-584-9495						4							
<b>Seco Tools LLC – Troy, MI, 248-528-5200</b>		<b>68, 69</b>				<b>4</b>	<b>5</b>						
Single Source Technologies – Auburn Hills, MI, 248-232-6232			1	2	3	4	5						
Sumitomo Electric Carbide Inc. – Mt. Prospect, IL, 847-635-0044						4	5						
Tool Alliance – Huntington Beach, CA, 714-898-9224						4							
Tool-Flo Manufacturing Inc. – Houston, TX, 713-941-1080						4	5						
Transor Filter USA – Elk Grove Village, IL, 847-640-0273					3								
Tungaloy America – Arlington Heights, IL, 888-554-8394						4							
<b>Walter USA LLC – Waukesha, WI, 262-347-2400</b>		<b>65</b>		2		<b>4</b>	<b>5</b>						
YG-1 Tool Co. – Vernon Hills, IL, 800-765-8665						4	5						

For more supplier listings, go to [moldmakingtechnology.com/suppliers](http://moldmakingtechnology.com/suppliers).

<i>Hard Milling</i>	<i>High-Feed Milling</i>	<i>High-Speed Electric Spindles</i>	<i>Inserts</i>	<i>Lathe Tooling and Accessories</i>	<i>Profilers</i>	<i>Reamers</i>	<i>Tool Management Systems</i>	<i>Toolchangers</i>	<i>Toolholders</i>	
7	8	9	10	11	12	13	14	15	16	WEBSITE
			10	11		13			16	<a href="http://alouettetool.com">alouettetool.com</a>
			10	11			14		16	<a href="http://bigkaiser.com">bigkaiser.com</a>
			10			13			16	<a href="http://cobracarbide.com">cobracarbide.com</a>
7	8		10						16	<a href="http://colecabide.com">colecabide.com</a>
			10							<a href="http://crystallume.com">crystallume.com</a>
										<a href="http://cvddiamond.com">cvddiamond.com</a>
7	8		10							<a href="http://dapra.com">dapra.com</a>
7	8									<a href="http://dataflute.com">dataflute.com</a>
						13				<a href="http://dmetool.com">dmetool.com</a>
7	8									<a href="http://edmnetwork.com">edmnetwork.com</a>
7	8		10	11		13			16	<a href="http://emuge.com">emuge.com</a>
7	8		10	11					16	<a href="http://greenleafcorporation.com">greenleafcorporation.com</a>
7	8						14		16	<a href="http://haimer-usa.com">haimer-usa.com</a>
7	8		10	11	12	13			16	<a href="http://hornusa.com">hornusa.com</a>
7	8		10	11		13	14		16	<a href="http://ingersoll-imc.com">ingersoll-imc.com</a>
7	8		10	11		13	14		16	<a href="http://iscarmetals.com">iscarmetals.com</a>
									16	<a href="http://jperformanceproducts.com">jperformanceproducts.com</a>
			10	11	12	13			16	<a href="http://kennametal.com">kennametal.com</a>
			10	11						<a href="http://lmtusa.com">lmtusa.com</a>
			10	11	12				16	<a href="http://micro100.com">micro100.com</a>
			10						16	<a href="http://millstar.com">millstar.com</a>
7	8					13				<a href="http://monstertool.com">monstertool.com</a>
										<a href="http://nachi-america.com">nachi-america.com</a>
7	8									<a href="http://niagaracutter.com">niagaracutter.com</a>
	8	9								<a href="http://nsk-america.com">nsk-america.com</a>
7	8		10			13			16	<a href="http://osgtool.com">osgtool.com</a>
7				11					16	<a href="http://rego-fix.com">rego-fix.com</a>
			10							<a href="http://robbjack.com">robbjack.com</a>
7	8									<a href="http://roundtool.com">roundtool.com</a>
			10	11					16	<a href="http://sandvik.coromant.com">sandvik.coromant.com</a>
			10	11	12	13			16	<a href="http://sct-usa.com">sct-usa.com</a>
7	8		10	11		13	14		16	<a href="http://secotools.com/us">secotools.com/us</a>
		9	10					15	16	<a href="http://singlesourcetech.com">singlesourcetech.com</a>
7			10	11		13			16	<a href="http://sumicarbide.com">sumicarbide.com</a>
										<a href="http://toolalliance.com">toolalliance.com</a>
			10		12				16	<a href="http://toolflo.com">toolflo.com</a>
										<a href="http://transorfilter.com">transorfilter.com</a>
										<a href="http://tungaloyamerica.com">tungaloyamerica.com</a>
			10	11	12	13			16	<a href="http://walter-tools.com/us">walter-tools.com/us</a>
7	8		10	11					16	<a href="http://yglusa.com">yglusa.com</a>

Image courtesy of Iscar Metals Inc.



### Milling Cutter Boosts Productivity, Process Reliability and Tool Life

Walter USA LLC says its new MD133 Supreme milling cutter is designed specifically for dynamic milling and delivers increased process reliability, particularly during unmanned operation.

The milling cutter offers increased productivity because it is capable of a high rates of metal removal and it reduces machining time. The MD133 Supreme has diameters of  $\frac{1}{2}$ – $\frac{3}{4}$ " (6–20 mm) and cutting lengths to  $5 \times D_c$ . They are designed for operating parameters typical of dynamic milling, such as a small width of engagement and a high depth of cut facilitated by a large cutting length. A chip breaker guarantees short chips even when working with large cutting depths. This milling cutter is available in two grades: WJ30RD for steel (secondary application: cast iron) and WJ30RA for stainless steels (secondary application: ISO S, N).

The milling cutter uses the entire cutting length, giving it an even wear pattern. Additionally, heat is dissipated via the chip, which leads to an improved tool edge life. The MD133 Supreme works for high-volume production environments and for users with smaller batch sizes. The MD133 Supreme has typical application areas in general engineering, aerospace, energy and the mold and die industries.

Walter USA LLC / 800-945-5554 / [walter-tools.com](http://walter-tools.com)

### Die and Mold Carbide End Mills Have Coating for Better Wear

RobbJack offers its die/mold series end mills. The company says that the DM/MDM die/mold carbide end mills are made with a revolutionary coating technology, reduce wear by 909 percent and last over 450 percent longer than comparable tools in hard metal applications. RobbJack says that the DM/MDM die/mold carbide end mill offers tighter tolerances, lasts longer in difficult areas like parting lines and produces better finishes that reduce or eliminate the need for polishing. According to RobbJack, when tests were conducted in D2 58 HRC that pitted comparable carbides and coatings against RobbJack's DM/MDM die/mold carbide end mills, RobbJack's tools outperformed every test tool with a smooth wear land of only .0025", which is 909 percent less wear.

RobbJack/Crystallume /  
844-342-0238 /  
[robbjack.com](http://robbjack.com)



# MAKE HARD EASY.

Making molds from hardened steels? Double your tool life with the Jabro JH112/JH142. With a superior HXT coating and optimized cutting geometry, these end mills boost performance for unsurpassed efficiency, accuracy and throughput.



### Slim Toolholder Precisely Machines Areas That are Difficult to Reach

The slim design of the Tribos-SVL toolholder extensions from **Schunk** enables precise and smooth machining of workpiece areas that are difficult to access. In spite of the slim design, the extension is robust and permits a run-out accuracy of less than 0.003 mm. The Tribos-SVL can be combined with a variety of toolholders, like the Tendo hydraulic expansion toolholders, Celsio heat shrink toolholders, collet toolholders and Tribos toolholders.

The Tribos extensions and the Tendo hydraulic expansion toolholders or the Tribos-R polygonal toolholders complement each other. Both systems have a vibration damping effect on the overall system. The Tribos SVL has a wide range of clamping diameters. They are available in metric from 0.3-20 mm and in inches from  $\frac{1}{8}$  -  $\frac{3}{4}$ ."

**Schunk / 919-572-2705 / [schunk.com](http://schunk.com)**



### End Mill Has Helix Design to Reduce Vibration While Machining

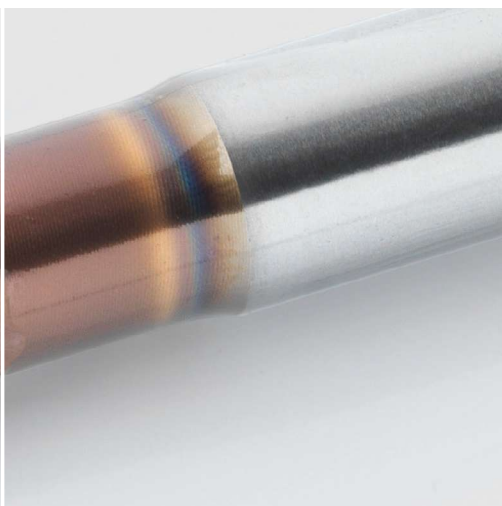
Haimer USA's Basic Mill solid carbide end mills are created with H6 shank tolerances using geometries with an unequal flute and helix design that reduces vibration while machining. The Basic Mill can be used in almost all material, including stainless steel, alloy steel, cast iron, aluminum and general steels. Haimer says that the end mill is capable of aggressive roughing machining strategies that include slotting, trochoidal milling, steep ramping and even drilling. The end mills is available in inch and metric, a full complement of radii and flute lengths and with or without Safe-Lock shanks. Haimer says that the Basic Mill is the do-it-all end mill for the shop.

Other technologies and products from Haimer include the Haimer Microset tool presetting machines, Power Clamp shrink fit machines, Haimer shrink fit tool holders and collet chucks, Tool Dynamic balancing machines, Haimer Safe-Lock and Duo-Lock technologies, Haimer 3D Sensors and Haimer Power Mill end mills.

**Haimer USA / 866-837-3265 / [haimer-usa.com](http://haimer-usa.com)**



**VISIT US AT  
IMTS 2018  
IN BOOTH #431564**



# SOLVING PROBLEMS WITH TECHNOLOGY

**Hard Metal, Graphite or Green Carbide?**

Crystallume delivers unparalleled performance and cost effective solutions.

For the toughest jobs & finest details, manufacturers rely on Crystallume.

**DIAMOND DONE RIGHT**



**Crystallume**

A DIVISION OF ROBBJACK CORPORATION

Made in the U.S.A.

To learn more, call

**1-800-789-4322**

[www.crystallume.com](http://www.crystallume.com)

©2018 Crystallume

## Toolholding Collet System Uses Mechanics to Create Grip Force

Rego-Fix says that the powRgrip toolholding collet system generates clamping forces equally as strong, if not stronger, than shrink-fit holders. The powRgrip system consists of three main components—holder, collet and press fit assembly mounting unit—that work together to generate what Rego-Fix describes as superior clamping force, high-vibration dampening and extreme precision.

Unlike other clamping systems for which heat or hydraulics are used to expand the material, the powRgrip uses the mechanical properties of the holder material to generate gripping force with tool run-out below 0.0001". Interchangeable collets are available from 0.125-1.000". They are available in metric sizes as well, and they hold both carbide and high speed steel tools.

The powRgrip system takes less than 10 seconds to press in a tool or to remove a tool from the holder. Because the system does not rely on heat, machinists can use the tools immediately after a tool change. Cycle testing of the system exceeded 20,000 insertions and removals. The powRgrip product line offers several ancillary technologies and accessories. Large powRgrip PG 32 collets are especially well suited for machining components that are made from Inconel and titanium. The large powRgrip PG 32 collets are also well suited for Rego-Fix secuRgrip technology, which combines powRgrip's gripping strength with a patented locking key system.

Extended Length Toolholders also enable operators to tackle machining applications that require longer reach or present clearance challenges. Likewise, computer, communication and consumer electronics manufacturers can tackle the specific demands of small complex parts and molds with the slim-nose PG6 toolholders. These toolholders enable machinists to access difficult-to-reach features when drilling or milling.

**Rego-Fix Tool Corp. / 317-870-5959 / [rego-fix.com](http://rego-fix.com)**



## Coating on Turning-Grade Inserts Resists Adhesion, Microchipping

Sumitomo offers its line of AC1030U turning grade inserts for precision machining, which are available in many geometries, including the company's GND grooving line. The inserts have an Absotech Bronze PVD coating and a substrate, which are designed to create a high-quality cutting edge,

resist adhesion and microchipping, and result in better surface finish.

**Sumitomo Electric Carbide Inc. /**

**800-950-5202 / [sumicarbide.com](http://sumicarbide.com)**





### End Mill Material Improves Edge Strength, Sharpness, Durability

YG-1 Tool Co. offers the Only One powdered metal composition (HSS-PM60) for its end mills, designed to provide high performance in unstable setups. A new coating is said to enhance the best features of end mills for difficult applications. Where rigidity is lost, this technology is said to offer better toughness than high speed steel (HSS) and cobalt, while maintaining similar wear resistance to solid carbide. Improved edge strength, sharpness and durability make Only One a good choice for high-temperature nickel-based alloys like Inconel. To accommodate difficult and unstable machining conditions without the cost of solid carbide, Only One tools are offered in roughing, finishing, variable-helix, center-cutting, ballnose, long and short geometries.

**YG-1 Tool Co. /**  
**800-765-8665 / [yg1usa.com](http://yg1usa.com)**

### Drill Has Coating to Facilitate Chip Evacuation

OSG USA's A Brand represents a new evolution in cutting tool technology. OSG USA says that the A Brand is a tooling brand that is composed of OSG's latest high-performance threading, drilling and milling innovations. The A-Drill series features the Exocarb ADF drill. The Exocarb ADF enables one-step drilling to simplify machining time and tool management and is suitable for a wide variety of drilling applications including inclined surfaces, curved surfaces, counter-boring, eccentric holes, thin plates and so on. The Exotap A-Tap Series is a tap line made from powdered metal HSS with OSG USA's proprietary coating that was developed to facilitate chip evacuation in a wide variety of work materials over a wide range of machining conditions.

**OSG USA /**  
**800-837-2223 / [osgtool.com](http://osgtool.com)**

### Digital Boring Heads Connect to App for Smart Manufacturing

The EWE digital boring head from Big Kaiser Precision Tooling Inc. reduces finishing costs and cycle times by connecting to Big Kaiser's smartphone and tablet app. According to Kaiser, this eases the monitoring and configuring of the head while assembling and running boring tools. The app reads changes in cutting diameter and helps operators determine optimal cutting parameters from their tool assemblies. The app also logs historical adjustments for all the tools that are ever synced with it, providing information for companies adopting smart manufacturing.

EWE boring heads were designed for connectivity, and they were designed for precision production boring on machining centers, jig mills, boring mills, transfer machines and high-speed milling machines as well. Big Kaiser says that their fully enclosed, compact design allows reliable operation, even under extreme cutting conditions or with coolant.

**Big Kaiser Precision Tooling Inc. / 224-770-2999 / [us.bigkaiser.com](http://us.bigkaiser.com)**



## HAIMER Microset

**HAIMER®**  
Quality Wins.

Leading in technology and design –  
tool presetting that is worlds ahead.

- Easy to use software
- Up to  $\pm 2 \mu\text{m}$  Repeatability
- Shop floor ready (thermally stable design)
- Industry 4.0 ready
- Reduce set-up times by as much as 70%

Sept 10 - 15, 2018  
Come visit us in Chicago!  
West Hall Booth #431546



Measuring and  
Presetting Technology

Tooling  
Technology

Shrinking  
Technology

Balancing  
Technology

[www.haimer-usa.com](http://www.haimer-usa.com)



# Choosing Between Solid Carbide and Indexable Cutting Tools

By Tom Raun

What factors drive machinists to select solid carbide or indexable cutting tools?

**Machine Tool.** Most milling machine tools purchased in the United States today are lighter-duty machines with CAT40 or HSK 63 spindles, which generate low horsepower and torque when they are operated at slow spindle speeds. Price is one of the main purchasing criteria for buying machines with these light-duty spindles. However, in moldmaking the trend toward finishing cores and cavities in a hardened state over producing electrodes and using EDM to complete a workpiece has driven mold shops to invest in light-duty machining centers with high-speed spindles.

**Programming.** Advancements in CAM systems also are driving the selection of solid carbide cutting tools over indexable cutting tools. The ability to effectively maintain control of cutting tool engagement (or the width of cut) has provided the opportunity to optimize and maximize roughing applications, especially those involving light-duty, high-speed milling machines. These new algorithms can control the engagement of the cutting tool throughout an entire operation, no matter how complex the workpiece geometry. Without these algorithms, catastrophic cutting tool failures would result that could damage the part or the machine spindle over time. This is especially true on a high-speed milling machine since high-speed spindle design does not hold up well against excessive abuse.

**Workpiece Geometry and Material.** Workpiece geometry plays a major role in determining cutting tool type and size. However, workpiece geometry alone should not be the deciding factor for selecting a cutting tool diameter. For example, a given workpiece geometry may provide access for a 2.00-inch diameter cutting tool or larger. But, can a lighter-duty spindle be effective in running this cutter? A very common mistake in milling is to choose a cutting tool that is too large for a given machine to effectively operate. Machinists are forced to sacrifice the effective and efficient use of carbide by limiting the depth or width of cut when choosing a cutter diameter that is too large. It is critical to match the cutting-tool diameter to the machine tool capability while staying within the limits of what the cutting tool can handle in terms of speed in a given material. Using solid carbide end mills in a high-speed approach offers more freedom when matching the cutting tool to the machine and material, especially on light-duty machines.

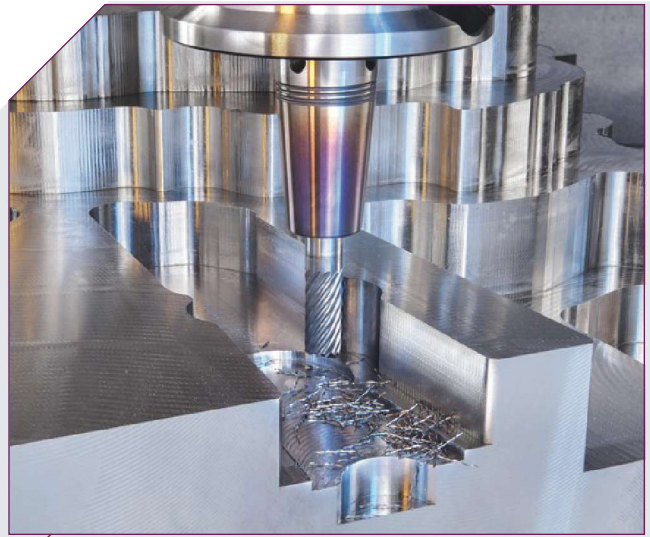


Image courtesy of Iscar Metals Inc.

Multi-flute end mills can optimize rough milling applications when machinists use them in a high-speed approach.

**Fixture and Part Clamping.** Rigidity is the most important variable in machining. When rigidity is lacking, a high-speed approach that reduces force may be the only option for productive milling. For example, rigidity is lacking when the workpiece geometry makes it difficult to clamp the part, when holding onto a slim piece of material in a vice or when milling operations distort the workpiece with thin walls or ribs.

**Milling Cutter Advancements.** Most 1-inch diameter and smaller cutting tools used in milling, whether indexable or solid carbide, are designed with two, three and four flutes. The design of indexable tools usually limits the addition of more flutes since a significant area is required to create the insert pocket and chip gullet. And, solid carbide tools with two, three and four flutes are still the most common due to their versatility. However, solid carbide and interchangeable solid carbide end mill designs are quickly evolving to optimize this high-speed milling approach. The small or light width of cut used allows the end mill's chip gullets to be smaller, which provides the opportunity to add more flutes with longer lengths of cut.

The use of solid carbide cutting tools in a high-speed approach may offer more freedom to adapt to common machining variables and to match or surpass what has previously been done with indexable tooling. This is especially appropriate in a light-duty environment that lacks rigidity and where working at lower speeds would constrain spindle power. **MMT**

## CONTRIBUTOR

Tom Raun is a national milling product manager for Iscar Metals.

## FOR MORE INFORMATION

Iscar Metals / 877-294-7227 / traun@iscarusa.com /  
iscarmetals.com



Image courtesy of Heidenhain Corp.

The difference between 303 and 304 stainless steel



## Need to get the job done? Look here first.

When you work in manufacturing, you know how things tick. But, every now and then you may come across a metalworking challenge that leaves you stumped. Join the industry's best peer-to-peer resource, so you can find the right solution for you. Practical Machinist is the most visited, free metalworking resource on the web. Register, post your questions, browse the 3.1 million discussion threads or connect with more than 143,000 other industry pros—just like you.

Visit [PracticalMachinist.com](http://PracticalMachinist.com) today!





# 50 YEARS of INNOVATION

# HURCO

1968-2018

**Hurco Companies, Inc.**  
**One Technology Way**  
**P.O. Box 68180**  
**Indianapolis, IN 46268**

Toll-Free: 800-634-2416  
 Email: [info@hurco.com](mailto:info@hurco.com)

[hurco.com](http://hurco.com)

## PRODUCTS/SERVICES

### Hurco Leads 5-Axis Revolution

Hurco is leading the 5-Axis Revolution, a technology that is becoming increasingly important for moldmakers. While a vast majority of moldmakers have relied on 3-axis machining centers in the past, 3-axis machining has limitations, especially for deep-cavity molds or tall-core molds.

Deep-cavity molds require long, skinny tools—to minimize chatter and prevent tool breakage, you have to slow down the feed rates. Often, you can't achieve the quality of surface finish you need using 3-axis machining for mold work. For fine finishing operations, especially on small-diameter molds, 3-axis machining can make the process more difficult than it needs to be.

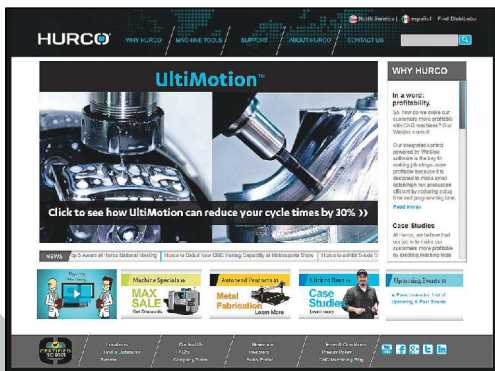
With simultaneous 5-axis machining, you can use shorter, stouter tools, which means you can push faster with increased feed rates. Using simultaneous 5-axis machining for mold work means you can take heavier cuts and Z depths aren't a problem. All of this results in shorter total machining time.

Hurco has made 5-axis a priority. The last 20 years of research and development has resulted in a broad line of 5-axis machining centers and advanced 5-axis control features. Additionally, Hurco sponsored a book written by a machinist for machinists about 5-axis/5-sided. Learn more at [hurco.com/5-axis](http://hurco.com/5-axis).



**Bonus:** All Hurco mills are equipped with patented UltiMotion™ technology, invented by Hurco. With UltiMotion™ you simultaneously reduce cycle time by 30% (or more) and improve surface-finish quality. Exclusive technology only available on Hurco mills. Learn more at [hurco.com/ultimotion](http://hurco.com/ultimotion).

## WEBSITE



[hurco.com](http://hurco.com)

## PRODUCT CATEGORIES

- Horizontal Machining Centers
- Lathes
- Machine Control Software
- Machine Controls
- Milling Machines
- Vertical Machining Centers



**TARUS Products Inc**  
**38100 Commerce Drive**  
**Sterling Heights, MI 48316**  
**USA**

Phone: 586-344-6844  
 Email: sales@tarus.com

[TARUS.com](http://TARUS.com)

## PRODUCTS/SERVICES

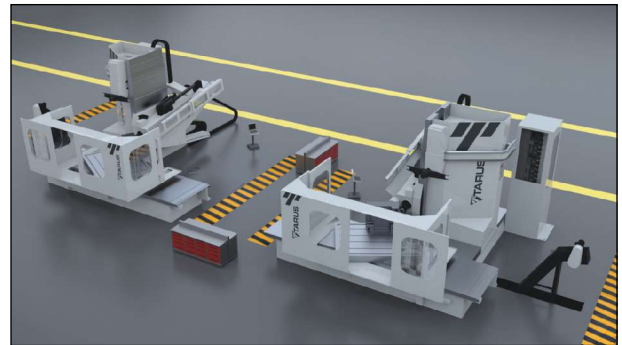
Ideally suited for the Moldmaking Industry are the TBM5 Gantry Milling Machine and the the DHDM-R-1 5 Axis Gundrilling Machine.

The TBM5 Gantry Mill is intended to be used for Semi Finish and Finish Contour Milling of Ferrous and Aluminum Tooling, Fixtures and Models as well as high-feed / low depth of cut rough milling with proper tooling and CAM programing.

Features of the TBM5 include Heidenhain or Siemens CNC, Kessler or Tramec / Fischer Milling Head and Spindle Sets, Liquid Cooled Direct Ball-nut Drive System, Heidenhain Glass Scales, 49 Tool ATC, Flood Coolant with Retractable Roof and Mist Extraction.

The DHDM-R-1 is a Five Axis Deephole Drilling Machine with Milling Capabilities intended for use by mold makers.

Features of the DHDM-R-1 include Gundrill and BTA/STS Drilling, a separate 50 Taper Milling Spindle, Robust Box Way Structure of Column and Tipping Axis, Clamping Rotary Table, 60 Tool ATC, and an optional Full Enclosure. Now available with Heidenhain and Siemens CNC.



## WEBSITE

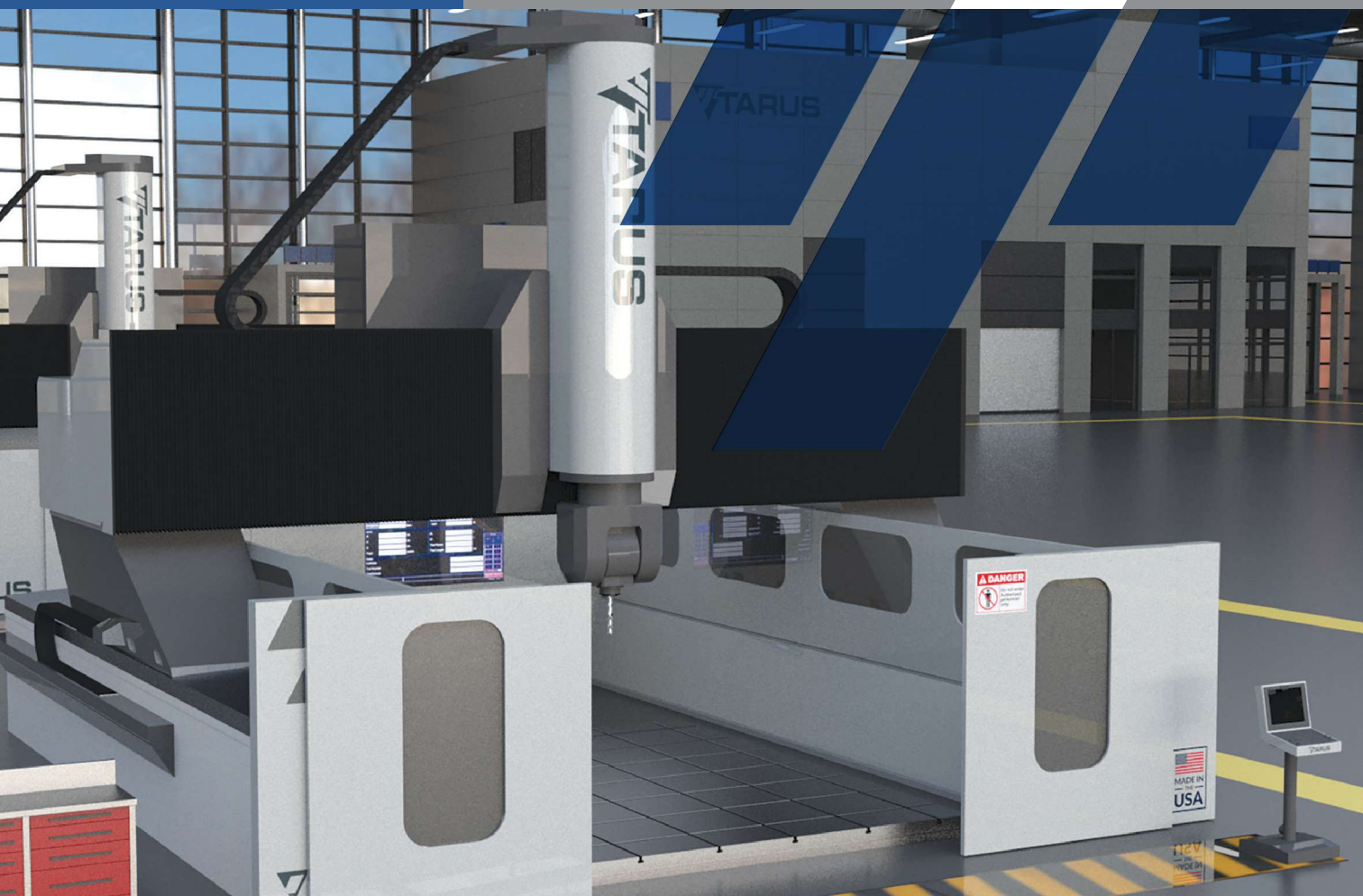


TARUS builds a range of CNC Milling and Drilling Machines for the Mold, Die, Aerospace and Energy Industries. For Nearly 50 years we have focused on providing high performance, reliable, long lasting Machine Tools built in the USA.

[TARUS.com](http://TARUS.com)

## PRODUCT CATEGORIES

- **Five Axis Milling Machines**
- **Gundrilling Machines**
- **Milling Machines**



## TBM-5-K

/ TRAVELING BRIDGE MACHINING CENTER

-HEIDENHAIN TNC640 or SIEMENS 840D CNC

-KESSLER or TRAMEC / FISCHER MILLING HEAD AND SPINDLE

WWW.TARUS.COM

38100 Commerce Drive, Sterling Heights, MI, 48312  
+1.586.977.1400 / sales@tarus.com





**Smart Attend**  
**230 Edward St.**  
**Aurora, ON, Canada**  
**L4G 3S8**

Phone: 866-210-9630

[smartattend.com](http://smartattend.com)

## PRODUCTS/SERVICES

Smart Attend continues to provide low-cost, accessible, and high-value solutions to customers worldwide through experienced staff and dedicated personnel. Our solutions have helped customers streamline information internally, remotely solve their problems to resolve any unscheduled downtime, and manage the production floor to save costs and increase overall capacity instantly. Our customers benefit from an overall decrease of 60% of unscheduled downtime per week instantly, and costly expedited shipments and time consuming manual production reporting becomes a thing of the past.

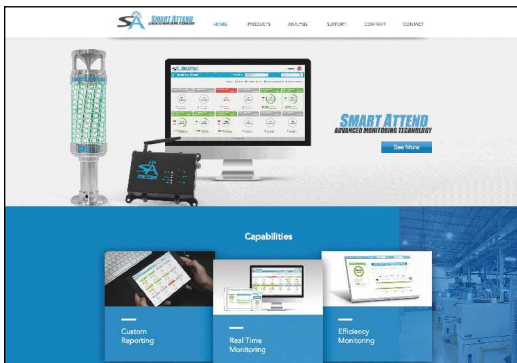
Born out of the collaboration of an injection moulding firm and a mold-making facility, Smart Attend continues to develop based on live feedback directly from its own production staff and its worldwide network of customers. Our solutions can remotely notify personnel of pending machine alarms, instantly provide job and shift performance information, and create a company culture built on proactive event response and managing costly everyday situations.

Our hardware and software continue to be designed and manufactured completely in-house and is able to develop magnitudes more quickly than any other solutions provider on the market today. We manufacture the hardware that drives our software with our own equipment, and therefore Smart Attend is able to design and implement complex solutions with ease and simplicity for its worldwide client base. Our in-depth manufacturing experience and knowledge help drive our product development and help our customers feel confident in our understanding of their issues. Remotely, our team can upgrade the hardware for our customers and can help identify costly downtime events and optimize production. Smart Attend is more than a software package, it's your companies trusted resource for production optimization and smart manufacturing expertise, here to show you that Industry 4.0 doesn't have to be a costly and time-consuming endeavor.

Are you ready to solve your problems? Visit our website and speak to your solutions provider today.



## WEBSITE



[smartattend.com](http://smartattend.com)

## PRODUCT CATEGORIES

- **Data Management Software**
- **Manufacturing Automation Software**
- **Production/Inventory Control Software**
- **Safety Equipment**



**SMART ATTEND**  
ADVANCED MONITORING TECHNOLOGY

*Solve your problems*

***FASTER  
THAN EVER***

*At the most affordable price*



"After integrating the Smart Attend, we immediately saved thousands in preventing unscheduled downtime. I cannot speak highly enough about the system and their service."

**Smart Attends** award winning production monitoring capabilities ensure you know exactly what decisions need to be made in those crucial moments. Instant visibility, real-time machine communication, and accurate information opens up new opportunities to grow as a business and implement more effective strategies.

[www.smartattend.com](http://www.smartattend.com)

# HEIDENHAIN

**HEIDENHAIN Corporation**  
**333 East State Parkway**  
**Schaumburg, IL 60173-5337**

Phone: 1-847-490-1191  
 Fax: 1-847-490-3931

[heidenhain.us](http://heidenhain.us)

## PRODUCTS/SERVICES



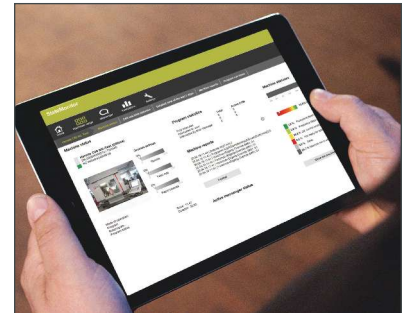
### TS 460 Workpiece Probe and TT 460 Tool Probe

The TS 460 workpiece probe and the TT 460 tool probes are the only devices in the market that have combined radio/infrared signal transmission. Together with the receiver, the SE 660 or (SE 661 for Endat) the system provides optimized signal quality for usage on both smaller, larger machines and transfer lines. Further, the TS 460 offers a patented collision adapter and an integrated workpiece cleaner.



### 5-Axis Mill-Turn Control

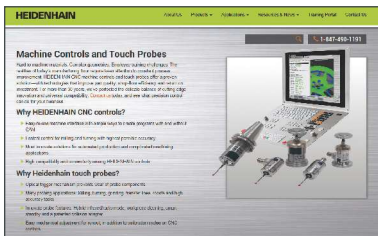
HEIDENHAIN 5-axis simultaneous Mill-turn control is now offered with groundbreaking touch technology that supplements its many field-proven cycles. The operator navigates quickly and intuitively through long lists, programs, and tables by what is known as kinetic scrolling. The kinetic scroll converts the impulse of hand contact into a particular scrolling speed. TNC 640 now features Global Programming Settings with virtual tool axis, Batch Process Manager for order sequencing and Tool-oriented machining.



### StateMonitor (SM)

HEIDENHAIN StateMonitor (SM) captures, visualizes and evaluates machine data and can export error messages and machine status modes to operator's tablets or smartphones. Thereby SM helps reduce downtime. Override settings such as spindle speed, rapid traverse and feed rate are visible and the utilization rate and availability are calculated. SM is easy to setup, connects to older HEIDENHAIN controls and MTconnect (Fall 2018) and its configurations can be customized.

## WEBSITE



HEIDENHAIN manufactures linear and angle encoders, rotary encoders, digital readouts and numerical controls for demanding positioning tasks. HEIDENHAIN products are used primarily in high-precision machine tools.

[heidenhain.us](http://heidenhain.us)

## PRODUCT CATEGORIES

- Linear Encoders
- Angle Encoders
- Rotary Encoders
- Grid Encoders
- Length Gauges
- CNC Controls
- Subsequent Electronics
- Touch Probes
- Measuring and Test Equipment





# HEIDENHAIN



## TNC 640 – High-End Control for Milling and Turning Operations

The TNC 640 from HEIDENHAIN: for the first time, milling and turning are combined in one TNC. Now users can switch as desired between milling and turning—within the same NC program. Switchover is independent of the machine kinematics. It automatically takes the respective operating mode into account and without any additional action. This new simplicity is complemented by dialog-guided plain language programming, the optimized user interface, powerful programming aids as well as comprehensive cycle packets taken from amply field-proven HEIDENHAIN controls into the TNC 640.

HEIDENHAIN CORPORATION, 333 East State Parkway, Schaumburg, IL 60173

847-490-1191

[www.heidenhain.us](http://www.heidenhain.us)

Angle Encoders + Linear Encoders + Contouring Controls + Position Displays + Length Gauges + Rotary Encoders



**Kitamura Machinery of  
U.S.A., Inc.**  
78 E. Century Drive  
Wheeling, IL 60090

Phone: 847-520-7755  
Fax: 847-520-7763  
Email: sales@kitamura-machinery.com

[kitamura-machinery.com](http://kitamura-machinery.com)

## PRODUCTS/SERVICES



### Mycenter-HX250iG

Don't be held back by your standard drill & tap. The Mycenter-HX250iG with 2-station APC, 40 tools, standard 15,000min<sup>-1</sup> spindle (optional 30,000 min<sup>-1</sup> high speed spindle available) and optional field expandable 10-station pallet pool and 102T magazine demonstrate true flexible, lean manufacturing capabilities within an ultra-compact footprint. Realize the benefits of increased productivity and process flexibility with this automation/robot friendly, fully spec'd HMC.



### Arumatik-Mi Control

Kitamura makes CNC operation easy with the *Arumatik®-Mi* control by simplifying operator-machine tool interaction. Powerful features such as a quick access customizable menu, icon-based touchscreen technology and ultra-high speed processing capabilities help increase productivity and peace of mind in the process. Anywhere-Remote®, Kitamura's new (IoT) platform partnership includes E-mail status updates, machine monitoring software suites and MTConnect® ready adaptor (basic).



### Double Column Type Vertical Machining Centers

Expanding capacity? Don't be limited by C-frame machines that may compromise accuracy. Kitamura Bridgecenter series machines offer mold builder accuracies with highly rigid, double column bridge-type construction designed for extreme cutting capacity. Ultra-compact with #40, 20k | #50, 12k 4-step geared spindle configurations, Kitamura Bridgecenters are available in sizes up to 120" X-Axis travel with astounding accuracies of +/-0.002mm (+/-0.000079")/full stroke.

## WEBSITE



[kitamura-machinery.com](http://kitamura-machinery.com)

## PRODUCT CATEGORIES

- Drilling Machines
- Five-Axis Machining Centers
- Hard Milling
- High-Feed Milling
- High-Speed Machining Centers
- Horizontal Machining Centers
- Machining Cells/Work Cells
- Milling Machines
- Vertical Machining Centers

CELEBRATING  
**85**  
YEARS

From every perspective, the Kitamura SUPERCELL-300G brings high-impact productivity to your shop floor. Owners love that these high-speed, 5-axis horizontal workhorses don't just save time, they create time. Instead of a 2-shift, 80-hour week, now you can operate lights-out, 24/7 for 168 hours. Machinists love the 20-pallet/174-tool capacity. And clients love your shop's new-found responsiveness and flexibility. It's a win-win-win, made easy. Learn how online or call for a demo today. [kitamura-machinery.com](http://kitamura-machinery.com) 847.520.7755



## [ SHOP FLOOR PRODUCTIVITY ]

JIM HAYSSEN  
Owner Bradford  
Machine Company

JOHN THERRIEN  
CNC Mill Supervisor

DAVID SQUIRES  
CNC Milling Machinist

CELEBRATING  
**85**  
YEARS

See us at IMTS 2018  
Booth 339148



# CHETO

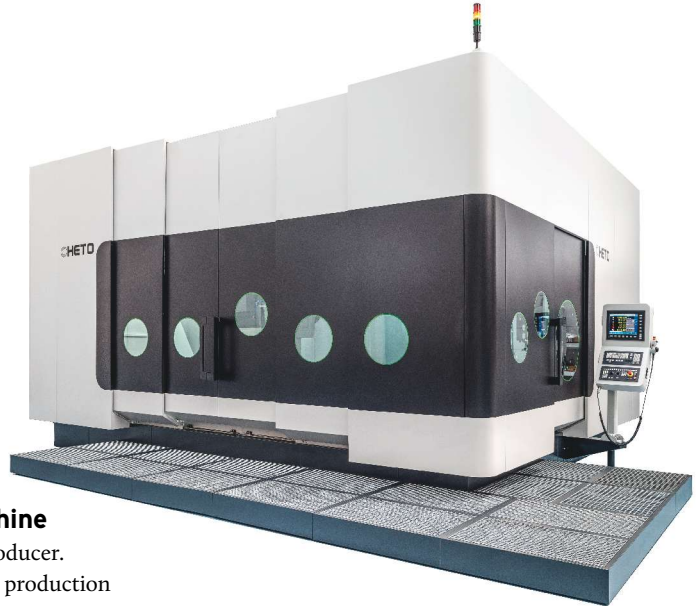
CNC DEEP HOLE DRILLING WITH MILLING

CHETO Corporation, SA  
Área de Acolhimento Empresarial de UL-Loureiro  
Oliveira de Azeméis  
Portugal, 3720-075

Phone: 351-256-247-970

[cheto.eu](http://cheto.eu)

## PRODUCTS/SERVICES



### CHETO CNC Deep Hole Drilling with Milling Machine

CHETO is a CNC Deep Hole Drilling with Milling Machine producer.

We develop our product line with a focus to add value to the production process, mainly for the Mold & Die Industry.

The Mold production is a complex and accurate process. Using CHETO machines you will get a reduction on cost and a much better time production.

The drilling process is slow, in comparable terms. Increasing the feed rates and saving time on overall process is our goal.

This is because the process is the most important factor to get the lower effective cost production and the best delivery time. CHETO is your Partner.

## WEBSITE



[cheto.eu](http://cheto.eu)

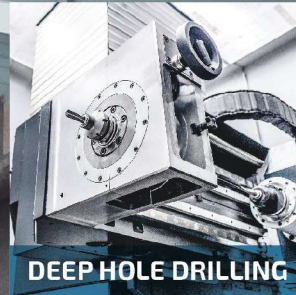
## PRODUCT CATEGORIES

- Deep-Hole Drilling Machines
- Drilling Machines
- Five-Axis Machining Centers
- Gun Drilling Machines

## INNOVATIVE CONCEPT to OPTIMIZE DEEP HOLE DRILLING, DRILLING and MILLING

DEEP HOLE DRILLING REQUIRES KNOWLEDGE, SPECIALIZED TOOLING,  
and the CORRECT MACHINE

WISE DECISIONS · DEEP REWARDS



DEEP HOLE DRILLING



MILLING

CHETO

### North America Exhibition



september 10-15

Chicago, IL

East Building-Level 2, booth 121229

Find your local distributor at [www.cheto.eu](http://www.cheto.eu)



# Okamoto

**Emerging Abrasives Technology**

**Okamoto Corporation**  
**370 Corporate Woods Pkwy**  
**Vernon Hill, IL 60061 USA**

Phone: 847-235-3500  
 Fax: 847-235-3274  
 Email: [sales@okamotocorp.com](mailto:sales@okamotocorp.com)

[okamotocorp.com](http://okamotocorp.com)

## PRODUCTS/SERVICES



### Okamoto . . . Superior Products, Support and Service Worldwide

Okamoto Corporation's USA Corporate Headquarters are located just outside of Chicago, IL. This facility features a newly built state-of-the-art showroom with precise temperature/humidity control ideal for customer test grinds. Additional US sales/support facilities centers are located in California, Kentucky and Connecticut.

Okamoto maintains manufacturing plants in Japan, Thailand and Singapore. In addition, Okamoto has 9 sales/service offices throughout Japan, 2 in Germany, 1 in the UK and 4 in China.



### ACC-818NC CNC Form Grinder

The ACC-818NC 2-axis simultaneous CNC Form Grinder is ideal for Surface, Slot, Step, Form and Contour grinding. It is available with ballscrew table drive enabling precise positioning making it ideal for use with a wide variety of third party indexing and centerless grinding devices.

Grind cylindrical components including pins, punches and mold components such as core pins with extreme accuracy and efficiency.

Table working area (W x L) is 8" x 18" with a 265 lb load capacity.

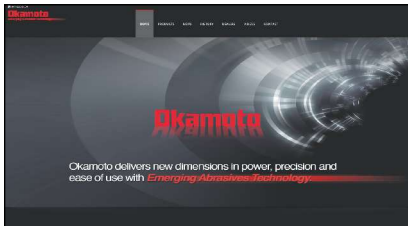


### UGM-1224NC Universal Grinder

The UGM-1224NC 3-Spindle Universal Grinder is designed for single component high-precision multi-function grinding.

This compact grinder houses a dynamic high-performance 3-spindle turret style head with temperature controlled high-precision spindles that provide standard OD, Angular OD/Face and ID grinding in a single chucking, dramatically boosting productivity while assuring exceptional workpiece geometries and unparalleled accuracies. DD motor drive spindle indexing assures precise positioning. It's the ideal choice for complex parts that typically require multiple grinders.

## WEBSITE



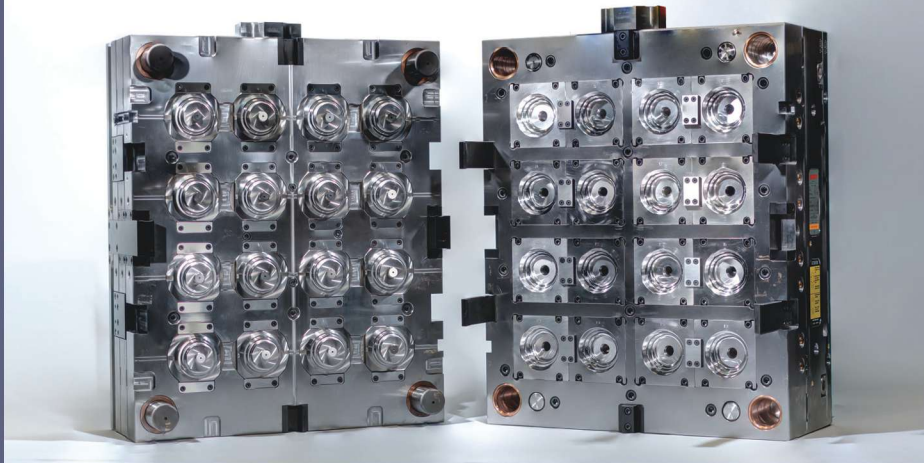
Visit our website to learn more about our wide range of high-performance grinding machines. See specifications, watch product videos, find your local dealer and more.

[okamotocorp.com](http://okamotocorp.com)

## PRODUCT CATEGORIES

- Saddle Type Surface Grinders
- Single and Double Column Type Surface Grinders
- Rotary Type Surface Grinders
- Form Grinders
- Internal Grinders
- Cylindrical Grinders
- Vertical and Horizontal Universal Grinders
- Specialty Grinders
- Aerolap Polishing Machine





Visit us at



IMTS2018  
North Hall, Booth 236834



# Okamoto

*Emerging Abrasives Technology*

## From Prep to Part **ABSOLUTELY PRECISE**

When it comes to critical mold preparation, precision is paramount. But so is capacity, reliability, ease-of-operation and long-term peak performance. Consider an **Okamoto Column or Double Column Type Surface Grinder** to streamline your demanding mold grinding applications. Their superior design, robust column construction and premium grade components makes them the "go to" choice for moldmaking professionals world-wide. And with capacities up to 32" x 80" and beyond no mold project is too big.

Available in MDI & CNC models.

**Visit our website now.**



**Okamoto Corporation** [www.okamotocorp.com](http://www.okamotocorp.com)

**EROWA®**  
system solutions



**EROWA Technology Inc.**  
2535 S Clearbrook Dr.  
Arlington Heights, IL 60005

Phone: 847-290-0295

[erowa.com](http://erowa.com)

## PRODUCTS/SERVICES



### EROWA SmartChucks

EROWA introduces its line of SmartChuck, which combines its well-known precision and stability with wireless signal transmission. The new design of these SmartChucks includes an integrated LED strip that displays the status of the chuck while in operation. It can indicate if the chuck is open, closed, improperly clamped, or has insufficient clamping force. A mobile app complements the SmartChucks, which can retrieve clamping equipment data on your smartphone. Status requests and life-cycle information can be checked at any time via Bluetooth technology.



### EROWA PowerChuck P

The newest model of our PowerChuck now includes two integrated compressed air ducts, which, when combined with a new version of the workpiece carrier pallet P (148 mm diameter), makes it possible to operate palletized fixtures pneumatically through the pallet and the chuck. This allows the fixture to be loaded with the workpieces during an automated manufacturing process. In addition to this, a robot can load and unload the machine with other palletized fixtures that are required depending on the order.



### EROWA Robot Compact 80

The EROWA Robot Compact 80 is able to load two machines, but the most noticeable improvement is that the Robot Compact 80 now has a maximum transfer weight of 80kg (176 lbs). Another enhancement that boosts performance is that it accommodates EROWA's UPC pallets (320 x 320 mm). Depending on configuration, the robot can hold over 300 palletized workpieces and up to 11 different pallet sizes. The optional integrated loading station can be used for large and heavy workpieces without interrupting the automatic program sequence of the robot.

## WEBSITE

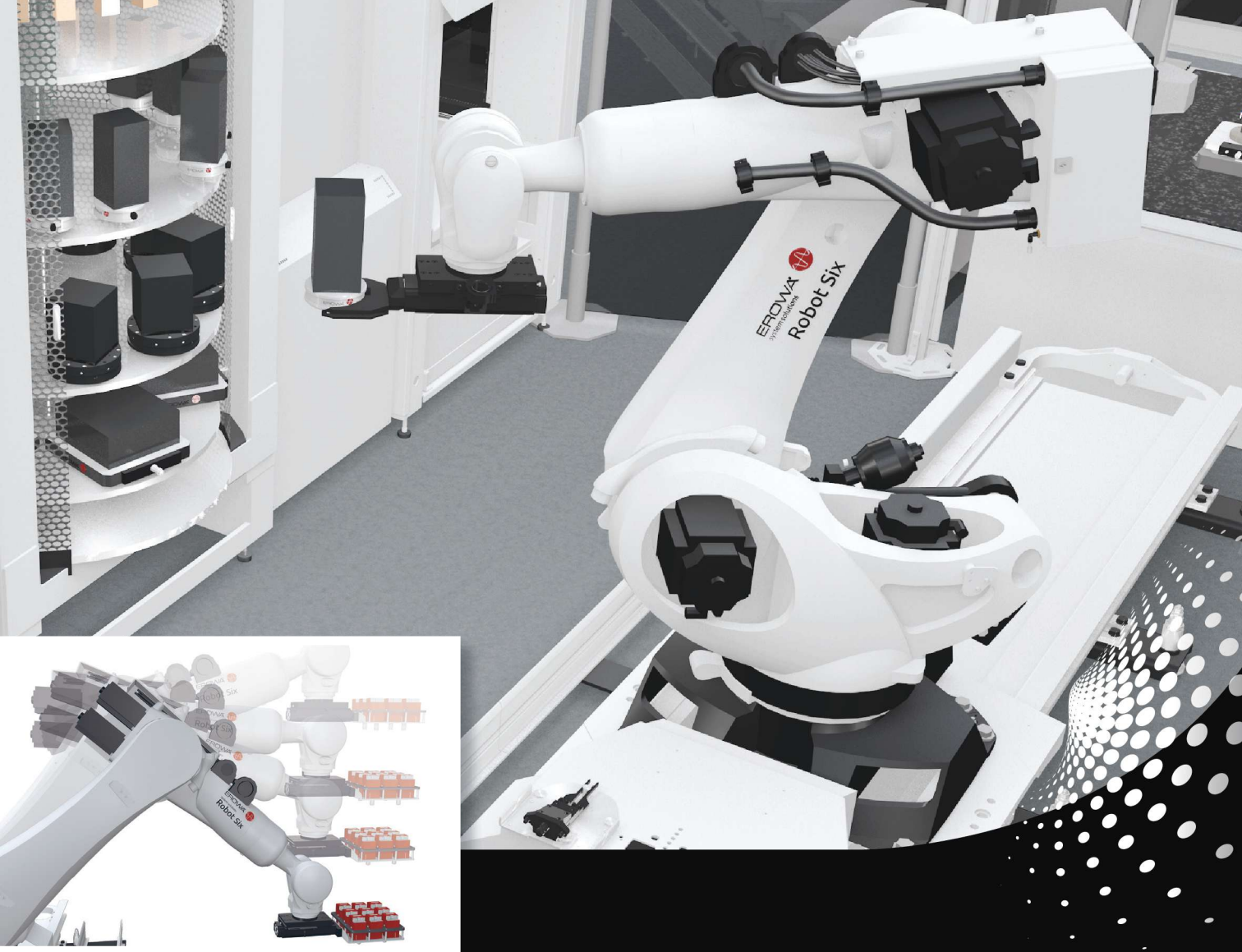


EROWA Technology, Inc. is a full service supplier of palletization and automation systems for the North American manufacturing market. Visit the official EROWA website for the latest news and product information.

[erowa.com](http://erowa.com)

## PRODUCT CATEGORIES

- **Coordinate Measuring Machine (CMM) Software**
- **Coordinate Measuring Machines (CMMs)**
- **Data Management Software**
- **Electrode Holders**
- **Fixtures**
- **Fixtures, EDM**
- **Lathe Tooling and Accessories**
- **Loading/Unloading Systems**
- **Manufacturing Automation Software**
- **Pallet Changers**
- **Robots**
- **Toolchangers**
- **Workholding Equipment**



# EROWA Robot Six

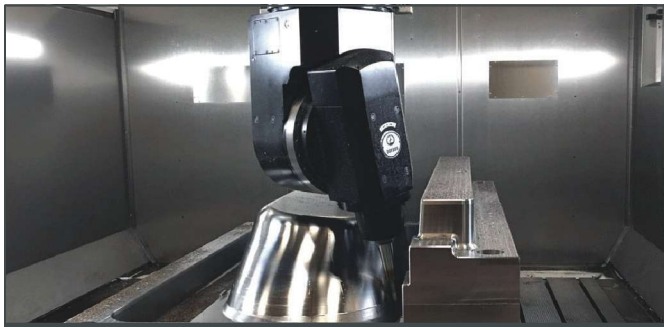
Introducing the **EROWA Robot Six**; the 6-axis robot which offers maximum versatility, flexibility and efficient loading into any type of machine. The lean yet robust design, allows large and heavy work-pieces up to 130 kg to be loaded with precision. Whether used as a standalone or part of a linear solution, the EROWA Robot Six will exceed your highest demands.


Stop by our booth at IMTS to see for yourself!

[www.erowa.com](http://www.erowa.com)







					<div>Boring Machines</div> <div>CNC Software</div> <div>Deep-Hole Drilling Machines</div> <div>Drilling Machines</div> <div>Five-Axis Machining Centers</div> <div>Graphite Electrode Machines</div> <div>Grinding Machines</div> <div>Gun Drilling Machines</div> <div>High-Speed Machining Centers</div> <div>Horiz. Mach. Ctrs.</div>											
COMPANY	Advertisers are listed in bold type.	See Ad	1	2	3	4	5	6	7	8	9	10				
Absolute Machine Tools Inc. – Lorain, OH, 440-960-6911			1		3	4	5	6	7	8	9	10				
Agathon Machine Tools Inc. – Bethel, CT, 203-730-8741	59								7							
Cheto Corp. – Oliveira de Azeméis, Portugal, +351 256 820 384	85				3	4										
Chevalier Machinery Inc. – Sante Fe Springs, CA, 562-903-1929			1			4	5		7			10				
DMG MORI – Hoffman Estates, IL, 847-593-5400				2			5				9	10				
Doosan Machine Tools America – Pine Brook, NJ, 973-618-2500			1			4	5					10				
EDM Network Inc. – Sugar Grove, IL, 630-466-5588								6			9					
Erowa Technology Inc. – Arlington Heights, IL, 847-290-0295	89															
FANUC America – Rochester Hills, MI, 248-377-7000				2												
Fives Machining Systems – Hebron, KY, 859-534-4924						4					9	10				
GF Machining Solutions – Lincolnshire, IL, 847-913-5300							5				9	10				
Grob Systems Inc. – Bluffton, OH, 419-358-9015																
Haas Automation Inc. – Oxnard, CA, 805-278-1800						4	5	6			9	10				
Hardinge Inc. – Elmira, NY, 607-734-2281							5		7							
Hurco Companies Inc. – Indianapolis, IN, 317-293-5309	1			2								10				
Hwacheon Machinery America – Lincolnshire, IL, 847-573-0100											9	10				
Hyundai WIA Machine America Corp. – Itasca, IL, 630-625-5600			1			4	5				9	10				
Kitagawa NorthTech Inc. – Schaumburg, IL,																
Kitamura Machinery Of USA Inc. – Wheeling, IL, 847-520-7755	83					4	5				9	10				
Makino – Auburn Hills, MI, 248-232-6200			1			4		6	7			10				
Matsuura Machinery USA Inc. – St. Paul, MN, 651-289-9700	15						5					10				
Mazak Corp. – Florence, KY, 859-342-1700			1	2		4	5	6			9	10				
MC Machinery Systems Inc. – Elk Grove, IL, 630-616-5920	97						5				9					
Methods Machine Tools Inc. – Sudbury, MA, 978-443-5388			1	2		4	5	6			9	10				
Milltronics USA Inc. – Waconia, MN, 952-442-1410			1					6				10				
Mitsui Seiki (USA) Inc. – Franklin Lakes, NJ, 201-337-1300			1				5		7		9	10				
Okamoto Corp. – Vernon Hills, IL, 847-235-3500	87								7							
Okuma America Corp. – Charlotte, NC, 704-588-7000				2					7			10				
Single Source Technologies – Auburn Hills, MI, 248-232-6232			1			4	5	6		8	9	10				
Sodick Inc. – Schaumburg, IL, 847-310-9000	100						5				9					
Supertec Machinery – Paramount, CA, 562-220-1675									7							
Takumi USA – Indianapolis, IN, 317-614-1515	1										9					
Tarus Products Inc. – Sterling Heights, MI, 586-977-1400	77				3		5			8	9					
Toyoda Americas Corp. – Arlington Heights, IL, 847-253-0340							5		7		9	10				
TRAK Machine Tools – Rancho Dominguez, CA, 310-608-4422																
Unisig – Menomonee Falls, WI, 414-252-3802						4	5			8						
United Grinding – Miamisburg, OH, 937-859-1975									7							
Xometry – Gaithersburg, MD, 240-252-1138							5									
Yama Seiki USA Inc. – Chino, CA, 909-628-5568						4	5				9					
YCM Technology (USA) – Carson, CA, 310-735-8610							5				9	10				

For more supplier listings, go to [moldmakingtechnology.com/suppliers](http://moldmakingtechnology.com/suppliers).

Jig Boring Machines	Laser Cutting Machines	Lathes	Loading/Unloading Systems	Machine Controls	Machining Cells/Work Cells	Machining Services	Milling Machines	Mill-Turn Machines	Multi-Tasking Machines	Pallet Changers	Robots	Toolchangers	Turning Machines	Vertical Machining Centers	Waterjet Machines	Workholding Equipment	
11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	WEBSITE
		13	14		16	17	18	19	20	21	22		24	25	26	27	<a href="http://absolutemachine.com">absolutemachine.com</a>
																	<a href="http://agathon.com">agathon.com</a>
																	<a href="http://cheto.eu">cheto.eu</a>
		13					18		20				24	25			<a href="http://chevalierusa.com">chevalierusa.com</a>
	12	13	14	15	16	17	18		20	21		23	24	25			<a href="http://dmgmori.com">dmgmori.com</a>
		13					18				22		24	25			<a href="http://doosanmachinetoolsUSA.com">doosanmachinetoolsUSA.com</a>
																	<a href="http://edmnetwork.com">edmnetwork.com</a>
			14							21	22	23				27	<a href="http://erowa.com">erowa.com</a>
	12			15							22						<a href="http://fanucamerica.com">fanucamerica.com</a>
			14						20	21				25	26		<a href="http://fivesmsi.com">fivesmsi.com</a>
							18			21	22	23		25			<a href="http://gfms.com/us">gfms.com/us</a>
					16												<a href="http://grobgroup.com/en">grobgroup.com/en</a>
		13					18							25			<a href="http://haascnc.com">haascnc.com</a>
		13					18						24	25		27	<a href="http://hardinge.com">hardinge.com</a>
		13		15			18							25			<a href="http://hurco.com">hurco.com</a>
							18		20					25			<a href="http://hwacheonusa.com">hwacheonusa.com</a>
		13			16		18		20				24	25			<a href="http://machine.hyundai-wia.com/usa">machine.hyundai-wia.com/usa</a>
																27	<a href="http://kitagawa.us">kitagawa.us</a>
					16		18							25			<a href="http://kitamura-machinery.com">kitamura-machinery.com</a>
							18							25			<a href="http://makino.com">makino.com</a>
																	<a href="http://matsuurausa.com">matsuurausa.com</a>
		13	14	15	16		18		20	21		23	24	25			<a href="http://mazakusa.com">mazakusa.com</a>
	12	13	14		16		18			21	22		24	25			<a href="http://mcmachinery.com">mcmachinery.com</a>
		13	14	15	16		18		20	21	22	23		25			<a href="http://methodsmachine.com">methodsmachine.com</a>
		13		15			18							25			<a href="http://milltronics.com">milltronics.com</a>
11			14		16		18	19		21	22	23		25			<a href="http://mitsuiseiki.com">mitsuiseiki.com</a>
																	<a href="http://okamotocorp.com">okamotocorp.com</a>
		13		15			18		20	21			24	25			<a href="http://okuma.com/americas">okuma.com/americas</a>
		13	14		16		18		20	21		23	24	25		27	<a href="http://singlesourcetech.com">singlesourcetech.com</a>
																	<a href="http://sodick.com">sodick.com</a>
																	<a href="http://supertecusa.com">supertecusa.com</a>
							18							25			<a href="http://takumiusa.com">takumiusa.com</a>
							18										<a href="http://tarus.com">tarus.com</a>
			14		16					21			24	25			<a href="http://toyoda.com">toyoda.com</a>
		13		15			18							25			<a href="http://trakmachinetools.com">trakmachinetools.com</a>
																	<a href="http://unisig.com">unisig.com</a>
																	<a href="http://grinding.com">grinding.com</a>
	12	13				17	18	19					24		26		<a href="http://xometry.com">xometry.com</a>
		13	14				18			21			24	25			<a href="http://yamaseiki.com">yamaseiki.com</a>
							18		20				24	25			<a href="http://ycmcnc.com">ycmcnc.com</a>

Image courtesy of Model Die and Mold Inc.

## Machine Series Has New Control System to Increase Convenience and Ease of Use

The PowerSeries machines from **Wittmann Battenfeld Inc.** are now equipped with the new Unilog B8 control system running under the Windows 10 IoT operating system. The company says that this control system preserves the

advantageous features of the Unilog B6 but offers even more features and enhanced user-friendliness and convenience.

Wittmann Battenfeld says that the Unilog B8 works with a Windows operating system, just like the Unilog B6, but is more easily operable. It has an intuitive multi-touch screen, a pivoting monitoring unit, and a manual operating panel in the central console of the machine. The screen shows a color-coded status bar with "color traffic lights" that provides status of machines or integrated robots.

Wittmann Battenfeld says that

the QuickSetup program enables fast, initial machine setting with a new mold. The control system calculates the initial process parameter data set for fast parameter setting. The calculations are based on the material data sets that are recorded in B8 and the entry of a data on the molded part and the machine. The control system also has an integrated, comprehensive help library. The smart screen display, which can be partitioned, enables display and operation of two different functions simultaneously so that users can look at and operate machines and peripherals through a single screen.

**Wittmann Battenfeld Inc. /**  
**860-496-9603 / wittmann-group.com**

## Marketplace Connects Companies Offering CNC Work with the Right Suppliers

**Orderfox Ag** offers a digital global marketplace that connects companies looking for assistance with CNC work to companies that offer CNC services. Users create a company profile that makes it easy for businesses to find one another. Companies that are not at operational capacity can use Orderfox.com to find new clients. The Orderfox platform has intelligent filter functions that help a company find the right work from among thousands of available jobs. Job details like contact information and company profiles are listed in the search results. Users can then express their interest in a business with the click of a button. It also helps companies who want to advertise available CNC work. Companies can advertise work and find the right CNC suppliers. Companies advertising work simply provide a brief description of the project, enter the workpiece specifications, upload any necessary attachments and the job will appear on Orderfox.com immediately. Orderfox.com offers users advertising work that has an overview with details of who has shown interest in a job and when.

**Orderfox Ag / 312-587-7699 / orderfox.com**

## VMCs Can be Connected to Form SmartProduction Line

**Okuma's** MU-S600V five-axis vertical machining center enables five-face machining of workpieces as large as 600 mm in diameter. Several machine tools of its type can be connected to form a compact smart production line, allowing for a fully automated transfer of workpieces from one machine to the next and eliminating downtime between processing stages. The production line layouts can be adjusted to accommodate changes in volume or lead time. The company's Laser Ex line of five-axis vertical machining centers are capable of milling, turning, grinding, laser metal deposition and heat treatment of a range of workpiece sizes and shapes, and its Multus multitasking machine is for stable, heavy-duty cutting with low spindle speeds.

**Okuma America Corp. / 704-588-7000 / okuma.com**



## Grid Encoder for Testing CNC Machines

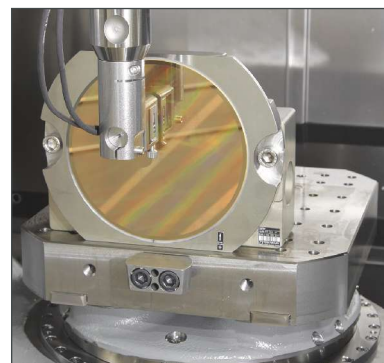
**Heidenhain Corp.** has improved its family of KGM grid encoders to better serve CNC-controlled machine users who require accuracy testing. The KGM 281 grid encoder is now available with a diameter of 140 mm and an increased accuracy of  $\pm 1 \mu\text{m}$ .

The 281 model has a grid plate with phase grating that has an optical measuring standard. It is embedded in a two-piece aluminum holder. The design of this holder prevents the mechanical stress that can happen at the level of the measuring standard even if the mounting surface is not plane. This makes it possible to guarantee the accuracy grade of  $\pm 1 \mu\text{m}$  for the system.

Users can mate the KGM 281 to the same dimensions as the previous KGM 181, but because of the revised mechanical design, it is 21.5 mm higher than the previous version.

These KGM grid encoders dynamically test the contouring accuracy of CNC-controlled machine tools. They can perform circular interpolation tests with radii ranging from 115 mm down to 0.1 mm at feed rates up to 80 m/min., for example, and they can also perform free-form tests in two axes. Heidenhain says that one advantage of the KGM is its contact-free measurement, which eliminates the influence of ball bearings. Heidenhain also says that the error resulting from the machine's geometry has no influence on the results of circular interpolation tests with very small radii.

**Heidenhain Corp. / 847-490-1191 / heidenhain.us**

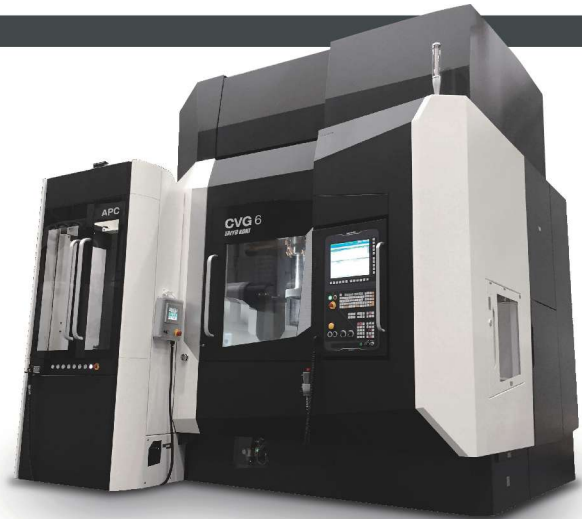




## ATC Provides Ample Workpiece Storage for Unmanned Operation of Machine

Mazak's Variaxis i-300 five-axis vertical machining center is more flexible and efficient with the addition of a high-capacity Auto Work Changer (AWC). Mazak designed the Variaxis i-300 AWC for automated small- to medium-size part-processing operations and for machining aluminum and other nonferrous metals for a wide variety of industries, including aerospace, medical and automotive. The machine comes standard with a multiple drum-tool storage system that holds as many as 145 tools, while the 32-position AWC accommodates workpieces up to 13.779" in diameter, 12.401" in height and weighing as much as 135 lbs. This combination of ample tool and workpiece storage capacities enables shops to achieve continuous unmanned operation and single-setup, done-in-one processing. As production needs increase, shops can expand the AWC and tool storage capacities to 40 workpieces and 505 tools (in increments of 60 tools), respectively.

**Mazak Corp. / 859-342-1700 / [mazakusa.com](http://mazakusa.com)**



## Pallet Changer Increases Productivity of Grinder by Improving Spindle Runtime

The CVG series vertical universal cylindrical grinding machine with an optional pallet changer from Taiyo Koki Grinding Machine Company, a **DMG MORI** company, is available in three different part-swing diameter sizes: 25.5", 37.5" and 53". The machine is able to grind OD/ID and faces all-in-one part chucking with guaranteed machine roundness accuracy of less than .00004". The machine has opposing twin wheel spindles. One is a larger, heavy-duty spindle dedicated to OD and face grinding that uses a 14" diameter wheel, and the other spindle is used primarily for ID and face grinding. Both grinding spindles are high-frequency.

The optional pallet changer increases productivity by improving the spindle runtime. Parts can be loaded onto a fixture outside of the machine while the machine is running. Machinists can add an available part-clocking station with a dummy spindle, which enables parts to be rotated and "clocked-in" at the part-loading station. Machinists can run multiple jobs simultaneously by registering and setting different workpieces outside of the machine, which automatically selects programs and tooling for a different workpiece. Being able to run different jobs through the machine at the same time improves productivity and throughput.

**DMG MORI / 847-593-5400 / [dmgmori.com](http://dmgmori.com)**

## Deep-Hole Drilling and Milling Machines Streamline Moldmaking

Unisig's USC and USC-M Series machines combine deep-hole drilling and milling capabilities, which the company says enable mold shops to reduce setup time, increase accuracy and eliminate mold design restrictions. The USC Series column-type machines generate highly accurate holes ranging to 1.5" in diameter in large workpieces. They are available in table-weight capacities ranging to 50 tons and are suitable for mold plates and frack pumps.

These machines enable the processing of large and small parts with four-sided machining capability in a single setup. The USC-M series machines use two independent spindles for gundrilling and BTA drilling and another CAT 50 machining spindle. When this additional capability is combined with a rotary workpiece table and programmable headstock inclination, accurate deep-hole drilling and all standard high-performance machining capabilities are available within the working envelope. The seven axes of control on the M-Series machines use the B, A, X, Y and Z axes for five-axis machining operations, the W axis for the combined gundrilling and BTA deep-hole drilling spindle and the U



axis for machining. This provides 3+2 machining to make deep-hole drilling and machining of compound angles faster.

**Unisig Deep Hole Drilling Systems / 414-252-3802 / [unisig.com](http://unisig.com)**

# Intelligent Monitoring with MTConnect

By Neil Desrosiers

In the past, responding to alerts, watching dashboards and manually analyzing data sets were the standard way to monitor machines in the manufacturing industry. But today's hyper-dynamic, highly distributed application environments have become too complicated to keep pace with the increasing amounts of vital data. The sheer volume of information is simply more than shops can manage using traditional tools. Manufacturers who want to stay competitive need not only to embrace digital connectivity, but also the Industrial Internet of Things (IIoT) to truly understand their data and use it effectively.

A standard digital connectivity platform that some of the world's leading manufacturers use is MTConnect, which enables users to collect data in structured XML rather than in proprietary formats to open up a world of new industry applications. Analysis that used to take experts hours or days to harvest can now be realized in seconds. While MTConnect can significantly help boost manufacturing efficiency and productivity, issues can arise (as is the case with any computer-based system). Fortunately, these issues are generally easy to recognize and resolve.

Here are seven of the most common issues with implementing the MTConnect standard:

- 1. Mismatch between the adapter and the machine.** Each machine requires a specific adapter. Even different models of the same machine require specific adapters that may be different from one another, so be sure to provide the machine tool's original equipment manufacturer with your machine model and software version when acquiring an adapter to ensure you receive the correct one.

- 2. A missing agent.** If a machine does not have an agent, a manufacturer will need to run a PC-to-host stand-alone agent on the network to communicate with the control via a transmission control protocol (TCP).

- 3. Wrong error log setting.** When installing MTConnect agent or adapter software, it is important to set the error-logging level in the configuration file to "information only" or "fatal" rather than "debug." The debug setting is used to



Image courtesy of Mazak Corp.

MTConnect enables today's manufacturers to collect data from digitally connected manufacturing equipment for process optimization.

test the agent and adapter and continually provides comprehensive operating information during installation.

- 4. Firewall interference.** The firewall feature of Windows may disrupt communication between the machine and software. Manufacturers can resolve this issue by configuring specific firewall exceptions for the 7878 and 5000 ports used in MTConnect.

- 5. Duplicate port configuration.** By default, MTConnect software communicates with the agent through Port 5000. However, when multiple stand-alone agents are located on a server, every agent has to be configured with a unique port number so that the software will correctly gather data from each agent and machine.

- 6. Inconsistent file names.** The names of device files must match those in the configuration file.

- 7. Incorrect adapter IP addresses.** Incorrect or out-of-order numbers in the IP address that a manufacturer's application uses to communicate with the adapter will produce errors. If the address is correct but is for the wrong adapter, machine data will be transmitted for a machine but not for the one that the manufacturer intended. **MMT**

## CONTRIBUTOR

Neil Desrosiers is an application engineer, developer and MTConnect specialist for Mazak Corp.

## FOR MORE INFORMATION

Mazak Corp. / 859-342-1700 / mazakusa.com

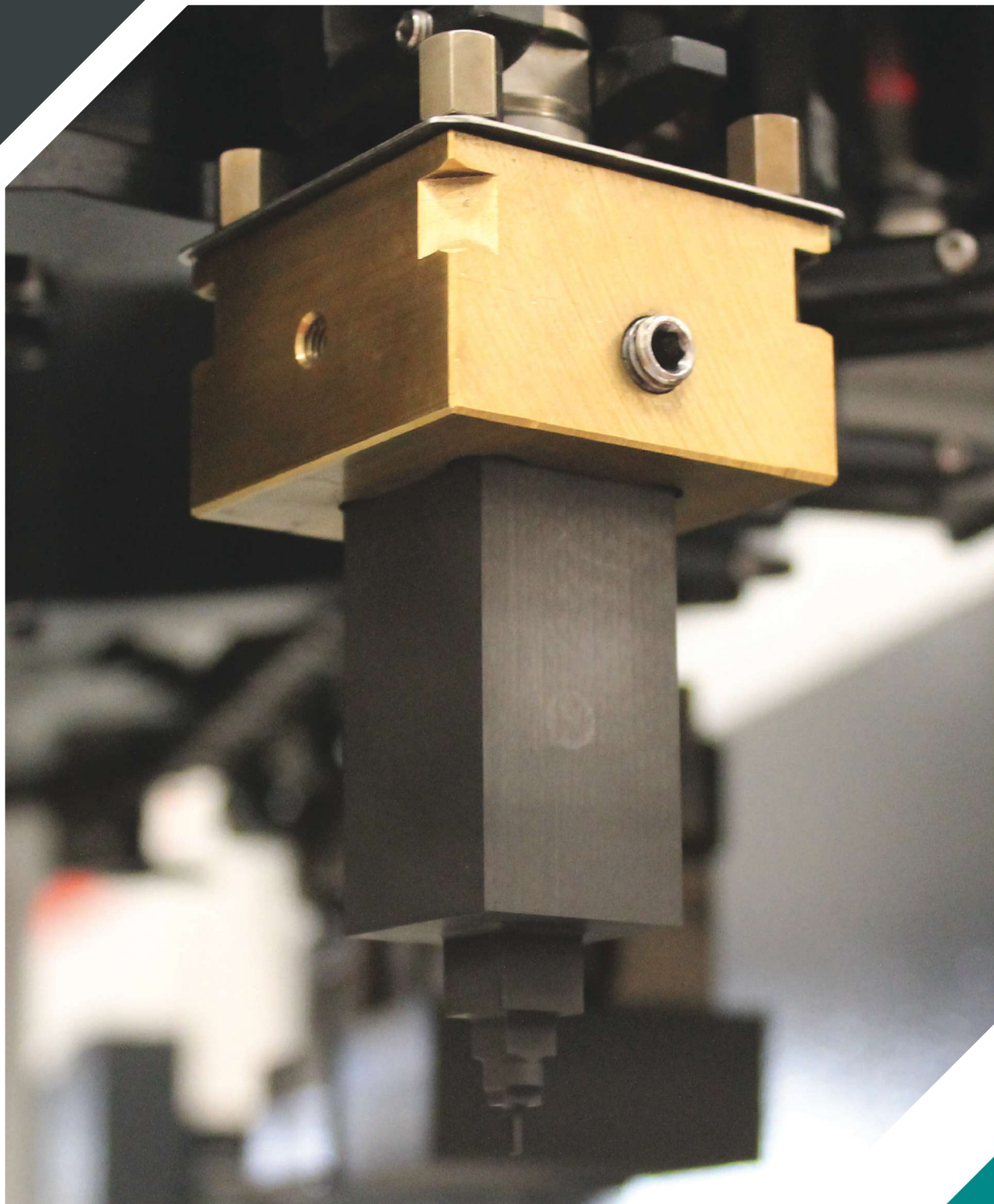


Image courtesy of MC Machinery Systems Inc./Mitsubishi EDM.





**MC Machinery Systems, Inc.**  
**85 Northwest Point Blvd.**  
**Elk Grove Village, IL 60007**  
**United States**

Phone: 630-616-5920  
 Fax: 630-616-4068

[mcmachinery.com](http://mcmachinery.com)

## PRODUCTS/SERVICES

### A World of Experience

As part of the global Mitsubishi Corporation, MC Machinery Systems draws from an extensive global source of support and innovation. Mitsubishi Corporation employs more than 60,000 people around the world, across a wide spectrum of industries including machine tools and controls, automotive, aerospace, industrial machinery, elevator, energy, metals, chemical, food and textile. This diversity, strength and stability trickles down to MC Machinery Systems customers—who benefit from Mitsubishi's massive global R&D efforts and widespread knowledge base.

### Metalworking Success

MC Machinery Systems customers get the best of both worlds: a single source for a diverse arsenal of manufacturing technologies, and our expansive and knowledgeable support network.

Our expertise spans virtually every aspect of metalworking—from simple fabrication to CNC-driven, automated manufacturing cells. But it isn't just the breadth of technology—laser, EDM, milling and press brake—that will bring your business to the next level; it's our ability to identify, implement and support the right combination of those technologies.

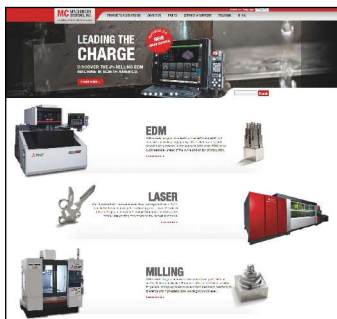


Sinker EDM  
EA8S Advance



Wire EDM  
MV 2400-S Advanced Type M800

## WEBSITE



[mcmachinery.com](http://mcmachinery.com)

## PRODUCT CATEGORIES

- Copper Electrodes
- DI Equipment
- DI Resin
- Electrode Holders
- Electrodes
- Filtration
- Fixtures
- Fluids
- Graphite Electrodes
- Laser Cutting Machines
- Milling Machines
- Sinker EDM
- Small Hole EDM
- Vertical Machining Centers
- Wire EDM
- Wires

# PINCH ME

IMTS2018  
**NEW LOCATION**  
**SOUTH HALL**  
BOOTH 338158



## PINCH IT, SWIPE IT, TAP IT.

### INTRODUCING THE NEW M800 CONTROL FROM MITSUBISHI EDM

Our new M800 control makes the industries best Wire EDM the easiest to operate. Combined with a new advanced hand pendant and a 19 inch touch screen LCD, the Mitsubishi MV series is the only EDM for your business.

**MC MACHINERY  
SYSTEMS, INC.**

a subsidiary of  Mitsubishi Corporation

To schedule a test cut or a free machine demonstration,  
contact us today at **630-616-5751** or visit us at [www.mcmachinery.com](http://www.mcmachinery.com)



COMPANY	Advertisers are listed in bold type.	See Ad	<div> <div>Copper Electrodes</div> <div>DI Equipment</div> <div>DI Resin</div> <div>EDM Services</div> <div>Electrode Holders</div> <div>Electrodes</div> </div>					
			1	2	3	4	5	6
3D Industries	– Bensenville, IL, 630-616-8700					4		6
Absolute Machine Tools Inc.	– Lorain, OH, 440-960-6911			2	3	4	5	6
Accu-Prompt Inc.	– Fridley, MN, 763-717-1511					4		
BA Die Mold Inc.	– Aurora, IL, 630-978-4747					4		
Belmont Equipment & Technologies	– Madison Heights, MI, 800-256-4811		1	2	3	4	5	6
Chemtool Inc.	– Rockton, IL, 815-957-4140							
Chicago Mold Engineering Co. Inc.	– St. Charles, IL, 630-584-1311					4		
Commercial Tool & Die	– Comstock Park, MI, 616-785-5400					4		
Copper and Brass Sales	– Southfield, MI, 800-926-2600							6
Dynamic International	– Pewaukee, WI, 262-521-1100							
EDM Network Inc.	– Sugar Grove, IL, 630-466-5588							6
EDM Sales and Supplies Inc.	– Maple Grove, MN, 763-424-1189		1	2	3	4	5	6
<b>Erowa Technology Inc. – Arlington Heights, IL, 847-290-0295</b>	<b>89</b>						<b>5</b>	
Ezell Precision Tool Co.	– Clearwater, FL, 727-573-3575					4		
GF Machining Solutions	– Lincolnshire, IL, 847-913-5300			2		4		
Graphel Corp.	– West Chester, OH, 513-779-6166		1			4	5	6
Hirschmann Engineering USA Inc.	– Schaumburg, IL, 847-468-9700		1				5	
Industrial Molds	– Rockford, IL, 815-397-2971					4		
ITW Fluids North America	– Carol Stream, IL, 800-452-5823							
Keller Products Inc.	– Acton, MA, 978-264-1911							
Kern Precision Inc.	– Webster, MA, 508-943-7202		1			4		6
Makino	– Auburn Hills, MI, 248-232-6200							
Manner USA Inc.	– Lawrenceville, GA, 770-449-1820					4		
<b>MC Machinery Systems Inc. – Elk Grove, IL, 630-616-5920</b>	<b>97</b>		<b>1</b>				<b>5</b>	<b>6</b>
McWilliams Sales & Service Inc.	– Mooresville, NC, 704-598-6616		1	2	3		5	6
<b>Mersen – Saint Marys, PA, 800-472-3483</b>	<b>101</b>		<b>1</b>					<b>6</b>
Methods Machine Tools Inc.	– Sudbury, MA, 978-443-5388							
Ohio Carbon Blank Inc.	– Willoughby, OH, 440-953-9302		1					6
ONA EDM USA	– Addison, IL, 630-268-1635		1	2	3	4	5	6
Performance Alloys & Services Inc.	– Germantown, WI, 262-255-6662		1					
PMI Industries Inc.	– Rochester, NY, 585-464-8050					4		
Poco Graphite, An Entegris Company	– Decatur, TX, 940-627-2121							6
Single Source Technologies	– Auburn Hills, MI, 248-232-6232							
<b>Sodick Inc. – Schaumburg, IL, 847-310-9000</b>	<b>100</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
System 3R USA LLC	– Lincolnshire, IL, 847-439-4888						5	
Transor Filter USA	– Elk Grove Village, IL, 847-640-0273							
Tri-Gemini LLC	– Hillside, IL, 708-786-4300		1					6
Wisconsin Engraving / UNITEX	– New Berlin, WI, 262-786-4521		1			4		6
Xact Wire EDM Corp.	– Waukesha, WI, 262-549-9005					4		
YCM Technology (USA)	– Carson, CA, 310-735-8610							

For more supplier listings, go to [moldmakingtechnology.com/suppliers](http://moldmakingtechnology.com/suppliers).



<i>Filtration</i>	<i>Fixtures, EDM</i>	<i>Fluids</i>	<i>Graphite Electrodes</i>	<i>Sinker EDM</i>	<i>Small Hole EDM or "Hole Popper"</i>	<i>Wire EDM</i>	<i>Wires</i>	
7	8	9	10	11	12	13	14	WEBSITE
			10					3dpros.net
7	8	9	10	11	12	13	14	absolutemachine.com
								accuprompt.com
								badiemold.com
7	8	9	10	11	12	13	14	belmont4edm.com
		9						chemtool.com
								chicagomold.com
								commercialtoolgroup.com
								tkmna.com
						13		dynamicintl.com
	8			11	12	13	14	edmnetwork.com
7	8	9	10	11	12	13	14	edmsalesinc.com
	8							erowa.com
								ezellprecision.com
				11	12	13	14	gfms.com/us
			10	11				graphelcorp.com
	8	9		11	12	13		hirschmannusa.com
								industrialmolds.com
		9						itwfluidsna.com
7								kellerproducts.net
			10					kernprecision.com
		9		11	12	13		makino.com
								m-form.com
7		9	10	11		13	14	mcmachinery.com
7		9	10	11	12	13	14	mcwilliamsedm.com
			10	11	12			edm.mersen.com
				11	12	13		methodsmachine.com
	8		10	11	12	13		ohiocarbonblank.com
7	8	9	10	11	12	13	14	onaedmusa.com
								moldstar.com
								pmiindustries.com
			10					poco.com
				11		13		singlesourcetech.com
7		9		11	12	13		sodick.com
	8			11		13		system3r.com
7		9						transorfilter.com
			10					tri-gemini.com
			10	11				wi-engraving.com
								xactedm.com
						13		ycmcnc.com

Image courtesy of Makino.



### Compact EDM Machine Has Varied Features for Accuracy and Ease of Use

GF Machining Solutions's new compact Form E 350 machine is a suitable die sinking EDM solution for small shops. The Form E 350 has sturdy C-axis construction, a cross table and a cast-iron frame for stability and force reduction, which helps maintain a precise spark gap between the part and the electrode. GF Machining Solutions says that regardless of part weight or dielectric volume, the machine delivers consistent accuracy. Integrated glass scales preserve long-term repeatability and eliminate the need for recalibration. The Form E 350 also eliminates errors from backlash and wear.

The machine features a programmable dielectric management system with a 270-liter capacity integrated inside the machine cabinet. This system fills and empties the work tank without human intervention to keep the machine in production.

The Form E 350 also comes with the Intelligent Speed Power Generator (ISPG) to provide quality surface finishes and precision applications in any conductive material. The generator improves machining speeds by 40 percent and reduces corner wear by 50 percent.

**GF Machining Solutions /**  
847-913-5300 / [gfms.com/us](http://gfms.com/us)

**IMTS2018**  
International Manufacturing Technology Show

**Sodick**

**IMTS Booth #134802, EAST**  
**Sept. 10th - 15th, 2018**



#### Automatic 3-Sided Drop Tank

Designed for easy setups, the ALN Series comes with a 3-sided automatic drop tank, providing full access to the work table. The water level automatically fills to the upper guide position for ease of use.



#### Fixed-Jet Annealing AWT

The FJ-AWT is Sodick's most reliable threader, annealing a length of wire to ensure straightness. The ALN is capable of threading submerged or unsubmerged, with jet or jetless.



#### Rigid Linear Motors

Sodick's patented Rigid Linear Motors are the first linear drives designed for EDM. With flat magnets mounted directly into the machine castings, Sodick's proprietary design ensures friction-free drive motion that maintains accuracy for 10 years and beyond.

## All New ALN800G Large WEDM ALN Series Innovation In Action.

Sodick is proud to be the #1 selling EDM brand in the United States, and worldwide. Our dedication to quality and reliability has led us to be the name most trusted by you, the EDM user. The ALN series is our most popular line of Wire EDM to date, with the latest generator and control, as well as an automatic drop tank for easy setup.

Visit us at **IMTS 2018** to learn more about Sodick Wire EDM and Sinker EDM, and explore our newest technology, Metal 3D Printing.

To learn more about Sodick technologies, email [Sales@sodick.com](mailto:Sales@sodick.com) or call us at: **(847) 310 9000**

[Sales@sodick.com](mailto:Sales@sodick.com)

[www.sodick.com](http://www.sodick.com)

**(847) 310 9000**

### EDM Machine Has Power Optimizer to Reduce Machining Time

**Makino** introduces a new EDM machine in its Edge-Series, the Edge2, to the U.S. manufacturing market. The machine was built for general precision machining applications. It provides accurate and reliable performance for standard die and mold components or contract manufacturing with a space-saving design.

The Edge2 is configured with a variety of productive, adaptive EDM technologies to efficiently handle many tasks while reducing machining time. SuperSpark4 dynamically optimizes the power discharge levels and jump cycles to reduce machining time up to 50 percent. Intelligent Expert System (IES) has advanced adaptive power to automatically stabilize EDM processes and enhance accuracy. MGH6 Control features a 15-inch touch-screen control system and simplified programming using the Makino Program Generator (MPG) function.

The Edge-Series sinker EDM machines feature an integral rise-and-fall work tank designed with unobstructed access to the work zone for setups, which Makino says greatly improves visibility to monitor the machining processes. The machine includes an eight-station automatic tool-changer (ATC) to extend unattended operation, and fully supported robotic automation for greater unattended operations. The machines are equipped with critical safety features, such as flame sensor and fire extinguisher systems, that are integrated and monitored by the machine control.

**Makino / 248-232-6200 / [makino.com](http://makino.com)**



### Mill Features Three-Axis Linear Motor Drive

**EDM Network** and Chmer EDM's HM4030L dust-free, graphite, high-speed mill features a three-axis linear motor drive that uses a Siemens 828D CNC control and drives and Chmer EDM linear motors. The optional dust-free oil shroud is unique to the Chmer high-speed mills and is offered on all three standard models HM43GT (graphite only), HM65GT and HM86GT (graphite and hard metal). These are all available in ball screw and linear motor drive configurations.

**EDM Network Inc. / 888-289-3367 / [edmnetwork.com](http://edmnetwork.com)**

### Electrodes Highlight Power of Machining with EDM Graphites

**Poco Graphite** has a product line that includes more than 100 graphite grades used in EDM, semiconductor and other industrial applications. The company says that the use of Poco EDM graphites increases the potential for optimum performance. Poco Graphite produces materials with consistent properties and performance for maximum EDM efficiency and overall cost reduction. The company showcases several machined electrodes of various material classifications to demonstrate the type of machining detail that can be achieved with Poco EDM materials.

**Poco Graphite, an Entegris Company / 877-762-6336 / [poco.com](http://poco.com)**



### It's Time to Make the Switch to Top Performing DS4 Ultra-Fine EDM Graphite

*"Our detailed engraving of molds and stamping dies demands an EDM electrode that provides excellent durability and delivers sharp corners and fine quality. We switched from the leading ultra-fine EDM graphite to Mersen's DS4 and it really performs... and saved us money."*

**— Bob Held  
Wisconsin Engraving**

Now, you've really got a choice in EDM graphite for your most challenging machining operations. Mersen's DS4, featuring the DarkStar ultra-fine carbon particle, is a proven winner that delivers unmatched EDM performance. It's time to start saving money in EDM... ask your EDM distributor for DS4!

**[edm.mersen.com](http://edm.mersen.com)**



**MERSEN**  
Shaping the future of EDM



ALOUETTE Tool Co  
info@alouettetool.com  
585-388-1240

**PULSAR**  
generator

5° Micro EDM control

**SX100-hpm**  
High precision drilling  
3D Micro EDM Milling



**SARIX**  
3D MICRO EDM MACHINING  
sarix.com

## EDM Machine Size is Paramount

By Cynthia Kustush

One issue that many machinists face is having a part that is bigger than the cutting envelope, which Extreme Wire EDM Services Inc. experienced with increasing frequency before its CUT P 1250 purchase. "It's an ongoing problem because no matter how big a machine we buy, there's always a larger job coming in. In some cases, we could only fit half of the block or part into the envelope. We would cut that end of it and then take it out and re-set it up for the other half to be cut, which eats up time and leaves a lot of room for mistakes and other hiccups," Bernt says. Setups can take half an hour or a full hour each, depending on the difficulty of the project. If a job needs to run overnight, only part of the workpiece can be cut, which leaves the balance sitting there until morning. The constant need for larger, more efficient machining capability pushed Extreme to approach GF Machining for a larger wire EDM solution.

"We began talking with our GF Machining representative about designing a machine that would give us the ability to take on much larger work. It took a few years of research and development before a large AgieCharmilles wire EDM machine was available that had the features we wanted and needed, like the ability to cut tapers to the full height of the machine, a hardened table and collision protection as standard," he says.

"Before we took delivery of the CUT P 1250, we had to turn away anything taller than 20 inches and anything longer than 43 inches. This is because the upper head on our next-largest wire EDM machine, an AgieCharmilles FI 640 CC, wouldn't go any higher than 20 inches, and its doors are only 43 inches wide," Bernt says. Sometimes, big workpieces were loaded into a machine with a forklift, which required setting the workpiece on rails above the table. "It wasn't much of a solution, though, because we were losing Z height from having to raise the part up onto the rails," he says. For example, if the rails are 5 inches high, the machinist could only fit a part that is 15 inches tall into the machine. **MMT**

### FOR MORE INFORMATION

Extreme Wire EDM Services / 616-249-3901 /  
extremewiredm.com

GF Machining Solutions / 847-913-5300 / gfms.com/us



Image courtesy of Matrix Tooling Inc.



COMPANY	Advertisers are listed in bold type.	See Ad					
			1	2	3	4	5
3D Systems Geomagic – Cary, NC, 919-474-0122			1	2	3	4	
<b>Alba Enterprises Inc. – Torrence, CA, 909-941-0600</b>	<b>57</b>		1				
Blum-Novotest Inc. – Erlanger, KY, 859-344-6789							
Brown & Sharpe – North Kingstown, RI, 401-886-2000					3	4	
CAE Services Corp. – Batavia, IL, 630-761-9898							
Capture 3D – Costa Mesa, CA, 714-546-7278					3	4	
CGI 3D Scanning – Eden Prairie, MN, 952-937-2005							
Direct Dimensions Inc. – Owings Mills, MD, 410-998-0880			1	2	3	4	
Exact Metrology Inc. – Cincinnati, OH, 866-722-2600					3	4	
FANUC America – Rochester Hills, MI, 248-377-7000							
Faro Technologies Inc. – Lake Mary, FL, 407-333-9911			1	2	3	4	
<b>Haimer USA – Villa Park, IL, 630-833-1500</b>	<b>71</b>		1				
<b>Heidenhain Corp. – Schaumburg, IL, 847-490-1191</b>	<b>81</b>			2			
Hexagon Manufacturing Intelligence – North Kingstown, RI, 401-886-2000					3	4	
IMS Company: Industrial Molding Supplies – Chagrin Falls, OH, 440-543-1615							5
Jesse Garant Metrology Center – Dearborn, MI, 313-996-5840							
Konica Minolta Sensing Americas Inc. – Ramsey, NJ, 201-236-4300			1	2	3	4	
Laser Design Inc. – Minneapolis, MN, 952-884-9648			1	2	3	4	
Mahr Federal Inc. – Providence, RI, 401-784-3100				2			
Marposs Corp. – Auburn Hills, MI, 248-370-0404							
Micro-Vu Corp. – Windsor, CA, 707-838-6272						4	
Mitutoyo America Corp. – Aurora, IL, 630-820-9666			1	2	3	4	
MouldPro – Rancho Cucamonga, CA, 909-941-0600			1				
NextEngine – Santa Monica, CA, 310-883-1888							
Nikon Metrology Inc. – Brighton, MI, 810-220-4360			1	2	3	4	
NT USA Corp. – Franklin, TN, 615-771-1899							
NyproMold Inc. – Clinton, MA, 978-365-4547							
Optical Gaging Products (OGP) – Rochester, NY, 585-544-0400						4	
Perceptron – Plymouth, MI, 734-414-6100			1		3	4	
PMI Industries Inc. – Rochester, NY, 585-464-8050							
Rego-Fix Tool Corp. – Whitestown, IN, 317-870-5959			1				
Renishaw Inc. – West Dundee, IL, 847-286-9953				2	3		
Resec Systems Inc. – Bergenfield, NJ, 800-394-6758						4	
Roland DGA Corp. – Irvine, CA, 949-727-2100							
Scansite – San Rafael, CA, 415-488-9500							
Starrett Co. – Athol, MA, 978-249-3551				2			
Verisurf Software Inc. – Anaheim, CA, 714-970-1683					3	4	
Vision Engineering Inc. – New Milford, CT, 860-355-3776						4	
Zeiss Industrial Metrology – Maple Grove, MN, 800-327-9735					3	4	
Zoller Inc. – Ann Arbor, MI, 734-332-4851			1			4	

For more supplier listings, go to [moldmakingtechnology.com/suppliers](http://moldmakingtechnology.com/suppliers).



<i>Gages</i>	<i>Inspection/Measurement Services</i>	<i>Laser Digitizing/Scanning Equipment</i>	<i>Leak Testers</i>	<i>Noncontact Measurement Systems</i>	<i>Optical Measuring Systems</i>	<i>Probes</i>	<i>Testing/Analysis Services</i>	<i>Vision Systems</i>	
6	7	8	9	10	11	12	13	14	WEBSITE
6	7	8		10	11	12	13	14	<a href="http://geomagic.com">geomagic.com</a>
						12			<a href="http://albaent.com">albaent.com</a>
6	7	8		10	11	12			<a href="http://blum-novotest.us">blum-novotest.us</a>
	7	8		10		12			<a href="http://hexagonmetrology.us">hexagonmetrology.us</a>
							13		<a href="http://caeservices.com">caeservices.com</a>
	7	8		10	11	12	13	14	<a href="http://capture3d.com">capture3d.com</a>
	7	8			11		13		<a href="http://CGI3DScanning.com">CGI3DScanning.com</a>
6	7	8		10	11	12	13	14	<a href="http://dirdim.com">dirdim.com</a>
	7	8		10	11	12	13	14	<a href="http://exactmetrology.com">exactmetrology.com</a>
								14	<a href="http://fanucrobotics.com">fanucrobotics.com</a>
6	7	8		10	11	12	13	14	<a href="http://faro.com">faro.com</a>
				10	11	12			<a href="http://haimer-usa.com">haimer-usa.com</a>
		8				12			<a href="http://heidenhain.us">heidenhain.us</a>
6	7	8		10	11				<a href="http://hexagonmetrology.us">hexagonmetrology.us</a>
6	7		9			12			<a href="http://imscompany.com">imscompany.com</a>
	7						13		<a href="http://jgarantmc.com">jgarantmc.com</a>
6	7	8		10	11	12	13	14	<a href="http://sensing.konicaminolta.us">sensing.konicaminolta.us</a>
6	7	8		10	11	12	13	14	<a href="http://laserdesign.com">laserdesign.com</a>
6				10	11	12			<a href="http://mahr.com">mahr.com</a>
6				10	11	12			<a href="http://marposs.com">marposs.com</a>
		8						14	<a href="http://microvu.com">microvu.com</a>
6	7	8		10	11	12	13	14	<a href="http://mitutoyo.com">mitutoyo.com</a>
						12			<a href="http://albaent.com">albaent.com</a>
		8		10					<a href="http://nextengine.com">nextengine.com</a>
6	7	8		10	11	12	13	14	<a href="http://nikonmetrology.com">nikonmetrology.com</a>
				10	11				<a href="http://nttoolusa.com">nttoolusa.com</a>
	7						13		<a href="http://nypromold.com">nypromold.com</a>
		8		10	11			14	<a href="http://ogpnet.com">ogpnet.com</a>
6	7	8		10	11	12	13	14	<a href="http://perceptron.com">perceptron.com</a>
	7						13		<a href="http://pmiindustries.com">pmiindustries.com</a>
									<a href="http://rego-fix.com">rego-fix.com</a>
		8		10	11	12			<a href="http://renishaw.com">renishaw.com</a>
		8						14	<a href="http://ressecsystems.com">ressecsystems.com</a>
		8							<a href="http://rolanddga.com">rolanddga.com</a>
	7								<a href="http://scansite.com">scansite.com</a>
6	7			10	11			14	<a href="http://starrett.com">starrett.com</a>
	7	8		10		12			<a href="http://verisurf.com">verisurf.com</a>
	7			10	11			14	<a href="http://visioneng.us">visioneng.us</a>
	7	8		10	11	12		14	<a href="http://zeiss.com/metrology">zeiss.com/metrology</a>
	7			10	11			14	<a href="http://zoller-usa.com">zoller-usa.com</a>

Image courtesy of Carl Zeiss Industrial Metrology LLC.



## Intex Tooling Technologies

Engineering • Product Development • Plastic Injection Tooling

### Intex Advantage



- **Customized mould building approach**
- **Personalized customer service**
- **Mould repairs & modifications**
- **Advanced mould flow capabilities**



### Technical Sales

Understand your project requirements upfront



### Power in Your Corner

Experience, knowledge, resources



### Complex Tooling Solutions

Two shot, multi cavity hotrunner moulds, part to print



### Project Management

Project management by experienced Mould makers from start to finish, capable of handling large tooling projects

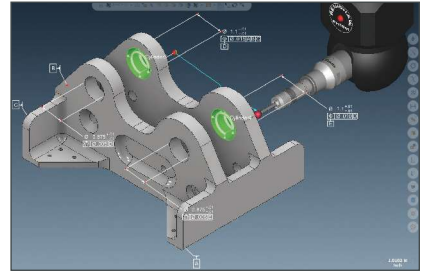


### Innovative Solution Providers

Engineering to manufacturing, we have successful solutions for every application

📍 230 Edward Street,  
Aurora, Ontario,  
Canada L4G 3S8

✉ sales@intextooling.ca  
🌐 www.intextooling.ca  
☎ +1 289-840-1095



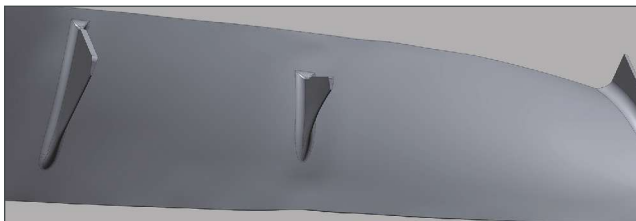
### Software Release Has CMM Feature for Widespread Compatibility

Universal CMM is a key option to the new Verisurf 2018 software as it ensures software compatibility with virtually all CNC coordinate measuring machines (CMMs). All CMMs, including previously closed legacy systems, are now open to Verisurf users. Universal CMM does not require controller upgrades or added software. The legacy CMM data is translated, enabling the operator to take full advantage of the Verisurf user interface, data management and reporting functionality. Verisurf says that this enables legacy CMMs to immediately become relevant as part of an overall measurement strategy.

Universal CMM communicates between Verisurf's standards-based I++ protocol and CMM controllers, enabling seamless interoperability between hardware and software. CMM operators avoid any risk associated with adopting new technology because with Universal CMM, they can continue to use legacy inspection programs if needed yet still enjoy the benefits of using Verisurf. Inspection programs created in Verisurf for a CMM can also be used on portable systems. Human and technology resource utilization improves substantially when all measuring devices can be operated with the same metrology software and skill sets; the result is a manufacturing 'enterprise-wide' measurement solution.

When shops run Verisurf 2018 Software with Universal CMM compatibility across all their measuring devices, newly added performance and productivity features of the software become available to everyone, including added programming shortcuts, Report Manager, an increase in I++ CMM probing speed and a Windows interface.

**Verisurf Software /**  
**888-713-7201 /**  
**verisurf.com**



### Airfoil Scanning Process Yields Parametric Model

**Exact Metrology Inc.** receives airfoils that customers provide (although the scan can happen at the customer's facility as well) for full documentation prior to scanning. Because of the reflective nature of the blades, a thin coating of Magnaflux spray is applied. When scanning the blade, Exact uses a fixture device that acts as an alignment constraint while holding the airfoil in place and enabling Exact technicians to capture data on the part without touching the part. The part is positioned on the rotating table or on a stationary marble top and scanned multiple times from multiple perspectives.

The targeting procedure uses an automated fitting of point clouds based on three positions on the part. The software then analyzes every point with overlap and runs a best fit algorithm to find the tightest and best alignment, resulting in a fully registered and organized point cloud.

The next step is to triangulate or mesh the points together. This mesh is further manipulated by reducing the points along flatter areas and retaining more triangles in areas of curvature and complexity.

In the surfacing process, a surface is basically draped over the mesh and smoothed to be reflective of the actual part. Once this task is completed and a watertight object is created, the model is ready to be exported in the client's desired format. The final deliverable is a parametric model. Unlike a solid model, the parametric model possesses relationships of all dimensions within the CAD.

**Exact Metrology Inc. / 513-831-6620 / [exactmetrology.com](http://exactmetrology.com)**

### Laser Trackers with Mobile Device Control Enable Portability

**Faro's** Vantage S and Vantage E laser trackers offer mobile device control and portability for efficiency and ease of use in part and assembly inspection, machine installation, metrology-guided alignment and reverse engineering. Also available is RemoteControls workflow, which is said to simplify operations such as target acquisition and accuracy checks and eliminate locking onto the laser beam with simple gestures.

**Faro Technologies Inc. / 800-736-0234 / [faro.com](http://faro.com)**

### Computer Tomographs Provide Flexibility with Speed, Large Measuring Ranges

**Zeiss Industrial Metrology** offers the Metrotom 800, which has an extended performance spectrum, and its Metrotom 1500. These computer tomographs are designed to address companies' need for flexibility as new materials and hybrid processes are developed, with features including speed and large measuring ranges.

**Zeiss Industrial Metrology / 800-327-9735 / [zeiss.com/metrology](http://zeiss.com/metrology)**



### Probe Filter Distinguishes False Triggering from Real Events

**Marposs** WRP60P and WRP45P high-accuracy touch probes with multichannel radio transmission are designed for high-accuracy, five-axis machining centers and milling machines. The WRP45P and WRP60P achieve part positioning, work-piece orientation and origin identification as well as accurate part measurement by automatically detecting the machine axis positions. Relying on piezo-electric technology, these probes provide measurement performance on 3D surfaces with repeatability within 0.25  $\mu\text{m}$ . The incorporation of a special filter helps to distinguish false-triggering events from actual touch events.

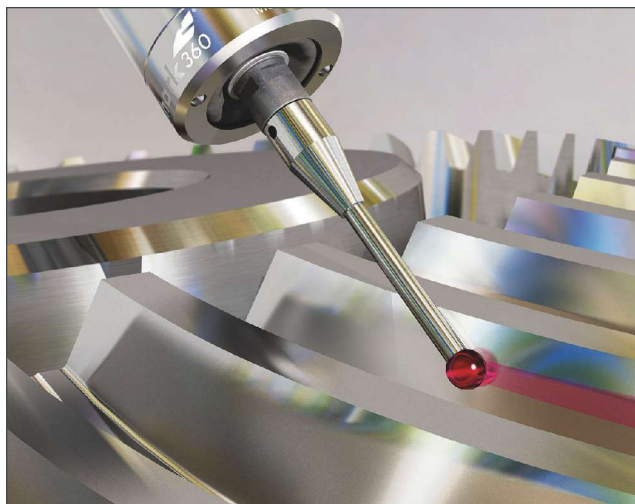
The probes operate with the WRI receiver and have a range of 15 m, making them well-suited for large machines. And, since the line of sight between the touch probe transmitter and receiver is not required, complex surfaces and deep-cavity parts can be inspected. Measurements may be performed at depths as great as 1 m because of the modular structure and extensions of the probe.

**Marposs Corp. / 888-627-7677 / [marposs.com](http://marposs.com)**

### Touch Probes Enhance Digital and Analogue Measuring in Machine Tools

**Prime Technical Services** offers Blum-Novotest solutions for digital and analogue measuring tasks in machine tools with Digilog brand touch probes. When recording the workpiece position, state and dimensions, the probe's analogue measurement produces higher quality results in the evaluation of surfaces and contours, the company says. The touch probes are designed for the extreme requirements of highly productive machining centers.

**Prime Technical Services Inc. / 216-210-7000 / [primetechnicalservices.com](http://primetechnicalservices.com)**





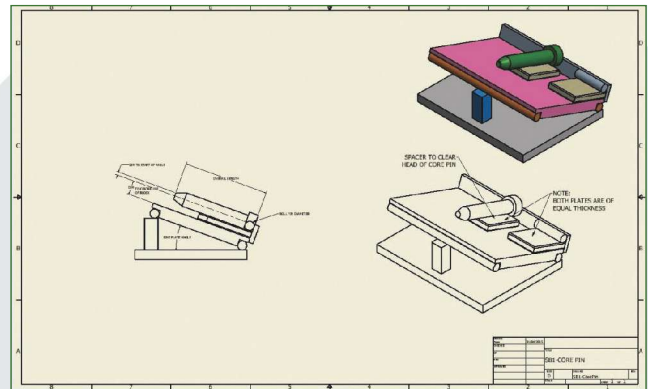
# Streamlining Roll Dimension Calculations

By Randy Hough

Today's complicated molds and shorter deadlines almost make the old cut-and-dry method of moldmaking obsolete. Now specialists manufacture components to 0.0001-inch tolerances that fit together perfectly during assembly, although hand fitting is still required to assemble a complicated injection mold. Whether electrical discharge machining, milling, turning or grinding, moldmakers need a precise method to inspect workpieces. This is where using roll dimensions to measure critical mold components, such as core pins, wedge blocks, shut-off surfaces and electrode details is still the most effective way to determine the exact size of a workpiece's angled detail.

Moldmakers need a surface plate, a sine plate, gage pins, a test indicator and a height gage or a gage block to use roll dimensions for moldmaking. An electronic height gage can replace the test indicator and gage blocks, if it is available. For accuracy, moldmakers need to ensure that all of these tools are calibrated and repeatable.

Manually generating roll dimensions is a time-consuming process, but today that process can be streamlined with a desktop, roll dimension calculator app that takes a few pieces of information and instantly calculates the required roll dimension without trigonometry. Roll dimension calculator apps are plug-and-play apps, but they do require some practice to fully utilize. They can save hours of calculations and simplify the machining process. Anyone who is familiar with Excel can easily input the formula and create a custom application to quickly calculate the math required for a roll dimension. The key is making sure that every department



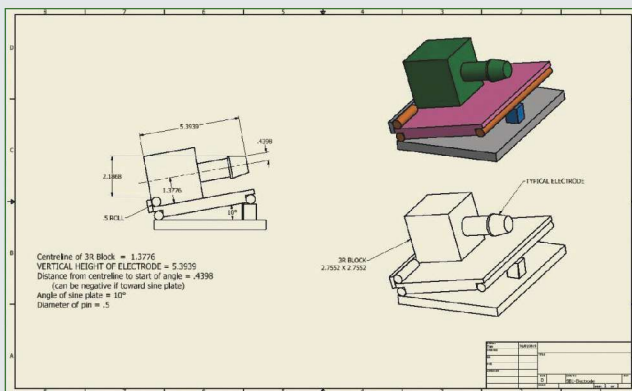
This is a typical setup for checking core pin details.

uses the same measurement process. All too often, the grinding department is using one method and the milling department another.

Follow these steps:

1. Gather the necessary information, and enter it into the calculator and press calculate.
2. Record this number.
3. Set up the sine plate on the appropriate angle.
4. Place the correct diameter roll pin (or gauge pin) in the corner of the sine plate against the back rail, as shown in the two examples. If a moldmaker is checking something such as a core pin with a head, he or she must use parallels in the setup. Moldmakers should be sure to use the same size parallel under the roll pin as is under the core pin.
5. Measure from the surface plate (or the bottom of the sine plate) to the top of the roll pin, and record.
6. Add the number from Step 2 to the number from Step 5. This is the target dimension.
7. Machine the component to the target dimension.

Some shops include roll dimensions in the CAD drawings, which is a great timesaver. However, what happens when a dimension changes during the machining process? This is particularly relevant when machining EDM electrodes, for example. The overall height is typically a random dimension and requires a modified roll dimension, if the height is different from the CAD drawing. With the roll dimension app, a moldmaker can obtain a new target dimension in seconds simply by changing the height in the app. [MMT](#)



This is a typical setup for checking EDM electrode details.

## CONTRIBUTOR

Randy Hough is president of Moldmaking Resource.

## FOR MORE INFORMATION

Moldmaking Resource / 603-667-0589  
 randy@moldmakingresource.com / moldmakingresource.com

# Mold Maintenance, Repair & Surface Treatment



Image courtesy of Millenium Tool Inc.



**Alliance Specialties and  
Laser Sales**  
265 Industrial Dr.  
Wauconda, IL 60084

Phone: 847-487-1945  
Fax: 847-487-2945  
Email: [info@alliancelasersales.com](mailto:info@alliancelasersales.com)

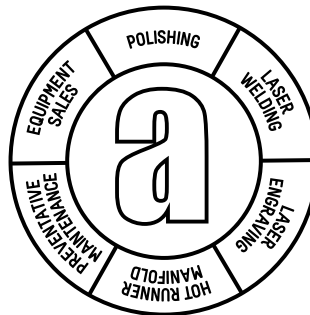
[alliancelasersales.com](http://alliancelasersales.com)

## PRODUCTS/SERVICES



### ID-1 Fiber Laser Welder

The ID-1 Fiber Laser Welding System is made in America by mold builders for mold builders. It features fiber laser technology which means lower power consumption, zero maintenance calls or the need for costly replacement lamps, no downtime and consistent power for over 70,000 continuous laser hours. Engineered with our customers needs in mind, the ID-1 can weld all tooling steels including aluminum, copper and other difficult to use materials.



### Complete Service Solution

The only complete service and maintenance company in the industry. Specializing in mold polishing, hot runner and manifold cleaning, preventative mold maintenance, laser welding and engraving. With Alliance you get the results you require when you need them, with professional insight in multiple areas of expertise. Because all services are done in one location, there is a lower chance of errors by eliminating multiple shipments and costly delays. #wedothattoo



### NGRV2 Laser Engraver

The NGRV2 laser engraving solution marries the technology of the past with that of the future, while maintaining affordability. It is engineered by retrofitting a Bridgeport-style machine with an IPG laser, U.S. sourced scan head, coupled with Alliance Laser software for design and implementation. It features a 36-square-inch field size, programmable x and y travel for a larger engraving surface area, automated rotary function, 750-pound weight capacity and easy-to-operate software.

## WEBSITE



We create long-lasting, successful relationships with our customers by listening and delivering solutions to their most difficult challenges. Simply put, we make a difference.

[alliancelasersales.com](http://alliancelasersales.com)

## PRODUCT CATEGORIES

- Engraving Services
- Finishing Services
- Mold Cleaning Services
- Mold Maintenance Repair
- Polishing Services
- Welding Services
- Laser Cutting Equipment
- Engraving Equipment
- Laser Welding Equipment
- Hot Runner Manifolds





# AMERICAN MADE FIBER LASER WELDING SYSTEM

BY MOLD MAKERS FOR MOLD MAKERS



## a1D.1

FIBER LASER WELDER

STARTING AT ONLY  
**\$1669.00/MONTH**

### THE ONLY LASER WELDING SYSTEM THAT CHECKS ALL THE BOXES.

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> 450 WATT FIBER LASER WITH ZERO MAINTENANCE COSTS | <input checked="" type="checkbox"/> GAS LENS MEANS FILTER, BETTER AIR FLOW & CLEANER WELDS |
| <input checked="" type="checkbox"/> LOWER OPERATING COSTS AND POWER CONSUMPTION      | <input checked="" type="checkbox"/> 220V SINGLE PHASE POWER REQUIREMENT                    |
| <input checked="" type="checkbox"/> CONSISTENT PRECISION LASER WELDING POWER         | <input checked="" type="checkbox"/> HEAD TILT AND ROTATION FOR ERGONOMICS                  |
| <input checked="" type="checkbox"/> X, Y, Z MOTORIZED TRAVEL FOR LARGE WORKING RANGE | <input checked="" type="checkbox"/> MOST VERSATILE AND AFFORDABLE SOLUTION                 |
| <input checked="" type="checkbox"/> MINIMAL HEAT OUTPUT MEANS NO CHILLER             | <input checked="" type="checkbox"/> <b>MADE IN THE U.S.A.</b>                              |



**ALLIANCE**  
SPECIALTIES AND LASER SALES

PHONE

847.487.1945

ADDRESS

265 INDUSTRIAL DR. WAUCONDA, IL 60084

MOLD  
SERVICES

[ALLIANCESPECIALTIESINC.COM](http://ALLIANCESPECIALTIESINC.COM)

MACHINE  
SALES

[ALLIANCELASERSALES.COM](http://ALLIANCELASERSALES.COM)



**LaserStar Technologies Corporation**  
One Industrial Court  
Riverside, RI 02915

Phone: 401-438-1500  
Fax: 866-516-3043

[laserstar.net](http://laserstar.net) / [laserstar.tv](http://laserstar.tv)

## PRODUCTS/SERVICES



### Open Workspace Laser Welding Workstations

Open Workspace Laser Welding Workstations are ideal for a variety of spot welding and seam welding applications, including plastic injection mold, dies and tooling repair; pressure-sensitive hermetic laser sealing; and other unique industrial applications.

Now available in nd:YAG (7800 LaserStar) and fiber (8800 FiberStar) systems and power levels (80-450 W) to meet a variety of application requirements. Designed & built in USA.



### FiberCube Laser Engraving System-3800 Series

The FiberCube® is a compact, turnkey laser marking, engraving and cutting system that offers the benefits of a non-contact, abrasion-resistant, permanent laser mark, engraving or cut onto almost any type of material. High-speed, high-precision FiberCube systems are ideal for a wide range of integration applications, including flat surfaces, advanced integrated XYZ motion for step-and-repeat laser marking, or coordinated rotary motion for seamlessly marking around a circumference. Designed & built in USA.

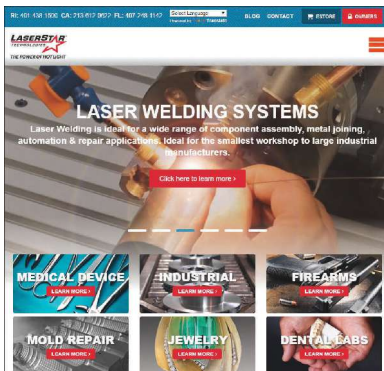


### Universal Jig Laser Welding Workstations

Universal Jig Laser Welding Workstations are ideal for a variety of spot welding and seam welding applications, including plastic injection mold, dies and tooling repair; pressure-sensitive hermetic laser sealing; and other unique industrial applications.

Now available in nd:YAG (7700 LaserStar) and fiber (7800-2 FiberStar) systems and power levels (80-450 W) to meet a variety of application requirements. Designed & built in USA.

## WEBSITE

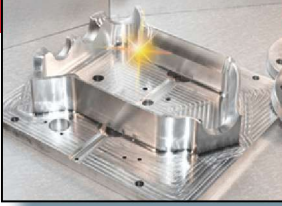


[laserstar.net](http://laserstar.net) / [laserstar.tv](http://laserstar.tv)

## PRODUCT CATEGORIES

- Mold Maintenance & Repair Services
- Laser Welding Equipment
- Surface Treatment
- Welding Services
- Laser Engraving
- Laser Cutting Equipment

# THE MOLD REPAIR WELDING EXPERTS



## New Fiber Laser Welding Systems Available!

Available in  
Multiple  
Configurations

Today's precision welding marketplace specializing in spot welding or seam welding applications have a wide range of new technologies available. LaserStar technology enhances their welding ability and provides the highest level of quality, craftsmanship and service to their clients compared to traditional welding methods. LaserStar's Manual Laser Welding Systems are ideal for a variety of common welding applications including: plastic injection mold, die and tooling repair, complex electronic components, high-precision industrial assemblies, pressure-sensitive hermetic laser sealing and other unique industrial welding applications.

Many materials can be laser welded including 300 and some 400 series stainless steel, mild steels, nickel and nickel alloys, aluminum and aluminum alloys, titanium, precious metal alloys (gold, silver and platinum), as well as many other materials.

LaserStar offers a variety of laser welding systems in both Nd:YAG and Fiber Laser Welding platforms, depending on your application requirements and are available in multiple power levels (80 Watt - 450 Watt).

**Contact the Laser Welding Experts today!**

**FIBERSTAR®**



**LASERSTAR®**  
TECHNOLOGIES

**WWW.LASERSTAR.NET**

### RHODE ISLAND

One Industrial Court  
Riverside, Rhode Island 02915 USA  
401-438-1500 • Fax: 866-516-3043  
Email: [sales@laserstar.net](mailto:sales@laserstar.net)

### FLORIDA

2453 Orlando Central Parkway  
Orlando, Florida 32809 USA  
407-248-1142 • Fax: 866-708-5274  
Email: [sales@laserstar.net](mailto:sales@laserstar.net)

### CALIFORNIA

20 East Foothill Boulevard, Suite 128  
Arcadia, California 91006 USA  
213-612-0622 • Fax: 866-347-0934  
Email: [sales@laserstar.net](mailto:sales@laserstar.net)

DESIGNED & BUILT IN **AMERICA**

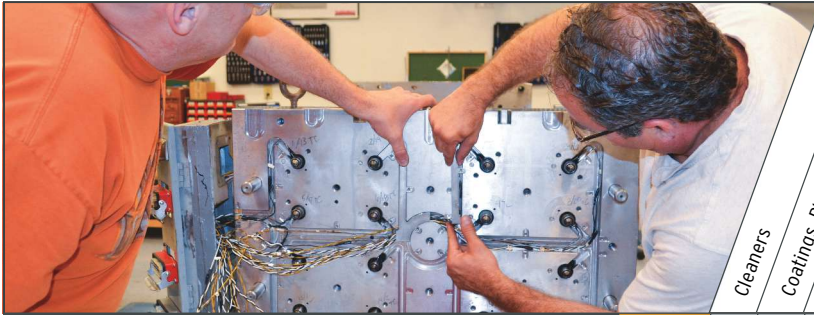
**FOLLOW LASERSTARTV**

FOLLOW US ON SOCIAL MEDIA





# Mold Maintenance, Repair & Surface Treatment



COMPANY	Advertisers are listed in bold type.	See Ad	<div> <div>Cleaners</div> <div>Coatings, Plating Services</div> <div>Coatings, Platings</div> <div>Dust Collectors</div> <div>Electroplating Services</div> <div>Engraving Equipment</div> <div>Engraving Services</div> <div>Finishers</div> <div>Finishing Services</div> <div>Heat Treating, Hardening Systems</div> <div>Heat Treating Services</div> <div>Laser Welding Equipment</div> <div>Manual Cleaning Equipment</div> <div>Mold Cleaning Svcs.</div> </div>													
			1	2	3	4	5	6	7	8	9	10	11	12	13	14
<b>Alba Enterprises Inc. – Torrence, CA, 909-941-0600</b>	<b>57</b>	<b>1</b>														
<b>Alpha Laser – US – Meadville, PA, 814-336-9000</b>	<b>117</b>							<b>6</b>						<b>12</b>		
<b>Alliance Specialties and Laser Sales Inc. – Wauconda, IL, 847-487-1945</b>	<b>111</b>		<b>2</b>											<b>12</b>	<b>14</b>	
Bales Metal Surface Solutions – Downers Grove, IL, 630-852-4665			2	3							9					
Blue Wave Ultrasonics Inc. – Davenport, IA, 563-322-0144		1														14
Boride Engineered Abrasives – Traverse City, MI, 231-929-2121		1														
Branson – Danbury, CT, 203-796-0400		1												12		14
Brush Research Manufacturing Co. Inc. – Los Angeles, CA, 323-261-2193										8						
Cold Jet LLC – Loveland, OH, 513-831-3211		1								8					13	14
<b>DME/Milacron – Madison Heights, MI, 248-398-6000</b>	<b>51</b>	<b>1</b>													<b>13</b>	<b>14</b>
Duro-Chrome Industries – Wauconda, IL, 847-487-2900			2					6	7		9	10		12		14
Dytron Corp. – Frazer, MI, 586-296-9600		1												12		
EAS Mold & Die Change Systems Inc. – Menomonee Falls, WI, 262-783-7955																
ENGIS Corp. – Wheeling, IL, 847-808-9400																
Extrude Hone – Irwin, PA, 724-863-5900											9					
Fisa North America – Elk Grove Village, IL, 847-299-8400		1														14
Gesswein & Co. – Bridgeport, CT, 203-366-5400		1			4		6							12		
Grieve Corp. The – Round Lake, IL, 847-546-8225													11			
High Tech Laser and Polishing – Lee's Summit, MO, 815-525-9800									7							
Ikonics Industrial Inkjet Solutions – Duluth, MN, 218-628-2217																
<b>LaserStar Technologies Corp. – Riverside, RI, 401-438-1500</b>	<b>113</b>							<b>6</b>						<b>12</b>		
Manner USA Inc. – Lawrenceville, GA, 770-449-1820			2						7		9	10				14
Mould Pro – Rancho Cucamonga, CA, 909-941-0600		1														
Nanoplas – Grandville, MI, 616-452-3907		1		3												
O.R. Laser – Elk Grove Village, IL, 847-593-5711														12		
Oerlikon Balzers Coating USA Inc. – Schaumburg, IL, 847-844-1753				3												
Omegasonics – Simi Valley, CA, 805-583-0875		1														
Phoenix Laser – Meadville, PA, 814-724-3666																
Polymer Cleaning Technology Inc. – Hillsborough, NJ, 908-281-0055		1														14
Precision Laser Technology – Rochester, NY, 585-458-6208									7							
Rocklin Manufacturing Co. – Sioux City, IA, 712-255-7957			2	3			6									
Rofin-Sinar Inc. – Plymouth, MI, 734-455-5400							6				10			12		
RUD-Chain Inc. – Hiawatha, IA, 319-294-0001																
Slide Products Inc. – Wheeling, IL, 847-541-7220		1														
<b>Smart Attend Inc. – Aurora, ON, Canada, 866-210-9630</b>	<b>79</b>															
SURFACETEC – Franklin Park, IL, 630-521-0001			2				5			8	9					14
Thermal-Tech Systems Inc. – West Chicago, IL, 630-639-5115		1														14
ToolingDocs – Wauconda, IL, 847-487-1000																
United Tool & Mold Inc. – Easley, SC, 864-859-8300														12		
Wisconsin Engraving / UNITEX – New Berlin, WI, 262-786-4521									7							

For more supplier listings, go to [moldmakingtechnology.com/suppliers](http://moldmakingtechnology.com/suppliers).

	Mold Dehumidification Systems	Mold Finishing Systems	Mold Maintenance & Repair Services	Mold Maintenance Training	Mold Sprays, Grease, Lubricants & Releases	Mold Transporters	Mold Treatment Systems	Mold/Die Spotting Presses	Polishing Equipment	Polishing Services	Replacement Parts	Retrofitting Services	Rust Preventatives	Safety Equipment	Sampling/Mold Tryout Services	Scrap Recycling Equipment	Scrapers	Storage Equipment/Services	Texturing Equipment/Services	Texturing Equipment	TIG Welding Services	Ultrasonic Equipment	Welding Services	
	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	WEBSITE
					19											31								<a href="http://albaent.com">albaent.com</a>
			17															33						37 <a href="http://alphalaser-us.com">alphalaser-us.com</a>
	16	17								24														37 <a href="http://alliancelasersales.com">alliancelasersales.com</a>
					19					24			27											37 <a href="http://balesusa.com">balesusa.com</a>
													27									36		<a href="http://bluewaveinc.com">bluewaveinc.com</a>
					19				23	24			27									36	37	<a href="http://bransonultrasonics.com">bransonultrasonics.com</a>
	16								23															<a href="http://brushresearch.com">brushresearch.com</a>
																								<a href="http://coldjet.com">coldjet.com</a>
	15	16	17		19	20			23		25		27	28			31	32					36	<a href="http://dme.net">dme.net</a>
			17							24														37 <a href="http://duro-chrome.com">duro-chrome.com</a>
			17																		35			<a href="http://dytronicorp.com">dytronicorp.com</a>
					20													32						<a href="http://easchangesystems.com">easchangesystems.com</a>
									23												35			<a href="http://moldpolishing.com">moldpolishing.com</a>
	16									24														<a href="http://extrudhone.com">extrudhone.com</a>
													27									36		<a href="http://fisa.com">fisa.com</a>
					19				23				27									36		<a href="http://gesswein.com">gesswein.com</a>
																								<a href="http://grievecorp.com">grievecorp.com</a>
		17							23	24										34				37 <a href="http://htlaser.com">htlaser.com</a>
																			33	34				<a href="http://ikonicsiis.com">ikonicsiis.com</a>
																								<a href="http://laserstar.net">laserstar.net</a>
		17								24		26			29					34				37 <a href="http://m-form.com">m-form.com</a>
					19												31							<a href="http://albaent.com">albaent.com</a>
					19								27											<a href="http://nanomoldcoating.com">nanomoldcoating.com</a>
		17																						37 <a href="http://or-laser.com">or-laser.com</a>
																								<a href="http://oerlikon.com/balzers/us">oerlikon.com/balzers/us</a>
																						36		<a href="http://omegasonics.com">omegasonics.com</a>
																								<a href="http://phoenixlaser.com">phoenixlaser.com</a>
																								<a href="http://polymercleaning.com">polymercleaning.com</a>
																				34				37 <a href="http://precisionlasertech.com">precisionlasertech.com</a>
																			33					37 <a href="http://rocklinmanufacturingco.com">rocklinmanufacturingco.com</a>
																								<a href="http://rofin.com">rofin.com</a>
														28										<a href="http://rudchain.com">rudchain.com</a>
					19								27											<a href="http://slideproducts.com">slideproducts.com</a>
														28										<a href="http://smartattend.com">smartattend.com</a>
		17								24		26												<a href="http://surfaceteccorp.com">surfaceteccorp.com</a>
		17		19						24		26	27									35		37 <a href="http://thermal-tech.com">thermal-tech.com</a>
		17	18																					<a href="http://toolingdocs.com">toolingdocs.com</a>
		17					22					26								34				37 <a href="http://utminc.com">utminc.com</a>
		17								24										34				<a href="http://wi-engraving.com">wi-engraving.com</a>

Image courtesy of MoldTrax.



### Pulsed Fiber Laser Welding System

The LMF70-HP from **Amada Miyachi America, Inc.** is the newest addition to its LMF Series of lasers. The 70-watt LMF70-HP is designed to be ideal for weld-

ing small components and thin metals up to 0.01-inch (0.25 mm) thick. Amada Miyachi says it is particularly well suited for welding battery tabs to cans (two thin sheets of metal), but can also weld thin wires (thermocouples, guidewires, etc.). In addition to welding, the unit is capable of engraving, deep engraving and cutting of metal, plastic welding and general purpose, high speed marking.

The laser is offered as an original equipment manufacturer product with galvo scanning beam delivery and controller or integrated into the LMWS platform, a CDRH Class 1 laser workstation.

The system is designed with multiple integration options to suit stand-alone operation, full production automation, as well as low volume prototype development. The air-cooled, sealed industrial package has been designed for operation in harsh environments and comes with powerful control software. The unit complies with IEC13849-1 category 3 Performance Level d (PL d) safety circuitry with proper integration.

**Amada Miyachi America Inc. /**  
**626-303-5676 / [amadamiyachi.com](http://amadamiyachi.com)**

### Mold Care Products Have No Chlorinated Solvents

**Slide Products** says that it has eliminated all chlorinated solvents from its line of mold care and processing products, which come in a variety of formulations, including NSF, food-approved, paintable, non-paintable and medical. Slide also purged compounds for resins and processing applications. The company's NSF products include mold releases, mold cleaners, rust preventives and lubricants. Product titles are EconoMist, a light-duty mold release; IPA Isopropyl Alcohol cleaner, a kosher-approved solvent; Mold Cleaner Plus Degreaser, which removes build-up on mold surfaces; On/Cycle mold cleaner, a multi-purpose equipment cleaner; NEXGEN, a biodegradable cleaner; White Rhino rust preventive, a fingerprint acid neutralizer; Super Grease aerosol, a dielectric lubricant; and its counterpart, Super Grease non-aerosol.

**Slide Products Inc. / 800-323-6433 / [slideproducts.com](http://slideproducts.com)**

### Spray Washer Suitable for Large Molds

**Ransohoff**, a division of Cleaning Technologies Group LLC, has introduced its Mega Jet Pressure Blast, an economical, manual, high-pressure spray washer for very large, heavy parts where floor space comes at a premium. The Mega Jet Pressure Blast is one of the products in the Ransohoff LeanJet line of cabinet parts washers. The parts can be loaded with an overhead hoist crane onto a rotating table. Cleaning Technologies Group LLC says that the delivery system is an innovative solution that has proven to be ideal for intricate details on machined parts. The Mega Jet Pressure Blast is contained in stainless-steel housing. Its cleaning process provides high pressure spray that is manipulated by hand to the various geometries of the parts. The washer runs 3-4 cycles per hour. The washer comes with compressed air jets for drying, along with a programmable controller and an HMI screen. Some typical applications for this machine include large gears, large aviation components, large molds and large dunnage parts.

**Cleaning Technologies Group Ransohoff / 877-933-8278 / [ctgclean.com](http://ctgclean.com)**



### Cleaner Combines Dry Ice Pellet Production and Dry Ice Blasting

**Cold Jet, LLC** offers the Combi 120H, an automated system that combines dry ice pellet production with dry ice blasting. The system integrates seamlessly into existing production lines for surface preparation of parts prior to painting or bonding or for automated deflashing and deburring solutions.

The system connects into existing plant-monitoring systems and can be monitored remotely for any field service requirements. Cold Jet says that the Combi 120H eliminates the need for cleaning parts with aqueous methods that require part drying and water treatment or containment systems. The system runs using a collaborative Universal Robotics Model 10 robot.

This automated solution makes it possible for dry ice blasting equipment to be integrated within a production line via a robotic system. The automated system is equipped with a pelletizer unit that guarantees continuous cleaning with freshly made dry ice. The system is placed in a sound-reduction chamber that controls the noise and provides for the extraction and filtering of air.

**Cold Jet LLC / 513-831-3211 / [coldjet.com](http://coldjet.com)**





### Small Mold Splitter/Tipper Has Wireless Remote Control for Safety

**Wee-Split Inc.**'s all-electric, patent pending, mold splitter and mold tipper is designed with the smaller mold in mind. It stands 54" tall on leveling pads, weighs less than 1,000 lbs, and is fully controlled and safely operated with a handheld, wireless remote control. It is easy to move the machine around the shop with just a pallet jack. It has a 2,000 lb capacity for splitting and tipping. It opens to 35.5" and closes to less than 5". Each platen has over 2,400 lbs of holding power that are supplied by electromagnets to provide additional safety when securing the mold.

**Wee-Split Inc. / 815-575-4337 / [wee-split.com](http://wee-split.com)**

### Coating Has Diamond Particles for Added Toughness

**Bales Metal Surface Solutions** provides coatings and finishes to protect from wear, abrasion and corrosion. Its coatings can increase hardness for better durability and lower the coefficient of friction for better lubricity. Its diamond polishing can achieve finishes from D3 to A1. The company's newest coating, Diamond EN, has the uniform corrosion resistance of electroless nickel with the added toughness of diamond particles for 57RC.

**Bales Metal Surface Solutions / 800-215-6653 / [balesusa.com](http://balesusa.com)**

### Diamond Files Enhance Mold Polishing Tool Lineup

**Boride Engineered Abrasives** adds a variety of diamond files to its product line which includes Diamond Needle Files, Extra Slim Needle Files, Contact Files, DH and DHM Files.

According to the company, Needle Files and Extra Slim Needle Files are critical grinding tools for mold and die shops and extruders while DH and DHM Files are specially designed tapered files for the aluminum extrusion and plastics industries with the primary application of filing inside slots and grooves. Contact Files offer solutions for the mold and die, electronic and automotive industries. The company says that these files are meant to complement its other mold polishing tools and equipment.

**Boride Engineered Abrasives / 800-662-0336 / [borideabrasives.com](http://borideabrasives.com)**



**A COMPLETE STABLE OF LASERS FOR MOLD REPAIR**



Our lasers are the most flexible, efficient, effective, reliable, and simply the best systems on the market.

We are willing to back this up with live demos, no matter the application.

**COME SEE US AT :**

**IMTS 2018**  
SEPTEMBER 10-15 | CHICAGO, IL

**FABTECH 2018**  
NOVEMBER 6-8 | ATLANTA, GA

CALL US NOW  
**814-336-9000**

**Indisputably the best lasers on the market.**

**REQUEST DEMO | [SALES@ALPHALASER-US.COM](mailto:SALES@ALPHALASER-US.COM)**





Access the related video under the Videos tab at *MMT* online.

## Evaluating Mold Releases

By Michael Muth

Establishing a baseline for productivity and identifying the number of achievable cycles before mold release reapplication should be done before evaluating any new or alternative release agents. For example, if you are spraying every sixth shot on part X, see if you can do it every seventh or eighth shot. Each additional cycle without spraying can add up to a significant savings.

Here are some essential steps to follow when selecting an agent to eliminate issues that slow down cycle time.

**Do the test using your toughest part.** If that looks good, try it on other parts that were molded with a variety of resins.

**Eliminate debris.** Be certain to thoroughly clean the mold and remove all traces of the old mold release. Cleaning the mold before each test helps ensure that your test results are accurate and reflect the performance of that specific release agent.

**Be consistent.** Be sure that molding conditions do not change during the trial. It is best to set up and make evaluations of all releases during one press operation session, because each operator has a molding style and pattern to

Often, a more expensive can of release agent can provide far greater performance in the number of parts released, so much so that the cost per released part can be far lower when using a more expensive yet better-performing release agent.

his or her work, as does a molding machine and mold. This can impact release agent performance and molding results.

**Test to see how many parts can be released with the current mold release and set up.** Then clean the mold to ensure a fresh molding environment. Apply the new test mold release based on the directions, and run the mold until parts begin to hang up and you need another coating of the test release.

Repeat this process multiple times to ensure that you get a number of test results to compare for consistency. Try to ensure that the only factor being altered is the mold release. Use the same operator, resin, mold temperatures and pressures so these factors do not affect the results.

**Use an entire can.** After picking the most effective release(s), run the test with one full can and record the

number of parts that are molded. Mold release performance can change, both positively and negatively, as more of the release product is used on the mold cavity. Using too much release can lead to buildup on the mold surface and negatively affect part release, and using too little will cause the parts to prematurely stick.

**Determine the cost effectiveness of the release.** Calculate the cost per part released by dividing the number of parts that Release Product A molds by the cost per can. Then do this calculation with

Release Product B. This provides an accurate measurement of the cost per released part for the mold release purchase. Often, a more expensive can of release agent can provide far greater performance in the number of parts released, so much so that the cost per released part can be far lower when using a more expensive yet better-performing release agent.

**Select based on productivity.** It is important not to make evaluations simply based on the product price. A far more important measure is the number of parts the product can release. The real item of interest is the maximum number of parts that can be molded for the amount of money spent on release. Now that a release evaluation establishes the key facts, you can calculate the most appropriate release for a particular resin and part. [MMT](#)

If you are spraying every sixth shot on part X, see if you can do it every seventh or eighth shot. Each additional cycle without spraying can add up to a significant savings.

### CONTRIBUTOR

Michael Muth is president of Slide Products.

### FOR MORE INFORMATION

Slide Products / 800-323-6433  
mmuth@slideproducts.com / slideproducts.com

## ONLINE



## Technology Solutions and Business Strategies at your fingertips!

- Technical Articles
- New Products
- Case Studies
- Tips
- Video Projects
- Daily Blog Posts
- Video Content
- Moldmaking Business Index
- End Market Reports
- Industry News
- Supplier Database

### EASY ACCESS TO INFORMATION

Optimized search and simple navigation make it easy to research the products, processes and suppliers you need.

### EXPANDED COVERAGE

including editorial from *Modern Machine Shop*, *Plastics Technology* and more.

Find solutions today at:  
**moldmakingtechnology.com**

**MoldMaking**  
TECHNOLOGY®



## ADVERTISE HERE!

To advertise in the Marketplace section of *MoldMaking Technology* contact Chris Brock at (440) 639-2311 or [cbrock@gardnerweb.com](mailto:cbrock@gardnerweb.com).

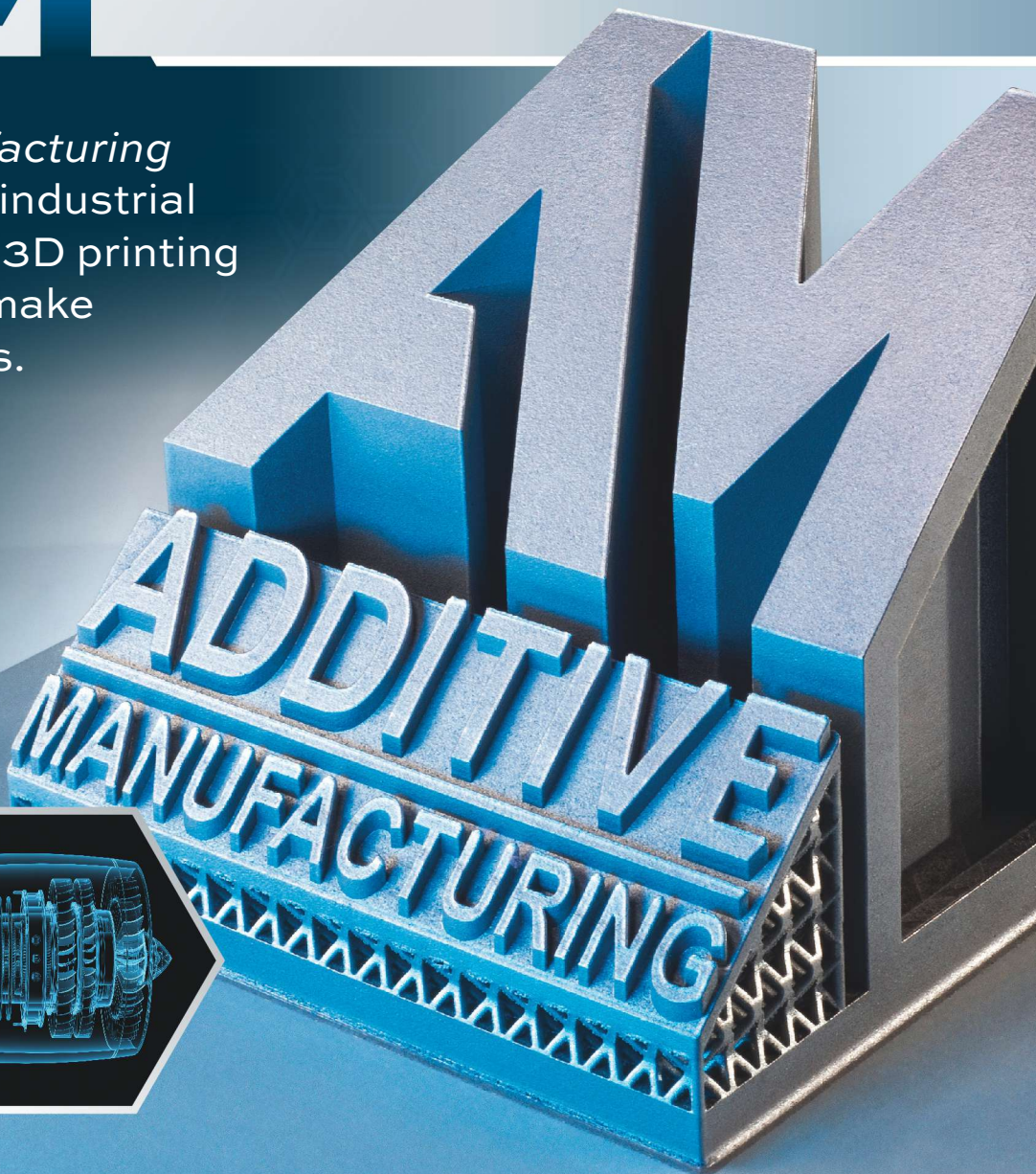
### ADVERTISERS' INDEX

AGATHON Machine Tools, Inc. ....	59	LaserStar Technologies Corporation. ....	113
ALBA Enterprises Inc. ....	57	Mastip, Inc. ....	39
Alliance Laser Sales. ....	111	Matsuura Machinery USA ....	15
Alouette Tool Co. Ltd. ....	102	MC Machinery Systems, Inc. ....	97
Alpha Laser US ....	117	Mersen ....	101
American Mold Builders Association ....	34	Milacron/DME Company. ....	51
AMT - The Association For Manufacturing Technology ....	4	Milacron/Mold-Masters Limited ....	Back Cover
Buderus Edelstahl GmbH. ....	30	Mold Base Industries, Inc. ....	56
CGS North America Inc. ....	10	Okamoto Corp. ....	87
CGTech ....	9	PCS Company ....	59
Chetocorporation S.A. ....	85	Practical Machinist, LLC ....	74
Crystallume ....	70	Progressive Components ....	Inside Cover
CUMSA USA LLC ....	58	Seco Tools Inc. ....	68, 69
Edro Engineering ....	25	Smart Attend. ....	79
EOS North America. ....	17	Sodick Inc. ....	100
EROWA Technology, Inc. ....	89	Takumi USA ....	1
Haimer USA ....	71	TARUS Products Inc. ....	77
Hasco America, Inc. ....	49	Vero Software ....	8
Heidenhain Corp. ....	81	Walter USA, LLC. ....	65
Hurco North America. ....	1		
INCOE Corporation ....	37		
International Mold Steel ....	27		
Intex Tooling Technologies. ....	106		
Iscar Metals, Inc. ....	63		
Kitamura Machinery of USA Inc. ....	83		



# Additive + Production

*Additive Manufacturing* focuses on the industrial applications of 3D printing technology to make functional parts.



Get practical, applications-based info on the machines, materials and methodologies being used to grow end-use tools and components.

PRINT | ONLINE | EMAIL | CONFERENCE

[additivemanufacturing.media](http://additivemanufacturing.media)

**AM**<sup>®</sup>  
**ADDITIVE**  
**MANUFACTURING**

A PROPERTY OF:







**Accu-Valve**  
Precision gate geometry  
and pin guidance technology.  
Highest gate quality for  
millions of cycles.

## Master<sup>®</sup> series

# The Hot Runner Platform that Exceeds All Expectations



Regardless of your molding application, Mold-Masters engineers a range of hot runner solutions focused on solving industry challenges that are proven to deliver precision, control, reliability and results. See how the Master-Series hot runner can solve your next molding challenge.

Collaborate with us on your next system.

[milacron.com/master-series](http://milacron.com/master-series)

